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# The Canadian Practitioner and Review.

VOL. XXVIII. TORONTO, NOVEMBER, 1903.

NO. 11

## UNIVERSITY OF TORONTO FACULTY OF MEDICINE.

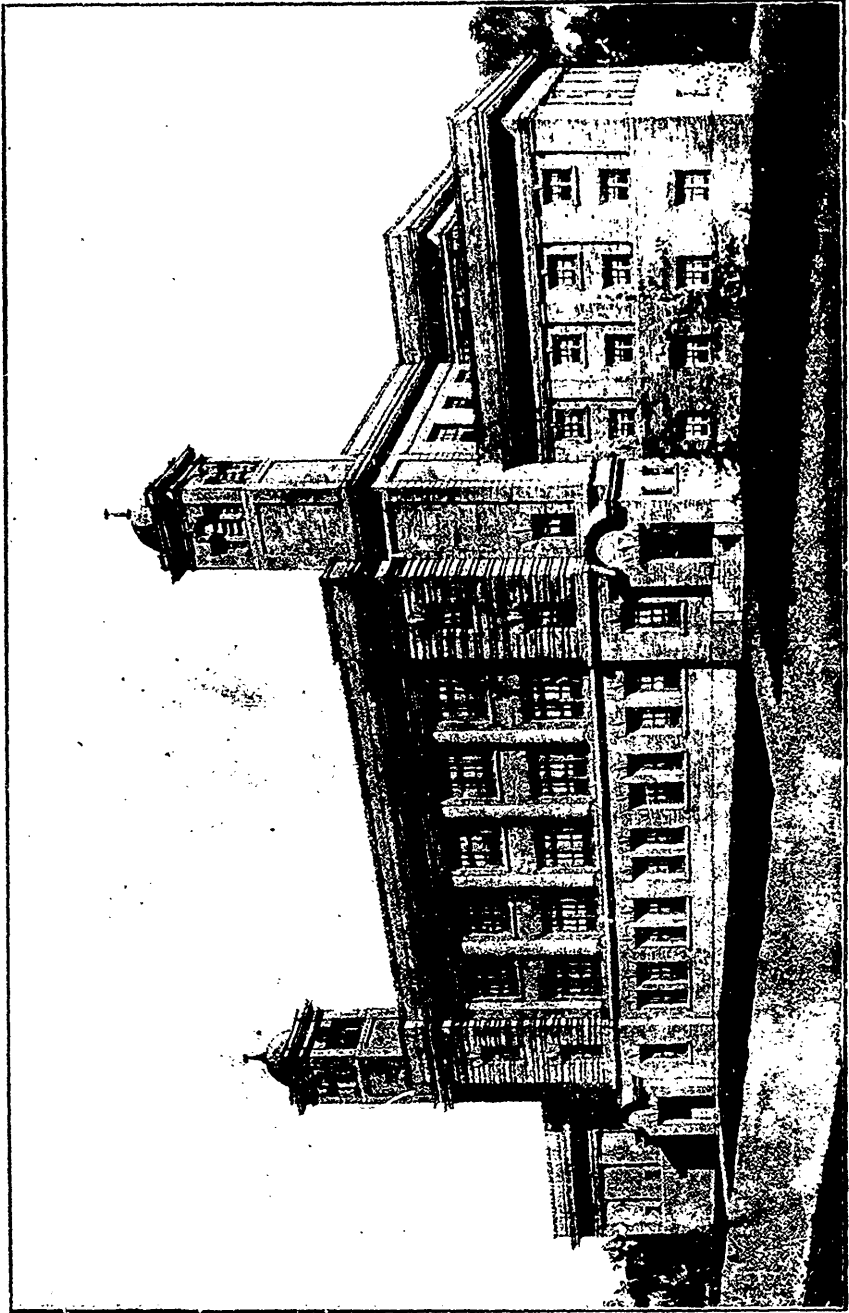
### Opening Exercises of the First Session after the Amalgamation of the Medical Faculties of the Universities of Toronto and Trinity College, and Ceremonies in connection with the New Building.

(Medical Faculties of Toronto and Trinity Universities.)

The formal opening of the Laboratories which have recently been erected by the University of Toronto in the Queen's Park took place on October 1st, when Professor Sherrington of the University of Liverpool, England, delivered an inaugural address, and the buildings were formally declared opened by President Loudon.

There were other distinguished guests present, of whom may be mentioned His Honour, the Lieut.-Governor, the Hon. Mr. Harcourt, Minister of Education of Ontario, Professors Welch and Osler of Johns Hopkins University, Professor Keen of Philadelphia, Professor Porter of Harvard, Professor Chittenden of Yale, Professors Roddick and Adami of McGill, Professor Barker of Chicago, Professor McMurrich of the University of Michigan, Professor Abbott of Philadelphia, Professor Goldwin Smith, Mr. Alfred Mosely and the Hon. Dr. Sullivan.

The various functions connected with the opening ceremonies included, in addition to the inaugural address by Professor Sherrington, addresses by the other guests of the University. Professor Sherrington's address was delivered on the afternoon of October 1st, the Dean of the Faculty of Medicine, Dr. Reeve, having previously entertained the visitors at luncheon. On the evening of the same day Professor Osler delivered the opening lecture of the session to the students. On the morning of October 2nd addresses were delivered to the students in the new lecture theatres; in the afternoon a special University Convocation was held for the purpose of conferring honorary degrees, and at this function the degree of LL.D. was conferred upon Professor Keen, Professor Welch, Professor Osler, Professor



THE NEW MEDICAL BUILDING.

Chittenden, Professor Sherrington, and, *in absentia*, upon Professor Bowditch of Harvard. In the evening a dinner was tendered by the Dean and members of the Faculty of Medicine to their guests.

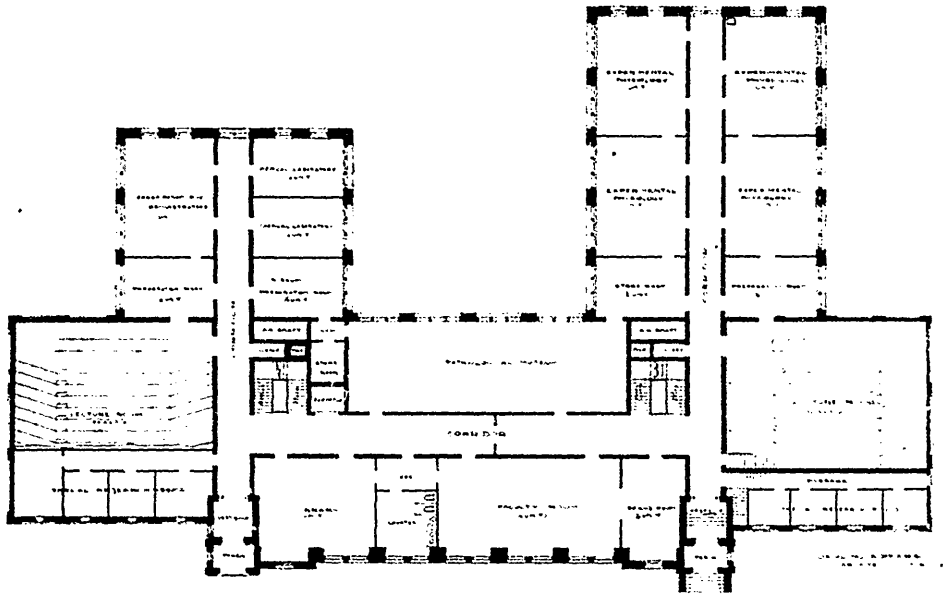
#### THE NEW MEDICAL BUILDINGS OF THE UNIVERSITY OF TORONTO.

The new buildings for the department of physiology and pathology of the University of Toronto, are the first to exemplify the unit system of laboratory construction proposed by Professor Minot, of Harvard University, and consequently an account of them may be acceptable to all who are interested in laboratory administration and construction.

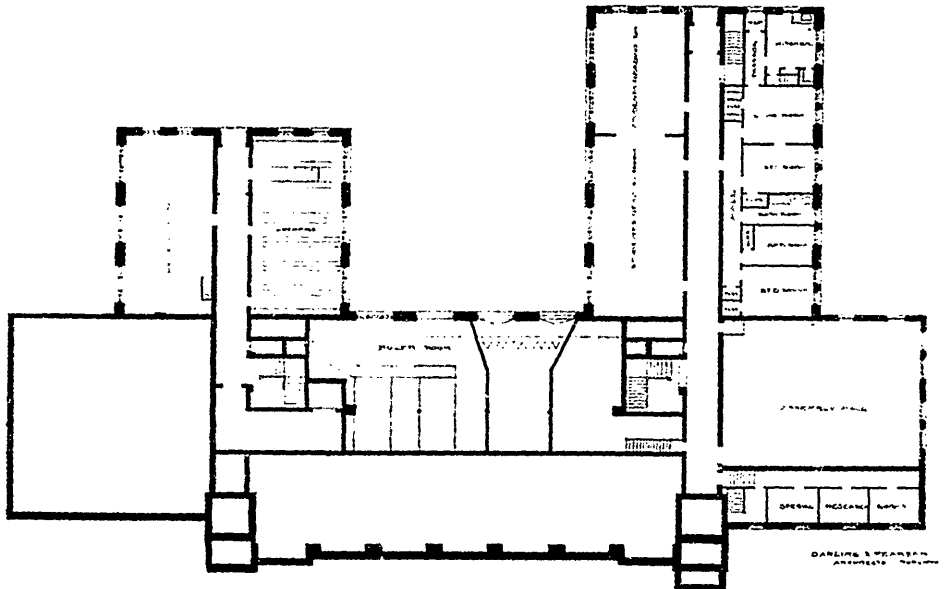
The main features of the unit system, as outlined by Professor Minot, are all comprehended in the character of the laboratory "unit" room. This must, first of all, be no larger than is required to accommodate readily the maximum number of students whose practical instruction a single demonstrator can efficiently guide and control. It must also be of such dimensions that it can, at need, be made to serve as a museum, a library or reading room, or a small lecture room. The units, further, must be so placed with respect to one another, preferably in pairs or series, that, by the removal of the partitions separating them, rooms of larger dimensions may, when desired, be obtained at a minimum cost and in a short time. The dimensions of such a unit, as determined by Professor Minot, are 23 x 30 feet, and this room will accommodate twenty-four working students, which number, experience shows, is the largest that should be under the supervision of a single class demonstrator.

The system, as may be seen, offers the great advantage of elasticity, for a laboratory director may enlarge or contract, at will, or according to the needs of the occasion, the accommodation required for a class, a feature that does not obtain in any other system of laboratory construction. It has also other and not less important advantages. The cost of construction is less than in any other system, it adequately provides for the all-important question of light, and it permits of subsequent extensions and additions without disturbance of the original arrangements. It is also to be noted that the system provides for the formation of smaller rooms through the division of the unit.

All these points were thoroughly canvassed when, nearly two years ago, the medical faculty of the University of Toronto took up the question of erecting new laboratory quarters for physiology, physiological chemistry, pathology and public health, and discussed the various plans of construction offered

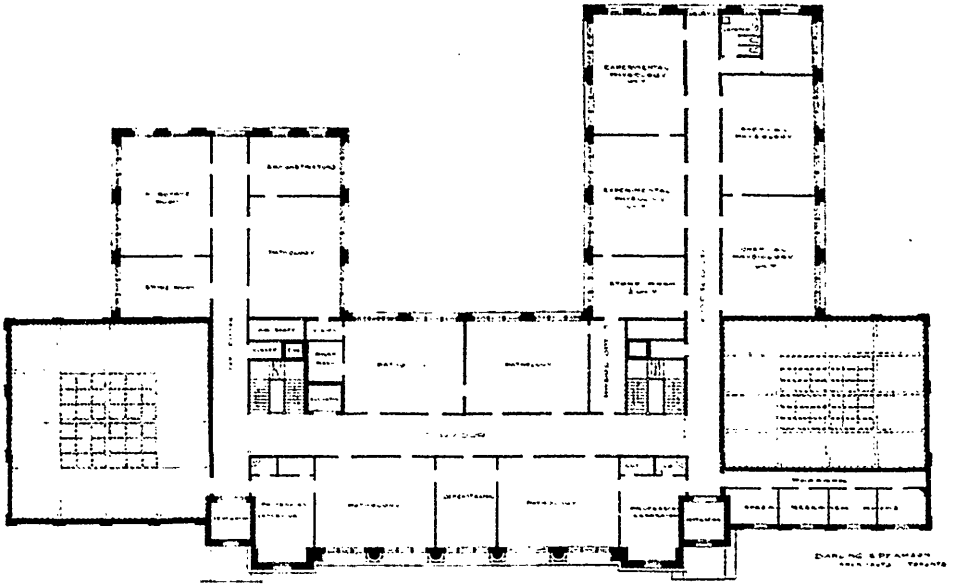


MEDICAL BUILDING TORONTO UNIVERSITY  
GROUND FLOOR PLAN



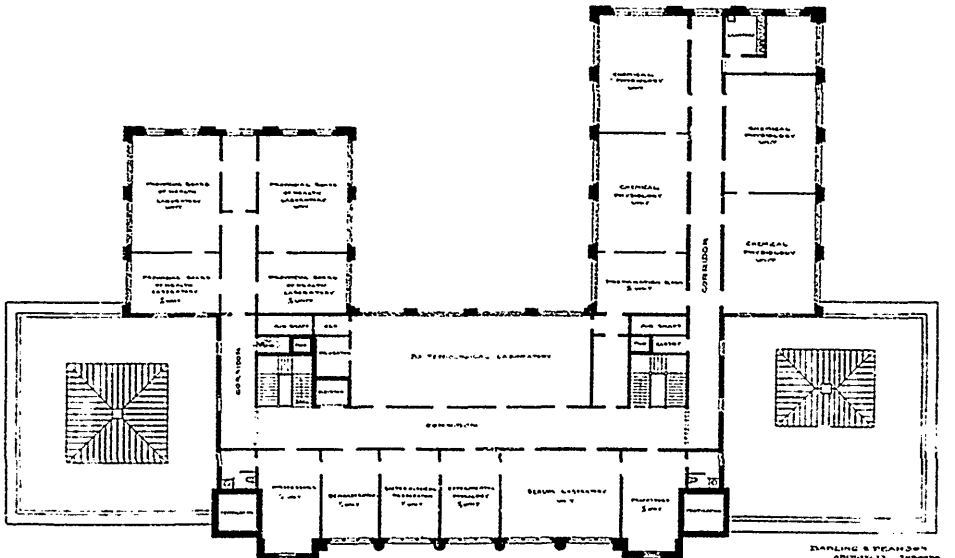
MEDICAL BUILDING TORONTO UNIVERSITY  
BASEMENT PLAN

DARLING & PEARMAN  
ARCHITECTS TORONTO



MEDICAL BUILDING TORONTO UNIVERSITY

FIRST FLOOR PLAN



MEDICAL BUILDING TORONTO UNIVERSITY

SECOND FLOOR PLAN


The result was that the faculty unanimously recommended the adoption of the unit system for the proposed laboratories. The university trustees accepted the recommendation, and construction, begun in August last year, has progressed so rapidly that the buildings are finished and the equipment is now completed. The whole is, therefore, at the moment in such a stage as to permit one to say to what extent the object sought has been attained.

Architecturally, so far as the exterior is concerned, the utmost has been done, considering the difficulties that the enormous window space interposed. The appearance of the buildings, however, is, on the whole, very acceptable.

The interior, on the other hand, is very satisfactory. The accommodation it furnishes, as well as the conveniences of arrangement it offers, is sufficient to demonstrate the great advantages of the unit system over the common, more or less haphazard, system of laboratory construction everywhere illustrated.

The buildings are to house physiology, physiological chemistry, pathology and public health. The wing to the right, as shown in the accompanying diagrams, accommodates physiology and physiological chemistry and contains, in addition to the lecture theaters, twelve units and eight half units. The other departments occupy the main portion and the left wing, which contains sixteen units and fourteen half units.

In the construction of these buildings according to the unit system special local conditions had to be considered, and, further, the possibility of their extension in a few years was a factor in determining the arrangement as a whole. This necessitated important modifications in the disposition of the units as suggested in Professor Minot's later paper.

What these modifications are may be gathered from examination of the copies of the plans of the various floors of the buildings. The latter are in the form of the figure , the lecture theaters forming wing-like extensions at the angles of the figure. This latter arrangement was adopted in order to permit the lecture rooms to be lighted from their roofs, and at the same time to avoid interfering with the lights for the units. An additional advantage resulted from the arrangement is that the corridors, which are centrally placed, permit ready access to the lecture theaters and units from the entrances and from the students' quarters.

The units are, for the most part, grouped in pairs on each side of the corridors on the various floors. The walls of the corridors are of brick, but those which separate the units from each other are of wood and plaster only, and they can consequently be removed in a few hours without leaving traces of

their disturbance other than those on the line of the fresh plaster added. Each unit communicates directly with its neighbor by a door, and, further, has two doors opening into the corridors. It is thus possible at any time to form two rooms out of a unit, each of which will communicate directly with the corridor.

The window space devoted to each unit is ample. It is, in fact, so large absolutely as the supporting capacity of the outer wall will safely permit. The window area is 242 square feet, while the outer wall of each unit measures 420 square feet. The window area is, therefore, nearly three-fifths that of the outer wall. The terminal units of the wings have additional window space in their second outer wall, and, of course, in these the lighting is brilliant. In all the other units, however, the lighting is, as already said, ample.

The corridors are lighted from the hall doors, from the large windows at the ends of the wings and from the wells over the stairway. An examination of the building itself shows that this provides sufficient illumination with diffuse daylight, and even on very dull days it is enough for all, except, perhaps, the main corridor extending between the two lecture theaters on the ground floor, and then resort may be had to electric lighting.

The two stairways are lighted from the roof, and are so placed as to permit the student reaching any floor directly from the basement, where the reading and writing rooms are situated. The locker rooms and lavatories, on the other hand, are in the subbasement and can only be reached from the basement corridor.

The wings are, including the basement and subbasement, five stories in height. The main portion is only three stories, if we leave out of account the boiler room. This arrangement is due to the fact that the rear part of the building is placed in a shallow ravine. White brick, with stone facings here and there, is the material; the roof is flat and bordered all round with a brick parapet.

The building is heated by air forced over heated coils by large fans driven by steam, and the ventilation is thus, in part, provided for, and also by the exhaust currents in the ventilation turrets which rise over the entrances.

A feature of special interest is presented by the small research rooms. The half units are intended to be used for various purposes, but chiefly for small groups of students pursuing advanced work or for special lines of research, but each of the fifteen small rooms, shown in the plans as adjacent to the lecture theaters, is reserved for individual workers carrying on selected investigations. These, with the other arrangements described, have been designed with the view of making the buildings a home for research.

From Dr. Macallum's article in *Science*, May 22nd, 1902.



John Hoskin, Esq., K.C., LL.D., the Chairman of the Board of Trustees of the University, addressed the audience which had assembled in the north lecture theatre on the occasion of the formal opening. He spoke of the building and equipment, emphasizing in a very pronounced way the great progress which had been made in medical research. He remarked that the work of construction had been completed in the short space of fourteen months from the time that the decision to build was arrived at. He also referred to the happy circumstance that the increased and efficient accommodation was provided at the very moment when two Medical Schools, namely Trinity and Toronto, had amalgamated, and when these increased facilities were so urgently required. Dr. Hoskin considered that we had to thank the Government of Ontario for the financial aid which they have provided, not only in connection with these new buildings, but also for the convocation hall which is in prospect. He then formally handed over the keys of the new buildings to the President of the University on behalf of the Board of Trustees, and in doing so he paid a tribute to the untiring energy of the Dean of the Medical Faculty, Dr. Reeve, to whose persistent efforts the completion of these new buildings is largely due.

President Loudon accepted the care of the building from the hand of the Chairman of the Board of Trustees and assured him that the Medical Faculty would use the buildings for the advancement of medical science in a manner that will enhance the reputation of the University and redound to the benefit of the public. He acknowledged with gratitude the prompt action of the Trustees, the Government and the Legislature. He would not forget the handsome way in which they had made provision for the Medical Faculty and for the department of Physiology. He then proceeded to recall for the benefit of his audience some facts regarding the progress of medical education in Ontario, and spoke as follows:—

“From the year 1788 onwards machinery has existed for the licensing of practitioners. At that time little or no teaching was available. Regular medical courses were begun in 1844, when on the 15th of January the inaugural lecture of the Medical Faculty of King's College, the then Provincial University, was delivered. The Faculty had been established after much controversy and negotiations, and it is to be noted that the Faculty of Medicine was then on a par with those of arts and law in the University, and was equally with them a charge on the endowment, drawing eventually between eight and nine thousand dollars annually from this source.

Within ten years after the establishment of medical instruction on an apparently permanent basis the University actually

in 1853 abolished the Medical Faculty of the University of Toronto.

From 1853 to 1887 we had the era of Proprietary Medical Schools.

The alleged ground for the abolition of the Medical Faculty was the supposed popular sentiment against State aid for a lucrative profession. Whether this was the real ground is still a matter of dispute. If it was the real ground the Legislature of succeeding years manifested great inconsistency in the application of the principle. For from 1852 to 1871 no less a sum than \$65,000 was granted by Parliament to the various Medical Schools, aid being given in fact to all who applied. After 1871 all these grants were cut off, just as had been the grants to Art Colleges a few years before.

Looking back over the past hardly anybody will venture now to assert that the era of Proprietary Schools was an unqualified success. Nobody will say that they provided an ideal medical education. But on the other hand, nobody will deny that much good and honest work was done, and that the education of our medical men in spite of difficulties reached a high standing.

Efforts were made by the University of Toronto to raise the standard of examination from time to time. That standard was raised, in 1882, for instance, and the numbers of the graduating class in medicine dropped at once from thirty-two to fifteen, and eventually to ten. The schools were, in fact, unable to cope with the situation. Their teaching was weak on the scientific side, and it was bound to be so. It was impossible for them to provide the expensive equipment and elaborate supervision necessary under modern conditions for thorough work on the scientific side.

Through the establishment of a teaching faculty of medicine, in 1887, medical education in Ontario entered upon a new era. Under the new organization, the expensive equipment of the University in biology, physiology, chemistry and physics was put at the service of the Medical Faculty, and moreover the Medical Faculty has been self-sustaining, and has been, in fact, an element of strength to the resources of the University.

The Medical Faculty has done a great work in the interests of the public by sending forth a great body of young men to alleviate the ills of humanity.

We are now entering upon an important forward movement in the work. The Federation of Trinity with the University of Toronto is practically assured, and on the strength of this the amalgamated Medical Faculties begin to-day its work in this Building.

Medical education through this step enters upon a new and higher stage of development, and the future is full of hope.

There is just one point further to which I wish to refer very

briefly—the question of State aid to the teaching of medicine. Old prejudices die hard. The old doctrine of prejudice of no aid to the students of a lucrative profession has been reiterated so often since the middle of the last century in Ontario, that it may seem almost like heresy to dispute it. But is the profession after all so very lucrative? There are some prizes, it is true: but is the average of wealth in the profession above that of a comfortable living?

To see the matter in its proper light we should take into account the enormous importance of public health, even from a financial standpoint. Large sums of public money—I am looking around for the Principal of the Ontario College of Agriculture—are spent annually upon the teaching of agriculture, engineering and pedagogy in view of their general importance, but not one cent for any branch of medical science.

It is my view that this doctrine of non-support should be revised. I do not advocate indiscriminate grants, but the subjects to which the whole time of a professor is given, such as pathology, might be given aid.

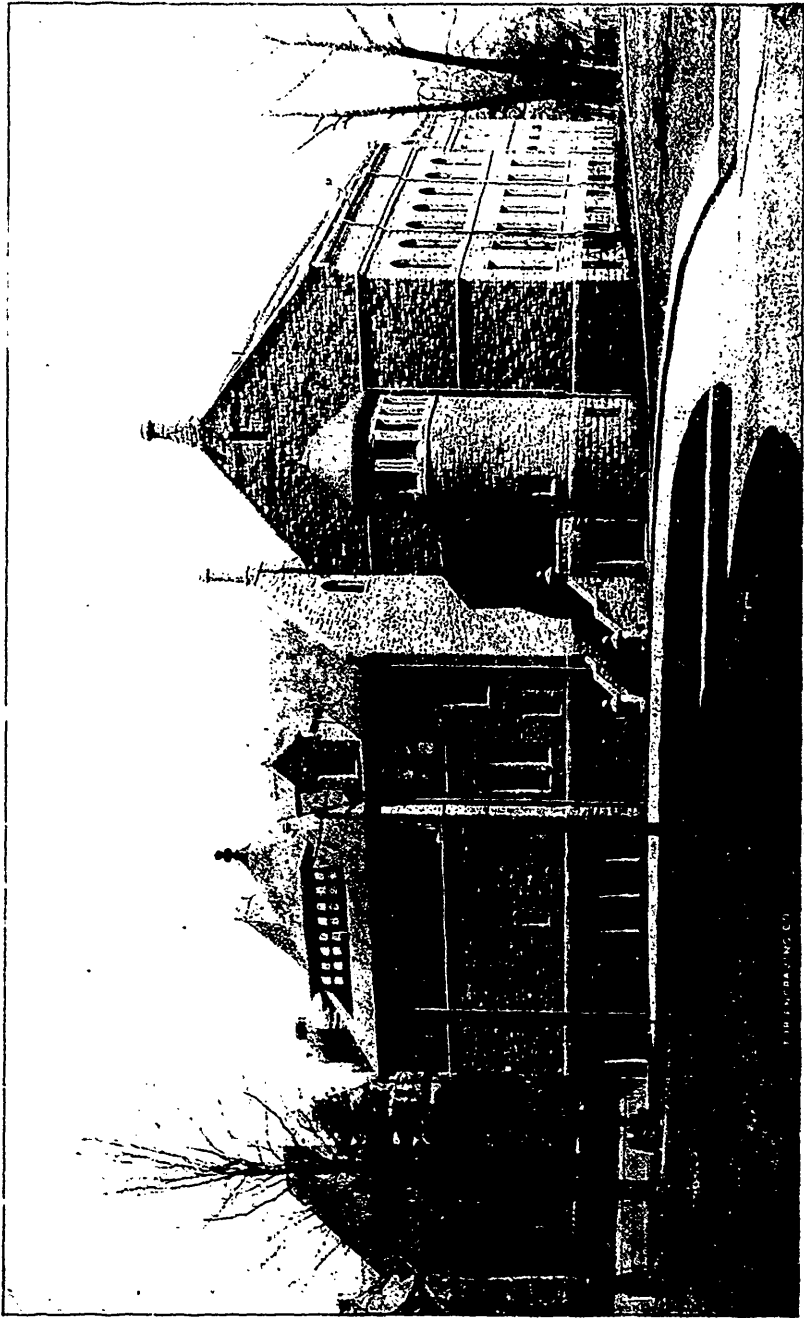
Is the physical condition of the student of less importance than his mental development?

The material prosperity of the country is advanced by the engineering profession, which profession is at least as lucrative as that of medicine: and after all of what advantage is material prosperity without the health to enjoy it. It is said that Rockefeller would give millions to be able to digest beefsteak.

The pathology and hygiene of domestic animals are taught in the Agriculture Colleges, and does it not seem strange that the claims in the same branches in connection with human beings should be ignored? I merely put forward the idea as one which I hope to see realized when public opinion becomes a little more enlightened, and some unreasonable prejudices are eradicated. I shall not detain you longer, but give way at once to the different gentlemen who have yet to address you.

We have recently had the pleasure of welcoming to Canada many of the representatives of commerce and legislation from the Motherland, but I may say that it affords us particular pleasure to-day to have with us upon this occasion so distinguished a representative of British Science as Professor Sherrington of the University of Liverpool. His work in physiology has won a high place in the world of science. We owe Professor Sherrington our very special thanks for responding to the invitation of the University to be present, and for his readiness to undertake a long and tiresome journey to be with us on this occasion, and I take this opportunity of expressing the indebtedness of the University to him for his great kindness.

The President then called upon Professor Sherrington to deliver the inaugural address



BIOLOGICAL BUILDINGS—WEST WING  
Containing the Museum and Anatomical Department.

T. H. E. P. B. A. C. (C)

ADDRESS BY PROF. CHARLES S. SHERRINGTON, M. A., M.D., LL.D., F.R.S.

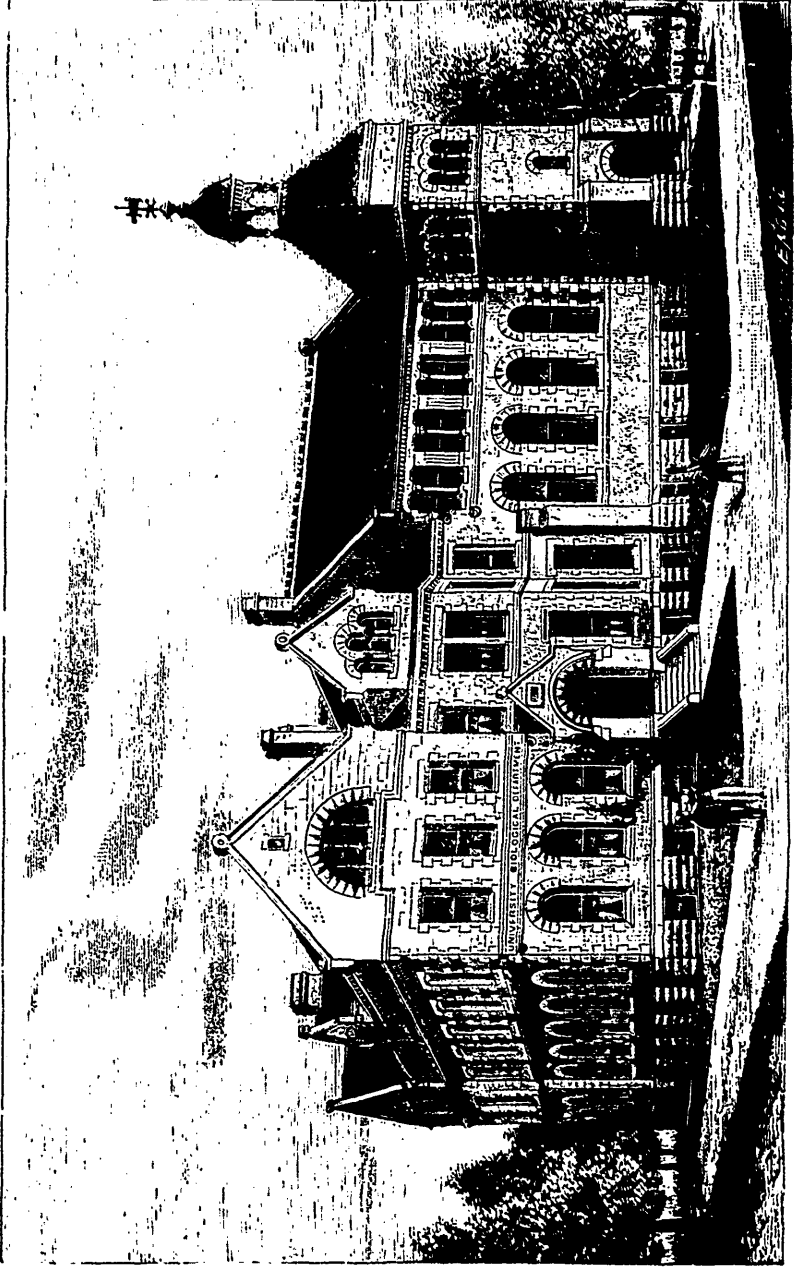
Holt Professor of Physiology, University of Liverpool, England.

Believe me it is a difficult thing for a stranger, even at your invitation, to address you on an occasion like the present. So many significant events crowd in upon him and time for reflection is needed to weld into a connected whole the impression he would wish to offer to you. Not that the growth and doings of this University have not been followed and watched with interest by us in the Old Country. On the contrary, your activity has been felt, not only as a matter of mutual congratulation, but as a spur to arouse us to effort in our own similar pursuit of educational aims. But the stranger coming among you necessarily feels the shortcomings of his acquaintance with the details of these academic enterprises you have taken in hand. One advantage, however, is his. His view, gained from a distance, necessarily has freedom and truth of perspective that may give it a value in your eyes.

Some things lose by perspective. Some things, large, when at close to hand, dwindle when viewed from afar. Not so Canada. The perspective given by the width of the Atlantic is but an appropriate setting across which to view her greatness and her far-reaching activity. And this event, this academic celebration, this *dies festus*, in your University to-day, retains from afar off all the significance of a great event. It loses no tittle of its dignity and import when viewed across ocean from the crowded turrets of the older Cambridge, or the hoary spires of Oxford. It shines, I assure you, like a beacon to the new University whose buildings are as yet unfinished on the hill above the port of Liverpool.

Coming from a region where history is long and the land little to this where written history is short and the expanse of land incomparably great, one realizes how relative is size. And in regard to the event of to-day the largeness of this country rises in my thought, not as a matter of mileage, but—that with you, more than with us in the Old Country, the size of to-morrow is vaster than the size of to-day. Each step of progress here, more than with us, has to be measured by its ample consequences in a more rapidly widening horizon of the morrow. These new laborator es have a field already demanding them, and a still larger lies before them in an immediate and historic future.

Biology is the study of life in regard especially to growth and organization. Every medical man is a biologist, and as a biologist it may be but natural if I regard to-day's event from a biological standpoint, and the community as an organism, and the university as a living organ, essential to the healthy life of the community.



BIOLOGICAL BUILDINGS—EAST WING.

## MEDICAL SCIENCE.

Science—especially medical science—is growing in importance to the community. We must have organization in science as in industry. This University to-day makes provisions of first rate importance for the organization of medical and allied sciences in the region which centres here. Capacity to rear and support men constitutes the extent of a country, and population is the biological measure of the social organism. The ceaseless energy of the race has begun to plant a great population in this land. Growth, great and rapid, is inevitably before it. The growth of nations as of individuals requires the vigilance of guiding hands. Growth, for it to take its course, rightly towards perfection, requires that provision for the security and expansion of the liberal arts and sciences forerun rather than halt behind the actual requirement of the hour. Not only for their direct utilitarian service. They form a whetstone for man's most universal tool, his intellect: also a discipline for character, in the pursuit of truth for its own sake. Scientific truth, when found, has often proved unpalatable to man,—as when it dethroned him from his fancied seat at the centre of the whole perceptible universe, a universe he had imagined simply subservient to his needs—or again, as when it taught him that instead of being a creature altogether apart from the brutes, there are flesh and blood bonds between himself and them. Regardless of its cost to his cherished fancies, man strives for scientific truth. And, as the old Greeks said, this purpose puts him farther from the brutes and nearer to the gods.

In nurturing science I would urge that a community cultivates more than mere utility. And even with regard to mere utility as the fields of knowledge fall ripe under the ceaseless husbandry of the world's thought, those who would join in the great reaping, and not only glean where others reaped before them, must cultivate for themselves. To do this requires more than the devotion of individuals. It requires the intelligent co-operation of whole groups of individuals. Organized scientific inquiry becomes in advanced countries a conscious aim of the community as a community.

## THE VARIOUS WORKERS.

That society may draw due benefit from wells of natural knowledge three kinds of workers have to stand side by side. First, the investigator, who, pursuing truth, extends discovery, with little or no reference to practical ends. He constitutes the fountain head of the knowledge that is for distribution. Other hands may reap the harvest, but his sets and rears the seed.

After the investigator comes the teacher. To him it belongs

to diffuse the knowledge won. This honorable and difficult task receives its best reward in seeing the small spiritual beginnings of a pupil widen out into the spiritual beginnings of a master. Thirdly, there is the applicer of natural knowledge. His part consists in making scientific knowledge directly serve practical needs. It is this work which to the popular idea often represents the whole of science, or all of it that is commonly termed "useful." The practical results of this work are often astounding to those ignorant of the steps by which they have been reached. The greatest of the steps, however, is usually the first one, made in the laboratory of the investigator. These three co-workers are co-equal in the priesthood. Science and the application of science are one growth, united together even as the fruit and the tree. The proper hearth stone round which the community should group these laborers, laboring for a common end, is the University. There the sacred flame of learning is fed from many sides by many hands.

#### VALUE OF SCIENCE.

It is sometimes said that pursuit of science renders a man deaf to the appeals of practical life. That it tends to withdraw him from the everyday interests of the people. That I do not believe of any science. Certainly not of biology and the medical sciences. From their very outset these subjects draw the mind toward study of an organization the most complex and the most perfect it can examine. The ancient *simile* that our old school classic, Livy, drew between the human body and the body politic, the state, has not lost, but won significance as the centuries have run. The achievement of the microscope has been the discovery that living things, whether plant or animal—all living things of more than minutest size—are commonwealths of individually living units. These cells, as they are called, are living stones that build the house of life. In that house each stone is a self-centred, individually living microcosm, individually born, breathing for itself, feeding itself, consuming its own substance in its living, and capable of and destined for an individual death. Each cell lives by exchanging material with the world surrounding it. In other words, its bulk depends on its surface. Hence surface increasing as the square, and volume, as the cube, cell-size, is circumscribed by tiny limits—microscopic limits. Had the dependence been greater than it is, and the average size of the cell less, and too small for resolution and discovery by the microscopes of seventy years ago, it is hard to imagine where biology would stand to-day. For two generations every biologist has been accustomed to think in terms of the cell theory. Every shred of the body he



knows as an intricate interlacement, embodying co-operation and mutual support of associate thousands of individually existent cells. Division of labor has gone on, and with it differentiation of function; while this group of cells combines with its own inner life some special function subservient to the needs of the great commonwealth, as a whole. Another group is specialized for another duty again subservient to the general needs. Each organism, however complex, each one of ourselves here, is built up of living myriads of cells. Each such organism consisted at outset but of a single cell, and from that in his life's growth have arisen the countless myriads composing him to-day. The blood relationship is close between all the cells of each one individual body. The cells of our nerves, or our muscles of our time-hardened bones are all blood relations through one common ancestor. Yet so far has specialization of these unit lives gone on, yet so far does function reflect itself in microscopic form, that there is greater likeness between my nerve cells, the nerve cells of a fish than between my nerve cells and my own muscle cells—despite the blood relationship between these latter. And in the commonwealth of cells that constitutes each one of us, goes forward day long, night long, as in the body politic, the birth of new units to replace the ones outworn, the subordination of many individual purposes to one, the sacrifice and destruction of the individual life for the benefit of the many.

Trained in the study of such an organism, surely the biologist and the medical man will be the last to underrate the importance of organization to the community for the common weal. Therefore I am rejoiced, but I am not surprised that it is your faculty of medicine which to-day, in its public spiritedness, erects and installs these fine laboratories, this potent addition to the organization of your community, for its activities in medicine and biological science. I would also, as a friend among you, offer you my congratulations on the consolidation of your two schools of medicine. Union means not only greater strength, but the more effective application of strength.

I need not to this assembly extol medicine. Many of her votaries are here; I venture to count myself as one. But to-day the relation toward her of education is a matter on which our minds are naturally set. Am I wrong if in regard to this it rises silently to me that from the educational standpoint medicine, like Janus of old, in a good sense, bears a double face? On the one hand, she is an empiric. She has learned to cure by what the comparative psychologist calls "the method of trial and error." Her conquests over sickness were acquired purely as result of experience, without help either from a priori or from inductive reasoning. And great and glorious is the role of her achieve-

ment on these lines. Of her humanitarian triumphs probably still—certainly until a generation ago—the greater share is assignable to this part. The use of quinine in malaria, the curative effects of the iodides and various metals, the discovery of chloroform and ether as anesthetics, these and the names of a long line of famous physicians from the renaissance down to some as justly famous as those of the past, and with us now to-day, suffice to certify the inestimable gifts that medicine as an empiric has given to mankind in his suffering. This face of medicine well may wear a garland.

### MEDICINE A SCIENCE.

In her other aspect, medicine is not an empiric, but a scientist. Who will refute me if I assert that medicine is as well an art as a science. Somewhere it is said that woman is the last thing man will ever civilize. So the scientific aspect, the male face of two visaged medicine, thinks of that female face, the empiric, with whom his lot is linked. He feels sometimes that his other half is the last thing science will ever render wholly rational. By dint of patient toil he improves her practice by showing her a reason now and then. No sooner is that done than she is off on a fresh flight into the inexplicable, and he must cudgel his brains anew to find her a fresh logical position.

The feminine, ever youthful trait in medicine, has to the student an undying charm. But on the whole the countenance of medicine has of recent years, for the student, become masculinely severe. This head of medicine has indeed become the larger. Hydrocephalic in appearance though it may be, it is filled, not with water, but with reasoned facts. The development proceeds in the main from certain data acquired in the century just passed. For instance, the chemist in discovering that all the million-sided chemical diversity of the perceptible universe is composed from a few—some 70 substances,—therefore called elemental, discovered also that living matter, instead of containing elements different from and subtler than those of the dead world, consists of just a few of those very same ones. Further, the doctrine of the indestructibility of matter was demonstrated in a new form, namely, as the indestructibility of energy, and the convertibility of any one form of energy into other forms. Thus dead and living matter become united as subject material for study. It became really possible to consider the living body as a chemical and physical machine, a machine to which the laws of chemistry and physics can be applied.

But this scientific progress in medicine, fruitful of benefit to the community, lays on the community a burden of obligation.

The empirical part of medicine is at once the most easy and the most difficult thing to teach. The preparation for learning it requires but little training in other subjects. Its facts lean on nothing but themselves.

#### HISTORICAL SKETCH.

With the scientific part of medicine it is different. That is based upon initiatory studies. Medicine, historically traced, we find first drawing help from the simplest and nearest at hand of these adjuvant studies. First she bent to the study of the gross form of the parts and organs of the body. The gross form of these is significant chiefly where they are machinery for application of mechanical powers. The greater part of the corporeal machinery is, however, not destined for such work, but has its purposes in processes chemical, thermal and electrical, to which—marvellous appendage—mentality is adjunct. Medicine in the course of the seventeenth and eighteenth centuries sucked dry for the most part what the study of the gross form of the body's parts could yield her. She then turned to study of microscopic form—examined what Bichat first named the tissues, the fabric of the body. In so doing she came upon a great generalization, the cell-doctrine, discovering an essential and visible similarity of microscopic structure in all that has life, differentiating it from all which has not life.

But even before the advent of the cell theory, medicine had begun to ask of chemistry what it could give her. With the discovery of oxygen and of the nature of combustion the links between biology and chemistry began to be tightly drawn. The young Oxford physician, Mayon, had performed the fundamental experiments on respiration and had discovered oxygen more than a century before Priestly and Lavoisier, but the time was not ripe until the stupendous work of Lavoisier had founded modern chemistry. The cell-theory was from the first not only morphological, but physiological. It meant for the application of chemistry to biology that the chemistry of the body or of one of its organs was a chemistry resultant from a thousand tiny living furnaces, individual seats of oxidation, deoxidation, polymerization, hydrolysis, and what not.

Not only that, but the living laboratory of the cell itself manufactures even the medium which the cells themselves exist: the saps and juices of the body. And we are beginning to know, thanks to pathology, that every species of animal produces an internal medium specific to itself. Further, your distinguished physiologist here, Professor Macallum, who has so revealed the distribution of the chemical elements within the cell, tells us that the internal medium which the cells of even the highest animal forms produce as appropriate for themselves,

still approximates in its salts to the water of the ancient geological seas in which their ancestry arose, and still reveal in fact the composition of that ancient ocean. In that respect these living cells, with all their influx of change, have been more durable and constant even than ocean itself. The contrast brings home to us a deep distinction between dead matter and living—the latter a moving equilibrium, gaining stability from the very motion of itself.

The bond between Schwann and Pasteur has opened a new perspective, and chemistry and medicine were drawn still tighter by their discoveries concerning those subtle influences named "ferments." Pathology, the study of these processes of the body in disease, even more than physiology, as yet has drawn help from this part of modern chemistry. If the processes of health are in fact the resultant of the due co-operation of ten million little foci of healthy chemical action in the body, the processes of disease are similarly divisible, and have to be traced to the unhealthiness of certain of these minute centres of activity. How extreme is the importance of chemistry to modern medicine, no single statement can perhaps emphasize so well as this—that is I believe, acknowledged on all hands—that in virtue of his chemistry, a chemist, Louis Pasteur, during the latter half of last century, was able to do more to alleviate the diseases of mankind and animals than any single physician of his time.

#### APPEALS TO PHYSICIST.

Also medicine has made appeal to the physicist, and from him she has got understanding of the body's heat, the basis of the knowledge of fever; she has learned the intricacies of the mechanism of the eye and refined methods of examining that organ and of remedying many of its defects; the laws that govern the circulation of the blood and the subtlest means of detecting the forces liberated in the working of the nervous system. In some cases, as sciences grow, their discoveries seem to sunder them the further one from another. In my belief, that merely shows they are at the outset of their career. To-day we find physics and chemistry converging and conjoining within a field of physical chemistry. It early became convenient to have a specific name for living material, wherever found. The name given was Protoplasm. It might have been better to call it  $x$  or  $y$ , so far was it in many respects an unknown quantity. Instead of looking forward to this material as a chemical entity, we incline now to regard it rather as a field for chemical action, satisfying certain particular conditions. Probably discoveries regarding these conditions will fall to the physical chemist, perhaps in a future very near at hand.

Probably such discoveries will be among the most valuable that medicine has yet received from any source.

I have said enough to remind us how interlocked with science medicine has become. She is applying sciences to her own problems, and they form a vast capital fund from which she can draw wealth. To give instruction in this part of medicine, to turn out men trained in it, is now one of the duties of a medical school. The earnest student has a right to expect such training from his *alma mater*. But for it the requirements are importantly different from those that suffice as an introduction to empiric medicine. In the first place, as Pasteur said, we cannot have the fruit without the tree. For scientific medicine the student must, perforce, be thoroughly trained in his sciences before he can really grasp instruction or truly profit from his medical teaching. One of the aims of his instruction in empiric medicine is to teach him to observe for himself, so in his instruction in scientific medicine, one of its aims is to enable him to apply science for himself. How small a fraction of all the realities of medical practice can be met in the few years of preparation of the student in the clinic at he passes through it in his school career. His teacher knows that well, and uses the cases there as types whereby the principles of medicine can be fixed as a beginning. The rest must be accomplished by the man himself, as his life's work. The more necessary that the man go forth from his school equipped not only with the present applications of science to disease, but so possessed of root principles of the sciences adjunct to medicine that he may grasp and intelligently use the further developments of scientific medicine after he is weaned from his instructors and the school. That is a way to obtain enlightened progress in professional practice. What truer safeguard can a man have alone it may be, and isolated from the centres of knowledge, what truer safeguard can he have against all the pseudo-scientific quackeries of the day, than some real knowledge of the principles of the sciences, along whose lines the discovery of medicine must develop?

#### BURDEN ON TEACHERS.

Therefore it is that the burden of obligation falls heavy nowadays upon the teaching resources of every faculty of medicine worthy of the name. There is, in the first place, the burden of increased intellectual labor. For the learner and the teacher is this true. To seize the proffered assistance of these great and complex sciences is not always easy. These studies are more difficult than those that were needed once, and they take longer to acquire. The mere instrumentarium of modern chemistry and physics, as applied to medicine, and of physiology and

pathology, and bacteriology and of hygiene, of itself suffices to bring conviction of the increased difficulty and longer training due for these studies now preparatory to medicine.

Further, these initiatory studies have become vastly more costly than was all that formerly was required. Experts have to be found who can devote themselves heart and soul and undividedly to their particular subject. Laboratories have to be erected and equipped, and on a scale that makes them a distinct feature of the modern world. Those that we see now here are models of their kind: wise foresight has planned them; public-spirited enterprise has constructed them. Nor does the achievement end with their erection. The laboratories and their equipment are but the factory and the plant; both fail in their purpose if they halt for sustenance. And beyond that the likeness does not go. The factory, once started, if it be wanted, can expect to pay, to support itself. Not so the laboratory. The laboratory is both a school of instruction and a school of thought. Well, then, no higher instruction can be expected unaided to pay the expenses it involves; it can only do so at the expense of those who come to learn, and that is to put its teaching beyond the reach of all but the wealthier few. And the instruction is costly, for it has to be practical. And another source of expense is that the laboratory has not only to distribute knowledge, but to manufacture it. The duties of a University do not begin and end with the disciplinary and didactic. Besides schools of instruction, they must be schools of thought. To be this latter, the laboratory must pursue research. Even for the welfare of the class-teaching this is essential. Instructive lectures may be given by men of ability, the whole of whose knowledge is second-hand, but it is doubtful whether the real life of science can be fully felt and communicated by one who has not himself learnt by direct inquiry from nature. Nothing so augments the teacher's power of impressive and incisive teaching of a subject than to have faced problems in it himself as an original enquirer. And, after rudiments have been once fairly acquired, there is for good students no training equal to that given by following even a small research under an experienced leader.

#### SCHOOL OF THOUGHT.

So, truly, does the laboratory become a school of thought. Your laboratories are arranged with admirable provision for research. The student should enter on his study of a natural science through the portal of its fundamental experiments. The attitude his mind thus takes is the true one—the only true one—for further insight into the subject. Too often humanistic studies at school have tended to kill the natural philosopher

within him—that innate curiosity for facts, the healthy heritage of childhood. He leaves school a little book-man. Even as to the phenomena of nature, he has been insensibly led to ask for statements upon authority, rather than to turn his own senses and observation to the phenomena themselves. To learn a science or acquire an art resting upon sciences, the first thing to do is to look at the fundamental facts for yourself. Our great teachers of medicine teach upon this plan. They teach where they learned, not in the library, but from the bedside of the sick. In laboratories such as those ruised here for pathology and physiology and hygiene students can learn these sciences as medicine is learned in the hospital ward, by direct inquiry into nature. The teachers you have given them are men who have won widely-recognized distinction as themselves direct enquirers into nature. Worthy students will appreciate the double boon their *alma mater* gives them—the means of learning at first-hand those secrets of nature which lie at the root of his craft's skill—and to learn them under guidance by men who excel in unravelling such secrets.

#### ENGLISH ACTION.

Only by enabling men to continue their learning after their teaching is over can we secure the greatest advantage any educational system can afford. Your laboratories here will encourage post-graduate work. We look with keen interest to the researches that will flow from them. No subjects offer finer fields for research than do the progressive studies, physiology, pathology and hygiene, to which your new University buildings are consecrated. And of the functions of a laboratory, research is not the least costly. We in the Old Country find that. Our central Government has done little to support research. Our nation, proud of its success in things practical, has been prone to despise the abstract and the theoretical. We do so foolishly; we do so at our peril. Behind all practical application there is a region of intellectual action to which, though our practical men have contributed little, they owe the whole of their supplies. Theory, if a goose, is the goose of the fairy tale that lays the golden eggs; no more such eggs if once you let her die. To speak of theoretic knowledge slightingly is for the lips of the fool. The value of abstract research to a country is becoming more widely acknowledged than it was. Sir John Brunner said the other day, at Liverpool, that there was no better investment for a business man than the encouragement of scientific research, and that every penny of the wealth he possesses has come from the application of science to commerce and manufacture. And

we find that the munificent citizens have and do come forward among us and meet by their individual gifts the pressing needs of our community at large.

#### NEW ERA DAWNING.

But we welcome a new era dawning on us. Liverpool, Birmingham, Sheffield and other great centres, begin to regard the local University as an institution entitled to support from the public means, for instance, by subsidy from public rates. Such subsidies can be used also for studies which do not come within allotment from the smaller subsidy from the central Government: medicine, for instance. Proud of the young universities—to which yours of Toronto is a time honored veteran—communities and local Governments are encouraging research within our universities. They do not expect such research to be able to pay its own way, but they recognize that indirectly it does pay the community that gives it a home. They feel it a duty which they owe themselves. Is not the university a party of their own life, and is not research a part of the university's life-blood? They feel it a right due to their own higher selves. It stimulates progress. Supported by the large-handed sympathy of the community and the local Government, it means quicker advance, both material and mental, it means invention and it means medical discovery. And *qui facit per alium facit per se*, is a motto worthy of a State.

#### USES OF LABORATORIES.

What, then, are finally the uses of these laboratories now opened by your University? They will assist in training men for various honorable callings, especially for that most ancient one of medicine. They will assist, no doubt, also to render life by practical applications of science superficially still more different from what it was only a short generation ago. They will assist to bring home and distribute to your community treasures of knowledge from all parts of the globe. They will assist—and it is thought dear to a high-spirited people—themselves to add to the sum total the treasures of knowledge of the whole human race. "*Noblesse oblige*" appeals to chivalrous nations, as well as to chivalrous individuals.

But their highest office seems to me, perhaps, not even these high ones, but a more difficult still. Genius cannot by any community, however wealthy and powerful, be made to order. In biblical language, it is the gift of God. All a community can do toward obtaining it, be our riches and willingness a thousandfold what they are, is to ensure the rare and glorious plant a meed of freedom, light and warmth for blossoming upon



our soil. Who can doubt that in this population here genius exists—not sown, it is true, broadcast, for nowhere is it thus—yet existent, scattered up and down? This it is for the community to foster, to discover.

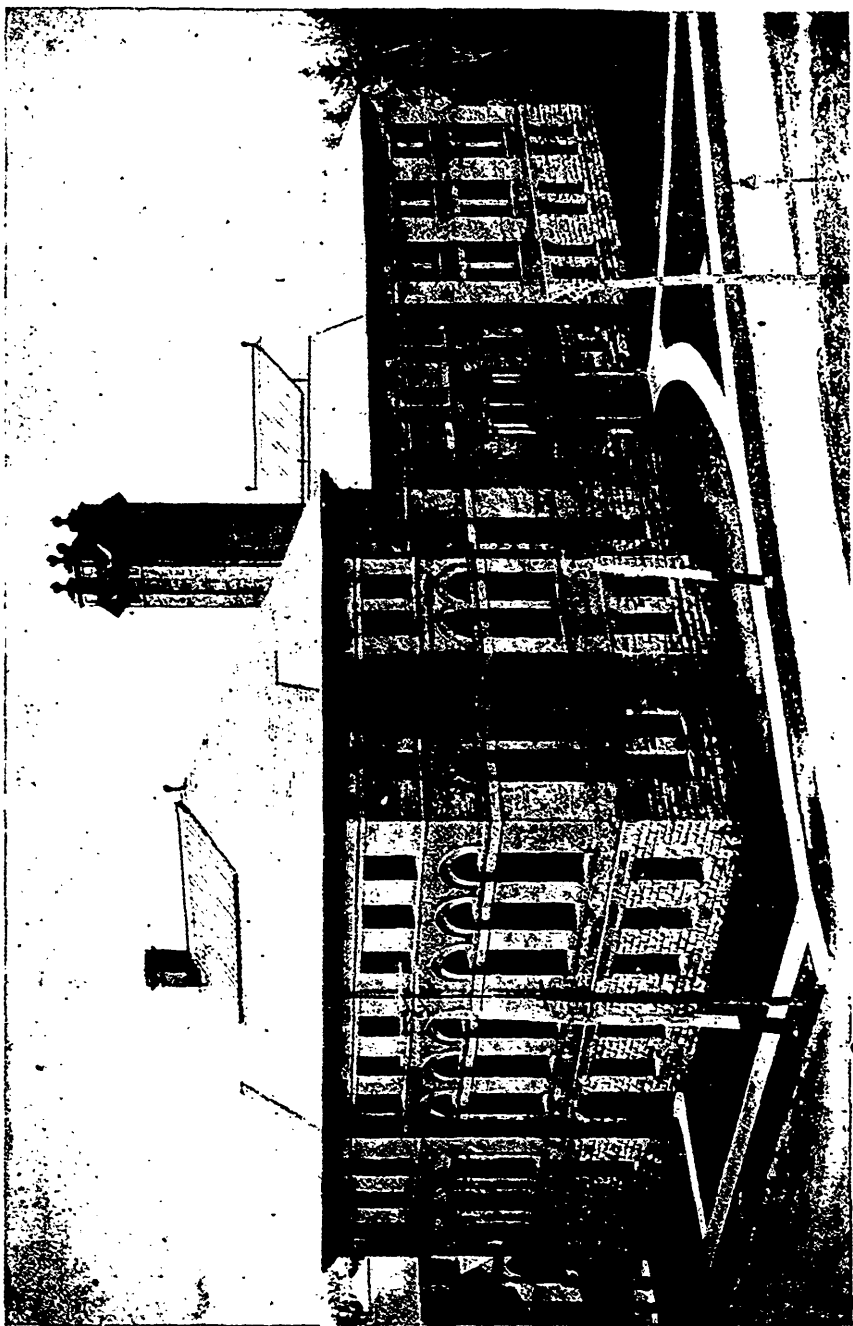
By help of these finely built and finished laboratories this much in one direction can be done. The problem to which a wise country turns is the discovery less of things than of men. By these laboratories, adequately supported, your community can create opportunity for the exercise of powers which come from sources within itself, but are utterly beyond its power to produce at will. Their loftiest function is creation of this opportunity. For that aim the studies in them must be followed with no single narrow technical purpose, but must be wide of scope and full of access to every rank of students. So shall these laboratories prove a corner-stone for the upbuilding of a temple of knowledge, and a touch-stone for the best ore of intellect within the bounds of this great land.

The President then called upon Professor Welch, Professor of Pathology in Johns Hopkins University, to address the audience.

**PROFESSOR WELCH, JOHNS HOPKINS HOSPITAL, BALTIMORE.**

*Mr. President, Mr. Dean, Ladies and Gentlemen:—*After hearing the last excellent address you will not expect any lengthy remarks from any one of us, although I do not wish to forestall what my colleagues may have to say. I esteem it a very great privilege to bring to this university of this city, of this province, my congratulations upon the opening of these laboratories which certainly are destined to increase very greatly the usefulness of this University. I consider it also especially gratifying that as a representative of the Johns Hopkins University this privilege belongs to me. There are unusually close ties I think between the Johns Hopkins University and the University of Toronto. We owe very much to you. You have sent us some of the very strongest of our supports in the University. I hardly need mention the names of your fellow townsman, Dr. Osler, Professor Barker, Dr. Fletcher Ferris and others who have come there admirably trained for our work.

This University has stood for high ideals in medical education. I was particularly interested, Mr. President, in hearing from you, as President of the University, your attitude with reference to the position of medical education in the University, and the necessity of its support by public beneficence and state aid. It is very curious as you indicated as regards the conditions here, and they were just the same through the United States, that medical departments should have begun in



THE CHEMICAL LABORATORY.

many instances as far back as the 18th century as integral parts of the University co-ordinate with other faculties of the University, and then for some reason or other—this is not the occasion to discuss that, although I think it is an interesting question—they lapsed into proprietary institutions and lost nearly all connection with the University\* Perhaps that may have been due, in a large part, to the rapid development of the country and the necessity of supplying physicians to pioneer localities, although it is not clear why they should have been half-educated physicians.

Up to about the beginning of the eighth decade of this century, medical education was at a very low ebb on this continent. But since that time conditions have changed and the time has come when universities recognize medicine as a worthy object of support and fully worthy of University ideals. It is only going back to the very beginnings of the university, as those who are familiar with its history know, that medicine occupied at the beginning a very interesting position in the development of universities. I need only speak of the school at Salerno and how in the middle ages the medical departments of universities were often their greatest glory, and how that department was often the home of all there was of sciences in those days, and of physics and natural science.

Medicine fell away and became less worthy of affiliation with universities. But one of the most interesting features of modern times is the recognition on the part of the universities that medicine is worthy of their support.

There is no direction in which a university can do more for itself or more for the advancement of mankind than in the advancement of medical education. It is equally true, I think, that medicine needs the support of a university for its highest development. Fortunate, therefore, you are that you have this close union here.

And I also consider that it is almost a matter of equal congratulation that you have brought together the two schools of medicine, Trinity and Toronto. That must make a much stronger school than otherwise you could have. As Prof. Sherrington has indicated, the practice of medicine is only in part a science. To this day it is largely empirical, but it is recognized that it must become an applied science to a larger extent; and in order to become an applied science it must be based upon the fundamental sciences which are to be cultivated in these laboratories, and these sciences again as he has already indicated must rest upon chemistry, physics, and general biology. So that these laboratories are to be dedicated to the kind of work which shall have the greatest influence not only upon scientific medicine but also upon practical medicine.

Very interesting also, Mr. President, were your remarks with reference to the influence which medicine has in these days upon public health and the interest which the public in general takes in medical things.

I do not know a more impressive illustration of that than what is taking place in the municipal campaign in the city of New York at this moment, where one of the chief arguments and main supports for the retention of the present administration there is the excellent work that is being done in the Health Department, the low death rate, the influence which the administration has had upon the death rate from contagious diseases.

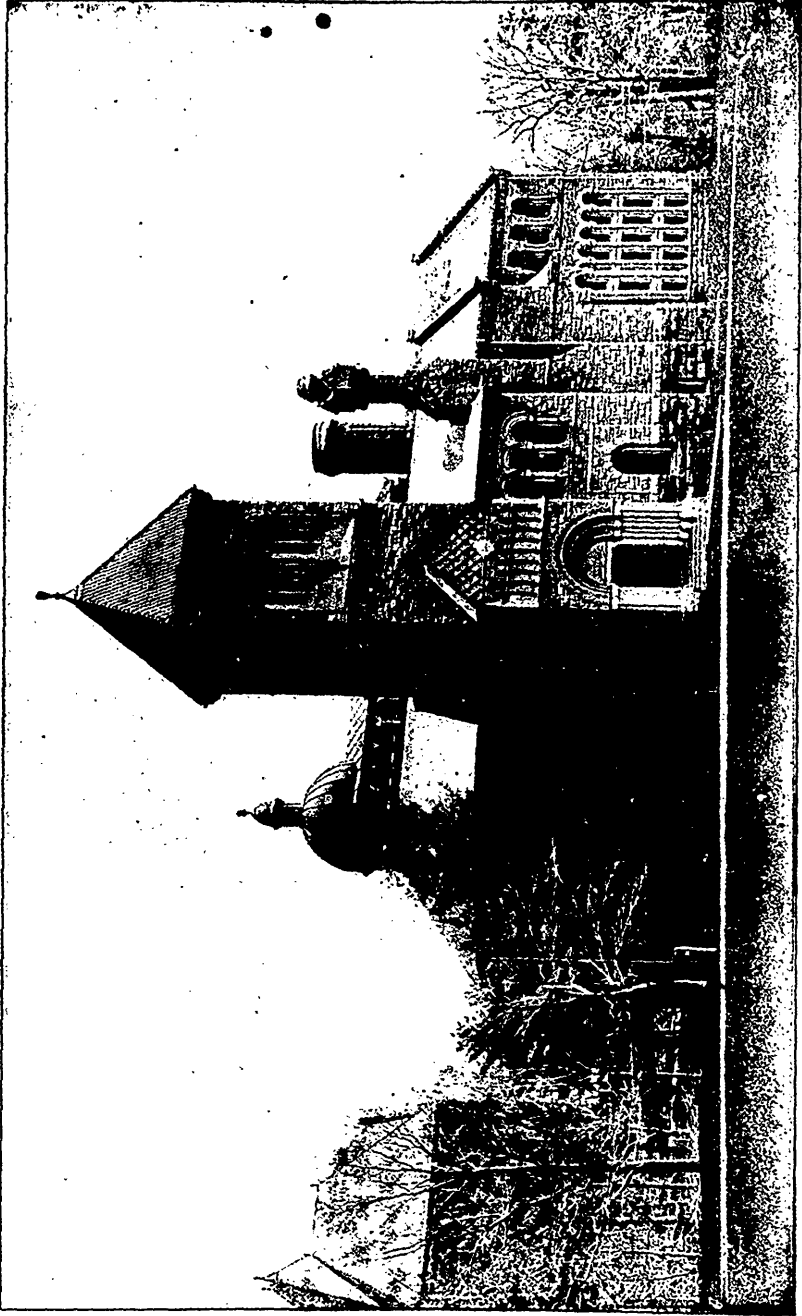
I have, perhaps, said enough, but I wish also to say that I have the fullest confidence in the future of these laboratories. It is not the building but it is what is done within them and the men who work within, that really count; and I close with the hope and expectation that these laboratories will be the home of sound scholarship and be productive of important investigations in medicine and that they will attract students from far and near and that they and your university may prosper.

The President then asked Professor Townsend Porter to read a paper which had been prepared for the occasion by Professor Bowditch of the Department of Physiology in Harvard.

**PROFESSOR BOWDITCH, HARVARD UNIVERSITY.**

I desire in the first place to extend my heartiest congratulations to the University of Toronto on the acquirement of the enlarged educational facilities, which it has been our privilege to inspect, for these beautiful building will not only enable the University to play an important part in the advancement of medical education in America, but they afford a substantial guarantee that the part will be played with distinguished success by this enterprising and well-equipped institution of learning. The importance of this movement for the advancement of medical education in America cannot easily be exaggerated, for if the momentum of the past quarter century be sustained, it may easily result in shifting the centre of medical teaching and research to the Western Hemisphere, so that, though our grandfathers sought medical inspiration in London and Edinburgh, our fathers in Paris and we ourselves have studied in Berlin, Leipzig, and Vienna, future generations of physicians may find their Mecca on the banks of the Hudson, the Schuylkill, the Patapsco, the St. Lawrence, the Charles or the Great Lakes.

Nor is it in medicine alone that we find evidence of abundant activity in the laboratories of the new world. Chemists



LIBRARY BUILDING, UNIVERSITY OF TORONTO.

and physicists have not been idle, but this is a theme upon which lack of time forbids me to dilate, and it will suffice if I merely allude to the important work recently done in Montreal which has contributed so effectively to produce, in our conceptions of the nature of matter, the revolution which now seems imminent.

It will be found, I think, interesting to enquire whether the American movement in medical education is characterized by any special features which distinguish it from those which have taken place elsewhere. Now no one who has studied the work done in American medical schools during the last ten or fifteen years can fail to be impressed by the enormous expansion of the laboratory method of instruction, which has there taken place. Whereas thirty years ago anatomy and chemistry were the only departments of medicine in which laboratory methods were in use, we have now laboratories of physiology, pathology, pharmacology, hygiene, bacteriology and surgery, while anatomy has greatly extended the scope of laboratory work by including the allied sciences of histology and embryology, and chemistry has become, to a large extent, the handmaiden of clinical medicine. Nor is it alone for purposes of advanced instruction and original research that laboratory methods have shown their value. Experience has proved that they may be extensively used by beginners in medicine in acquiring elementary knowledge of the various medical sciences. In fact there is practically no limit to the amount of laboratory work which first year students in medicine, with an academic training behind them, can perform under the guidance of competent instructors. A few years ago when my colleague, Dr. Porter, was arranging a laboratory course in nerve-muscle physiology, he announced his intention of supplying the first year students with capillary electrometers. I was inclined to doubt the wisdom of the plan for I knew the delicacy of the instrument and the care needed for its manipulation, but, nothing daunted, Dr. Porter proceeded to construct capillary electrometers by the hundred and placed them in the hands of the students. To my surprise the experiment was a complete success and the students acquired a practical knowledge of the electrical phenomena of nerves and muscles which they could have got in no other way.

We need not, therefore, hesitate to employ laboratory methods of instruction from any doubt about the ability of the students to profit by them, but there is a distinct limitation to their use imposed by the fact that they are much more costly, both in time and money, than any other means of teaching and that, if employed exclusively, it would be quite impossible to impart to the student even a small fraction of the medical information which every educated physician must possess. It

is doubtless true that contact with the phenomena themselves and not with descriptions of them has a highly stimulating effect upon the mind of a student and that "the best knowledge is that which comes from personal experience" but we must not, on this account, condemn the lecture, the recitation and the text-book as worthless methods of instruction, nor deny all value to knowledge communicated from the experience of others.

It is, in fact, obvious that unless the student can profit by the experience of those who have gone before him, and begin where the latter have left off, no important advance in human knowledge will be possible. A wisely planned course of medical instruction will, therefore, recognize the lecture and the recitation as no less important than the laboratory, both for purposes of imparting information and as methods of mental discipline. We must remember that it is quite as easy to abuse the laboratory as the didactic method of instruction. Indeed, this seems to be a danger which now threatens us, and I fear that we may all live to see the day when we shall feel that the pendulum of educational reform has sprung too far in the direction of laboratory methods of instruction.

The future historian of medical education in America will probably point to the early years of the present century as the time when the elective system, already extensively employed in academic instruction, secured a foothold in the professional schools. The idea of election in medical studies is not, however, altogether a new one even at the present time. In post-graduate schools the right to choose the courses desired is the essential feature in their organization, and since the establishment of the compulsory four years' course, a portion of the instruction of the fourth year has in some of our schools been given in elective courses in various specialties.

Now no one is likely to question the desirability of every first-class medical school furnishing the most advanced instruction in all the departments of medicine. Such a school must, in fact, offer instruction in every subject which any student may desire to pursue, and this of course necessitates the adoption of some sort of an elective system, for it is obviously impossible for even the most intelligent students in the time allowed to assimilate all the various information which such a school may be expected to impart.

The only question is whether the choice of medical studies should be limited, as it practically is at the present time, to post-graduate schools or whether undergraduates in medicine shall be allowed a certain freedom in determining the direction of their medical work. Now there is probably no medical school of which it may not be said that in nearly every department many things are taught which are subsequently found to be of

use to only a fraction of those receiving the instruction. Moreover this state of thing is frequently fully recognized by the students themselves who are thus encouraged to do perfunctory and superficial work. It is indeed well known that a certain number of medical students very early make up their minds either that they will become surgeons, obstetricians or specialists of some sort, or, on the other hand, that they have a strong aversion to certain branches of medicine and a determination never to practice them. For such students a prescribed curriculum necessarily involves great loss of time and energy.

Led by these and similar considerations the Harvard Faculty of Medicine recently addressed itself to the task of revising the course of study with a view of distinguishing between the *essential* and the *desirable* in medical education. The required instruction in every department was reduced to the limit of that which was considered absolutely necessary for the mental equipment of a safe practitioner of medicine and all the more advanced instruction was provided for in elective courses. It was thus found possible to condense the required instruction of the school into the first three years of the course leaving the fourth year to be wholly devoted to elective work. Hence at the end of the third year the Faculty practically says to the students, "We now consider that you have received sufficient training in all the matters of which no one who calls himself a physician can afford to be ignorant. We think you are not likely to make any serious error in the diagnosis and treatment of the ordinary diseases. We believe that you will know enough to call in the services of a specialist when your own knowledge fails. We think that you have been so instructed in the fundamental principles of the various medical sciences that you can apply them successfully to the cases arising in your practice. We do not consider, however, that you are yet worthy of the Harvard M.D. degree. To obtain this distinction you must devote another year to medical study and in that year a wide choice of studies is open to you. If you wish to become a general practitioner of medicine take the elective courses in clinical medicine and frequent the general hospitals. If you desire to be a surgeon follow the courses in clinical surgery. If you incline toward any of the specialities take elective courses in the anatomy and physiology of the organs which interest you and follow the clinics in those hospitals where those special diseases are treated. If you are particularly interested in any of the medical sciences take advanced instruction and research work in the laboratory devoted to the science of your choice."

It will be observed that an elective system thus arranged, while it permits, by no means compels an early specialization



of medical study. In practice it will doubtless be found that the elective courses in the various specialties offered to fourth year students will be much the same as those of the post-graduate school. Thus it will be possible for students of medicine to take up special work at any time they may see fit. It is as yet too early to speak of the results of this method of instruction for the elective fourth year will go into operation for the first time in September, 1904. When, two years hence, Harvard invites her friends to help her inaugurate the new Medical School buildings it will be possible to report upon the subject as an accomplished fact instead of as a promising experiment.

In alluding to the new Medical School buildings I am led to speak of an architectural contribution which Harvard is making to the cause of Medical Education, viz., the so-called "Unit System of Laboratory Construction."

It is obvious that, if, in planning a group of laboratory buildings, it is found possible to make each laboratory consist of a series of rooms identical in size and general construction, great architectural economy can be secured. In administration also great advantages will result for, with the growth of the institution, it will be possible to accommodate one department in rooms originally planned for another, by merely changing the character of the furniture which they contain. Moreover the enlargement of a laboratory will, under this system, consist simply in the addition of a certain number of unit rooms and this process can be repeated as long as the building space holds out. The detailed plans by which these important results can be reached have been carefully worked out by Dr. C. S. Minot who I had hoped would be with us to-day. In his absence I venture to make this brief allusion to a plan of construction which will be illustrated in our new Medical School buildings and which has been for him a matter of very careful study.

Such are some of the contributions which Harvard is making to the cause of medical education. Other schools are doing likewise. May the generous rivalry between the medical schools of the Western Hemisphere go on, for in it is involved the welfare of the human race.

**PROFESSOR CHITTENDEN, OF YALE UNIVERSITY.**

*Mr. President, Ladies and Gentlemen:* I have the honor and the great pleasure of bringing to the University of Toronto greetings from Yale University, and from the American Physiological Society. We congratulate you upon all that has been accomplished in the past by this University in the domain of experimental and scientific medicine. And we look forward, Sir, with hope and with pride to the future, believing that with the increased facilities here offered still greater achievements

will be accomplished. We congratulate you especially on what has been done here in the domain of physiology under the wise leadership of Professor Macallum. To me there is a special gratification in seeing the provision which has been made for furthering the study of physiological chemistry in this University. In this department of the science of medicine there is much to be done. Physiology, pathology and hygiene are all reaching out their hands to physiological chemistry asking for aid.

Many problems might be enumerated which readily suggest themselves, and which are closely connected and intimately associated with physiological chemistry. It seems to me—and I trust I do not exaggerate—that much of the immediate future advance in experimental and scientific medicine will be associated with the advance in physiological chemistry, and I feel like congratulating this University upon the provisions now being made for advanced study in physiological chemistry as a part of a study of physiology.

If I may be allowed to say one word more in this connection it would be this, there should not be a divorce of physiological chemistry from physiology. Physiological chemistry in my judgment should be considered as a part of physiology, and not an independent part. It may need a chemist to do the work, but the interpretation of the results and the value of the work, certainly for medicine, lies in the physiological interpretation; and physiological chemistry I think should be always connected or worked as a part of a broad department of physiology, not as an independent department.

The Yale University sends by me the message "God speed in your efforts to broaden and increase the fields of usefulness in the department of medicine in this University."

**PROFESSOR RODDICK, DEAN OF THE FACULTY OF MEDICINE,  
MCGILL UNIVERSITY.**

I have much pleasure in conveying a message of congratulation from the University of McGill in view of the increased facilities for teaching which have been recently provided in the University of Toronto. I desire also to express entire approval of the recent amalgamation which had taken place between the Faculties of Toronto and Trinity, and to state the belief that it is not impracticable or impossible for a general confederation of the Universities of Canada to take place. I am still very specially interested in the scheme of Dominion registration. I believe that the proposed Bill would have become law had it not been for the antagonism of the Province of Quebec. I trust, however, that an amendment would shortly be forthcoming, which would allow any group of Provinces to embrace the scheme.

**PROFESSOR ABBOTT, OF THE UNIVERSITY OF PENNSYLVANIA.**

*Mr. President, Members of the Corporation, Ladies and Gentlemen:* I have the great privilege on this auspicious occasion of bringing greetings from the sister school on behalf of the University of Pennsylvania. I have the honor to offer their hearty congratulations upon the completion of this addition to your already splendid equipment. We believe that the results to accrue from the plan laid down by you will more than compensate for all the energy that has been expended in preparing these beautiful laboratories. With such facilities as we see about us, and such direction as the work is sure to receive from your able instructors, it is our belief that the University of Toronto more than ever before will take a prominent place among the factors that are operating for the good of medical education. Again, Sir, let me offer our hearty congratulations.

**PROFESSOR J. P. McMURRICH, OF THE UNIVERSITY OF MICHIGAN.**

As an old alumnist of the University of Toronto I have peculiar pleasure in being able to convey the congratulations of the sister University of Michigan, where they have recently opened a new Medical Building.

There was one argument which I think the President omitted, and which seems to me the most powerful of all: and the fact that the University of Toronto is now entering into these magnificent laboratories with chances to fulfil that argument leads me to speak of it—the argument from the enormous contributions which can be made to the material welfare of the country and otherwise by research done in medical laboratories. A single discovery will give to the country resources which cannot possibly be estimated in any terms fit to express them. A discovery such as that, for instance, which has recently been made in Harvard University by the Pathologist, Professor Councilman, is one which will amply repay for all the expenditure which a Government can possibly make throughout the life of a University, in what it will give us in the way of power to prevent and exterminate a scourge which carries away from us thousands of lives of the utmost value to the State.

**PROFESSOR L. F. BARKER, OF THE UNIVERSITY OF CHICAGO.**

After offering congratulations to the University of Toronto from the University of Chicago, which granted more fellowships to Toronto graduates than to any other University in America, Professor L. F. Barker said:—

If one looks about him in the scientific world for the most striking characteristics of our times, he will find it, perhaps, in the systematic organization of investigative work. There has

never before been a time when original research has been so carefully planned or so consciously directed as now. The world is tremendously impressed with the result of science attained during the last two centuries, but it would not be surprising, with the immense system of inquiry now in vogue, if during the twentieth century discoveries were made which would exceed in number and eclipse in grandeur those of all the centuries which have preceded.

In the forward march of science, great theories are originated, have their day, and are demolished. But it is surprising how often an old theory, thought to be thoroughly extinct, will be exhumed and resuscitated. Like Colonel Bogie of the golf links, a scientific bogie may be "downed" one day but it is likely to "down" its antagonists the next. The science of chemistry began with alchemy—the attempt of the ancients to manufacture gold out of the baser metals. Gradually the doctrine of the immutability of the "elements" developed and the efforts of the alchemists were believed to be attempts at the absolutely impossible; one who harbored their hopes was regarded as ridiculous. But the physicists and chemists have been making some startling discoveries in the recent past, as the results of which the elements have been shown to be less "immutable" than was thought. Each of them gives off radiations of minute particles, the so-called "electrons" or "ultimate corpuscles," each of which is at least 1,000 times lighter than the atom of hydrogen, and each of which so far as can be made out, is the same as every other particle of the same magnitude, no matter what its source.

It may not be true that the "element" Radium decomposes into the "element" Helium, as has already been asserted, but certain it is that physicists and chemists feel far less certain today of the elementary nature of the so-called elements than they have for a hundred years. Indeed, I heard one of the oldest chemists in America say about a fortnight ago, that in his opinion, the principal work of the laboratories of physics and chemistry during the next ten years would be devoted to attempts to analyze and synthesize the elements. It is amusing to think of the excitement among the gold-seeking alchemists of the middle ages—wherever they might be at the time—should some one be fortunate enough in the not too distant future, to take electrons derived, say, from iron and combine them into the precious metal, gold. That such a thing may be suggested even, shows us clearly the great changes which are going on in chemical thought.

Again there is the doctrine of "spontaneous generation" kept alive for so long by its supporters and especially by the unfortunate Bastian, until it was thoroughly extinguished by

the researches of Tyndall and Pasteur. Would it be surprising if this dead doctrine were revived? Surely no more so than the resurrection of alchemistic dreams. Those biologists who are busily engaged in the application of physical chemistry to the study of protoplasm are already cherishing again the possibility of something making living things from things not alive. Some of them even dare to say so, and others would like to say so, did they not fear that they would be suspected of carrying "bees in their bonnets." Truly, not all theories sleep that have closed eyes!

Professor Roswell Park, of the University of Buffalo, conveyed the congratulations of that institution to the University of Toronto. He was then followed by the Honorable Senator Sullivan, of the Medical Faculty of Queen's University, Kingston, who conveyed the congratulations of the institution which he represented.

A large body of students assembled in the University Gymnasium on the evening of October 1st to hear the opening lecture.

PROFESSOR WM. OSLER, JOHNS HOPKINS UNIVERSITY.

#### THE MASTER-WORD IN MEDICINE.

Before proceeding to the pleasing duty of addressing the undergraduates, as a native of this province and as an old student of this school, I must say a few words on the momentous changes inaugurated with this session, the most important, perhaps, which have taken place in the history of the profession in Ontario. The splendid laboratories which we saw opened this afternoon, a witness to the appreciation by the authorities of the needs of science in medicine, makes possible the highest standards of education in the subjects upon which our Art is based. They may do more. A liberal policy, with a due regard to the truth that the greatness of a school lies in brains not bricks, should build up a great scientific centre which will bring renown to this city and to our country. The men in charge of the departments are of the right stamp. See to it that you treat them in the right way by giving skilled assistance enough to ensure that the vitality of men who could work for the world is not sapped by the routine of teaching. One regret will, I know, be in the minds of many of my younger hearers. The removal of the department of anatomy and physiology from the biological laboratory of the university breaks a connection which has had an important influence on medicine in this city. To Professor Ramsay Wright is due much of the inspiration which has made possible these fine new laboratories. For years he has encouraged in every way the cultivation of the scientific branches of medicine and has unselfishly devoted much time to promoting the best interests of the

Medical Faculty. And in passing let me pay a tribute to the ability and zeal with which Dr. A. B. Macallum has won for himself a world-wide reputation by intricate studies which have carried the name of this University to every nook and corner of the globe where the science of physiology is cultivated. How much you owe to him in connection with the new buildings I need scarcely mention in this audience.

But the other event which we celebrate is of much greater importance. When the money is forthcoming it is an easy matter to join stone to stone in a stately edifice, but it is hard to find the market in which to buy the precious cement which can unite into an harmonious body the professors of medicine of two rival medical schools in the same city. That this has been accomplished so satisfactorily is a tribute to the good sense of the leaders of the two faculties, and tells of their recognition of the needs of the profession in the province. Is it too much to look forward to the absorption or affiliation of the Kingston and London schools into the Provincial University? The day has passed in which the small school without full endowment can live a life beneficial to the students, to the profession or to the public. I know well of the sacrifice of time and money which is freely made by the teachers of those schools; and they will not misunderstand my motives when I urge them to commit suicide, at least so far as to change their organizations into clinical schools in affiliation with the central university, as part, perhaps, of a widespread affiliation of the hospitals of the province. A school of the first rank in the world, such as this must become, should have ample clinical facilities under its own control. It is as much a necessity that the professors of medicine and surgery, etc., should have large hospital services under their control throughout the year, as it is that professors of pathology and physiology should have laboratories such as those in which we here meet. It should be an easy matter to arrange between the provincial authorities and the trustees of the Toronto General Hospital to replace the present antiquated system of multiple small services by modern well equipped clinics—three in medicine and three in surgery to begin with. The increased efficiency of the service would be a substantial *quid pro quo*, but there would have to be a self-denying ordinance on the part of many of the attending physicians. With the large number of students in the combined school no one Hospital can furnish in practical medicine, surgery and the specialties a training in the art an equivalent of that which the student will have in the sciences in the new laboratories. An affiliation should be sought with every other hospital in the city and province of fifty beds and over, in each of which two or three extra-mural teachers could be recognized,

who would receive for three or more months a number of students proportionate to the beds in the hospital. I need not mention names. We all know men in Ottawa, Kingston, London, Hamilton, Guelph and Chatham, who could take charge of small groups of the senior students and make of them good practical doctors. I merely throw out the suggestion. There are difficulties in the way: but is there anything in this life worth struggling for which does not bristle with them?

Students of Medicine: May this day be to each of you, as it was to me when I entered this school thirty-five years ago, the beginning of a happy life in a happy calling. Not one of you has come here with such a feeling of relief as that which I experienced at an escape from conic sections and logarithms and from Hooker and Pearson. The dry bones became clothed with interest, and I felt that I had at last got to work. Of the greater advantages with which you start I shall not speak. Why waste my words on what you cannot understand. To those of us only who taught and studied in the dingy old building which stood near here is it given to feel the full change which the years have wrought, a change which my old teachers, whom I see here to-day—Dr. Richardson, Dr. Ogden, Dr. Thorburn and Dr. Oldright—must find hard to realize. One looks about in vain for some accustomed object on which to rest the eye in its backward glance—all, all are gone; the old familiar places. Even the landscape has altered, and the sense of loneliness and regret, the sort of homesickness one experiences on such occasions, is relieved by a feeling of thankfulness that at least some of the old familiar faces have been spared to see this day. To me at least the memory of those happy days is a perpetual benediction, and I look back upon the two years I spent at this school with the greatest delight. There were many things that might have been improved—and we can say the same of every medical school of that period—but I seem to have got much more out of it than our distinguished philosopher friend, J. Beattie Crozier, whose picture of the period seems hardly drawn. But after all, as someone has remarked, instruction is often the least part of an education, and, as I recall them, our teachers in their life and doctrine set forth a true and lively word to the great enlightenment of our darkness. They stand out in the background of my memory as a group of men whose influence and example were most helpful. In William R. Beaumont and Edward Mulberry Hodder, we had before us the highest type of the cultivated English surgeon. In Henry H. Wright we saw the incarnation of faithful devotion to duty—too faithful, we thought, as we trudged up to the eight o'clock lecture in the morning. In W. T. Aikins, a practical surgeon of

remarkable skill and an ideal teacher for the general practitioner. How we wondered and delighted in the anatomical demonstrations of Dr. Richardson, whose infective enthusiasm did much to make anatomy the favorite subject among the students. I had the double advantage of attending the last course of Dr. Ogden and the first of Dr. Thorburn on materia medica and therapeutics. And Dr. Oldright has just begun his career of unselfish devotion to the cause of hygiene.

To one of my teachers I must pay in passing the tribute of filial affection. There are men here to-day who feel as I do about Dr. James Bovell—that he was one of those finer spirits, not uncommon in life, touched to finer issues only in a suitable environment. Would the Paul of evolution have been Thomas Henry Huxley had the Senate elected the young naturalist to a chair in this university in 1851? Only men of a certain metal rise superior to their surroundings, and while Dr. Bovell had that all important combination of boundless ambition with energy and industry, he had that fatal fault of diffuseness, in which even genius is strangled. With a quadrilateral mind, which he kept spinning like a teetotum, one side was never kept uppermost for long at a time. Caught in the storm which shook the scientific world with the publication of the *Origin of Species*, instead of sailing before the wind, even were it with bare poles, he put about and sought a harbor of refuge in writing a work on Natural Theology, which you will find on the shelves of second-hand book shops in a company made respectable at least by the presence of Paley. He was an omnivorous reader and transmutor, he could talk pleasantly, even at times transcendently, upon anything in the science of the day, from protoplasm to evolution; but he lacked concentration and that scientific accuracy which only comes with a long training (sometimes, indeed, never comes), and which is the ballast of the boat. But the bent of his mind was devotional, and early swept into the Tractarian movement, he became an advanced Churchman, a good Anglican Catholic. As he chaffingly remarked one day to his friend, the Rev. Mr. Darling, he was like the waterman in Pilgrim's Progress, rowing one way towards Rome, but looking steadfastly in the other direction towards Lambeth. His "Steps to the Altar" and his "Lectures on the Advent" attest the earnestness of his convictions; and later in life, following the example of Linacre, he took orders and became another illustration of what Cotton Mather calls the angelic conjunction of medicine with divinity. Then, how well I recall the keen love with which he would engage in metaphysical discussions, and the ardor with which he studied Kant, Hamilton, Reed and Mill. At that day, too, the Rev. Prof. Bevan was intrusted the rare privilege of directing



the minds of the thinking youths at the Provincial University into proper philosophical channels. It was rumored that the hungry sheep looked up and were not fed. I thought so at least, for certain of them, led by T. Wesley Mills, came over daily after Dr. Bovell's four o'clock lecture to reason high and long with him

"On Providence, Foreknowledge, Will and Fate  
Fixed Fate, Freewill, Foreknowledge absolute."

Yet withal, his main business in life was as a physician, much sought after for his skill in diagnosis, and much beloved for his loving heart. He had been brought up in the very best practical schools. A pupil of Bright and of Addison, a warm personal friend of Stokes and of Graves, he maintained loyally the traditions of Guy's, and taught us to reverence his great masters. As a teacher he had grasped the fundamental truth announced by John Hunter of the unity of physiological and pathological processes, and, as became the occupant of the chair of the Institutes of Medicine, he would discourse on pathological processes in lectures on physiology, and illustrate the physiology of bioplasm in lectures on the pathology of tumors to the bewilderment of the students. When in September, 1870, he wrote to me that he did not intend to return from the West Indies I felt that I had lost a father and a friend; but in Robert Palmer Howard, of Montreal, I found a noble step-father, and to these two men, and to my first teacher, the Rev. W. A. Johnson, of Weston, I owe my success in life—if success means getting what you want and being satisfied with it.

## II.

Of the value of an introductory lecture I am not altogether certain. I do not remember to have derived any enduring benefit from the many that I have been called upon to hear, or from the not a few that I have inflicted in my day. On the whole, I am in favor of abolishing the old custom, but as this is a very special occasion, with special addresses, I consider myself most happy to have been selected for this part of the programme. To the audience at large I fear that what I have to say will appear trite and commonplace, but bear with me, since, indeed, to most of you how good soever the word, the season is long past in which it could be spoken to your edification. As I glance from face to face the most striking single peculiarity is the extraordinary diversity that exists among you. Alike in that you are men and white, you are unlike in your features, very unlike in your minds and in your mental training, and your teachers will mourn the singular inequalities in your capacities. And so it is sad to think will be your careers; for one

success, for another failure; one will tread the primrose path to the great bonfire, another the straight and narrow way to renown; some of the best of you will be stricken early on the road, and will join that noble band of youthful martyrs who loved not their lives to the death; others, perhaps the most brilliant among you, like my old friend and comrade, Dick Zimmerman (how he would have rejoiced to see this day!), the Fates will overtake and whirl to destruction just as success seems assured. When the iniquity of oblivion has blindly scattered her poppy over us, some of you will be the trusted counsellors of this community, and the heads of departments of this Faculty; while for the large majority of you, let us hope, is reserved the happiest and most useful lot given to man—to become vigorous, whole-souled intelligent general practitioners.

It seems a bounden duty on such an occasion to be honest and frank, so I propose to tell you the secret of life as I have seen the game played, and as I have tried to play it myself. You remember in one of the Jungle Stories that when Mowgli wished to be avenged on the villagers he could only get the help of Hathi and his sons by sending them the master-word. This I propose to give you in the hope, yes, in the full assurance, that some of you at least will lay hold upon it to your profit. Though a little one, the master-word looms large in meaning. It is the open sesame to every portal, the great equalizer in the world, the true philosopher's stone, which transmutes all the base metal of humanity into gold. The stupid man among you it will make bright, the bright man brilliant, and the brilliant student steady. With the magic word in your heart all things are possible, and without it all study is vanity and vexation. The miracles of life are with it: the blind see by touch, the deaf hear with eyes, the dumb speak with fingers. To the youth it brings hope, to the middle-aged confidence, to the aged repose. True balm of hurt minds, in its presence the heart of the sorrowful is lightened and consoled. It is directly responsible for all advances in medicine during the past twenty-five centuries. Laying hold upon it Hippocrates made observation and science the warp and woof of our art. Galen so read its meaning that fifteen centuries stopped thinking, and slept until awakened by the *De Fabrica* of Vesalius, which is the very incarnation of the master-word. With its inspiration Harvey gave an impulse to a larger circulation than he wot of, an impulse which we feel to-day. Hunter sounded all its heights and depths, and stands out in our history as one of the great exemplars of its virtues. With it Virchow smote the rock, and the waters of progress gushed out while in the hands of Pasteur it proved a very talisman to open to us a

new heaven in medicine and a new earth in surgery. Not only has it been the touchstone of progress, but it is the measure of success in every-day life. Not a man before you but is beholden to it for his position here, while he who addresses you has that honor directly in consequence of having had it graven on his heart when he was as you are to-day. And the master-word is *Work*, a little one, as I have said, but fraught with momentous sequences if you can but write it on the tablets of your hearts and bind it upon your foreheads. But there is a serious difficulty in getting you to understand the paramount importance of the work-habit as part of your organization. You are not far from the Tom Sawyer stage with its philosophy "that work consists of whatever a body is obliged to do, and that play consists of whatever a body is not obliged to do."

A great many hard things may be said of the work-habit. For most of us it means a hard battle; the few take to it naturally; the many prefer idleness and never learn to love labor. Listen to this: "Look at one of your industrious fellows for a moment. I beseech you," says Robert Louis Stevenson. "He sows hurry and reaps indigestion; he puts a vast deal of activity out to interest, and receives a large measure of nervous derangement in return. Either he absents himself entirely from all fellowship, and lives a recluse in a garret, with carpet slippers and a leaden inkpot, or he comes among people swiftly and bitterly, in a contraction of his whole nervous system, to discharge some temper before he returns to work. I do not care how much or how well he works, this fellow is an evil feature in other people's lives." These are the sentiments of an overworked, dejected man; let me quote the motto of his saner moments: "To travel hopefully is better than to arrive, and the true success is in labor." If you wish to learn of the miseries of scholars in order to avoid them, read Part I, Section 2, Member 3, Subsection XV. of that immortal work, the *Anatomy of Melancholy*, but I am here to warn you against these evils, and to entreat you to form good habits in your student days.

At the outset appreciate clearly the aims and objects each one of you should have in view—a knowledge of disease and its cure, and a knowledge of yourselves. The one, a special education, will make you a practitioner of medicine; the other, an inner education, may make you a truly good man, four square and without a flaw. The one is extrinsic and is largely accomplished by teacher and tutor, by text and by tongue; the other is intrinsic and is the mental salvation to be wrought out by each one for himself. The first may be had without the second; any one of you may become an active practitioner, without ever having had sense enough to realize that through life you have been a fool; or you may have the second without

the first, and, without knowing much of the art, you may have the endowments of head and heart that make the little you do possess go very far in the community. With what I hope to infect you is a desire to have a due proportion of each.

So far as your professional education is concerned, what I shall say may make for each one of you an easy path easier. The multiplicity of the subjects to be studied is a difficulty, and it is hard for teacher and student to get a due sense of proportion in the work. We are in a transition stage in our methods of teachings, and have not everywhere got away from the idea of the examination as the "be-all and end-all," so that the student has constantly before his eyes the magical letters of the degree he seeks. And this is well, perhaps, if you will remember that having, in the old phrase, commenced Bachelor of Medicine, you have only reached a point from which you can begin a life-long process of education.

So many and varied are the aspects presented by this theme that I can only lay stress upon a few of the more essential. The very first step towards success in any occupation is to become interested in it. Locke put this in a very happy way when he said, give a pupil "a relish of knowledge" and you put life into his work. And there is nothing more certain than that you cannot study well if you are not interested in your profession. Your presence here is a warrant that in some way you have become attracted to the study of medicine, but the speculative possibilities so warmly cherished at the outset are apt to cool when in contact with the stern realities of the class-room. Most of you have already experienced the all absorbing attraction of the scientific branches, and nowadays the practical method of presentation has given a zest which was usually lacking in the old theoretical teaching. The life has become more serious in consequence, and medical students have put away many of the childish tricks with which we used to keep up their bad name. Compare the picture of the "sawbones" of 1842, as given in the recent biography of Sir Henry Ackland, with the representatives to-day, and it is evident a great revolution has been effected, and very largely by the salutary influences of improved methods of education. It is possible now to fill out a day with practical work, varied enough to prevent monotony, and so arranged that the knowledge is picked out by the student himself, and not thrust into him, willy-nilly, at the point of the tongue. He exercises his wits and is no longer a passive Strassbourg goose, tied up and stuffed to repletion.

How can you take the greatest possible advantage of your capacities with the least possible strain? By cultivating system. I say cultivating advisedly, since some of you will find the acquisition of systematic habits very hard. There are

minds congenitally systematic; others have a life-long fight against an inherited tendency to diffuseness and carelessness in work. A few brilliant fellows try to dispense with it altogether, but they are a burden to their brethren and a sore trial to their intimates. I have heard it remarked that order is the badge of an ordinary mind. So it may be, but as practitioners of medicine we have to be thankful to get into their useful class. Let me entreat those of you who are here for the first time to lay to heart what I say on this matter. Forget all else, but take away this counsel of a man who has had to fight a hard battle, and not always a successful one, for the little order he has had in his life; take away with you a profound conviction of the value of system in your work. I appeal to the freshmen especially, because you to-day make a beginning, and your future career depends very much upon the habits you will form during this session. To follow the routine of the classes is easy enough, but to take routine into every part of your daily life is a hard task. Some of you will start out joyfully as did Christian and Hopeful, and for many days will journey safely towards the Delectable Mountains, dreaming of them and not thinking of disaster until you find yourselves in the strong captivity of Doubt and under the grinding tyranny of Despair. You have been over confident. Begin again and more cautiously. No student escapes wholly from these perils and trials; be not disheartened, expect them. Let each hour of the day have its allotted duty, and cultivate that power of concentration which grows with its exercise, so that the attention neither flags nor wavers, but settles with a bull-dog tenacity on the subject before you. Constant repetition makes a good habit fit easily in your mind, and by the end of the session you may have gained that most precious of all knowledge—the power to work. Do not underestimate the difficulty you will have in wringing from your reluctant selves the stern determination to exact the uttermost minute on your schedule. Do not get too interested in one study at the expense of another, but so map out your day that due allowance is given to each. Only in this way can the average student get the best that he can out of his capacities. And it is worth all the pains and trouble he can possibly take for the ultimate gain—if he can reach his doctorate with system so ingrained that it has become an integral part of his being. The artistic sense of perfection in work is another much to be desired quality to be cultivated. No matter how trifling the matter on hand, do it with a feeling that it demands the best that is in you, and when done look it over with a critical eye, not sparing a strict judgment of yourself. This it is that makes anatomy a student's touch-stone. Take the man who does his "part" to perfection, who has got out all there is

in it, who labors over the tags of connective tissue and who demonstrates Meckel's ganglion in his part—this is the fellow in after years who is apt in emergencies, who saves a leg badly smashed in a railway accident, or fights out to the finish, never knowing when he is beaten, in a case of typhoid fever.

Learn to love the freedom of the student life, only too quickly to pass away; the absence of the coarser cares of after days, the joy in comradeship, the delight in new work, the happiness in knowing that you are making progress. Once only can you enjoy these pleasures. The seclusion of the student life is not always good for a man, particularly for those of you who will afterwards engage in general practice, since you will miss that faculty of intercourse upon which often the doctor's success depends. On the other hand sequestration is essential for those of you with high ambitions proportionate to your capacity. It was for such that St. Chrysostom gave his famous counsel, "Depart from the highways and transplant thyself into some enclosed ground, for it is hard for a tree that stands by the wayside to keep its fruit till it be ripe."

Has work no dangers connected with it? What of this bogie of overwork of which we hear so much? There are dangers, but they may readily be avoided with a little care. I can only mention two, one physical, one mental. The very best students are often not the strongest. Ill-health, the bridle of Theages, as Plato called it in the case of one of his friends whose mind had thriven at the expense of his body, may have been the diverting influence towards books or the profession. Among the good men who have studied with me there stands out in my remembrance many a young Lycidas, "dead ere his prime," sacrificed to carelessness in habits of living and neglect of ordinary sanitary laws. Medical students are much exposed to infection of all sorts, to combat which the body must be kept in first-class condition. Grossteste, the great Bishop of Lincoln, remarked that there were three things necessary for temporal salvation—food, sleep and a cheerful disposition. Add to these suitable exercise and you have the means by which good health may be maintained. Not that health is to be a matter of perpetual solicitation, but habits which favor the *corpus sanum* foster the *mens sana*, in which the joy of living and the joy of working are blended in one harmony. Let me read you a quotation from old Burton, the great authority on *morbi eruditorum*. There are "many reasons why students dote more often than others. The first is their negligence; other men look to their tools, a painter will wash his pencils, a smith will look to his hammer, anvil, forge; a husbandman will mend his plough-irons, and grind his hatchet, if it be dull; a falconer or huntsman will have an especial care of his hawks, hounds,

horses, dogs, etc.; a musician will string and unstring his lute, etc.: only scholars neglect that instrument, their brain and spirits (I mean) which they daily use."\*

Much study is not only believed to be a weariness of the flesh, but also an active cause of ill-health of mind, in all grades and phases. I deny that work, legitimate work, has anything to do with this. It is that foul fiend Worry who is responsible for a large majority of the cases. The more carefully one looks into the causes of nervous breakdown in students, the less important is work *per se* as a factor. There are a few cases of genuine overwork, but they are not common. Of the causes of worry in the student life there are three of prime importance to which I may briefly refer.

An anticipatory attitude of mind, a perpetual forecasting, disturbs the even tenor of his way and leads to disaster. Years ago a sentence in one of Carlyle's essays made a lasting impression on me: "Our duty is not to *see* what lies dimly at a distance, but to *do* what lies clearly at hand." I have long maintained that the best motto for a student is, "Take no thought for the morrow." Let the day's work suffice; live for it, regardless of what the future has in store, believing that to-morrow should take thought for the things of itself. There is no such safeguard against the morbid apprehensions about the future, the dread of examinations and the doubt of the ultimate success. Nor is there any risk that such an attitude may breed carelessness. On the contrary, the absorption in the duty of the hour is in itself the best guarantee of ultimate success. "He that observeth the wind shall not sow, and he that regardeth the clouds shall not reap," which means you cannot work profitably with your mind set upon the future.

Another potent cause of worry is an idolatry by which many of you will be sore let and hindered. The mistress of your studies should be the heavenly Aphrodite, the motherless daughter of Uranus. Give her your whole heart, and she will be your protectress and friend. A jealous creature, brooking no second, if she finds you trifling and coquetting with her rival, the younger, earthly Aphrodite, daughter of Zeus and Dione, she will whistle you off and let you down the wind to be a prey, perhaps to the examiners, certainly to the worm regret. In plainer language, put your affections in cold storage for a few years, and you will take them out ripened, perhaps a bit mellow, but certainly less subject to those frequent changes which perplex so many young men. Only a grand passion, an all-absorbing devotion to the elder goddess can save the man with a congenital tendency to philandering, the flighty Lydgate who sports with Celia and Dorothea, and upon whom the

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\* Quotation mainly from Marsilius Ficinus.

judgment ultimately falls in a basil-plant of a wife like Rosamond.

And thirdly, one and all of you will have to face the ordeal of every student in this generation who sooner or later tries to mix the waters of science with the oil of faith. You can have a great deal of both if you only keep them separate. The worry comes from the attempt at mixture. As general practitioners you will need all the faith you can carry, and while it may not always be of the conventional pattern, when expressed in your lives rather than on your lips, the variety is not a bad one from the standpoint of St. James: and may help to counteract the common scandal alluded to in the celebrated diary of that gossipy old pastor-doctor, the Rev. John Ward: "One told the Bishop of Gloucester that he imagined physicians of all other men the most competent judges of all others affairs of religion—and his reason was because they were wholly unconcerned with it."

### III.

Professional work of any sort tends to narrow the mind, to limit the point of view and to put a hall-mark on a man of a most unmistakable kind. On the one hand are the intense, ardent natures, absorbed in their studies and quickly losing interest in everything but their profession, while other faculties and interests "fust" unsued. On the other hand are the bovine brethren, who think of nothing but the treadmill and the corn. From very different causes, the one from concentration, the other from apathy, both are apt to neglect those outside studies that widen the sympathies and help a man to get the best there is out of life. Like art, medicine is an exacting mistress, and in the pursuit of one of the scientific branches, sometimes, too, in practice, not a portion of a man's spirit may be left free for other distractions, but this does not often happen. On account of the intimate personal nature of his work, the medical man, perhaps more than any other man, needs that higher education of which Plato speaks,—“that education in virtue from youth upwards, which enables a man eagerly to pursue the ideal perfection.” It is not for all, nor can all attain to it, but there is comfort and help in the pursuit, even though the end is never reached. For a large majority the daily round and the common task furnish more than enough to satisfy their heart's desire, and there seems no room left for anything else. Like the good, easy man whom Milton scores in the *Areopagitica*, whose religion was a “traffic so entangled that of all mysteries he could not skill to keep a stock going upon that trade” and handed it over with all the locks and keys to “a



divine of note and estimation," so it is with many of us in the matter of this higher education. No longer intrinsic, wrought in us and ingrained, it has become, in Milton phrase, a "dividual movable," handed over nowadays to the daily press or to the hap-hazard instruction of the pulpit, the platform or the magazines. Like a good many other things, it comes in a better and more enduring form if not too consciously sought. The all-important thing is to get a relish for the good company of the race in a daily intercourse with some of the great minds of all ages. Now, in the spring-time of life, pick your intimates among them, and begin a systematic cultivation of their works. Many of you will need a strong leaven to raise you above the dough in which it will be your lot to labor. Uncongenial surroundings, an ever-present dissonance between the aspirations within and the actualities without, the oppressive discords of human society, the bitter tragedies of life, the *lacrymae rerum*, besides the hidden springs of which we sit in sad despair—all these tend to foster in some natures a cynicism quite foreign to our vocation, and to which this inner education offers the best antidote. Personal contact with men of high purpose and character will help a man to make a start—to have the desire, at least, but in its fullness this culture—for that word best expresses it—has to be wrought out by each one for himself. Start at once a bed-side library and spend the last half hour of the day in communion with the saints of humanity. There are great lessons to be learned from Job and from David, from Isaiah and St. Paul. Taught by Shakespeare you may take your intellectual and moral measure with singular precision. Learn to love Epictetus and Marcus Aurelius. Should you be so fortunate as to be born a Platonist, Jowett will introduce you to the great master through whom alone we can think in certain levels, and whose perpetual modernness startles and delights. Montaigne will teach you moderation in all things, and to be "sealed of his tribe" is a special privilege. We have in the profession only a few great literary heroes of the first rank, the friendship and counsel of two of whom you cannot too earnestly seek. Sir Thomas Browne's *Religio Medici* should be your pocket companion, while from the Breakfast Table Series of Oliver Wendell Holmes you can glean a philosophy of life peculiarly suited to the needs of a physician. There are at least a dozen or more works which would be helpful in getting wisdom in life which only comes to those who earnestly seek it.

A conscientious pursuit of Plato's ideal perfection may teach you the three great lessons of life. You may learn to consume your own smoke. The atmosphere is darkened by the murmurings and whimperings of men and women over the non-

essentials, the trifles that are inevitably incident to the hurly burly of the day's routine. Things cannot always go your way. Learn to accept in silence the minor aggravations, cultivate the gift of taciturnity and consume your own smoke with an extra draught of hard work, so that those about you may not be annoyed with the dust and soot of your complaints. More than any other the practitioner of medicine may illustrate the second great lesson, that we are here not to get all we can out of life for ourselves, but to try to make the lives of others happier. This is the essence of that oft-repeated admonition of Christ, "He that findeth his life shall lose it, and he that loseth his life for my sake shall find it," on which hard saying if the children of this generation would only lay hold, there would be less misery and discontent in the world. It is not possible for anyone to have better opportunities to live this lesson than you will enjoy. The practice of medicine is an art, not a trade, a calling, not a business, a calling in which your heart will be exercised equally with your head. Often the best part of your work will have nothing to do with potions and powders, but with the exercise of an influence of the strong upon the weak, of the righteous upon the wicked, of the wise upon the foolish. To you, as the trusted family counsellor, the father will come with his anxieties, the mother with her hidden grief, the daughter with her trials, and the son with his follies. Fully one-third of the work you do will be entered in other books than yours. Courage and cheerfulness will not only carry you over the rough places of life, but will enable you to bring comfort and help to the weak-hearted and will console you in the sad hours when, like little Uncle Toby, you have "to whistle that you may not weep."

And the third lesson you may learn is the hardest of all—that the law of the higher life is only fulfilled by love and charity. Many a physician whose daily work is a daily round of beneficence will say hard things and think hard thoughts of a colleague. No sin will so easily beset you as uncharitableness towards your brother practitioner. So strong is the personal element in the practice of medicine, and so many are the wagging tongues in every parish, that evil-speaking, lying, and slandering find a shining mark in the lapses and mistakes which are inevitable in our work. There is no reason for discord and disagreement, and the only way to avoid trouble is to have two plain rules. From the day you begin practice never under any circumstances listen to a tale told to the detriment of a brother practitioner. And when any dispute or trouble does arise, go frankly, ere sunset, and talk the matter over, in which way you may gain a brother and a friend. Very easy to carry out, you may think! Far from it: there is no harder battle to

fight. Theoretically there seems to be no difficulty, but when the concrete wound is rankling, and after Mrs. Jones has rubbed in the cayenne pepper by declaring that Dr. J. told her in confidence of your shocking bungling, your attitude of mind is that you would rather see him in purgatory than make advances towards reconciliation. Wait until the day of your trial comes and then remember my words.

And in closing, may I say a few words to the younger practitioners in the audience whose activities will wax not wane with the growing years of the century which opens so auspiciously for this school, for this city, and for our country. You enter a noble heritage, made by no efforts of your own, but by the generations of men who have unselfishly sought to do the best they could for suffering mankind. Much has been done, much remains to do; a way has been opened, and to the possibilities in the scientific development of medicine there seems to be no limit. Except in its application, as general practitioners, you will not have much to do with this. Yours is a higher and more sacred duty. Think not to light a light to shine before men that they may see your good works: contrariwise you belong to the great army of quiet workers, physicians and priests, sisters and nurses, all over the world, the members of which strive not neither do they cry, nor are their voices heard in the streets, but to them is given the ministry of consolation in sorrow, need, and sickness. Like the ideal wife of whom Plutarch speaks, the best doctor is often the one of whom the public hears the least; but nowadays, in the fierce light that beats upon the earth, it is increasingly difficult to lead the secluded life in which our best work is done. To you the silent workers of the ranks, in villages and country districts, in the slums of our large cities, in the mining camps and factory towns, in the homes of the rich, and in the hovels of the poor, to you is given the harder task of illustrating with your lives the Hippocratic standards of Learning, of Sagacity, of Humanity, and of Probity. Of learning, that you may apply in your practice the best that is known in our art, and that with the increase in your knowledge there may be an increase in that priceless endowment of sagacity, so that to all, everywhere, skilled succor may come in the hour of need. Of a humanity, that will show in your daily life tenderness and consideration to the weak, infinite pity to the suffering, and broad charity to all. Of a probity, that will make you under all circumstances true to yourselves, true to your high calling, and true to your fellow man.

After Professor Osler's address the Dean of the Faculty of Medicine, Professor R. A. Reeve, addressed the students and conveyed the thanks of the Faculty of Medicine to the lecturer

of the evening. He stated that in his opinion it was very fitting that we should have endeavored to secure the presence here of some of the leading men of the larger and older institutions of learning in the United States and in the Motherland to celebrate the double consummation, the completion of our medical buildings, which embodies some principles, which, for the first time, have found expression in a structure of this kind, and in the union of the Medical Faculties of Toronto and Trinity.

Professor J. Algernon Temple, lately Dean of the Faculty of Medicine of the University of Trinity, addressed the audience. He expressed the regret which he said was shared by his colleagues, in abandoning the old Trinity Medical College, where he has devoted much time and energy in teaching for the past 27 or 28 years, and from whose halls many illustrious men have graduated. Whilst making these sacrifices, however, he believed sincerely that the step was in the interest of medical education in this Province, and in the interests of the two schools which had amalgamated.

#### VISITORS' ADDRESSES.

On Friday morning the students had the advantage and opportunity of listening to addresses by several of the Visiting Professors. In the large north lecture theatre Prof. W. W. Keen, of Jefferson, spoke to them on Literary Methods in Medicine, giving excellent and well-matured advice as to their reading, note-taking, case-recording and record-filing.

Prof. Welch, of Johns Hopkins, eloquently portrayed the importance and advantage of their pathological studies and their bearing upon successful and scientific practice.

Prof. Adams, of McGill, took up the same parable, and earnestly impressed all his hearers with the necessity of bringing up the Clinical Laboratory and Hospital work to a level with the present excellent position of Physiology and Pathology in the University.

Professor Abbott, of the University of Pennsylvania, then spoke upon the importance of Hygiene and Preventive Medicine in the Medical Course. He clearly pointed out the duty of the Medical Practitioner to the state, and illustrated, by the citation of instances, the widespread calamities which result from the neglect or the perfunctory performance of this duty. He humorously showed how this department of preventive medicine, although the youngest, exercised the greatest influence in the community, and was occasionally, as now in New York, the basis and groundwork of a municipal campaign and, as formerly in England, the rallying cry of a great political party "Sanitas Sanitatum."

In the south lecture room Professor Chittenden addressed the classes of the primary years and he dwelt on the necessity to the medical student of having a thorough preparation in the sciences at the foundation of medicine. He pointed out that it is impossible for the physician to rightly interpret pathological phenomena unless he has a fair knowledge of biology, physics, chemistry, physiology, and physiological chemistry. The possession of a good knowledge of these subjects gives an immense advantage to the physician in the exercise of his calling. Professor Sherrington spoke of the changes that had taken place in the requirements of the medical curriculum, and advised the students to cultivate thoroughness in their studies.

Professor Porter described the Harvard method of teaching physiology to medical students, and emphasized the fact that it is not what you know from the point of view of theory that is all important, but the knowledge of the manner in which the facts and generalizations of physiology were obtained. Unless a student is properly trained in this way, he may fail utterly in interpreting physiological phenomena, even if he have access to all the literature on physiology.

Professor Barker strongly advocated the view that every medical student should be able to read French and German, and he should also early acquire a knowledge of medical reference literature in order that he might at once, when called upon to do so, be in a position to consult the publications on any particular subject.

#### SPECIAL CONVOCATION.

Special Convocation for conferring honorary degrees was held in the University Gymnasium on the afternoon of Friday October 22nd, the Vice-Chancellor, the Hon. Chief Justice Moser, presiding.

#### PROFESSOR W. W. KEEN, JEFFERSON MEDICAL COLLEGE, PHILADELPHIA.

Professor Cameron presented William Williams Keen, M.A., M.D., LL.D., Professor of Surgery, Jefferson Medical College, Philadelphia, for the degree of LL.D. Dr. Keen then addressed the Convocation.

*Mr. Vice-Chancellor, Mr. President, Students of the Medical Department of the University of Toronto, Ladies and Gentlemen :—*

I thank you most sincerely for the unexpected honor of this degree, an honor which I shall always remember with the greatest pleasure. In doing so, it gives me great pleasure to join my congratulations with those which have been so happily

expressed by others of your honored guests upon the erection of your new building for physiology, physiological chemistry, pathology, and public health. These branches of medicine, with anatomy, which already has an admirable home, are fundamental, and the progress of medicine, surgery, obstetrics, and all the specialties is conditioned, first of all, upon progress in these departments.

The laws governing the action of all forces—such as power when applied by the lever, the pulley, the inclined plane or the screw, the forces of heat, light, electricity, magnetism and steam—are first discovered. Then come the practical applications of these forces through machines by which we can use them. In the wake of such theoretical knowledge have come the balance, the printing press, the steam engine, the locomotive, the dynamo, the trolley, the telegraph, the telephone, etc. These are the machines which minister to civilization, and have transformed modern life. Were it not for the unwearied theoretical study in the laboratory, by which the abstruse laws governing these forces have been discovered and accurately stated, we should be groping in the dark and wasting our time, our money and our opportunities. In 1903, we would be as our fathers were in 1803. Just so in medicine. The same patient laboratory workers must be encouraged by the facilities which you have now provided for them to solve the problems of physiology (that is, the study of the various organs in their normal condition), of pathology (that is, the study of the various organs in diseased conditions), the complex reactions of chemistry (which, in the future, far more than in the past, will aid us both in physiology and pathology), and of public health, which will diminish the suffering, promote the well-being, and prolong the lives of the entire community.

You have provided now the external physical conditions for successful study. The intelligent young men around you, yearning for distinguished careers in science, will be swift to take advantage of such splendid opportunities, and will be the best guarantee that the moral and intellectual conditions shall equal the physical.

Those not wholly familiar with the progress of medicine in the last two or three decades may think, in view of the enormous and well-known progress made by medicine, surgery and bacteriology, that medical science may have reached its limits, and may wonder whether there are any other worlds to conquer.

Worlds to conquer? Aye! scores of them! The solution of each problem does but reveal two or three new ones; increase of knowledge but shows us how little we really know. Professor Welch's Huxley Lecture, which disclosed the marvelous

progress made in the study of immunity, showed a still larger world of the unknown which must be subdued. The surgeon longs for such an intimate knowledge of sepsis as will enable him to convert an already septic wound into an aseptic wound: and that the cause and then the cure of cancer, and other similar diseases, may be vouchsafed to him; the physician is seeking for the germs of scarlet fever, typhus fever, chicken-pox, whooping cough, measles; the pathologist is questioning the blood and slowly compelling it to disclose the secret foes and friends of health floating in its crimson tide: the physiologist is investigating the internal secretions; and the therapist is experimenting upon the various antitoxins and immunizing serums. The darkness of the night of ignorance is gradually fading, the dawn is lighting up the eastern sky, some day the glorious sun of complete knowledge will appear above the horizon to flood the world with its bright rays.

But you need more than these fundamental branches, without which no progress could be made. The "final cause," the ultimate reason for the existence of the doctor is to alleviate suffering and cure disease. When well grounded in the fundamental branches, for which you have now made provision, he must learn how to apply this knowledge to actual sick and suffering men, women and children. How shall he learn to do this? It must either be from lectures and books, when he hears and reads about disease, or by coming directly in contact with disease itself in living but suffering men, women and children. Which method shall be adopted?

You have bought a fine watch, a locomotive, a steam yacht, or have built a costly electric plant. You seek a skilled watchmaker to repair your watch, or you want to engage an engineer to run one of those complicated machines. Which will you choose, the watchmaker or the engineer who has only listened to lectures and read books on watchmaking, electricity, steam, the dynamo, the locomotive and ships' engines, or the man who has not only become theoretically familiar with their construction, but has actually handled them till every part is as familiar as his own bedroom, who has taken them apart and put them together again scores of times, and has healed sick watches and cured sick engines? To ask the question is to answer it. Will you do better by your watches, your engines, your yacht, your electrical plant, which only cost money, than by your bodies, which are indissolubly bound up with your very lives and the happiness of those dearer to you than your own lives?

The great daily laboratory of the medical profession is the sick-room. To be equal to his task, therefore, the doctor, even when he graduates, must be familiar with actual patients and

not be compelled to learn by blunders, the penalty for which is paid by his patients in shattered health or tedious convalescence, or by ghastly mistakes, each of which has cost a life. You must, therefore, provide a complete university hospital in which hundreds of the sick and suffering will find relief at the hands of your devoted and skilful Faculty and at the same time afford the students the occasion for study and observation, for case taking, for dressing of wounds, and for clinical and bacteriological examinations, and so learn the chameleon phases of disease, the means of cure, and the methods of operating. This hospital must have also not only its wards for those actually sick or dangerously injured, but a large out-patient department for every specialty, for those whose illness, or accident, or injury does not require them to leave their homes and their families and enter a hospital, but who can be cared for by simply visiting the hospital at suitable intervals. Here the minor accidents and ailments may be early and easily cured, and so prevented from threatening life or limb. In these out-patient departments your students will see all the usual forms of disease and be trained in their proper treatment.

It is sometimes objected by those who are not familiar with the actual facts, that this method of actual bedside instruction does harm to the sick. May I quote in reply what I said in an address to the Congress of American Physicians and Surgeons last May: "I speak after an experience of nearly forty years as surgeon to half a dozen hospitals, and I can confidently say that I have never known a *single patient* injured or his chances of recovery lessened by such teaching. Moreover, who will be least slovenly and careless in his duties, he who prescribes in the solitude of the sick chamber, or operates with two or three assistants only, or he whose every moment is eagerly watched by hundreds of eyes, alert to detect every false step, he omission of an important clinical laboratory investigation, the neglect of the careful examination of the back as well as of the front of the chest, the failure to detect any important physical sign or symptom? Who will be most certain to keep up with the progress of medical science, he who works alone with no one to discover his ignorance, or he who is surrounded by a lot of bright young fellows who have read the last *Lancet*, or the newest *Annals of Surgery*, and can trip him up if he is not abreast of the times? I always feel at the Jefferson Hospital as if I were on the run with a pack of lively dogs at my heels. I cannot afford to have the youngsters familiar with operations, the means of investigations, or the newer methods of treatment of which I am ignorant. I must, perforce, study, read, catalogue, and remember; or give place to others who will. Students are the best whip and spur I know. The poor-



est charity patient in a hospital often has his disease more thoroughly investigated and has a better chance of recovery than a well-to-do or even rich patient, because a hospital affords the means for such complicated investigations which are not possible in private practice.

Such a hospital and out-patient department should be under the control of the Trustees and Faculty, and all its beds and other facilities should be wholly given up to the teaching Faculty. Much friction will thus be avoided; the professors of medicine, surgery and other branches will be the physicians, surgeons, etc., to the hospital by right, and not by courtesy, and the didactic instruction in the college and the clinical instruction in the hospital will be most advantageously correlated. College, hospital, out-patient department and laboratory are all parts of one great medical machine. Cut off or dislocate one, and all are crippled; the education of your own family physicians, your surgeons, your obstetricians, and your specialists is marred; and you, men and women of Toronto, and your children, and all of Canada, will suffer.

One thing more is needed to carry out this scheme—large endowments. Modern medical teaching is excessively expensive, because it has become so largely individual instead of to great classes, and so the teaching force has had to be enormously increased; and because it is chiefly in the laboratory which demands expensive buildings, costly equipment, and still more instructors. Has it ever occurred to you that universities are the only bodies which sell their wares below cost? Railroads, industrial plants, merchants, all sell their goods for cost plus five, ten, or twenty per cent., which represents their profit. Universities sell theirs for twenty-five to fifty per cent. less than cost, which represents their actual loss in money. Hence, the \$10,000,000 for the Medical Department of Harvard, the \$7,000,000 for the Medical Department of Chicago, the \$2,000,000 given to the Medical Department of Columbia University, the \$7,000,000 for Johns Hopkins, the millions so freely given to McGill University. Universities and medical schools must have large endowments, either from generous friends or from the Government. The former have shown their interest in this university by large gifts. It now rests with the Government to help you either by annual grants or by additional endowments. I feel the more at liberty to urge this before a British audience, because Sir Norman Lockyer, as President of the British Association for the Advancement of Science, spoke in clarion tones but a few weeks ago in support of this same idea, and showed its urgent need in Great Britain. It is no less urgent in Canada. Liberal aid to universities and technical schools, including pre-eminently the medical schools, is one of the wisest

and most profitable investments a Government can make, and will most surely meet with popular approval. The profits on the formerly wasted coal-tar products alone have more than repaid Germany all her vast grants to her chemical laboratories, in which the methods of utilizing this waste were discovered: and the pre-eminence of Germany in medical research has been maintained by similar expenditures upon her medical schools. Why should not the familiar label "Made in Germany" be replaced by "Made in Canada"?

Professor Wm. Clark, of Trinity University, then presented Dr. William Henry Welch, M.A., M.D., LL.D., Professor of Pathology in Johns Hopkins University, for the degree of LL.D.

Professor Welch then addressed the Convocation and spoke as follows:

No one could be insensible to an honor conferred by this University, and I certainly appreciate most highly the distinction and decoration conferred upon me to-day. I wish I were worthy of all that has been said of me. I am sure that my colleagues must wish that some non medical man may present them also upon such an occasion—certainly a too partial judgment of my work and of my merits. But I do appreciate most highly the honor as coming especially from this Canadian University. We do not think of you as foreign. You are certainly the closest of kin to us, and the deepest of sympathy exists I am sure between us. There is certainly no line of nation or country drawn between the representatives of science and of letters. They represent one great brotherhood in the world. And we think of the members of the medical profession in Canada and of the representatives of science in this country as belonging to and forming part of us—we are all, as I say, one brotherhood. I may say that I can only re-echo the sentiments that Dr. Keen has so ably presented to you, and especially express my sympathy with his idea of the importance of the university hospital connected with the medical school. That has been our greatest strength in the Johns Hopkins University Medical Department. What we have been able to do for the advancement of medical education in this country has been due in very large measure to the fact that Johns Hopkins left a part of his large endowment for the support of a hospital, which is, as he says, in his will, to be a part of the Medical School. In that respect we have been most fortunate, and I say I think that, although the time must surely come, you will hardly reach the height of your endeavor here until that aid is secured and you have a hospital which is directly under your control. It has been a great gratification to me, as I am sure it has been to all of my colleagues, to have been present here on this most interesting occasion during these two days. I feel most

amply rewarded by the inspiration which I have received by having come in contact with my colleagues here and members of the Faculty and others whom I have had the pleasure of meeting. I feel impressed greatly with the spirit which prevails here, and I feel the utmost confidence in the future of this institution. No one who understands the conditions here can help feel that, great as its work has been in the past, still greater is its work to be in the future.

The Vice-President of the University, Professor R. Ramsay Wright, then presented Professor William Osler, M.D., LL.D., F.R.S., Professor of Medicine in Johns Hopkins University.

Professor Osler then addressed the Convocation as follows:—

I need hardly tell you how much I appreciate the honor you have conferred upon me to-day here in the University in which I began my scientific education. I say, sir, it is with peculiar delight that I have been present at these exercises. It is really beyond words to express the feeling that an old student has when he sees at last this Faculty housed in such a building as that which was opened yesterday. It really is a great delight and the building is so fine, there is nothing, I think, on the continent to be compared with it for the purposes for which it has been destined.

Professor McPhedran then presented Russell Henry Chittenden, Ph.D., Professor of Physiological Chemistry in Yale University.

Professor Chittenden addressed the Convocation and spoke as follows:—

*Mr. President, Members of the Board of Trustees, Ladies and Gentlemen:*—I desire first of all to express my hearty appreciation of the honor which this University has seen fit to confer upon me. I am sure that I shall always hold with pride this distinction. I take it to be that this honor which has come to me to-day is probably in a large measure a recognition of physiological chemistry, as well as the science I represent. I take pleasure that it is so, because in my mind physiological chemistry as one of our biological sciences is destined to play a very important part in the development of the medicine of the future. In this science which is so young, which has been in existence as a distinct science hardly a quarter of a century, I believe at least are the germs of many things which are destined to add health, strength, wealth and prosperity to the nations of the world. That, perhaps, may sound like a very broad statement, but in biology, the science of life, there is nothing more important than a study of the functions of the body; and in physiological chemistry we have a science which is striving most zealously to open up new avenues for the betterment of mankind.

Matters of nutrition, upon which we all depend for our very existence; matters connected with the germs which medicine looked at now so attentively; matters of remedies—remedies when needed, exceedingly important. Every physiological action depends, we believe, upon chemical constitution, and the physiological chemist is striving with might and main to learn more about these matters for the benefit of human-kind.

It seems to me that this University of Toronto has an unparalleled opportunity for the development of this phase of physiological work. As stated yesterday, I viewed with great pleasure the new opportunities here presented for the study of physiological chemistry, and I believe that in this direction lies an opportunity for good, which, if followed up, will bring unbounded credit to this University; and just here let me say that if these opportunities are to come in physiological chemistry, in physiology and biology in general, there must be aid. It is not a question merely of money. Money is, of course, essential. We cannot have adequately fitted-up laboratories, we cannot have all the essentials for work unless there is money to provide these; but in addition there must be men, there must be brains at the disposal of the University, and the plea I would like to make here—and I trust it is quite an appropriate one to make here—is that facilities be offered for the carrying on of research work by young men who may be induced to stay here and cultivate these opportunities, through research fellowships and other methods.

That the strength of a university depends upon the strength of its men is a trite saying, but if a university is to grow we must provide young men—forceful men, men endowed with all the opportunities which the occasion demands—to take the place of the older men and push on the work and help to create an atmosphere which will redound to the credit of the University.

The plea I would like to make, therefore, is that every possible effort be made in the biological sciences to draw the young men here, and keep the young men who have started here at work along advanced lines, and to offer such inducements that other men will come to you here, and thus build up a school of active investigators and broaden the bounds of the science in which they are interested, and thereby increase the general usefulness of the University.

Professor A. B. Macallum then presented Charles S. Sherrington, M.A., M.D., F.R.S., Holt Professor of Physiology, University of Liverpool.

Professor Sherrington addressed the Convocation and spoke as follows:—

*Mr. President, Gentlemen, Members of the Board of Trustees*

*of this University, Ladies and Gentlemen*:—It is a difficult thing to adequately express my appreciation of the distinction which your University so kindly has given me at the present moment. In fact, I do not feel able for the moment to express the feeling with which I regard the honor that I have just received.

I must say in defence of myself that some of the kind remarks that I have heard fall from the lips of Professor Macallum, make me imagine that he is thinking about somebody else, and that there is some mistake, but I consider myself fortunate, and the mistake is on the right side. The visit, through the occasion of this function, which has been so interesting to all of us, and which has brought me to Toronto, has, I can assure you, served as an encouragement and as a stimulus that I hope I shall to some extent adequately convey to my colleagues who are at work in the University of Liverpool.

Of course, I cannot yet more than suspect that in a large measure the honor that I have just received I owe to the benevolence of a time-honored institution here for the most infantine of universities. Our university, as it shelters at the present moment some of your graduates from Toronto, you may be interested to hear, is, I think, just one month old. It will be with a special pride and pleasure that my fellow-students and my fellow-members in that faculty will receive the news of the step that this university has taken. They, at that great distance, will, I know, appreciate having a small piece of Toronto University among them. I am only too proud to be that little piece of Toronto University over there, and I am encouraged because, from the words that Dr. Osler spoke, I begin to believe that I have entered upon an ornamental stage.

It may, perhaps, interest you, sir, if I report the fact that our university over there has as its Chancellor at the present moment one who is well known in the Dominion, a former Governor-General, Lord Stanley that was, Lord Derby that is.

I can only, in conclusion, hope that those finely built laboratories, at whose inauguration I have been present, will be but the forerunner of more, and I would take this opportunity of joining my own testimony with those that have been offered by Professor Keen, Professor Osler and others, as to the importance to the community of adequately supporting and adequately running what is and must be an expensive and not directly paying portion of the machinery of education. However, this is not the moment to dilate upon a theme with which I am afraid I have already wearied you.

In conclusion I would add that it will be one of the dearest privileges that I shall hold—to maintain, as far as a man can maintain, the honor, dignity and prestige of the University of Toronto.

President Loudon presented by name, Henry Pickering Bowditch, M.A., M.D., D.Sc., LL.D., Professor of Physiology in Harvard University, and the degree of LL.D. was conferred upon him *in absentia*.

Convocation then adjourned.

#### THE DINNER.

On Friday night the Faculty of Medicine entertained their guests at dinner in the University Dining-Hall. Over one hundred sat down and among the guests present were: The Minister of Education, Professors Sherrington, Keen, Osler, Welch, Porter, McMurrich and Barker, Principal Hutton, Messrs. Alfred Moseley, B. E. Walker, J. Herbert Mason, Z. A. Lash, and others.

After proposing the health of the King, the President, who was in the chair, called upon the Minister of Education to propose the toast of the University: this the Honorable Mr. Harcourt did in a very happy manner, and response was made by Professor Irving H. Cameron.

The Vice-President then gave the toast of Our Guests, which was drunk with great enthusiasm.

Professor Osler, who replied first, referred especially to the great work which Professor Ramsay Wright had done for the cause of scientific Medical education in Ontario. He next recalled some amusing incidents occurring in his boyhood, in which the Architect of the New Buildings (Mr. Frank Darling), and Mr. Zeb. A. Lash, K.C., the chairman of the New Residence Committee, who were blushing present, played a conspicuous part. He then congratulated the Faculty upon the public spirit manifested on both sides, in the amalgamation of the Medical Faculties of both Universities in advance of the completion of Federation, and predicted great things for the future, but strongly urged the necessity for proper Hospital accommodation and Clinical facilities, under the control of the Faculty, before the full measure of good could be accomplished. With one of his usual sallies, he left the room to catch the night train for Montreal, announcing on the way that he had prepared an excellent speech for the occasion, which Professor Keen would presently deliver—as his own.

Professor Keen, after expressing the pleasure he had in being present, and his appreciation of the hospitality extended to the visitors, spoke in commendation of what he had seen of the methods and means of instruction in the University, and joined with Professor Osler in urging the need and necessity of a University Hospital. He concluded an address which presented high flights of eloquence, with a stirring appeal for Anglo-Saxon unity in the moral and intellectual future of the world.

Mr. Alfred Moseley, C.M.G., the generous and public-spirited Englishman who equipped and maintained an ambulance and nursing-staff in the South African War, and subsequently sent out a labor commission to the United States (which recently made a very valuable report) and who is now supporting a Commission of Enquiry into American Educational Methods, was then called upon. He gave a very interesting account of the impressions formed upon his mind in a two months tour of Canada on the question of a Preferential Tariff, Free Trade within the Empire, and Mr. Chamberlain's position: and concluded a most lucid and instructive speech by bespeaking for the members of his Education Commission, who should visit Canada, a measure of the hospitality which he had himself enjoyed.

Professors Sherrington and Welch then returned thanks for the guests, and said many pleasant things about the University and their visit, Professor Welch remarking that he had now assisted at the opening of two of the University Buildings, and that he was quite prepared to come back to do similar duty for a third. His sponsorial duties are a pleasure to him and not a tax.

Mr. Byron E. Walker was called upon as a member of the Board of Trustees, and made a most important deliverance upon the finances of the University, and the duty of the Government and of private wealth thereto. He traced the development and expansion of the University, and showed how the original endowment had become insufficient for present needs, and how men of wealth would presently realize—as the process of education went on—that their duty and the Government's in educational matters was not vicarious and alternative, but supplemental and co-operative. He said the Government had, under pressure, always made good the deficits of the University, and he felt assured they would always do so: but he felt it was humiliating and beneath the dignity of a great Institution to be annually approaching the Government in *forma pauperis*, and that under the cramping influence of a perpetually recurring deficit, the best work was inhibited and lost. He made reference to the Ontario Surplus, and declared that it was a disgrace to any Government to have a surplus when the University—the creation and child of the State—was crying for bread and stunted in its growth by penury. Mr. Walker then dilated upon the effect of the senseless bugaboo of "direct taxation" upon both Government and people, and pointed out how successfully and well the system worked in Michigan, where the people cheerfully and willingly paid a fraction of a mill upon the dollar for the support of education. He advocated its adoption in Ontario.

Mr. Z. A. Lash afforded much entertainment by his inimitable recitation of "Johnnie's First Moose" by Dr. Drummond.

The Nestor of the Faculty and of the Professors, Dr. James H. Richardson, sole survivor of the Faculty of 1853, was then called upon and gave an account of the first Faculty and of its dissolution. He referred very pathetically to the history of the early days, and concluded his interesting reminiscences by thanking God that he had lived to see not only the restoration of the Medical Faculty and the good work it had accomplished in the last seventeen years, but also the final triumph of the unification of Medical teaching in the University.

With the singing of "Auld Lang Syne," a most pleasing and enjoyable gathering was dissolved, and the commemoration exercises ended.

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### PROGRESS OF TORONTO UNIVERSITY.

There could not have been a more auspicious beginning for the new era of things in the University than the ceremonies connected with the formal opening of the new medical laboratories. The occasion marked the first step in the federation of Trinity University with the Provincial University, for the two medical institutions consolidated are the medical faculties of those universities, and this alone would have made the inaugural functions of more than ordinary interest, even to the non-medical portion of the public. The presence also of such distinguished teachers as Professors Welch, Osler, Sherrington, Chittenden, Keen and others, was in itself sufficient to make the opening function a memorable one. Further, the whole programme of the ceremonies was carried out without a single interruption. The university authorities are to be congratulated on this result, as well as on the cordial co-operation of the members of the two faculties which have chosen to throw their lot together.

The texts of the various addresses show how far-reaching are the questions of medical education, and how pressing is the necessity of a solution of many of them. Professor Sherrington's very able address was in the main devoted to the needs of medicine as a science, and to the difficulty under existing conditions of satisfying these needs. It is everywhere the case that the great expansion which has taken place in the sciences has taxed to the utmost the resources of the universities, and the demands of the medical sciences in this respect are amongst the most urgent. Adequately constructed laboratories and their maintenance are costly affairs, which cannot be managed as one manages a dividend-paying enterprise. If it were so, then only the wealthy few could afford to enter the profession of medicine. From the point of view only of imparting the



instruction required the difficulty is great, but it is more formidable when all the conditions of efficiency in teaching must be met. Research is an absolutely necessary feature in modern medical teaching as in some other departments of higher instruction. This is very clearly put by Professor Sherrington. "The duties of a university do not begin and end with the disciplinary and didactic. Besides schools of instruction, they must be schools of thought. To be this latter, the laboratory must pursue research. Even for the welfare of the class-teaching this is essential. Instructive lectures may be given by men of ability, the whole of whose knowledge is second-hand, but it is doubtful whether the real life of science can be fully met and communicated by one who has not himself learnt by direct enquiry from nature. Nothing so augments the teacher's power of impression and incisive teaching of a subject as to have faced problems in it himself as an original enquirer. And after rudiments have been once fairly acquired, there is for good students no training equal to that given by following even a small research under an experienced leader."

Research, however, is not the least costly factor in the university problem, and the question is, how to provide for it. In the new University of Liverpool, which aims at being an institution for research, the situation was met by the people of Liverpool imposing a penny on the pound rates, which would mean a direct contribution by the people themselves of about £18,000. From this it is evident that sections of the English public are keenly alive to the value of research in their universities. Amongst ourselves the doctrine that research be carried on in the University does not appear to have acquired the influence that it should have, but certain departments of the Provincial institution have not failed in their duty in this respect. Extremely valuable work has, for instance, been done in the physical, chemical, biological and physiological laboratories, work which has made the University known throughout the world as a progressive seat of learning, and there is good reason for the hope that research will play an ever-increasing part in university life and work. Those who are advocates of research must, however, not neglect to educate the public as to the value of research, for the ultimate support of scientific investigation must be derived from the people of this province. The university teachers must now and then leave their laboratories to show the public, as Professors Welch, Sherrington Osler and Chittenden have done in their inaugural addresses last week, that research is the life of a true university, and that it is the mainspring of all progress and intellectual and material welfare in a nation, and if they fully do their duty in this line, adequate financial support will not in the end be lacking.—*The News*.

## Personals.

Dr. John Hunter, of Toronto, left for New York for post graduate work, October 24th.

Dr. Brefney O'Reilly passed in Gynecology and Midwifery for the conjoined London examination.

Dr. H. B. Anderson returned from his sojourn in North Muskoka much improved in health.

Dr. Harold Parsons spent a week in Baltimore, early in October, looking for pointers in connection with the teaching of clinical microscopy.

Congratulations to our friend Doctor Lewellys Franklin Barker who was married to Miss Lilian Haines Halsey, of Baltimore, on the twenty-ninth of October.

Dr. H. S. Hutchinson (Tor. '01), who was lately in charge of the new Sanitarium, Gravenhurst, has returned to Toronto and is engaged at work in the new laboratories.

We are pleased to announce that Dr. Charles D. Parfitt has quite recovered, and extend congratulations on his marriage to Miss Fitz-Randolph of Plainfield, New Jersey, October 31st.

Dr. Macdougall King (Tor. '02), has commenced practice in Denver, Colorado, and has also been appointed Instructor in Physiology in the Medical Faculty of the University of Denver.

Dr. V. E. Henderson, B.A. (Tor. '02), is now engaged in post graduate work in Prague. We hope to publish in our next issue a paper from him on "Hay-fever: Oteology an Specific Treatment."

Regular students registered for the session of 1903-4:

First year.....	155
Second year.....	135
Third year.....	164
Fourth year.....	161
Total.....	615
Occasional students.....	91
Grand total.....	706

The occasional students are from the Ontario Dental College, and receive instruction in Anatomy in the University. In addition there are a few fifth year students, working chiefly in the laboratories. The fifth year course is being organized.

The numbers are smaller in the primary than in the final years on account of the recent establishment of a combined six years' course in Arts and Medicine. A number entered for this course in 1902 and 1903. Those who did so in 1902 will be enrolled in the first year—Medicine, next session.

Dr. J. M. Lefevre, of Vancouver, B.C., passed through Toronto on his way to England in the latter part of September.

Dr. R. A. Reeve, Dean, had a serious attack of influenza at the time of the opening exercises. He went up to the gymnasium on the evening of October 1st with a temperature of 104, and while delivering his interesting address was obliged to cling to the lectern for support. After this he was confined to his bed for about ten days. He left Toronto for Preston Springs and came back in a couple of weeks in perfect health much to the delight of his friends, in time to entertain the medical students at a smoking concert on Halloween.

## Miscellaneous.

### The Treatment of Symptoms.

In a highly interesting article on this subject, Walter M. Fleming, A.M., M.D., of New York City, uses the following language: "Long experience in the treatment of diseases in their incipiency, evidences beyond all debate, that almost invariably, the attack in a large proportion of cases is inaugurated by febrile symptoms of greater or lesser severity. Also, it may be noticed that constipation or torpid inactivity of the bowels prevails. Therefore, the first indication in the incubation or incipiency of the attack, of almost any form or nature, is primarily to allay the fever, pain-nervousness and solicitude of the patient, and secondarily to empty the alimentary canal. These two ends being accomplished, a long advance towards a possible abortive issue of the attack has been made, or in any event, the first indication and requirements are fulfilled, in proper progress toward a cure.

Thus in the primary treatment of the numerous ills, which are characterized by the above quoted symptoms, the physician will find Laxative Antikamnia and Quinine Tablets at once handy, convenient and reliable, safe and sure, and to which the turbulent symptoms of fever, constipation, pain-sleeplessness, nausea and generally wretched depression yield so promptly and gracefully, that it is certainly refreshing to the physician himself, to note the change in his patient, from suffering and solicitude to comfort and quiet. I certainly know of no other remedy which will so readily and decisively allay and control the symptoms above enumerated."

"For therapeutic efficiency in rapid resolution of the products of inflammation, Antiphlogistine is unexcelled."

"Expectation becomes realization in all cases of localized inflammation where Antiphlogistine is applied."

### The Canadian Medical Exchange.

We draw the attention of physicians who may desire to sell their practices, or those who may wish to buy a medical practice, to the Canadian Medical Exchange. Dr. Hamill has been conducting this important department of medical affairs for the last ten years, and from close knowledge of his method of doing business, we can recommend him to the confidence of the profession, and advise any of our readers who may have any business in this line, to place it in Dr. Hamill's hands with the full assurance that the utmost business ability, integrity and professional secrecy, will be utilized.

### Sanmetto in Prostatitis, Urethritis, Cystitis.

I have used Sanmetto extensively in my practice for some years, and in well chosen cases have always gotten good results. I look upon it as a most valuable remedy in prostatitis, urethritis, cystitis, and in fact all inflammatory conditions of the genito-urinary tract.

Jackson, Mich.

W. J. CHITTOCK, M.D.

J. Wm. Henry, M.D., Brooklyn, N.Y., states: "Aside from the ordinary value of Glyco-Thymoline in its use on abnormal mucous membrane, I consider it of extreme value in the treatment of diphtheria. In a recent case of the most severe type, in which every symptom pointed to a discouraging prognosis, I used Glyco-Thymoline by spray and swab with the ordinary constitutional treatment. The temperature soon lowered and the crisis was passed without serious trouble, much to my surprise and gratification.

In tonsillitis it has been my standard treatment for some time. Its action is quick, and the effect was very agreeable to the patient."

"Extension of the septic products along the vascular highways is prevented by the use of Antiphlogistine."

During the last two years I have constantly and extensively employed Pepto-Mangan (Gude) in my practice and cannot sufficiently praise its curative action in diseases of the nervous system and digestive organs.

Rovereto, Tyrol, Austria.

DR. JULIUS KEPPEL.

"The abstraction of blood from the deep blood-vessels into the superficial capillaries through physiologic innervation is physiological phlebotomy. Bleed, but save the blood, is the mechanics of Antiphlogistine."

### The Scarcity of Cod Liver Oil.

It is doubtful if the condition created by the present great scarcity of cod liver oil can find a parallel in the history of medicine. That an article of such wide popularity and general use as cod liver oil should become so scarce and high in price is an incident that gives rise to serious thought. Never before, perhaps, has it been so clearly shown how great the constant demand is for this product. From all parts of the country come urgent inquiries regarding the outlook in the near future and in some sections it is almost impossible to get the pure oil at any price. This famine in cod liver oil, if continued for any length of time, might easily result very seriously. There are thousands of people, young and old, who use this oil continually and whose health depends upon it. To deprive them of cod liver oil for even a short period would be to deprive them of a very valuable life food, and as there is nothing to take the place of cod liver oil the seriousness of a prolonged famine can be better imagined than described. It is a source of satisfaction to know that Scott's Emulsion will bridge the temporary scarcity of pure oil and will keep this valuable article within the reach of every one who needs it. It is not alone dangerous but unnecessary to experiment with the numerous cheap substitutes for cod liver oil. While Scott's Emulsion is known to be the standard emulsion of cod liver oil, containing only the purest and best ingredients, there can be no excuse for using the cheap, worthless substitutes.

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Final decree, enjoining James Kerr et al from selling substitutes for Fairchild's Essence of Pepsine.

Fairchild Brothers & Foster, a corporation, plaintiff, against James Kerr, defendant.

Now, on motion of Gould & Wilkie, attorneys for the plaintiff, it is adjudged that the defendant, his clerks, agents, servants and employees, be and they hereby are, enjoined and restrained perpetually from selling or dispensing either at the drug store of the said defendant, at West New Brighton, in the Borough of Richmond, of the City of New York, or elsewhere, any Essence of Pepsine, or pharmaceutical preparation of any sort or kind whatsoever, not manufactured by plaintiff, in imitation of, or in substitution for, Fairchild's Essence of Pepsine, whenever Fairchild's Essence of Pepsine is prescribed or asked for, and from representing by any word or action that any preparation sold by said defendant, not manufactured by plaintiff, is Fairchild's Essence of Pepsine, together with taxed costs.

THOMAS L. HAMILTON, *Clerk.*

# ORGANIC IRON MEDICATION IN SECONDARY ANEMIAS.

A CLINICAL AND HEMATOLOGICAL STUDY.

BY LINO S. CHIBAS, M.D.,

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G. A. DE SANTOS SAXE, M.D.,

Assistant Pathologist to the Columbus Hospital, New York.

A great deal has been written in recent years on the value of the various new organic iron compounds in the treatment of anemia, and our only excuse for the presentation of this report is that every new series of clinical observations, made with due conservatism and accurately recorded, is of value in confirming or disproving some fact or theory in medicine.

The problem of treating secondary anemias is an interesting one. In each case there is, in the first place, the primary factor, be it loss of blood through hemorrhage, spontaneous or traumatic; or be it the lowering of the functional activity of the blood-forming organs wrought by disease somewhere in the body, or by the action of toxins; or the direct destruction of the red cells and their hemoglobin in the circulating blood by some more violent toxic agency.

The first question, therefore, is how to remove the primary factor, or, at least, how to arrest its influence on the state of the blood. The second is how to improve the state of the blood, so as to give it a new lease of life by increasing the amount of hemoglobin—that prime agent of oxygen exchange—and the number of red cells, the carriers of this agent.

In each individual case of secondary anemia there are different obstacles to be overcome as regards the primary factor; and therefore the treatment of the primary disease varies; but the therapy of the secondary condition is alike in all cases. Iron and its assistant, manganese, are the specifics to which we must have recourse—of that there has long since been no doubt—but the form of iron that should be used for this purpose is another question.

The problem as to the exact site and mode of absorption of iron which is administered therapeutically has occupied pharmacologists for a number of years, and a great deal has been written on the subject, and yet there is still no agreement even as regards some of the essential parts of this question. Is iron absorbed at all in the inorganic state? If so, in what form and in what quantities? What form of iron is most readily absorbed? How does iron act if it is not absorbed, or if only infinitesimal amounts, totally inadequate for the needs of the

body, enter the plasma and are taken up by the molecules of hemoglobin? All these questions have been discussed and rediscussed, but as yet, as Hammarsten<sup>1</sup> says: "The action of the iron salts is obscure."

In a clinical article we are not called upon to go into details in discussing the various phases of the question as to the absorption and mode of action of the iron salts, but a few words may be said to show the present status of the subject.

Whether iron compounds of the inorganic group are absorbed at all, is a question of subsidiary interest in the present inquiry. There are two diametrically opposite views on this question. Bunge and his pupils<sup>2</sup> say that inorganic iron salts are not absorbed in any amount, however small, and that Bland's pills and similar preparations act only by combining with the hydrogen sulphide and the alkaline sulphides of the intestine, thus preventing the decomposition of the organic compounds of iron existing in our food, especially in vegetables, and so permitting the absorption of these compounds into the blood. The opposite view is held by Quincke<sup>3</sup> and others, but the balance of evidence is in favor of Bunge's hypothesis.<sup>4</sup> The well-known fact that enormous doses of iron are required to produce appreciable effects in chlorosis supports this theory. Thus, if a woman takes six grains of reduced iron three times a day (eighteen grains daily), it will take weeks to restore her to the normal condition if her hemoglobin has fallen to fifty per cent. And yet, the entire amount of iron in the blood of a normal woman of average weight is only thirty grains, so that if the inorganic iron were absorbed, as some observers claim, a few days would suffice to restore the balance of hemoglobin and red cells.

On the other hand, organic iron compounds, especially such as are composed of iron with a proteid substance that resembles as closely as possible the proteids of the food as they occur in the intestine (*e.g.*, peptones), are undoubtedly absorbed into the blood in sufficient amounts to produce a comparatively speedy therapeutic effect in anemia, without injuring, as the inorganic compounds often do, the epithelial covering of the stomach and intestine, and thus causing gastro-intestinal symptoms summarized under the two general headings of dyspepsia and constipation.

It is these advantages that led to the general adoption of the peptonates, albuminates, etc., as the remedies to be preferred in the treatment of anemia. In this report we deal with one of these preparations, that known as pepto-mangan, Gude, in which iron and manganese exist in the form of peptonates. Gude's pepto-mangan has been used for a long time at the Columbus Hospital as a matter of routine in all anemic

patients during convalescence from prolonged illness or from operations. The satisfactory results which have been obtained with this preparation have been noted, in a general way, by the visiting staff as well as by the house physicians, but until now we had made no study of the exact results, as attested by the examination of the blood before and after the initiation of the treatment.

In order to determine more accurately what could be expected of pepto-mangan in secondary anemias as they occur in a general hospital, we studied a number of cases in the medical, surgical and gynecological wards. Of these a majority were in the services of Drs. Ramon Guiteras and Egbert H. Grandin, visiting surgeon and visiting gynecologist to the hospital, and take this opportunity to acknowledge their courtesy in permitting us to pursue this work.

About forty cases were studied from October 1, 1902, to March 1, 1903, in as thorough a manner as possible, with a view of determining the action of the preparation to be tested. Unfortunately, for reasons beyond our control, a great many of these patients left the hospital, believing themselves sufficiently improved, without giving us time to try the remedy for a sufficient period to obtain definite results. We present, however, twelve cases in which the medication was continued for three or more weeks, usually for about a month in each instance. In each of these cases blood-counts were made before beginning the treatment, as well as after it had been discontinued. The cases are given below, simply as they appeared in our notes, and they were not selected particularly on account of the results noted, but merely because they were the cases studied more completely than the rest.

#### REPORT OF CASES.

CASE 1.—Mrs. R. F., Italian, 42 years of age, was admitted to the hospital on December 4th. Diagnosis, ovarian cyst. Symptoms of secondary anemia. She was operated upon December 5th and the uterus was removed through the abdominal incision, as it was found to be the seat of a fibroid tumor which had degenerated into sarcoma. She was discharged cured on January 10, 1903. During her convalescence she took one tablespoonful of pepto-mangan (Gude) three times daily. The examination of the blood showed the following findings:

December 4, hemoglobin 50 per cent., reds 3,350,000, whites 15,000. December 18, after hysterectomy, hemoglobin 39 per cent., reds 2,300,000, whites 16,000. January 10, hemoglobin 70 per cent., reds 4,250,000, whites 7,800.

The patient left the hospital in an excellent condition showing no signs of anemia or debility.



CASE 2.—A.P., Italian, 25 years old, admitted November 17th, with stricture of the urethra and signs of marked anemia. November 24th, perineal section and internal urethrotomy for stricture. There was considerable hemorrhage during and for a few days after the operation.

Examination of blood: December 12, eighteen days after operation, hemoglobin 68 per cent., reds 3,700,000, whites 10,429. January 4th, 1903, twenty-eight days after beginning the use of pepto-mangan, hemoglobin 95 per cent., reds 4,800,000, whites 8,400.

Pepto-mangan was given in doses of one tablespoonful three times daily from December 13th to January 10th. The patient was discharged cured on January 10th, in good general condition.

CASE 3.—M.S., Italian, 25 years old, admitted October 14th. The diagnosis was perinephritic abscess and tuberculous knee-joint, and the patient showed pallor of the skin and mucous membranes. He was operated upon by lumbar incision for perinephritic abscess on October 24th, and his knee-joint was excised December 18th.

Examination of blood: December 13th, 1902, three weeks after first operation, hemoglobin 70 per cent., reds 3,104,000, whites 5,888. December 20th, 1902, two days after excision of joint, hemoglobin 70 per cent., reds 2,751,000, whites 24,000. January 10th, when discharged, hemoglobin 85 per cent., reds 4,640,000, whites 5,150.

This patient was given pepto-mangan for three weeks from December 21st to January 10th. He was discharged improved in good health. The anemia was very marked on December 20th after the second operation, and the increase in the blood cells and hemoglobin was very satisfactory for a case of this severity after three weeks' treatment.

CASE 4.—Ida M., five years old, Italian parents, born in the United States, was admitted November 30th, 1902, suffering from typhoid fever. December 12th, after the convalescence had set in, the child was extremely anemic-looking, with pale skin and pale, bluish-red mucous membranes. Pepto-mangan was ordered, a teaspoonful three times daily, on December 12th. Eight days later the first blood examination was made; two weeks later, the second. The findings of the pathologist were as follows:

December 20th, hemoglobin 75 per cent., reds 4,750,000, whites 30,000. January 8th, hemoglobin 85 per cent., reds 4,960,000, whites 9,200. The patient was discharged cured on January 8th.

CASE 5.—Cesare C., aged 25 years, single. Had been operated upon one year ago in South America for vesical calculus and