An Address ON SCIENCE AND MEDICINE IN THE MODERN UNIVERSITY.

Delivered to the Toronto University Trustees and Senators and to the Medical Profession of Ontario and their Guests on the Occasion of the Opening of the New Medical Buildings of the United Faculties of Toronto and Trinity Universities.

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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 close at 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 because 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 laboratories have a field already demanding them, and a still larger lies before them in an immediate and historic future.

PURSUIT OF SCIENCE A CIVIC DUTY.

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.

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. Now, the growth of nations, as of individuals, requires the vigilance of guiding hands. Growth, for it to take its course rightly towards perfection, requires provision for the security and expansion of the liberal arts and sciences to forerun rather than to halt behind the actual requirement of the hour. The sciences are of value 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 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 brute creation, there are flesh and blood bonds between himself and brutes. Regardless of its cost to his cherished fancies, man strives for scientific truth. And, as the old Greeks said, this purpose puts him further 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 merely 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 set and rear the seed.

After the investigator comes the teacher. To him it belongs to diffuse the knowledge won. This honourable and difficult task receives its best reward in seeing the small spiritual beginnings of a pupil widen into the spiritual beginnings of a master. Thirdly, there is the applier 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 these steps, however, is usually the first one, made in the laboratory of the investigator. These three co-workers are coequal in the priesthood. Science and the applications of science are one growth, united together even as the fruit and the tree. The proper hearthstone round which the community should group these labourers, labouring for a common end, is the university. There the sacred flame of learning is fed from many sides by many hands.

THE BIOLOGIST AS CITIZEN.

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. Why, 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 by. 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 cells 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 labour has gone on, and with it differentiation of structure; 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 subser-

vient to the general needs. Each organism, with all its solidarity, each one of ourselves here, is built up of living myriads. 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 of our muscles, of our lime-hardened bones are all blood relations through one common ancestor. Yet so far has specialization of these unit lives gone on, so far does function reflect itself in microscopic form, that there is greater likeness between my nerve cells and 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 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 commonweal. 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 in biological science. I would also, as a friend among you, offer you my congratulations on the consolidation of your two schools of medicine into one. Union means not only greater strength, but the more effective application of that strength.

TWOFOLD ASPECT OF MEDICINE.

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 saliently 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." Conquests over sickness acquired purely as result of experience, without help either from *a priori* or from inductive reasoning. And great and glorious is the rôle of her achievement 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 anaesthetics—these and the names of a long line of famous physicians from the Renaissance down to some as justly famous as the past, and with us now to-day, suffice to certify the inestimable gifts that medicine as *empiric* has given to mankind in his suffering. This face of medicine well may wear a garland.

MEDICINE AND 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 as an art a science. Somewhere it is said that woman is the last thing that 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, 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 masculine head of medicine has indeed become the larger. Hydrocephalic in appearance, it yet 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 the most common of those 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 became 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.

HISTORICAL SKETCH.

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.

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 purpose 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, Mayow, had performed the fundamental experiments on respiration and had discovered oxygen more than a century before Priestley and Lavoisier, but the time was not yet 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 degrees of oxidation, deoxidation, polymerization, hydrolysis, and what not.

Not only that, but the living laboratory of the cell itself manufactures even the medium in 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 geologic 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 flux 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.

By Schwann and Pasteur the bonds between chemistry and medicine were drawn still tighter through 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.

To the physicist also medicine has made appeal. 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 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 then 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.

MEDICAL EDUCATION.

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 every medical school worthy of the name. The earnest student has a right to expect such training from his Alma Mater. For this, however, the requirements are importantly different from those that suffice as 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 empirical 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 as 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 discoveries 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 labour. For both 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, 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 was formerly 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 accordant with that plan. 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, 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. One reason why the instruction is costly is that 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.

SCHOOL 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 secondhand, 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 as himself to have faced the problems of his subject as an original inquirer. 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.

So truly does the laboratory become a school of thought. Your laboratories here 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 the child—to destroy that innate curiosity for facts, the healthy heritage of childhood. He leaves school a little bookman. 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 raised here for physiology and pathology students can learn these sciences as medicine is learned in the hospital ward, by direct inquiry into Nature. The teachers you give them are men who have won widely-recognized distinction themselves as direct inquirers into Nature. Worthy students will appreciate the double boon their Alma Mater thus gives them—the means of learning at first hand those secrets of Nature which lie at the root of their craft's skill, and to learn them under guidance from 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 slightly is for the lips of a fool. The value of abstract research to a country is becoming more widely acknowledged among us 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 to manufacture. And we find that munificent citizens have and do come forward among us and meet by their individual gifts the pressing needs in this respect 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-honoured 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 part 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. *Qui facit per alium facit per se*: that 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 honourable 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 the quarters of the globe. They will assist—and it is a thought dear to a high-spirited people—themselves to add to the sum total of the treasures of knowledge of the whole human race. "*Noblesse oblige*" appeals not only to chivalrous individuals, but to chivalrous nations.

Yet 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 complete 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 free 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 touchstone for the best ore of intellect within the bounds of this great land.

An Address

ON

THE MASTER-WORD IN MEDICINE.

*Delivered to Medical Students on the Occasion of the Opening
of the New Laboratories of the Medical Faculty of
the University of Toronto, October 1st, 1903.*

By WILLIAM OSLER, M.D., F.R.S.,

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I.—THE UNIVERSITY OF TORONTO: PRESENT—PAST.

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, make 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 departments of anatomy and physiology from the biological laboratory of the University breaks a connexion 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 connexion 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 a harmonious body the profession 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 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 science in the new laboratories. An affiliation should be sought with every hospital in the city and province of fifty beds and over, in each of which two or three extramural teachers should 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 one 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