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Addresses

THE RELATION OF THE HOSPITAL TO MEDICAL EDUCATION AND RESEARCH.*

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The most urgent need of the medical schools of this country at the present time is the possession of well organized and well equipped hospitals, available for teaching, and I esteem it a great privilege to bring greetings and congratulations to the Jefferson Medical College on this splendid addition to its educational resources. Coming, as so many of us do, directly from the meeting of the American Medical Association in Atlantic City, my colleagues, representing the medical profession of this country, will surely be glad to have me express on this happy occasion in their behalf congratulations to this college and to this city. We must all rejoice in the enlarged opportunities for bedside teaching supplied by this fine hospital to the Jefferson Medical College, which from its foundation over eighty years ago has laid especial emphasis on clinical instruction, which has sent forth so many graduates who have achieved professional success and eminence, and which has possessed such distinguished teachers and ornaments of our profession as McClellan, Eberle, Dunglison, Bache, Drake, Meigs, J. K. Mitchell, Dickson, Pancoast, Mütter, the Grosses, Brinton, Da Costa, whose worthy, living successors will not deem it invidious if I add to this incomplete list the name of that leader of American surgery, their absent colleague, Keen, who, resting from his many years of brilliant and successful work in behalf of this college, will in a distant land be glad with us to-day.

The Jefferson Medical College is indeed singularly fortunate in the possession of this large general hospital, admirable in construction and arrangement, entirely under the administration of a single board of trustees common to the college and the hospital, who control all of the appointments to the hospital staff and who in serving the best interests of the patients are in the fullest sympathy with the needs of medical education and active in its promotion. It is precisely the lack of hospitals under the control of our medical schools which constitutes one of the most serious obstacles in the development of medical education in this country, and all interested in the advancement of medical science and teaching in America have reason to be grateful to the State of Pennsylvania and the private benefactors whose enlightened generosity has made possible this enviable possession of the Jefferson Medical College.

* Address at the opening of the new Jefferson Medical College Hospital, June 7, 1907.

The theme of my remarks on this occasion—the relation of the hospital to medical education and medical research—is naturally suggested by the event which we are assembled to celebrate.

The discussion of the problems of clinical teaching and investigation by one engaged in laboratory work, although actively interested in all that pertains to the advancement of medical education, may have the advantage, so useful to a speaker, of a certain detachment of view, of length, if not clearness, of perspective, and of the absence of too disturbing a consciousness of all the difficulties inherent in the working out of details.

It would be interesting to trace the evolution of methods of clinical instruction from their inception, or rather revival, in Padua by Montanus about the middle of the sixteenth century to the present time. We should follow the conveyance of these methods by the elder van Heurne toward the end of the sixteenth century from Padua to Leyden, where in the course of a century they reached the high development attained under the great Boerhaave, *communis Europæ preceptor*, and whence influences, spreading in the eighteenth century first to Göttingen, Halle, Vienna, and Edinburgh, can be traced continuously down to this very day and to the medical schools of America. But such a historical survey, hitherto imperfectly drawn, is a theme by itself, which I must forego, although commending it as an attractive one to medical historians.

While the early history of medical education in this country is a story of feeble resources, but still of high endeavor and of just appreciation of the requirements of training for a learned profession, we can not contemplate with similar satisfaction and pride the deplorable period which followed through many years of lowered standards of preliminary education, of shortened courses, and of faulty arrangement of the curriculum. Nevertheless, these unfortunate conditions, attributable mainly to the circumstances of rapid, pioneer development of the country and to the absence of any responsible supervision outside of the medical schools, were saved from giving results as bad as they are often depicted and as the system seemed to demand by a measure of practical, clinical instruction, by the high character and gifts of many of the teachers, and by the preservation of sound traditions of the physician's calling.

Nothing is more remarkable in the history of medical education in this country than the rapidity with which our better schools have emerged in the last two decades from this low state. Especially noteworthy during this period is the development in these schools of laboratory teaching from the weakest to the strongest position in the curriculum, with the corresponding and most gratifying growth in this country of the sciences of anatomy, physiology, pathology, biologic chemistry, pharmacology and bacteriology. Hygiene, unfortunately, has lagged

behind, mainly, I believe, through lack of careers for trained hygienists in this country, especially on our boards of health.

The introduction and development of laboratory teaching has had a profound influence on our ideas of methods of medical education. In the laboratory knowledge is acquired not by reading or being told about things or even by seeing them demonstrated by another, but by immediate contact with the object of study, by power to use technical instruments and procedures, and by personal observation and experiment. A final adjustment has not yet been reached between this practical method of acquiring knowledge and the older didactic or expository method, to which within proper restraints I am not unfriendly, but the days of dominance of didactic teaching in our medical schools are numbered.

A pertinent inquiry in this connection is whether improvement in the teaching of medicine and surgery has kept pace with that of the laboratory subjects. Improvement in the former there has been, but it is, nevertheless, true that the so-called theoretical subjects are to-day taught most practically and the so-called practical branches most theoretically. It is above all familiarity with the methods and results of teaching in the laboratory which has emphasized this contrast and has indicated directions of improvement. Such contrasts, however, as those implied in the distinctions so commonly drawn between theoretical or scientific subjects on the one hand and practical subjects on the other in the medical curriculum, and between the methods of teaching in the laboratory and those of teaching in the hospital are unfortunate and not inherent in the nature of the subjects. Both classes of subjects are practical in that they admit of application to practical use and in that their common aim is to serve the training of practitioners, and both are scientific in that they rest on and are furthered by co-ordinated knowledge gained by systematic observation, experiment and reasoning. The justification for the presence of any obligatory subject in the medical curriculum and for the amount of time devoted to it is its importance for the training of sound practitioners of medicine and surgery. Nor should there be any difference in the general principles underlying the methods of teaching the laboratory subjects and those of teaching the clinical branches. For the latter the hospital is the laboratory where the results of Nature's experiments are to be studied and alleviated by the methods of science.

Training in the laboratories in the early years of the medical course should be a preparation for the final work in the hospital where the ultimate goal of medical education is approached—the ability to interpret and to forecast, and the power to prevent, to remove or to relieve the manifestations of disease and injury. Important as clinical teaching must have been even in the relatively undeveloped state of medicine and surgery in past centuries, it is vastly more important in these days of accumulated medical knowledge and experience, of refined methods of diagnosis by physical examination and by a multitude of technical procedures, and of improved methods of medical and surgical treatment.

Do the methods of teaching the clinical subjects generally adopted in our medical schools at the present time bring the student sufficiently into that intimate, prolonged, personal contact with the object of study, in this case the living patient, which secures that abiding, vital, useful knowledge, the possession of which alone is power for good, and the lack of which is helplessness and even

power for harm? As I have intimated, I believe that the clinic falls behind the laboratory in this regard, and that the greatest strength of the curriculum is not where it should lie.

It is not many years since practically the sole method of clinical teaching in the medical schools of this country was the amphitheater clinic. Not a word need be said against the value of this important form of clinical instruction, but no argument is needed to show that by itself it does not suffice for the practical training of students in the science and art of medicine.

A distinct advance was marked by the introduction in recent years of the system of ward classes, by which students in groups are admitted to the hospital wards and given opportunities to examine patients and to receive personal instruction. It is not necessary for my present purpose to discuss the various forms of these ward classes or the methods of conducting them, or similar classes for practical, clinical instruction, or to point out in detail their great value to the student, which is universally recognized.

Neither the amphitheater clinic nor the ward class meeting under an instructor at stated hours and for short periods of time, useful as they are, represents the full ideal of the laboratory method of teaching. They correspond rather to demonstrative courses, which have their own place and value. Such courses alone would represent the attempt to teach a subject like bacteriology by demonstrations of methods, cultures and microscopic slides instead of having the student make his own media, plant and cultivate the bacteria by his own hands, and follow and study from day to day with his own eyes the characters of the growing organisms. It is only by the latter method that bacteriologists are made and it is only by a similar method that capable practitioners of medicine and surgery can be made, and if this essential training is not at least begun in the undergraduate days in the medical school, it must be secured, if at all, later, often under disadvantageous circumstances and at great cost both to patient and to physician.

This kind of clinical training means practical work in the dispensary and especially that students in their final year of study have patients assigned to them in the public wards of the hospital, where under proper restrictions they can freely come and go, that they take histories, make necessary examinations for diagnosis, follow the course of disease from day to day and become familiar with methods and results of treatment, all of this work being, of course, under competent supervision and undertaken only after suitable preliminary studies. Privileges and opportunities for practical training of the kind indicated are at present enjoyed in most of our hospitals only by the fortunate internes, but the system is familiar in Great Britain as that of clinical clerks and surgical dressers, and in Germany as that of *Praktikanten*, hospital service in this capacity being a requirement in these countries for admission to examinations for the license to practice. The system has been in successful operation at the Johns Hopkins Hospital since the opening of the medical school.

It should be emphasized that the system, unlike that of ward classes, constitutes a part of the regular, orderly machinery of the hospital, that the students do work important for the interests of the patient and which, if not done by them, would have to be done by others. How important this kind of clinical training is deemed

by that country which has long held the leadership of medical science is indicated by the recent addition in Germany to the formerly required period of study of the so-called practical year of continuous service in a hospital before the student is eligible for the license to practice.

I believe that it is incumbent on our medical schools and public hospitals to furnish students with opportunities for the kind of clinical training which I have briefly sketched and have indicated as comparable to the laboratory method of teaching. Let us briefly consider what objections can be urged against this method of clinical training and what obstacles stand in the way of its general adoption in this country.

The difficulties are not to be sought primarily in the lack of desire or willingness on the part of medical schools to advance along these lines of improved clinical teaching. It may be that the advantages of the newer methods are not so widely and fully appreciated as is to be desired, but the leaders and especially the younger generation of clinical teachers are alive to the importance of reform.

The difficulties and objections come from that other essential arm of medical education—the hospitals. Under the prevailing system of medical education in this country the most valuable asset of a medical school is the possession of an endowed, good general hospital, the appointments to which are controlled by the school and a main purpose of which is to serve the interests of medical education, while serving the best interests of the patients. There are few hospitals which stand in this relation to a medical school and of these still fewer capable of furnishing the requisite clinical opportunities, for it is self-evident that the system of ward-work which I have outlined is practicable only when the ratio between the number of patients and the number of students does not fall below certain limits.

Most of our schools must look to outside public hospitals to aid them in this most important part of the training of medical students, and the appeal of the schools and the students, an appeal which should be supported by the entire medical profession, is one which should receive the most careful consideration from the trustees of these hospitals. The source of the appeal should be heeded. Our medical charities could not exist without the free gift of their services by physicians, and the mere pecuniary value of these services, amounting annually to many millions of dollars, exceeds that of all the funds contributed to their endowment. The welfare of the community is vitally concerned with the supply of well trained physicians, never so much so as to-day when the power to relieve suffering and to check the incalculable waste to society from preventable disease has been greatly increased and is constantly growing. If the public wants good doctors it must help to make them.

A hospital which includes, as most public hospitals do, among its recognized legitimate functions not only the care of the poor sick, but also the training of physicians and nurses and the advancement and dissemination of medical knowledge adds no function which is new in principle when it admits advanced undergraduate students to work in its wards, while by so doing it greatly increases its usefulness and service to the community, and I believe also to the patients. There is no very material difference between the qualifications of these advanced students to undertake this work and the qualifications of internes when first admitted to the hospital

staff. The introduction of these students into the hospital in accordance with the plan of ward work recommended interferes in no way with the orderly discipline and quiet of the wards.

The objection concerning which the greatest misapprehension exists and which doubtless weighs heaviest in the minds of managers of hospitals and of the lay public, unfamiliar with the actual facts, is the fear that harm will be done to the patients by permitting them to be examined by students. The primary purpose of the hospital is, of course, the care and treatment of the patients and the first duty of hospital trustees and physicians is to the patient. Nothing which prejudices the welfare of the patient can for a moment be permitted, and if it were true that the kind of clinical training which I am advocating inflicted any injury whatever on the patient, no other considerations could outweigh this objection.

The objection, however, is entirely unfounded. Every one acquainted with the conditions knows that our clinical teachers and the attending physicians and surgeons of hospitals are keenly solicitous for all that conduces to the comfort of their patients and makes for their recovery, every whit as much so for the poor as for the rich. They can be safely trusted to take every precaution to guard patients from harm and to imbue their students from the start with the same spirit of anxious solicitude for the welfare of the patients. A main purpose of the kind of clinical training under consideration is precisely to teach students when and how to examine patients, and I am informed by my clinical colleagues that students are, if anything, overcautious in their anxiety to refrain from any possibly injurious disturbance of the patient and that they carefully observe any directions which may be given regarding patients. Your own Dr. Keen in his admirable presidential address to the Congress of American Physicians and Surgeons on "The Duties and Responsibilities of the Trustees of Public Medical Institutions" expressed himself on this point of possible harm to the patient from bedside instruction in these forcible words:

I speak after an experience of nearly forty years as a surgeon to a half-dozen hospitals and can confidently say that I have never known a single patient injured or his chances of recovery lessened by such teaching.

So far from being detrimental, the teaching of physicians and students is distinctly advantageous to a hospital and its patients. The teaching hospital is in general more influential, more widely useful and more productive in contributions to medical knowledge than a hospital not concerned with teaching. Such a hospital is more attractive to physicians and surgeons of distinction and, therefore, more likely to be able to attach such men to its attending staff, and thereby secure the best medical service. The stimulating influence of eager, alert students on the clinical teachers in hospitals has been so delightfully depicted by Dr. Keen in the address just cited, and which should be widely read by trustees and physicians, that I can not refrain from quoting his remarks on this point in full. He says:

Moreover trustees may overlook one important advantage of a teaching hospital. Who will be least slovenly and careless in his duties, he who prescribes in the solitude of the sick chamber and operates with two or three assistants only, or he whose every movement is eagerly watched by hundreds of eyes, alert to detect every false step, the 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 can not afford to have the youngsters familiar with operations, means of investigation or 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.

There is no teacher who will not subscribe to these words of Dr. Keen.

It should furthermore be emphasized that the efficiency of the teaching hospital in its main function of treating diseased and injured patients is increased not only by securing the most skilful medical staff, by the constant stimulus of their interest and activity and by the spirit pervading the institution, but also by the participation of advanced students in the work of the dispensary and the wards in accordance with the system of clinical training which I am urging on your attention. When one considers all the time-consuming microscopic, chemical and physical tests applied in modern diagnosis and necessary to secure complete records of cases of disease, it can be readily understood that the increased force of those trained to make these examinations conduces to more accurate diagnosis, and to more satisfactory control of the progress of the patient from day to day, and therefore to better treatment. In advocating improved methods of clinical training and the introduction of such training more generally into public hospitals I plead and plead earnestly for the student, but I plead also for the hospital and the patient.

It is really lamentable to contemplate the immense clinical material which exists in the public hospitals of our large cities and which could be made available for the education of students and physicians and for the advancement of medical knowledge, but which is utilized for these purposes either not at all or very inadequately. Medical schools of these cities do not begin to secure the advantages of location which rightfully belong to them and they allow themselves to be outstripped by schools less favorably situated and the hospitals themselves are less useful than would otherwise be the case.

I am well aware of the practical difficulties in establishing the necessary relations with hospitals not already connected with medical schools. These difficulties, however, are not insurmountable if the trustees, teachers and medical staff sincerely desire their removal. The new order doubtless involves readjustment of existing conditions both in the schools and in the hospitals concerned. In many instances there will follow a considerable increase of the force of clinical teachers and a wider recognition of work done outside of the college walls and of the immediate direction of members of the faculty, a recognition, it may be, of something on the order of the Scottish extramural teaching or of the German privat-docent system, but adapted to our own special conditions. Careers will be opened to hospital physicians and surgeons, especially to young men, ready and fitted to teach but who now find the doors closed to them.

My remarks thus far have related mainly to the needs of undergraduate medical students and to methods of undergraduate clinical teaching. Education at best is only begun in the school, and the most the medical

school can hope to do is to send its graduates forth fitted to begin their professional work and to continue their lifelong education with the greatest advantage to themselves and to others. I have on another occasion discussed the serious lack of opportunities in this country for the training of young men who aim at the higher careers in clinical medicine and surgery, and I contrasted these opportunities with similar ones now open in our laboratories for those who desire to become teachers, investigators or directors of laboratories of anatomy, physiology, pathology or other medical science. Training for the higher clinical careers requires a long apprenticeship after graduation from a medical school and after the ordinary hospital internship and is best secured by prolonged service in a hospital as resident physician or surgeon under conditions which secure more thorough practical experience and better opportunities for scientific study and investigation than those which now exist under the customary arrangement of the medical staff of our hospitals. I shall not now occupy time by renewed consideration of this aspect of my subject further than to state my belief that the reorganization of the resident and interne medical staff of the hospital indicated for this higher training of graduates of medicine is also that best adapted, if not essential, for the successful operation of the system of ward work for undergraduates which I have sketched and for the highest efficiency of the hospital.

A teaching hospital, such as the new Jefferson Medical College Hospital, will not be content solely with making the best possible provision for the treatment of injury and disease and for imparting knowledge, it will recognize as one of its most important functions also the increase of knowledge. Although I am approaching the end of the time allotted to this address, I can not pass this subject by without reference, albeit necessarily a hurried one.

For purposes of accurate diagnosis and treatment by modern methods a general hospital must nowadays be supplied with no small equipment for clinical laboratory examinations, and a good pathologic laboratory is now generally recognized as essential to such a hospital even in its routine work. Practical courses in the clinical laboratories are among the most valuable additions of recent years to the medical curriculum.

The problems of disease presented by living patients are the most difficult and complex in the whole range of the physical and natural sciences. Much light can be shed on them by investigations conducted in physiologic, chemical, pathologic, pharmacologic and bacteriologic laboratories, especially by experimentation on animals, but it is increasingly clear that the scientific study of many of these problems can be undertaken with the greatest advantage in well-equipped, special laboratories connected with the hospital clinics and in charge of investigators trained in chemical, physical and biologic methods, with convenient access to the material for study and in close touch with the clinicians. I may cite as good examples of such laboratories those of the university clinic in Munich under the direction of Professor Friedrich Müller.

The familiar analytical and statistical study of cases of disease, based on simple clinical observations, and first extensively and fruitfully applied by the great French clinicians of the early part of the last century, has been of immense service to medicine and will continue to be of service. A good clinical observation has precisely the same scientific value as a fact demon-

strated in the laboratory, and, even if more difficult of interpretation, is often the safer guide for the action of the physician.

It is, however, from the special clinical laboratories that we may reasonably hope for a more penetrating insight into the causes and nature of many diseases, an insight which perhaps may arm physicians with a saving power of prevention and treatment of some of the organic diseases of advancing life comparable to the inestimable gifts of bacteriologic laboratories to the prevention and treatment of infectious diseases. We must welcome the establishment of such laboratories and the new directions which they are giving to medical research. When the purposes of such laboratories are made clear, their foundation and support should make an especially strong appeal to public and private philanthropy.

The medical laboratories of whatever kind and the clinics, while each must cultivate its own special field, are fundamentally one domain, one in their scientific methods and spirit and one in their common purpose to advance medical knowledge and thereby bring healing to the nations.

In this great domain and with this high mission may the Jefferson Medical College and Hospital, with their past of honorable achievement and their future of larger opportunities, grow and prosper, serving skilfully the sick under their care, and blessed with wise counselors, with able and devoted teachers and contributors to medical science and art, with zealous students from far and near, and with loyal graduates—an institution standing in this community and throughout the land as a powerful influence for all that is best in our profession!

THE OLD JEFFERSON HOSPITAL.*

J. CHALMERS DA COSTA, M.D.

Professor of Surgery and Clinical Surgery in the Jefferson Medical College.

PHILADELPHIA.

We meet to-day to dignify with appropriate ceremonies an event of the first importance in the history of this school—an event long hoped for, long despaired of, but which has finally come to pass. The dream of a multitude of yesterdays is realized to-day, and this splendid new hospital is a monument, not to public vanity, not private gain, but to unselfish effort for humanity and science. Those who tracked the toilsome pathway, those who bore the heavy burden, may well be pardoned a feeling of exultation and a sense of triumph.

My first and most agreeable duty is to turn to the Hon. William Potter and his associates of the board of trustees, and, in the name of the great alumni of this school and of my colleagues of the faculty, tender our heartfelt and most grateful thanks.

This event is of the first importance to the Jefferson Medical College, but its influence is of far wider significance. It is of importance to medical science that a corps of the army of healing, a corps in the front of the battle against Death, has been strengthened and enthused. It is of economic importance to the city and the state. When a man is saved from death or rescued from sickness he returns to the support of a family which might otherwise be a public charge, and he becomes again an industrial unit, a factor in the produc-

tion of wealth, a factor which adds its share to the power and greatness of the commonwealth. From the economic view alone, to say nothing of the humane aspect, it actually pays the state to aid hospitals financially. It particularly pays it to aid teaching hospitals, in which the lessons learned from a single sick or injured man may save valuable lives and cure hundreds in distant places. The event is also of importance to the diseased and hurt of the state and city, for more of them than formerly can come to us for help. The need of hospital accommodation is every year becoming more and more pressing. This is an age when dangerous occupations multiply. The streets are filled with rapidly-moving and death-dealing vehicles; every few stories of a great modern building mean one man dead and many injured; every twenty miles of railroad in the country mean a man killed, and every three miles mean a man injured, each year; great machine shops and factories crush and mutilate, and deadly electric currents are on all sides of us. Closely adjacent to the hospital are the slums, the inhabitants of which, when injured or diseased, know no resource but the hospital; the people of the slums pour into the wards and throng in the out-patient departments. The very situation of the building means a wealth of clinical material, because it is placed where it is most needed. In the slums the slime of humanity gathers; there plagues are ever lurking, ready to burst forth and overwhelm us; there is drunkenness; there is madness; there is pauperism; there is illegitimacy; there is "Vice with her naked talons;" there is "Crime with her dripping fangs." Truly the slum is the shadow of civilization itself, and in that shadow crawls every noisome reptile and springs every noxious plant. The slum is the interrogation to civilization; it is the problem that excites the anxious and apprehensive interest of the scientist, the philanthropist, the statesman and the philosopher; it is the Sphinx's riddle, and to fail to answer it means destruction.

We depart from the old hospital, and truly it is time we did; yet even in going to better quarters there is reminiscent regret at leaving the old home. We leave much besides a building that has outlived its highest usefulness. We leave memories of good work done, of progress inaugurated, of great men and of high achievements. In the arena of that building voices have spoken in tones so authoritative as to sound through this hemisphere and to echo beyond the sea, and the spirits of absent or departed great ones seem to stand beside me as I speak.

In that arena the Grosses and the elder Pancoast operated, and Bartholow and J. M. Da Costa taught. There spoke Levis, Parvin, Wallace, Biddle, Brinton, Maury and others. There, as guests, have stood Esmarch, of Kiel; Mikulicz, of Breslau; Faure, of Paris; Lorenz, of Vienna; Bryant, Durham, Horsley, Ballance and MacCormac, of London; Macewen, of Glasgow; Lawson Tait, of Birmingham; Annandale and Chien, of Edinburgh; Emmett, Weir and Thomas of New York; Senn, of Chicago; our own Marion-Sims, and a host of others. There, until yesterday, one fortunately still living was a tower of strength. I refer to our distinguished Emeritus Professor of Surgery, my well loved master, Keen. I find in these memories strength and inspiration, and I will hold them and cherish them as long as memory remains a portion of my intellect, and until my body becomes again a part of the dreamless dust.

Thirty years ago, in May, 1877, the hospital that we now leave was opened for patients. Our college was, I believe, the second institution in the country to have its

*Address at the opening of the new Jefferson Medical College Hospital, June 7, 1907.