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# TRANSACTIONS

OF THE

**DR. FRED. C. ZAPATA**  
1704 LEXINGTON ST.  
CHICAGO.

# Association of American Medical Colleges

*Comptroller  
559*

ST. PAUL, MINN.,

JUNE 3, 1901.

*Bulletin of the American Academy of Medicine,  
August, 1901*

EASTON, PA.:  
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### EVOLUTION OF THE AMERICAN MEDICAL COLLEGE.<sup>1</sup>

BY ALBERT R. BAKER, M.D., Cleveland, Ohio, Chairman Faculty of the Cleveland College of Physicians and Surgeons.

#### I. THE MEDICAL COLLEGE VERSUS THE MEDICAL PRECEPTOR.

Largely owing to the persistent and judicious guidance of the Association of American Medical Colleges, the medical schools of this country have undergone a complete transformation during the past decade. Until very recently the medical schools of the country were but the natural expansion of the earlier system of medical instruction in the preceptor's office. Young men generally without previous literary or medical education were taken into the office of the practising physician, to whom they rendered such assistance as building fires, caring for horses, and mixing drugs, where they could have the advantages of a library and a few "bones." Here the student "pulled his first tooth, opened his first abscess, performed his first vaccination, applied his first blister, and administered his first emetic. His clinical lectures were heard as he rode from one patient to another with his preceptor." Naturally, as the reputation of a physician increased, students came to him in increasing num-

<sup>1</sup> President's address before the Association of American Medical Colleges, St. Paul, Minn., June 3, 1901.

bers ; gradually his lectures given upon horseback as he rode through the sparsely settled country took a more formal character and were delivered in his office, or even in a public hall. Dissections were undertaken clandestinely ; neighboring physicians were called upon for assistance either in making dissections or in quizzing the students, and thus the nucleus of a medical school was formed. A charter was applied for and obtained, the founder of the school receiving the title of dean, and his associates, professors, and thus a new full-fledged medical college was established, with no endowment, no buildings, no equipment, and no assets except the prospective students' fees, but empowered to confer a high-sounding Latin diploma, which few, if any, of the teachers, could read, much less those upon whom it was conferred. Notwithstanding all the uncomplimentary things that have been said about these pioneer institutions, they performed useful service in the practical education of the physician of the times.

They admirably supplemented the education received in the preceptor's office. Anatomy was generally well taught by laboratory methods. During later years, in many schools, chemistry was also fairly taught and patients in hospitals and dispensaries were utilized to more or less profit in clinical teaching, and the much-abused didactic lecture was not wholly bad, although it was an imposition upon the medical student to compel him to listen to the same course of lectures twice ; to make him take the same dose the third and fourth time, as I have heard has been done, borders upon the ludicrous. If, however, it is kept in mind that the medical college of the past was only intended to supplement and round out the medical education the student received in the preceptor's office and was not intended to furnish a complete medical education, its work will not appear so entirely inadequate as might seem from a hasty examination of the curriculum. The former method of study had many advantages ; while as a rule it did not make scientific practitioners, the medical man educated in the physician's office had many advantages over the one educated in the modern medical school. He had abundant opportunity for clinical study at close range ; he was trained daily in the art of prescribing and dispensing medi-

cine ; he learned many of the essentials of a successful practitioner which cannot be gained in the laboratory or even in hospital and dispensary practice. Our patients suffer from mental ills as well as physical ones, and the secret of retaining their confidence through serious illness, of protecting them from the meddlesome interference of some busybody, can only be learned by practical experience, and this experience can be gained nowhere so advantageously as in the office of a successful practitioner. But, notwithstanding the many advantages of study in the preceptor's office, the time-honored custom is fast becoming a tradition of the past. The medical student of to-day is not willing to sweep the office, build fires, groom horses, care for the children, and make himself generally useful to the doctor's family in order to pick up what seem to him only a few crumbs of medical knowledge dispensed by the way.

"The medical preceptor has served his day and age, and must be numbered among the antiquated institutions of a pioneer civilization ;"<sup>1</sup> and I fear in some respects our modern medical schools are but poorly filling his place. Recognizing the importance of the medical preceptor the College of Physicians and Surgeons, of Chicago, recommend in its *Announcement* of 1899 that as soon as a student matriculates he select a clinical professor as his preceptor, but I am informed that the plan has never been carried out. It is a suggestion, however, that I believe worthy of further consideration.

## II. OVERCROWDING THE PROFESSION BECAUSE OF TOO MANY MEDICAL SCHOOLS.

Among the unfortunate legacies left us from the past are the numerous medical colleges and the consequent overcrowding of the profession. We are suffering not only from the ease with which a man could surround himself with a few teachers and found a medical school, but there was a sort of swarming process at work to multiply medical schools. The founder or his successors always held a sort of a proprietary interest in the school, he brooked no rival ; he was the great luminary, and the rest were but satellites revolving about him ; as soon as any one had

<sup>1</sup> Address of Albert R. Baker, M.D., Medical Department of University of Wooster. Reprinted in *Cleveland Medical Gazette*, March, 1889.

aspirations for greater things off came his head, this not infrequently resulting in the founding of a rival medical school, and consequently a lowering of fees, lowering of standards, increase in the number of students, and overcrowding of the profession. One of the most disgraceful chapters of our medical history might be written upon the jealousies and medical fights and quarrels, usually centered about rival medical colleges. The day is past when one surgeon, or one specialist, or one consultant can practically control all the work in his department in a given locality; nor can one man any longer dictate the entire policy of a medical school. One of the most hopeful features of the present day is the decrease in that attitude of belligerent rivalry that surgeons and specialists have entertained toward each other.

My observation has been that there are fewer of those medical feuds in which the wives of professors in rival schools "do not speak as they pass by." Another hopeful sign is the tendency of rival medical schools to unite, thus making one strong institution where two or more weak ones barely existed before.

New York State, in both of her large cities, has given us a good example of what can be done, and the example of New York City and Buffalo should be followed by nearly every city in the country.

There are at least two or three times as many medical schools in the United States as there should be. No new schools should be established unless most liberally endowed. It seems as though our Association could be of great service in bringing about the union of two or more schools, when located in the same city, or even in adjacent cities. This is much more easily accomplished now than formerly. Owing to the general introduction of the laboratory and class methods of graded instruction there is scarcely any limit to the number of teachers that can be profitably used in teaching, and one of the best ways of filling the place of the old preceptor is by subdividing the students into smaller classes and multiplying the number of teachers. Many subjects cannot be profitably taught in classes of more than four or five. There are enough graduates of medicine in the United States to-day to supply the actual demands for the next five or ten years.

The post-graduate schools have in a feeble way endeavored to supplement the knowledge which practising physicians gained in the older way. But they now need longer and better post-graduate courses of instruction than these institutions can give. They, at best, are only temporary makeshifts, like the old didactic lecture course of instruction to supplement the work of the old-time preceptor. What most of these old practitioners need is a year, or two, or three of careful, systematic laboratory and clinical instruction such as our best medical schools are now giving. The increased attendance of post-graduates in regular medical schools is a hopeful sign indeed.

In the Cleveland College of Physicians and Surgeons, from 1890 to 1895, there were 132 men graduated, only two of whom already held the degree of M.D.—about 1.5 per cent. From 1896 to 1901, of 170 graduates, 33 had the title of M.D.—about 19 per cent. If the older practitioner expects to successfully compete with the recent graduate he will have to reenter medical schools and supplement his past education with that of the present. No one can successfully practise to-day without a working knowledge of bacteriology, pharmacology, and many other ologies of which the older doctors never heard when students.

What we need is not *more*, but *better*, doctors, and I know<sup>1</sup> of no better material to make good ones out of than those who are already in the profession.

This Association, in 1894, gave to students and graduates of homeopathic and eclectic schools recognition for work done in those institutions. This action has done more to break down sectarian medicine than anything else. Incidentally it has greatly elevated the standing of the profession in the minds of the people at large, and I doubt not that many of the liberal gifts which have come to medical schools in recent years are due to this cause alone. The farce of a presumably educated profession keeping up the fiction of a fight over an exploded dogma like that of "*Similia Similibus Curantur*," was enough to lower the estimation of the profession in the minds of every one. The Association should make it as easy as possible for all educated, intelligent, honest, legally qualified practitioners to get into the



fold of the regular profession, but taking every precaution to keep out the ignorant quacks and dishonest advertising mountebanks who are unworthy of membership in our ranks.

The adoption of the continuous course in some of our leading schools seems to be a step in the right direction. Even some of the leading literary institutions are beginning to realize that it is not good business policy to shut down the plant for two or three months in the year, and have adopted the continuous course.

It seems almost necessary for the medical schools to remain open the entire year. The dispensaries and most of the clinics must remain open and it is a needless waste of clinical material to have students present only six or eight months of the year. One of the most valuable features of the continuous course is the opportunity that is given new men for places in the faculties of medical schools; another is the possibility of instituting courses of elective study. If the continuous course is generally adopted there will no longer be any excuse for the summer medical schools.

### III. ALL REPUTABLE REGULAR MEDICAL COLLEGES SHOULD BE UNITED IN ONE STRONG EDUCATIONAL BODY.

It is desirable that all the reputable regular medical colleges in the country should be members of this Association. When a school holding membership infringes some technical rule of the Association, I do not believe that it should be pitched bodily out of the Association, as we have sometimes done heretofore. They should be disciplined in some other way. In many cases a reprimand and a promise not to sin again would be all that is needed. In other cases it might be necessary to make a report to the Confederation of the State Medical Examining and Licensing Boards. A refusal of one or more of the state boards to let graduates of such a school come up for examination would soon have the desired effect of either elevating its standard of requirements, or closing it for want of students. Expulsion should be reserved for flagrant violations, and then there should be a mutual understanding between our Association and that of the state medical examining and licensing boards that expulsion

from our Association means a refusal of recognition of the school by the various state boards. I believe such a course is practicable. On the other hand, our standard of requirements for membership should not be so high as to make it unattainable by the less liberally endowed medical schools. Many of the smaller schools in growing cities, even though not large at present, have possibilities which should not be ignored.

At the suggestion of the secretary I took the responsibility of inviting representatives of all the schools affiliated with the Southern Medical College Association to meet with us and participate in our educational program.

It seems to me that the difference in our standard of requirements for membership is so slight that we ought to be able to unite our forces. I have been informed that already several schools, members of the Southern Medical College Association, have made application for membership. I would recommend that a committee be appointed to confer with a committee already appointed from the Southern Association empowered to undertake such preliminary steps as may be necessary to secure the union of all reputable American medical colleges in one educational body.

#### IV. MINIMUM STANDARD REQUIREMENTS FOR PRACTICE OF MEDICINE.

Since the organization of the American Medical College Association eleven years ago, the standard of medical education has advanced by leaps and bounds, and the action of the Association has been acquiesced in by the vast majority of the medical colleges throughout the country so heartily that it has seemed sometimes there was scarcely a limit to the high standard of requirements which might be established; but there must be a line drawn somewhere. Our standard of minimum requirements cannot be an ideal one; it must be a practical one attainable by the average medical school and meeting the requirements of the average medical student.

Huxley<sup>1</sup> says: "The problem of the medical university is to make an average man into a good practical doctor and with no more expense than can be afforded by the class from which doc-

<sup>1</sup> See "Life and Letters," Vol. II., p. 329.

tors are recruited or than will be rewarded by the prospect of an income of four to five hundred pounds a year. It is not right to sacrifice such men and the public on whom they practise for the prospect of making one per cent. of medical students into men of science."

It is barely possible, as Huxley intimates, that if we insist upon requiring of every medical man a thorough preliminary collegiate education, supplemented by a too long and rigorous medical training, we have cultivated tastes and necessities that may unfit him for the station in life he will occupy.

I can easily imagine that such a medical man might not prove a success as a country practitioner. The time and capital invested is wholly out of proportion to the probable returns, either financial, social, or professional.

Some of the more richly endowed institutions may demand an ideal standard and may provide courses of instruction meeting the requirements of a more advanced grade of students, preparing them to become men of science, original investigators, teachers, and specialists. Indeed, some of these schools already do so, and it is no longer necessary, as formerly, for our students to go abroad to obtain such advanced instruction. It would be, however, most unfortunate indeed, for higher medical education if these wealthier institutions were to stand aloof from this organization and refuse to lend their influence in elevating the standard of the entire profession. A Pharisaical attitude is no more commendable in the medical than in the theological world.

After carefully considering this subject the joint committee of the College Association and the Confederation of Medical Examining and Licensing Boards came to the conclusion that the minimum standard for admission should be that adopted by the Confederation of State Medical Examining and Licensing Boards at Columbus, June 5, 1899.<sup>1</sup> The resolutions adopted by the Confederation essentially necessitates a preliminary education equivalent to that of a graduate from a good high school and four courses of graded instruction in a medical college of not less than six months each in four separate years.

It seemed to your committee that this was the lowest possible

<sup>1</sup> See *Buffalo Medical Journal*, August, 1899.

standard that could be accepted in the present state of medical science. The student with less than a high school preliminary education is not fitted to undertake the study of medicine intelligently, and such a student could not hope to master such a complex and extensive subject as that of the science and art of medicine, so as to become a successful practitioner in less than four years. It is hoped that the adoption of this standard will fully meet the requirements of a minimum standard for some time to come, so that our session in the future may be devoted more largely to the scientific and pedagogic part of our work. It is probable that in the future this subject of minimum standards will be largely regulated by the Confederation of Medical Examining and Licensing Boards.

In the meantime it is no more than right and just to medical students, as well as to medical colleges, that some uniform minimum standard be adopted for entrance and graduation,—one that would be recognized throughout the United States. As Dr. Coleman says:<sup>1</sup> “Every state board is obliged to reject applicants for examination whom they know to have endeavored to comply with *some* law.” It is clearly impossible to obtain uniform laws throughout the entire country within any reasonable period of time; hence, the necessity of our Association adopting a standard that will meet with the approval of all the state boards.

The minimum requirements of the constitution which will be submitted for your consideration at the executive meeting tonight has been approved by the Confederation of State Medical Examining and Licensing Boards. Ohio has manifested its approval of this standard by enacting it into her statutes, and during the few years since its enactment it has proved most satisfactory, working neither hardship to the students nor to the medical colleges.

#### V. MEDICAL POLITICS.

The work of the state medical examining and licensing boards has already relieved the colleges in many states of the responsibility of deciding who is fitted to enter upon the study and practice of medicine. There is, however, much to be done in

<sup>1</sup> BULLETIN OF THE AMERICAN ACADEMY OF MEDICINE, April, 1901, p. 320.

securing legislation to this end, in states that have no state boards of examination. There is also much hard work to be accomplished in the way of reciprocity between the boards. How this is to be accomplished so as to be a leveling-up, rather than a leveling-down, process is a most serious proposition. It is a subject which this Association will have to consider most seriously in the near future. The injustice that now obtains when a practitioner wishes for any reason to change his location is unendurable.

Of necessity, much of our work heretofore has been of a medico-political character, and to a certain extent must continue to be so. As long as we have forty or fifty examining boards, many members of which are appointed solely as a reward for political service, there will be need of watchful oversight. These boards are as capable of doing great harm as well as great good. No doubt there have been injudicious things done in the name of higher medical education that have made the "judicious grieve."

It has been suggested that our meeting should be identified with the National Teachers' Association rather than with the American Medical Association, hoping thereby to escape from some of the medical politics with which we have been more or less encumbered.

But it would seem "better to endure the ills we have than to fly to those we know not of." With all our faults I am sure that when the history of medical education in the United States comes to be written by the future historian, the work of the Association of American Medical Colleges will receive greater credit than all other agencies combined for unselfish, untiring, effective work in elevating the standard of medical education.

#### VI. MEDICAL PEDAGOGY.

It seems to me as I get the perspective of the work of our Association more in view, that in the future it will be along educational lines. We must introduce better methods of teaching; we must study medical pedagogy. Our work should be a helpful, inspiring, and educational one, rather than a political one. Our sessions should be of the nature of post-graduate work, in

*A. R. Baker 1901*

teaching teachers how to teach. We should have more educational and pedagogic sessions. Possibly it would be wise to meet in sections; or as we did some years ago—holding conferences on Syllabus<sup>1</sup> in different parts of the country.

The widely divergent views entertained at these meetings as to the best method of teaching, and the time required for the study of various subjects, were so marked that it seemed almost impossible to arrive at any definite conclusion. One of the most heated discussions we had was in the conference at Chicago, upon the subject of hygiene; one teacher maintained that four hours were sufficient to teach this subject, and another insisted that the minimum requirement should be 150 hours, supplemented by laboratory teaching.

I am sure that conferences of this kind would not elicit such radically different opinions at this time and that we could come much nearer to an agreement than a few years since.

I believe that if such conferences could be held and certain questions discussed, such as to the length of time to be devoted to laboratory teaching? How much to didactic lectures? To quizzes? To clinical lectures? To dispensaries? How frequently should written tests be exacted? How many subjects should be taught at one time? How should they be grouped together so as to economize the student's time to the best advantage? Should clinical teaching be restricted to the last two years?

Innumerable questions suggest themselves to the medical teacher, and in regard to many of them there are no rules formulated and no precedents to follow; each teacher devotes as much time to his subject as his convenience or fancy may dictate.

There is no one to say him nay, unless, perchance, he encroaches upon the time or poaches on the preserves of some equally irresponsible teacher, it is not to be supposed that we could formulate rules like the laws of the Medes and Persians that could not be violated; but we might outline some approximately ideal standard toward which we might work, and which

<sup>1</sup> See Reports of Committee on Syllabus, *Journal of the American Medical Association*, June 29 and July 6, 1895. Also Report of the Committee on Syllabus, Feb. 15, 1896.

would prove extremely useful to the teacher trying to see the light.

I have no doubt that a comparison of the relative amount of time devoted to the teaching of various subjects in our best institutions would reveal some curious anomalies. How much valuable time of the student even to-day is wasted sitting in a large amphitheater witnessing an abdominal section, or a cataract extraction?

There is a fascination about a capital operation made by a renowned surgeon that holds the attention of the medical student, but which from an educational standard is hardly as profitable as a seat in the gallery at a play.

I submit a tabulated statement of the work required in diseases of the eye, ear, throat, and nose in thirteen medical colleges. The statement is made from *Announcements* that happen to be on my desk, which show some curious anomalies as to the time devoted to the teaching of these subjects. Undoubtedly much of the work in some schools is elective, and this table is not a fair statement of the work required; but, making all due allowance for discrepancies in published announcements and actual work required, it is probable that some schools demand four or five times as much (in certain subjects) of the student's time as others do. For instance, in the tabulated statement above mentioned one school has a total of 99 hours scheduled and another 740 in diseases of eye, ear, nose, and throat.

It is altogether probable that in some of these schools the student is required to attend recitations, quizzes, lectures, clinics on the eye, etc., supplemented with hospital and dispensary practice; in other words, he is taught to fit spectacles, better than the jeweler optician and to treat all minor eye diseases, while in others, all that is demanded is one or two hours devoted to clinical or didactic lectures, supplemented with more or less dispensary practice, all of which may, or may not, be obligatory. Now, which is right? Does one teach too much or the other too little?

If fifteen or twenty professors of ophthalmology would meet and discuss the best method of teaching, might they not arrive at some general conclusion that would be of inestimable value to

Colleges.	Junior.	Weekly time.	Senior.	Weekly time.	Total.	Entire course.
University of Buffalo	Otology and Laryngology	2 hours	Ophthalmology	3 hours	} 6 hours	180 hours
	Otology	2 hours	Laryngology	1 hour		
University of Pennsylvania	Otology	2 hours	Otology	2 hours	} 8 hours	232 hours
	Laryngology	1 hour	Laryngology and Rhinology	1 hour		
Western Reserve of Cleveland.	Otology and Laryngology	1 hour	Ophthalmology	1 hour	} 99 hours	99 hours
	Otology	1 hour	Dispensary and Clinic	1 hour		
Medical College of Indiana	Otology and Ophthalmology	1 hour	Ophthalmology and Otology	2 hours	} 5 hours	125 hours
	Otology	1 hour	Laryngology and Rhinology	2 hours		
Baltimore College of Physicians and Surgeons	Diseases of Eye	2 hours	Disease of Nose, Throat, and Chest	6 hours	} 9 hours	225 hours
	Sur-Diseases of Ear	1 hour				
Medico and Chirurgical College of Philadelphia	Laryngology and Otology	5 hours	Laryngology and Otology	5 hours	} 16 hours	464 hours
	Otology	2 hours	Ophthalmology	4 hours		
Baltimore Medical College	Col-Eye and Ear	2 hours	Eye and Ear	1 hour	} 5 hours	125 hours
	Nose and Throat	1 hour	Nose and Throat	1 hour		
Miami Medical College of Cincinnati	Ophthalmology	2 hours	Ophthalmology	3 hours	} 12 hours	348 hours
	Otology, 1 hr.; Rhinology, 1 hr.	2 hours	Throat and Nose	3 hours		
College of Physicians and Surgeons, Chicago	Otology	1 hour	Ophthalmology	2 hours	} 6 hours	198 hours
	Laryngology and Rhinology	1 hour	Laryngology and Rhinology	1 hour		
Jefferson Medical College	Col-Ophthalmology	2 hours	Ophthalmology	6 hours	} 13 hours	377 hours
	Nose and Throat	2 hours	Ear, 2 hrs.; Throat, 3 hrs.	5 hours		
Toledo Medical College	Nose and Throat	2 hours	Nose and Throat	2 hours	} 5 hours	145 hours
			Eye and Ear	1 hour		
Rush Medical College	Throat and Nose	3 hours	Throat and Nose	6 hours	} 20 hours	740 hours
	Eye and Ear	2 hours	Eye and Ear	9 hours		
University of Cleveland	College of Physicians and Surgeons	1 hour	Ophthalmology	1 hour	} 4½ hours	135 hours
	College of Physicians and Surgeons	1 hour	Eye, Ear, Nose, and Throat Clinics	2½ hours		



the teacher of this subject? It might be possible to suggest in a general way how much knowledge of ophthalmology the student should be obliged to acquire.

The remarks which have been made as to the time to be devoted to the study of diseases of the eye are equally applicable to all special branches.

## WHAT PRELIMINARY EDUCATION BEST FITS A MAN FOR THE STUDY OF MEDICINE?<sup>1</sup>

BY VICTOR C. VAUGHAN, A.M., M.D., Dean of the Medical Department, University of Michigan, Ann Arbor, Mich.

In the time allotted to me for the consideration of this very important and essential subject, it is impossible to go into the matter as fully as I should like. Therefore, I will take up only the most salient points. Every man must know how to use his own language. We will take it for granted then, that every one admits that a thorough drill in the English language, in composition and in writing, is desirable. There is just one point that I wish to mention in this connection, rather parenthetically, and that is that I believe that medical students should have a more thorough training in composition after they enter the medical college than most of them get. I have often found that medical students, medical teachers, and many successful practitioners cannot report a case grammatically and have absolutely no ideas of what is necessary for them to know in order to look up the literature on any subject.

I think it was a serious mistake when medical colleges ceased to require a thesis from medical students. I believe that every medical student should be required to write an essay upon some specially selected subject. At least one essay during each of the four years of his college training, and that he should be compelled to work up some subject quite extensively for presentation as a final thesis. This is the only way by which the medical student can learn how to make the proper use of the literature in medicine in looking up a subject. I have made the experiment time and time again of asking some bright student to write an essay for me on the history of the plague, or the history of hydrophobia. I turned the student loose in a library of about 10,000 volumes, containing practically everything that is necessary for him to write quite extensively upon that subject, only to find him as helpless as a new-born babe. He did not know how to proceed.

<sup>1</sup> Read before the Association of American Medical Colleges, St. Paul, Minn., June 3, 1901.

In the second place, I believe we will all admit that every one who enters a learned profession should know the history of his own country. If he is a resident of the United States, he should know the history of the United States. If he is a resident of some foreign country, we should allow him to substitute the history of the country from which he comes. Every learned man should have some knowledge of general history.

Now, we come to the subject of mathematics. How much mathematics is necessary to fit a man for the successful study of medicine? I do not mean to be a specialist in ophthalmology, because if that is his intention he cannot possibly know too much mathematics. But for the ordinary study of medicine as a whole, how much mathematics does he need? He, of course, must know his arithmetic perfectly, his algebra, and he should know something of plane geometry and plane trigonometry. Without plane trigonometry it is impossible for any man to understand physics, which should be taught in all medical colleges. It is one of the great deficiencies of our medical schools, in many of them at least, that physics is not properly taught.

Many teachers contend that physics should be taught elsewhere than in medical schools. I find that the medical department of the University of France still finds it necessary to teach its medical students physics. The University of Berlin also finds it necessary to teach its medical students physics. This branch has been very much neglected, and I hope to see the day when all medical colleges in this country will give physics a prominent place in their curriculum.

The next question is, how much of the natural sciences should a man know who contemplates taking up the study of medicine? He should know something of general biology, botany, and zoology, at least the general classification of plants and animals as well as their structure. He should know this not only from the study of text-books and by attendance at lectures, but from practical laboratory work in biology, including embryology. Furthermore, biology should be taught every student who studies medicine. The same is true of chemistry, especially the chemistry of organic matter.

Now I come to a point in which many of you will no doubt differ with me. I hold that medical schools, all those who can

afford to do so, and I believe all can, should require of their students a reading knowledge of either French or German, or preferably both. As Anglo-Saxons we are rather inclined to boast that a man can travel around the world with a knowledge of only one tongue, English. That is true, but it will be a long time before English will be the language of science or the language of medicine. As long as a small canton in Switzerland, Zurich, for instance, does more for medical education than any state in this country, it is not likely that English will become the language of medicine. It may be said that the medical man can get all that is of importance that is published in either French or German through translations of such work. True, he can get a great deal of it through translations, but, on the other hand, he loses a great deal because everything suffers by translation. Moreover, he falls into a great many serious errors. I can show you an instance where a professor in one of our leading medical colleges has translated an article on the feeding of infants from the German, and, through his ignorance of the German language, he has advised that children with summer diarrhea should be fed on hydrocarbons. The original article distinctly said that the infant should be fed on carbohydrates. This is not an isolated mistake; it is one very frequently made. Even the abstracts that appear in many of our medical journals are very often misleading.

A large part of my professional work has been devoted to consultations, and when I am called in consultation with a doctor, very often a country doctor, and find on his table the *Berliner Medicinische Wochenschrift* or the *Deutsche Medicinische Wochenschrift*, or one of the leading French journals, I feel at once that I am in touch with a man far above the average. I thoroughly believe that all medical colleges that can afford to do so should make this a requirement for admission to their institution, a reading knowledge of both French and German in addition to their own language.

As to Latin and Greek, I do not believe that it is necessary for a man to study these languages for six years in order to succeed in the practice of medicine. I should give to my own boys a certain amount of Greek and Latin because I am sure they will be benefited by it. But the prolonged courses usually

given in these branches I do not believe to be essential to the proper study of medicine.

I have always believed that a state university which is engaged in the teaching of medicine should take an advanced stand in the matter of medical education. Of course, there are many medical schools that cannot afford to have the high requirements which I have spoken of, but I do believe that state universities should not consider the number of students, except as far as may be necessary, because the number of students does in a certain way affect the appropriation. But in state universities in general, and other endowed medical schools, the requirements for admission should be high, and it is the duty of these schools to take the lead in this direction.

With these points in view, the Department of Medicine and Surgery of the University of Michigan has now practically the requirements to which I have referred. We have made these arrangements, and we think them very good ones, although we should not ask all medical schools to have the same requirements. A student who can comply with all the requirements that I have given you can enter this school and if, after four years, he is successful in his work, he can graduate. A student who has not had French or German and who has not had trigonometry can enter our school, but it will take him from five to six years to graduate, according to the conditions imposed upon him at the time of admission. In this way we have a sliding scale, which practically means that the man who can come up to our requirements will graduate in four years, whereas, the student who comes directly from the high school and who cannot meet the requirements, is given an opportunity of making up his trigonometry, his German and his French, with the prospect of graduating within five or six years after his admission.

There is just one other point in considering the question of advanced requirements for admission. We were, of course, compelled to answer the question as to whether or not we should require an A.B. or a B.S. degree for admission. Personally, I am thoroughly opposed to that, and I will tell you the reason why. In the first place, a Bachelor's degree has no standard value. It may mean much and it may mean little. From some schools it means no more than an ordinary high-school educa-

tion, whereas, in some other schools it carries a great deal of weight with it. It is uncertain, however, because it has not been standardized. Therefore, it cannot be made a proper requirement for admission. All of the large universities in this country have now adopted what is known as the elective system; that is, the student, after he has passed his Freshman year, is permitted to attend whatever courses he chooses. His choice is, of course, regulated to some extent by the rules and regulations of such institutions.

Another advantage in not requiring an A.B. degree is this: I am quite confident from my own observation of medical students during the last 25 years, watching them as students and keeping track of them after they have graduated and gone into practice, that it is very desirable that men who begin to study medicine should do so at a comparatively early period in life. It is very seldom that a man who begins to study medicine late in life, although I admit there are some exceptions to this, makes a success in practice. Usually a man with a degree has reached an advanced period in life. It has taken too much time to acquire it. Heretofore we have admitted these students and have given them credit of one year's time, providing they have done a certain amount of scientific work, and as a result of this they will try to do the regular college work in less time, making up what deficiencies they have in three years, and while they are all good students when they enter, they, as a rule, graduate at the foot of the class. That has been my experience.

#### DISCUSSION.

Dr. Winfield S. Hall, Chicago, Ill.:

Mr. President: I feel that I can not let this opportunity pass without saying a word for the college graduate. I have had an opportunity, for quite a number of years, of watching the influence of college training upon medical students. My experience has been such as to lead me to take a ground somewhat different from that which has been taken by Dr. Vaughan. Some of the best men who have finished their course at our institution, and who successfully met the ordeals imposed upon graduates in Chicago and other large metropolitan centers, namely, the competitive examinations for positions in hospitals, have been college graduates. Of course, we all know that any man with a good memory can cram up and pass a competitive examination. That does not mean much, but these men have not stopped there. They have gone on; they

are successful in practice, and are forging ahead to-day at a very rapid and encouraging pace. There is no reason to doubt that they will reach a very high place in the medical profession.

There is this, however, which I have noticed: If these men have spent years in the study of Greek and Latin, they enter the medical school somewhat handicapped. They have not received that long drill in the classics, however, without getting the mental equipment that goes with the years of training. But most of these men have spent years in the study of biology, chemistry, and physics; they are men who take the baccalaureate courses in science in the neighboring institutions, the universities of Wisconsin, Minnesota, Michigan, and Illinois. After their Freshman year they have spent most of their time in the biological and chemical laboratories, and when they enter the medical school they are fully capable of finishing their course in three years, plus two summers, making practically the equivalent of four years. They are the men whose college course has given them an especial advantage.

Dr. John M. Dodson, Chicago, Ill. :

I desire to emphasize what Dr. Hall has said, and I fully agree with him. I cannot understand how the experience of one school should be so different from that of another. The experience which Dr. Vaughan has had is entirely different from the experience which Rush Medical College has had with college men.

It seems to me that we should not lose sight of the fact that the prime object of education is not the acquisition of information but the training of the mind. The important thing is that men who enter a medical school should have been taught to observe accurately, to describe clearly, and to think logically. Of course, in doing that they should have acquired a fair knowledge of one or two foreign languages and a good knowledge of their own. Mathematics are also of importance, and the ancient languages have their place. They are useful as affording a certain kind of culture which cannot be obtained in any other way. Culture, however, is the main object. I believe that the average college graduate coming from a four-year school, with such a training in the modern languages and the sciences as is required by Rush Medical College as a prerequisite for admission to advanced standing, will turn out a better man at the end of three years of medical training than the average student without such a preparation after five years in the medical school. He is able to make much better use of his time, his faculties have been trained to such a degree that he can work to much better advantage. I do think, however, that these men should be granted credit, not in *time*, as for example, one year of credit, but for the work actually accomplished which corresponds to any of the first years of the curriculum of the medical school. The school with which I am connected has modified the rule so that we do not say to the student "We give you a year of advanced standing," but that "We will give you credit major for major." A major means a

certain amount of work,—60 hours of didactic work or 120 hours of laboratory work. This is allowed him for any work that he has done in his science course which is equivalent to that amount of work in our course. This never exceeds nine majors, that is, the work of our first year. The continuous session has been a great convenience to these men. They are able to take an extra quarter in which to make up their deficiencies in the first-year work and then go on with the Sophomore work. Some of them have had to take two quarters.

In some schools human anatomy is offered as an elective study for the B.S. degree and is intended for those students especially who expect to take up the study of medicine. One thing I am sure of and that is that this inducement of a year of credit in the medical course for this work has been one of the strongest incentives that we have had for the young man to take a college course before entering on the study of medicine. We would surely all like to see every medical student spend at least two years in a college before he enters on the study of medicine. To remove that inducement by telling the student that in spite of his four years in college we give him no credit for the work done and put him on the same basis as the high-school graduate, would, to my mind, be a serious step backward. I am aware that the laws of the state of New York refuse these men recognition, but the Board of Regents of New York two years ago endeavored to amend that law, but unfortunately failed to get the signature of the governor. The same bill was again introduced this year but again failed. I thoroughly agree with Dr. Vaughan that we would not recognize a simple degree, but should give the college graduate credit for such actual work as corresponds to any of the courses of the medical curriculum.

Dr. Lewis J. Nolte, Milwaukee, Wis. :

Dr. Vaughan voices exactly the views expressed by Professor Barker, late of Columbia College, which were that we should give our young men the necessary education to admit them to our medical colleges, bringing them up to the standard, if necessary, in certain points. In that way we allow them to go on without giving them any unnecessary education, which will simply prolong their lives as students and carry them on in years so that they cannot enter on their medical careers until late in life. I believe in getting the physician into life as soon as possible with an education that is adequate but not excessive, and which will bring him up to an age when he is capable of coping with the world successfully.

Dr. Vaughan (closing the discussion) :

I evidently did not make myself plainly understood. I agree perfectly with both Dr. Hall and Dr. Dodson. The best students we have in our school to-day are college graduates. If my own boys were to study medicine I would put them through the literary college first,—there is no objection to it. The objection I do make is to accept an A.B. degree for admission to a medical school without inquiring what that A.B. degree means.



The second objection is to give a year's time in medicine for an A.B. degree. I know dozens of students who have received credit of one year's time in medical schools who have studied none of the preliminary branches of medicine. That is the point. A gelatin plate will not harden any quicker for the man who has an A.B. degree than for the man who has not an A.B. degree, and yet the former tries to do in three years what the man directly from the high school does in four years. He cannot do it. The men we have been giving a year's credit, allowing them to finish their course in three years because they were college graduates, men whom we expect to stand at the head of their class when they graduate do not stand there at all. I should be well pleased if every medical student had a preliminary college course before entering a medical college. I believe the medical profession in this country is strong enough to compel the literary schools to give courses which will prepare students for the study of medicine. If the literary schools will not do this, we will give them these courses after the end of the medical college.

## THE TEACHING OF ANATOMY IN MEDICAL SCHOOLS.<sup>1</sup>

BY C. A. HAMANN, M.D., Cleveland, Ohio.

*Mr. President and Gentlemen :* In selecting this subject for a paper before this Association I am aware that I am taking a much discussed topic, one that has from time to time received much attention, and concerning which there has been considerable difference of opinion. The importance of the subject to the medical educator, and the hope that useful points will be brought out in the discussion rather than anything in particular that I have to offer, are the reasons for my bringing it before you.

The value of anatomy as a fundamental study is so apparent and so universally recognized that it would be a waste of time to exploit it here. Not only as a fundamental branch, serving as the basis and ground work of the whole superstructure of medicine is it important, but it should be regarded as more than this. A knowledge of this subject should be kept up and added to. Anatomy should be the ever-present companion of the physician and surgeon. It is the branch of the curriculum that is most fixed and unchangeable.

The teachings of most of the other branches are subject to continual changes and modifications as advances and discoveries are made, but with anatomy it is different. The gross anatomy of man has been so thoroughly worked out that very few discoveries and new facts can be added. It is not my object to discuss research and to attempt to point out what directions and paths investigators must pursue to further advance this science; I wish to discuss the teaching of anatomy to medical students, and shall approach the subject by propounding certain questions and then strive to answer them.

*1st. Who should teach anatomy?* Here we are at once brought face to face with a question which has been differently answered by various writers, and one concerning which there is room for a considerable difference of opinion. In former times

<sup>1</sup> Read before the Association of American Medical Colleges, St. Paul, Minn., June 3, 1901.

anatomy was taught exclusively by men who were practitioners of medicine and surgery, particularly the latter. Prominent examples of these surgeon anatomists were Pancoast, Sabine, Agnew, and others.

This was the custom in England, where the professors of anatomy were nearly all surgeons, and to a certain extent it is still the case. In America, up to quite recent times, this custom was followed. In Germany the two subjects were dissociated earlier, I believe, than in any other country. In France, surgical anatomy was highly cultivated, and the teaching of anatomy was largely in the hands of surgeons.

In recent times there is a marked tendency to specialize, and in the larger schools at any rate, the professor of anatomy is not a practitioner, but devotes his time entirely to teaching and to research. There is no question that the field of anatomy is so vast that in order to attain greatness, indeed to do full justice to the subject, it is necessary for a man to devote his energies to it alone, unhampered by the cares of practice. It is even necessary to sub-divide anatomy—to specialize in this field.

Anatomy is a science that can exist without medicine, but medicine cannot exist without anatomy. Anatomy is not merely a handmaid of medicine—it has long ceased to be that. The further advance of anatomy requires that some men, qualified by their inclinations and training, should devote themselves to the pursuit of investigation in this field. In other words, there should be pure scientists, not only to further the progress of research, but also to train, lead, and inspire others. A large and well-endowed medical school should have a pure scientist at the head of the department of anatomy. He should, however, be relieved of the larger share of undergraduate teaching, and should devote most of his time to investigation. The drudgery of teaching should be performed by men under his direction. In my opinion, however, the pure anatomist is *not* the best man to teach anatomy to medical students. At any rate, in addition to *his* teachings, there should be teaching of *applied anatomy*, by a man who is engaged in the practice of medicine and surgery. The pure anatomist, I repeat, is not the man who will give the most valuable instruction to medical students. He is obviously not interested in so-called practical matters and he

has little or no knowledge of the needs of the medical man in the domain of anatomy. His instructions will not have the same interest to the students, and he will with difficulty hold their attention. It will be hard for him to select from the vast amount of detailed description, those things which are of interest and importance to the coming doctor. His interests will be in another direction. Do not understand me to mean for one moment that I would presume to disparage the pure anatomist; on the contrary, I have the very highest possible respect and admiration for him.

The idea that I wish to convey is that the teachings of the pure anatomist should be supplemented by the teachings of a man engaged and interested in practical medicine and surgery. One who knows his anatomy, who knows and can teach the application of the subject to practical work, one who has the enthusiasm, the energy, and ability, to instil into his students an appreciation of the value and necessity of correct and extensive anatomic knowledge. I plead guilty to the accusation of urging the utilitarian and practical side of anatomy, rather than the purely scientific side, in medical teaching. If only one of the two kinds of teachers is available, I should prefer the man who is engaged in practice. You will say that the practical side of our subject can be taught by the instructors in medicine and surgery and the various specialties. I do not believe that that is feasible, or best. I know that most of the teachers of the practical or clinical branches are not capable of imparting correct and sufficient teaching in applied anatomy. They do not know the subject well enough in the first place. Or, you will say with Gegenbaur, that the practical deductions are apparent, that they flow from the scientific teachings in streams and can be seen and recognized by the students. I do not believe this. The practical deductions that can be made must be pointed out by one who is a good anatomist and who possesses also the necessary clinical knowledge.

*2d. What should be taught?* Of the vast amount of anatomical knowledge that is now the common property of all, there is only a certain portion that should, or indeed can be taught in medical schools. There is abundant opportunity for selection from the great field, and he is the wise and efficient teacher who

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makes a judicious selection. There is so much that is superfluous, that is a mere burden upon the memory, valuable for its own sake, as is all knowledge, but it is not necessary for the coming doctor. The medical student is overburdened with work, and it should be the teacher's object to lighten that burden, to cull from the great mass of anatomic details those things that are of value, and to pass lightly over, or ignore, those things which are not. Medical students should not be regarded as future biologists or embryo Huxleys, Darwins, or Leidys, but as coming practitioners of medicine and surgery. It is in these fields that their future work lies and they should be trained with that in view? Very, very few of them will devote themselves to purely scientific work after graduation. I am an exponent of the utilitarian idea in the teaching of anatomy. I would have that portion of anatomy taught, and taught in such a way that the knowledge gained will be of use in practice. Now as to some details regarding what should be taught.

*a.* Comparative anatomy: Should it have a place in the medical curriculum? In a general way I should answer that it should not, but I will modify this somewhat. In an ideal preparation for the study of medicine, the study of comparative anatomy, to the extent of dissection of a few typical forms, should be pursued; in other words, comparative anatomy should be studied before the medical course is begun. If it is not, I think that a brief course, say four or six weeks, in which a specimen of each of the classes of vertebrates is dissected is appropriate. It gives the student a broader view; it trains the hand, and it is of some assistance in preparing him for experimental work on the lower animals, to be done later in the physiologic laboratory. At the Western Reserve University, a brief course of this kind is given in the first year, the main object of it being to render the student familiar with the viscera, vessels, and nerves of those animals with which he subsequently works in practical physiology.

Throughout the course in descriptive anatomy, there should be frequent references to the structure of lower animals. Human anatomy should, to a certain extent, be taught from the standpoint of the morphologist. There are so many facts which can be much more thoroughly comprehended and understood, and

therefore better remembered, when reference is made to the oftentimes simpler and more schematic structure (if you will allow the expression) of lower types.

I believe thoroughly in this way of presenting the subject. But the method should not be pushed to the extreme. The great facts of comparative anatomy and morphology in a medical course, should only be made use of to elucidate and explain the structure of the human body.

*b. Embryology:* This subject should certainly form a part of an anatomic course (provided it is not studied before), for reasons that are quite obvious. If possible, a practical laboratory course of four to six weeks should be given, preferably in the second year, when the student already knows something of the structure of the adult body. Histology forms in most schools a part of the course in anatomy; in some, the instruction is given by the professor of physiology. I shall have nothing to say on this matter, for the present paper deals with the teaching of gross anatomy.

*3d. How long should anatomy be taught?* During the first three years, I should say; possibly it would be better to omit the subject in the third year and return to it in the fourth. When the student has gained and is gaining his knowledge of the clinical branches, he will be much better prepared to appreciate the value of anatomy. This has other advantages. It gives him a review of the subject. We should remember that after a student graduates, he has but little opportunity to pursue the study of practical anatomy further; hence it is well that he should obtain, or at any rate have an opportunity in the medical school of gaining that sound anatomic knowledge, which is to be the basis of his future work in the medical profession. Let me say here, that anatomic studies are not only valuable for the actual practical knowledge which they impart, but also for the reason that they lead to exactness, they lead to habits of searching for the underlying physical changes in disease and injuries, of not being satisfied with vague and indefinite explanations of illness and injuries. Hence I would have as much time devoted to the subject as can, in justice to the other branches, be given to it.

The following is an outline of the course pursued in the Western Reserve University. In the first year, osteology, syndesmology, myology, and augeiology are taken up; and the

student dissects two or three parts. In the second year, the rest of the subject is gone over, *i. e.*, splanchnology neurology, the anatomy of the sense organs and of the genito-urinary organs; the student dissects three parts. The entire body is thus dissected in the first and second years, and the dissection of the first part is repeated. In the second year the student also attends the lectures on applied anatomy.

In the third year there are two lectures, and a demonstration each week on applied anatomy.

4th. *How should anatomy be taught?* Didactic lectures have of recent years been largely replaced by recitations and demonstrations. For a student to listen to a systematic description of bones, muscles, and arteries, in a large amphitheater, where little or nothing can be seen of the object under discussion, is almost a waste of time. I would not do away with didactic lectures altogether. If the teacher is a good lecturer, if he can present the subject in a clear, forcible, and interesting way, a certain number of didactic lectures are of value, and indeed a necessity. But recitations and demonstrations to small sections of the class are more helpful for the successful carrying on of the larger part of the instruction. After all, as has repeatedly been said, the dissecting room is the place to learn anatomy. The student must gain his knowledge by actually handling and working out the parts. "Knife and forceps anatomy," as Mitchell Banks calls it, is the proper kind. The repeated handling of the parts, the gaining of manual and visual familiarity with the body, are what is necessary. Mere verbal knowledge is insufficient—indeed almost useless.

Dissecting is unfortunately neglected by many students. There are some disagreeable features about the work. Every possible effort should be made to render dissection as agreeable as can be. In the first place the material should be well preserved, the arteries and veins well injected. (The methods of embalming and preserving of anatomic material can not be discussed here.) The dissecting room should be kept thoroughly clean, and as free as possible from odors; the offal should not be allowed to accumulate; students should be compelled to keep the table neat and not covered with scraps of fat and muscle, and the parts should be kept moist. Attention to these details serves to make the

naturally somewhat repulsive work much more pleasant. There should be competent demonstrators at hand all the time that dissection is going on,—so much material is wasted by students, structures are destroyed and the work is hurriedly done, or done not at all.

To assist the students I have had printed slips upon which are given a few guides, and the names of the structures that should be worked out. These are of material aid. There is danger of affording too much assistance to the student ; he should be allowed to work out his own salvation, very largely. He should verify the statements made in the text-books as far as possible.

There are, however, many things which the student can not work out himself. These must be shown him. Demonstrations to small sections, say eight or ten men, afford an invaluable method of imparting anatomic instruction. The anatomic museum should be drawn upon and its treasures shown and explained ; within certain limits, students should also be permitted to handle wet and dry preparations. Too often the museums are not made use of at all in anatomic teaching. The student perhaps sees the jars, models, etc., at a distance, in the amphitheater but that is all. Students should be urged to frequent the museum, and the contents should be so arranged that they can be studied. The plan adopted in the University of Edinburgh is a most excellent one. Arranged in galleries about the dissecting room are jars and vessels containing dissections and anatomic preparations, which can be viewed at leisure by the students. In some of the German universities there have been arranged "Studir Saale" in which the specimens, preparations and models are so arranged that they can be well seen from all sides and examined in detail.

In the teaching of osteology much time is wasted by some teachers who go too much into detail. Of what use is it, for instance, to insist that students should know all about the palate bone or the various carpal bones. A few general and leading facts are all that are necessary. Osteology is usually regarded as a dry and uninteresting study. However, it can be made attractive and interesting by a good teacher. In the part of the anatomical course devoted to bones and joints, it should be the duty of the teacher to emphasize the salient points ; for example, much can



be taught concerning the periosteum that will be of benefit to the student in his surgical studies. The whole groundwork of bone pathology can be laid in the osteologic course. Regeneration of bone, subperiosteal resections, epiphysial injuries and many more pathologic processes and injuries that could be mentioned, can be understood thoroughly, only if the student has a proper conception of the normal structure and function of the parts; and the place to learn this is in the anatomic rooms.

Of course all this goes without saying. But I wish to emphasize the connection that should be shown by the teacher between anatomy and practical medicine and surgery. Anatomy as a purely descriptive science is extremely dry and uninteresting, a mere task for the memory. The teacher should by his practical deductions, so interest the student, and endeavor to lead him to think for himself, that he will regard the anatomic course as the most enjoyable and profitable part of the curriculum. I know that this can be done. The objection may be urged that a first-year student can not appreciate the relations between normal and pathologic conditions for as yet he knows nothing of pathology. To a certain extent this is true. But he can be taught something of them, and the interweaving of a certain amount of practical knowledge with the dry details of descriptive anatomy is of immense value.

In the second year the viscera and the nervous system should constitute the main parts of the course. For the future practitioner of internal medicine it is extremely important that these subjects should be very thoroughly taught. I believe that splanchnology and neurology have, in the past, received an insufficient amount of attention. The arteries and muscles were thoroughly described and a knowledge of them insisted upon, whereas the viscera and central nervous system were slighted. This is a great mistake. There is a great deal of time wasted in trying to teach the origin and insertion and relation of muscles, for instance. The relations of arteries, collateral circulation, etc., have received altogether too much attention, in proportion to their importance. How seldom are the larger arteries tied in continuity! What is the use of trying to get the student to memorize the details of their relations? There are more important things.

In the second year the study of applied anatomy, as a separate course of lectures and demonstrations, may be begun. In the third year the study of applied anatomy is completed. In reality, according to the views and methods above outlined, applied anatomy will have been studied from the very first, but I mean by the third-year course in applied anatomy, a course of lectures, demonstrations, and quizzes, which serve, in the first place, as a review and partial repetition of the first two years work, and in the second place, a course in which are brought forth more prominently and more in detail the relations of anatomy to medicine and surgery. The student, being now engaged in the clinical branches, is better qualified to appreciate the value of anatomy and to profit by his instructions. I would not call this course one on surgical anatomy—it should be more than this. Medicine and the specialties should receive attention; anatomy applies to them as well as to surgery. In this course, it is to be presumed that the student possesses a fair knowledge of descriptive anatomy, and with this as a basis, the instructor should proceed to illustrate the practical value of this knowledge, to draw deductions, to explain on an anatomic basis the phenomena of disease and injury.

You may criticize me by saying that too much is thus attempted in the anatomic course, that the teacher is giving a sort of general course on medicine and surgery, and that there won't be much left for the other instructors. Of course there will be overlapping; this may be an objection, or it may not. At any rate there will be enough left for the other chairs. I do not think the teacher of anatomy is overstepping his bounds, when he refers, in a proper and legitimate way, to the relations between his science and pathology and the clinic branches.

Among the many things which can be properly taken up in this course is surface anatomy. By this I mean the actual handling of the cadaver, and the living subject as well, by the students. Many pathologic conditions can be produced on the cadaver, and then studied; for instance fractures, dislocations, hernia, effusions, into joints, etc. It is also approximate, in such a course, to describe and illustrate the anatomy of as many operations as possible.

Organs can be outlined, joint lines indicated,—but I shall not

wear you with a citation of the many ways in which applied anatomy can be made interesting and profitable. It is a question whether applied anatomy should not be taught during the last year of the medical course. Good arguments for doing so can be brought forth.

In the above remarks I have indicated my views as to the spirit in which anatomy should be taught, as to the subjects to be most emphasized and as to the methods to be followed. In conclusion, permit me to offer the following propositions :

1. Anatomic teaching should extend over three years of the medical course.
2. Those parts of the subject should be taught, which will be of most use to the future practitioner ; the instruction should therefore be of a practical nature, rather than theoretical and purely scientific.
3. Dependence should be placed upon demonstrations and recitations rather than didactic lectures, and above all, the dissecting room should be regarded as the place to learn anatomy.
4. Instruction in applied anatomy should be given by a competent anatomist, who is also a practitioner.

#### DISCUSSION.

Dr. Hal. C. Wyman, Detroit, Mich.:

I wish to say simply one word in regard to this paper. The writer apparently ignored entirely the value of drawing as a means of teaching anatomy. This is probably an oversight on his part. I have had considerable experience in the teaching of anatomy, and I am convinced that the art of drawing is a most valuable aid. Possibly it might be an excellent idea to teach anatomy for three full years, or even four years. If the student is taught to draw, I think he will be better able to understand anatomical structures and relationships just as the child in school learns the outline of a country and the location of geographic points by making drawings. In my opinion this matter cannot be overestimated.

Dr. Wm. L. Rodman, Philadelphia, Pa.:

I have enjoyed Dr. Hamann's paper very much. I think he has reviewed the subject in a most thoughtful and careful way, and I am sure that we all agree with him in the conclusion he has drawn. I have always believed, as Dr. Hamann does, that the students get too little anatomy in our schools to-day. I believe it is important that they should be taught anatomy for at least three years, getting regional anatomy in the third year or, perhaps as he suggested, omitting it in the third year and returning to it in the fourth.

We would accomplish two things by doing this : Students would understand clinical medicine and surgery much better if they get this regional anatomy in the fourth year. In the second place, students would be better able to pass creditable examinations before state boards. We all know that students at the present time are really not able to put up as good an examination as did the students 30 years ago, when they were taught anatomy in the Senior year. I would at least require the third year in regional anatomy as, I think, practically all the best schools do. It is better, as the essayist said, to skip it in the third year and return to it in the fourth year, thus giving them the benefit of a general review which will help them greatly in their work.

I, furthermore, agree with the essayist in the position he has taken about the minutiae of the anatomy of the bones and muscles. I was impressed with what he said. The best lecture I ever heard in my life on the sphenoid bone was by the best professor in anatomy. He took up the sphenoid bone and said, "Gentlemen, this is a sphenoid bone. All I have to say about it is, d—n the sphenoid bone." I think it was the best lecture he could give. Many anatomists spend several lectures on the sphenoid bone.

The didactic lecture is of more value in anatomy than in any other branch. The personality of the teacher comes in here, as anatomy is nothing more or less than applied to surgery. I do not believe it well to teach anatomy by the quiz system altogether. I think a good didactic lecture, such as my friend Bodine, who is the best teacher of anatomy I ever heard in my life, gives his students will teach the students more anatomy than any quiz course. More attention should be paid to important surgical areas, such as Scarpa's triangle, the perineum, the inguinal canal, etc., and less time spent on the muscles of the back, the sphenoid bone, and such things as have very little practical application in surgery. When I was a student we had to learn the names and course of all the small intrinsic vessels, giving them in their order, and yet the surgeon pays absolutely no attention to them. I am very glad that the doctor presented this very valuable paper, and I hope it will bear fruit.

## MEDICAL SCHOOLS WHICH DO NOT GIVE DIPLOMAS.<sup>1</sup>

BY R. H. WHITEHEAD, M.D., Dean Medical Department of the University of North Carolina, Chapel Hill, N. C.

One who glances over the publications of the various organizations of the country relative to medical education is likely to receive the impression that the system is in a somewhat chaotic condition. A closer observation, however, will soon convince us that beneath all the disorder, and to some extent responsible for it, are earnest and persistent efforts to elevate the professional standard. The varied conditions of different portions of the country with respect to population, wealth, and general education, the honest differences of opinion as to the end desired and the best means of attaining that end, are so great that for the present, at least, a certain amount of clashing of forces seems inevitable, even though those forces may all be directed toward the same ultimate goal. Yet the history of our country is such that we may feel hopeful that in the course of time a system of medical education shall be evolved which will be suitable to our people, and in which the profession may take pride.

The object of this paper is to call your attention to the part played by "medical schools which do not give diplomas," and also to the part which such schools may reasonably be expected to play in the future. I should state, at the outset, that the schools I have in mind are such as are *bona fide* departments of universities or literary colleges, and intentionally confine their work to what are commonly called the fundamental branches of medical science.

In the first place, I should like to point out some circumstances which naturally favor instruction in such schools — advantages due on the one hand to their connection with a literary institution, and to small classes on the other. In the first division I note that the commercial spirit, concerning the evils of which so much has been said, is not apt to be present. These schools are not conducted with the idea of making money; they

<sup>1</sup> Read before the Association of American Medical Colleges, St. Paul, Minn., June 3, 1891.

are not expected to do more than pay expenses. Their sessions are long, and exorbitant demands are not made upon the student's time. Many a one, I am sure, upon examining the schedules of some of our medical colleges must have wondered when the students found time to meditate upon and "inwardly digest" all that they had seen, felt, and heard on a given day.

Again, academic methods prevail, the standard of scholarship is high, and the medical student is subject to the same rules of general discipline with his academic fellows.

In such schools all the work is devoted to the fundamental branches; there is no atmosphere of the hospital and clinic to distract the student's attention from them. Doubtless many of you, who teach anatomy, chemistry, or physiology, have experienced trouble from this source.

In such schools, too, the faculty is apt to be formed by trained teachers, men who have chosen teaching as a profession. Bricks and mortar do not constitute a school any more than they constitute a state; it goes without saying that unless it is directed and pervaded by the spirit of the true teacher, the best equipped school cannot do the best work.

Not the least of these advantages, in my opinion, is the opportunity for general culture afforded young men who have been unable to obtain a collegiate education. If the school be a part of university which, in the words of a distinguished university president, is "a place where there is always a breath of freedom in the air; where a sound and various learning is taught heartily without sham or pretense; where all classes and conditions and beliefs are welcome, and men may rise in earnest striving by the might of merit; where wealth is no prejudice and poverty no shame; where there is a will to serve all high ends of a State struggling up out of ignorance into general power; where men are trained to observe closely, to imagine vividly, to reason accurately, and to have about them some humility and some toleration" — no right-minded student can spend two years in a climate even approximating this without benefit.

As to the advantages of small classes, I become more and more impressed by them. The constant contact of pupil with teacher, the opportunities to individualize instruction, to stimu-

late a lazy man or to encourage a dull one, the ability of the students to see the demonstrations clearly, and the comparative facility with which the modern methods of laboratory instruction can be carried on, all seem to me immensely helpful.

But, of course, these circumstances alone do not suffice. The school must be adequately equipped with laboratories presided over by faithful instructors. Proper laboratories, I take it, all now hold to be absolutely essential in medical education; no one now doubts that the laboratory method of instruction, being the natural and logical one, is the best for the student, not merely as a means to the acquisition of facts, but also as a stimulant to the powers of observation and judgment.

I presume that it is unnecessary to say anything in this presence concerning the importance of the fundamental branches of medicine; and I mention the subject only to say that it is this work which the schools under consideration seem particularly adapted to. Given a school possessed of the natural advantages mentioned, properly equipped, and provided with a competent corps of instructors, it necessarily follows that its work will be done well; indeed, the conditions for good work seem almost ideal. And I am in a position to affirm that these schools do accomplish their work in an excellent way, and perform a distinct service for their communities. For example, I know one such school which was established, in large measure, as the result of complaints by the state board of medical examiners that such a large proportion of the applicants for license were found deficient in these fundamental branches (they stated, among other things, that less than one-third of the applicants passed their examination upon anatomy). I am authorized to say that since the establishment of the school no applicant, who has successfully completed his two-year course, has failed to pass the examination for license—no matter where he obtained his diploma. I think I may claim, then, that these schools are worthy factors in medical education, and as such deserve the support of those who are interested in its improvement. In this connection it is pleasant to state that such schools are accorded membership in your Association, and that their work is recognized by such bodies as the Board of Regents of New York.

A few words, in conclusion, as to the part which such schools

may be expected to play in the future. According to our prevailing system of education, a student who desires a good collegiate education preliminary to his course in medicine must usually devote eight years to study before he can obtain license. If, in addition, a year or two of hospital experience is considered advisable, the man's life is half spent before he can begin to "make a living." There is, moreover, a possible danger that the best education may be removed beyond the reach of those who are not possessed of a considerable portion of this world's goods. These conditions are receiving some attention (many are doubting if they are necessary), and some "short cuts" have been devised. If it shall be decided that such movements are desirable, the class of schools under discussion will be in a position to render valuable service. There are several scientific studies which, while absolutely necessary in the medical curriculum, are also useful for general educational purposes. By making such studies elective in the Junior and Senior years of the collegiate course, it would be possible to shorten materially the time now required to obtain the B.S. and M.D. degrees, without damage to the student's collegiate or medical education. Is not, for example, the extensive course in physiology required of medical students as useful as the elementary course given in the biologic department of the college? And is not the anatomy of man as good and pure science as the anatomy of the cat?

This short paper does not by any means pretend to exhaust the subject; but I trust that it has been sufficient, in some degree, to show that these schools are worthy elements in our system of medical education.

#### DISCUSSION.

Dr. S. W. Williston, Lawrence, Kansas :

Dr. Vaughan, in his very excellent paper, spoke of the desirability of a closer relationship between literary work and such preparatory work as leads to the study of medicine. He said that this work should become more intimately associated with a general university course. I believe that this can be brought about in no better way, nor more fully, than by the recognition of the work that literary colleges or universities are giving to-day in the preparatory and fundamental branches of medicine. I represent a university which offers such a course. We do not wish to offer the third- and fourth-year courses in the study of medicine, because the facilities which we ought to



have for such work are beyond us. What we have we do not believe is sufficient for proper medical education. On the other hand, we do represent an endowed institution where all facilities for the successful study of the fundamental branches of medicine are at hand and can be given to the best advantage. The university has recognized this work in the medical department by agreeing to confer on all students who have finished the work as a part of the four-year course, the degree of B.A., thus shortening the time for the medical degree.

As has already been stated, the longer the preparation for medicine is carried after the twenty-fifth year of the student's life, the greater the injury which is done him. The work done in our institution conforms with the requirements as laid down by the college association, and in no instance do we allow a student to pass or receive credits who is not well prepared to enter the third year of a good clinical school. Many schools in the west are anxious to do likewise and are willing and ready to prepare students for the best clinical work. I believe all large state universities that are not favorably located for the real professional branches of medicine will be glad of this opportunity, not because of the need of more medical schools, but because we recognize the fact that we can give instruction as well as can be given in medical colleges in anatomy, chemistry, physiology, histology, and pathology. We are working on an endowed basis and the student does not begin to pay for the cost of his education. Furthermore, I do not believe that the scientific branches can be properly taught in a medical school where the student pays the whole cost. It cannot be done in a literary college, and we ought not to expect a student to pay even the larger part of it in a medical college. I endorse all that Dr. Whitehead has said on this subject, because I know by practical experience what can be done in this line of work.

Dr. Seneca Egbert, Philadelphia, Pa.:

This subject involves three or four details that I think some of us do not clearly understand. In the first place, as one who has had to arrange a curriculum for a number of years, my difficulty has been to find sufficient time for what seems to be the absolutely necessary studies and branches for a well-balanced medical course. Much has been said to-day about teaching anatomy for three years. Dr. Vaughan has advocated the teaching of French and German in the medical school, requiring a considerable amount of time—many hours a week. The majority of mankind has but a limited capacity for doing a certain amount of work every day, and besides our four-year course in medicine is scarcely long enough for the studies that we feel are necessary for a successful training. The schools represented by Drs. Whitehead and Williston can do this preliminary work much better than many of the medical schools in this country. We are looking with tolerance, though some may not approve, upon the affiliation of certain of our larger medical institutions with literary colleges. Therefore it would scarcely be fair to the schools doing this preparatory work if we should exclude them from membership in this Association. A man can go to Cornell, enter the scientific department, and in six years get two degrees, B.S., and M.D. The

same is true of two New York schools, the University of Chicago in affiliation with the Rush Medical College, and the University of Pennsylvania. It seems to me that other colleges which are amply able to give just as good a course, ought to have the same privilege, by being allowed to give men their first two years in medicine just as the other literary colleges do which I have mentioned.

We have now reached a critical period in medical education. We want every man who enters the medical profession to be as well educated as possible. On the other hand, some of you have said that it does not pay a man to take a college course, because it takes too long. Most men are 25 years of age when they graduate from a scientific college and are ready to enter a medical college. One reason for this is, that we have been increasing our requirements for entering a literary college and a man must, of necessity, spend more time in a preparatory school so as to be able to meet the requirements. It is harder to get into the Freshman class of an academic school today than it was to enter the Junior class 50 years ago.

The preparatory colleges must do something to help along the good work. The leading literary colleges are doing all they can to give first-class preparation in medicine. I know more about Princeton than any other school because I am a graduate of that college. A man can get a better course there in the fundamental sciences, barring anatomy and second-year medical chemistry, than he can in most medical schools. I have found that most of the college graduates have taken a high standing in medical work. I agree there with Dr. Hall. The requirements of this Association are that a man shall not be entitled to advanced standing in a medical school unless he has done science work in a literary college. Therefore, I see no reason why schools like Dr. Williston's and Dr. Whitehead's should not have full privileges. They can do the work just as well. What we want from them are men who are well trained in French and English and the fundamental sciences,—men who are well equipped for the practical and clinical work which they will get in the third- and fourth-year courses of a medical college.

Dr. Logan, Kansas City, Mo.:

I heartily endorse the remarks of the previous speaker. I think this is a question which we have been trying to answer for some time. These universities are certainly making a step in the right direction, and it is not for us, who are teaching advanced medicine, to endeavor to jeopardize their interests and thus prevent them from accomplishing what we have so long longed for in medical education. I see no reason in the world why this would not be of the greatest benefit to the medical colleges. It certainly puts into our hands men who are thoroughly prepared and thoroughly able to appreciate what we have to offer them. It will not only lighten the labor for the medical teacher, but it will increase the knowledge and capabilities of the medical student. We must not forget that.

Dr. Seneca Egbert, Philadelphia, Pa.:

I do not believe that I am violating any confidences when I say that the

Board of Trustees of Princeton are contemplating the adding of a chair of anatomy and physiology to the work now done in that college. I do not believe that they anticipate or desire to establish a medical department at that university. Princeton is merely following in the footsteps of other colleges who have established similar courses, largely because the medical profession of the country have asked these institutions to give their students some work in the sciences preparatory to medicine, work which will entitle them to advanced standing in the medical school. Nearly every medical college in the country has said to these institutions: "Help the boys along with this preliminary work and we will give them advanced standing." Much money has been spent by these schools to give the students this work, and we must all admit that their course is beyond reproach.

Dr. John M. Dodson, Chicago, Ill.:

I am of the opinion that much advantage would accrue to both the college and the student if the first year's work in the medical school was transferred to the literary school. After July 1st, Rush Medical College, of Chicago, will offer no teaching in the first and second years in its own buildings. The teaching in these branches will be given in the University of Chicago, with which Rush Medical College is now affiliated. This is done because it is believed to be of great advantage to divorce entirely the teaching of the fundamental branches from the teaching of the clinical years. We have learned by experience that the Freshman and Sophomore students are distracted from their work, if it is done in the same building with clinical work. They persist in attending clinics to the great detriment of the work in the fundamental branches. Further than that, if the work is done in the university, the students are there placed in an atmosphere of research and investigation which is something that the medical profession needs to cultivate and encourage at the present time.

I had an opportunity last year to visit a number of colleges and universities in this country, particularly in the south, and I was greatly impressed with the thought of the advantages which might accrue from a similar movement in those schools. It seems to me that the complete transfer of this work would serve several very important things. First, it would place the entrance requirements in the hands of the university or college where, in almost all instances, they would be much better guarded than now. Secondly, it would place the medical student in an atmosphere of an institution of general learning. Third, it would transfer the teaching of these branches to men whose lives are devoted to that work, instead of those whose teaching is done as a sort of stepping-stone to something else. Most of our teachers of anatomy and chemistry are not anatomists and chemists, but they are doing this work in the hope that some one will drop out of the teaching faculty, and that they will then be promoted to the chairs of medicine or surgery or something else. It is a foregone conclusion that the best work cannot be done in this way. Fourth, it would be a measure of economy, as it would avoid the duplication of the equipment for laboratory and other work. Human anatomy ought to be taught as a branch of general learning and not as a

mere stepping-stone. Pathology should be put in the same class. Pharmacology might well be relegated to the literary years, thus divorcing these branches in such a way that they would be studied as general sciences.

Medicine, it seems to me, is an applied science. The proper course of procedure in the study of an applied science is first the mastery of the science itself, and then the study of its application. Perhaps I can best illustrate by citing an example: Take a student who enters a medical school without any knowledge of chemistry. He is impressed with the idea that he is preparing himself for medicine. His time is very fully occupied, and he is jealous of every moment. Of every topic that comes up in his study of chemistry, he wonders as to whether it will be of any practical value to him. If he thinks it will not, he is bound to neglect it. Yet neither he nor his teacher can possibly tell him what part of chemistry is going to be of service to him in the future. The very things that seem to be of purely theoretical interest to-day, will two or three years hence be of the utmost practical importance. If he has been broadly and thoroughly trained he can keep abreast with the progress of chemistry, read its current literature intelligently, and be prepared to adapt new views and facts when they come to him, although he may not be an expert chemist. I am firmly convinced that this is a step in the right direction and I sincerely hope that this Association will place the medical departments of those universities teaching only the first two years of medicine, on exactly the same footing as the medical schools.

Dr. Walter L. Carr, New York City :

I wish to endorse the sentiments expressed by the gentlemen who have spoken on this subject. I have always believed it to be of great advantage to the medical student to get his preliminary education in the fundamental branches in an atmosphere entirely free from clinics. I have always noticed that as soon as a student begins to attend clinics and sees a little of practical medicine, it is a very hard matter to get him to go thoroughly and scientifically into these primary branches. I am heartily in favor of keeping him entirely away from the practical work in medicine, and holding him down to that work which will fit him for the study of clinical work.

Dr. Wm. H. Wathen, Louisville, Ky.:

I do not believe it is best, by any means, to confine the student for the first two years to the literary or scientific department of a university. It is very well to do so for the first year, keeping him away from all clinical advantages. If he knows no chemistry when he enters the school, he will not become a chemist within two years. If a medical student receives his first or second year of instruction in the medical department of the college, and if his time is consumed in attending clinics in place of his other work, it is because of the faulty curriculum of the college, and because of faulty management. The college of which I am dean has a hospital immediately adjoining the college. There all the dispensary work is carried on every morning in the week. Immediately afterward we have the operations in the clinical amphitheater. The first- and second-year men are not permitted to enter

certain clinics under any condition. They are kept engaged in their laboratories of histology, chemistry, pathology, or such laboratory as we may see fit to put them into during those hours. In this way we have no trouble, whatever, in keeping these students out of our clinics. They are not allowed there, and they are required to be somewhere else. I admit that second-year students may derive certain benefits from some clinics. If you deprive them from attendance on these clinics they will be wandering around and doing nothing. There can be no objection whatever for the student in his second year to witness a surgical clinic for one hour during the day, but make your curriculum such that that student is compelled to be just where you want him to be. If you conduct your college properly he will certainly be there; otherwise he should not receive any credits for any work at the end of the year. We must insist on attendance on the required work.

Dr. D. C. Bryant, Omaha :

Do I understand that the teachers in these schools are to be physicians or scientific men ?

Dr. Whitehead :

I said nothing about that. Personally, I am of the opinion that most of them ought to be physicians.

Dr. Bryant :

If they are not physicians it seems to me that we are losing sight of an important thing as one of the speakers has already mentioned. He said that medicine is an applied science. If we have a man teaching anatomy who knows nothing about surgery, he does not teach the anatomy properly; he does not point out those things which are most necessary in medicine and surgery. The same thing applies to the chemist. There is an immense amount of chemistry which is entirely unnecessary to the medical man, and on the other hand there are some parts of chemistry which are very necessary to the medical man. Therefore, unless the chemist is an educated physician, the student will not get these necessary points.

The same applies to bacteriology where we have an endless number of germs which are of no importance whatever, and the very few which are important will not be pointed out by an unscientific man. The same applies to pathology and all the other branches. Then arises the question whether we are making the man better by giving him two years of his medical course in the university, granting him an A.B. degree, and giving him two years in the medical college for which we grant him an M.D. degree, or whether it would be better for him to follow the course we are now pursuing. Which will educate him the better? Education is what we are after.

Dr. S. W. Williston, Lawrence, Kan.:

In the school which I represent our teachers are not all doctors of medicine. Two years ago we sent all over this country to get a properly prepared teacher of physiology who was a doctor. We failed to find him, however, and we finally had to take a doctor of philosophy from Heidelberg. We always try to get the very best man we can.

Dr. Victor C. Vaughan, Ann Arbor, Mich.:

I think the work that is being done in the University of North Carolina is right in line with my argument. I say that we ought to compel the literary colleges to fit students for the study of medicine, and we certainly ought to be strong enough to compel the literary colleges to make their courses suitable. The University of Michigan will allow a man, who has all the requirements I mentioned, enter and graduate in four years. If he does not have those requirements he must take six years. What will be the result? Most of these men will go to some literary college and get those two years of work before they come to us. I often have a man write to me telling me that he is a high-school graduate and that he desires to enter our school. I answer him by saying that he will have to take six years, or that he can take two years of literary work in Yale and Princeton, and then come to us and graduate in four years. That will increase the number of students entering the literary schools, and it will force these schools to shape their course for men who desire to enter medical colleges later on.

The University of Michigan was the first to adopt the combined course by allowing a student to graduate in six years. I assure you it was a hard struggle to get the faculty of the literary department to adopt this course. The idea is prevalent among many men that useful information is something a student must not get in his college course. The trustees of our institution fail to see the reason why a medical student should know Latin or Greek. Finally by force of argument and circumstances, we compelled the literary department of the University of Michigan to yield us two years of medical study. The greatest trouble we have, and the one on which they held out the longest, was to teach human anatomy in this course. They would not allow a man in the literary department to study human anatomy and get credit for it because he could use it in after-life. But he could study cat-anatomy and frog-anatomy and crayfish-anatomy and get credit for it.

There is one thing we seldom think of. The German student, for instance, goes through the gymnasium which is equivalent to about the middle of our Sophomore year in our best universities. After he gets through the gymnasium he goes to the university and then studies medicine, or philosophy, or law, or whatever he pleases. It is nonsense to ask most young men who have to pay their own way through school, to go four years to the literary college and then four years to the medical college. It simply cannot be done. It is working an injustice. Furthermore, we should not accept every A.B. or B.S. without first inquiring as to the standing of that degree.

Dr. W. J. Means, Columbus, Ohio :

There is one point in this discussion which has not been brought out, and which is an important one in the matter of preliminary education. When we make the minimum entrance requirement, graduation from the high school, we lose sight of the age at which these young men get through our high schools. In many of them, in fact I might say 50 per cent., the graduates are about 17 or 18 years of age. A boy at 17 is not old enough to enter a medical college or to commence his medical study, although he has the

preliminary requirements' as laid down by the American Medical College Association. I think it would be a great deal better to offer him a six years' course, and at the end of that course to confer upon him the degrees of B.S. or A.B. and M.D. that will allow him to graduate from the medical college at the age of 23, the possessor of two degrees. It seems to me that this should be considered in our discussion on preliminary requirements.

Dr. P. Richard Taylor, Louisville, Ky.:

This discussion has not been limited to the writer's paper which had reference to those medical colleges which do not confer a degree. It offers a student two years of work, after which he can enter a school which will graduate him in the regular time. He said nothing whatever about full-fledged medical schools, referring merely to those who teach the fundamental branches.

Dr. R. H. Whitehead (closing the discussion):

My paper was written for the purpose of suggesting a general, rather than a detailed, discussion of the subject referred to. I have nothing to add and merely wish to thank the Association very warmly for the kindness with which the paper was received.

ON THE IMPORTANCE OF ACCURATE AND COMPLETE RECORDS OF THE STUDENTS' WORK  
AND THE ISSUE OF CREDIT CARDS  
FOR THE SAME.<sup>1</sup>

By JOHN M. DODSON, M.D., Rush Medical College, Chicago.

In passing upon the credits presented by students applying for advanced standing from other medical schools, the writer has been struck by the great diversity of the forms used for this purpose and the lack of clearness and accuracy in many cases. In a four-year graded course, if a student is to be dealt with intelligently and justly, and the degree of M.D. conferred on each one who is fairly entitled to it, and on no other, it is imperative that the nature and extent of his work and the results of the examinations to which he is submitted, should be carefully recorded from time to time, and that he should be kept informed of his progress by the issue to him of a credit card at stated intervals. The importance of these matters becomes still greater when a student comes to change from one school to another. This tendency of students to migrate during the medical course is obviously on the increase. It is a tendency, moreover, which should be encouraged rather than otherwise, as tending, in the case of the good student with an honest purpose, to result in greater breadth of view and of knowledge, and as extending the student's range of choice in the selection of those teachers, courses, and, especially, clinical advantages, which are adapted to his needs. The migratory plan constitutes one of the strongest features of the German university system.

Whether one does or does not coincide in this view of the advantages of migration, the fact is indisputable, and one must concede the right of every student to a "card of dismissal," whenever he wishes to leave a college, which card, or a credit slip accompanying the same, should set forth fully and clearly just what work he has accomplished and the length of his attendance on the course for the medical degree.

It seems evident that the importance of this matter is not uni-

<sup>1</sup> Read at the annual meeting of the Association of American Medical Colleges, St. Paul, Minnesota, June 3, 1901.



versally recognized and the writer desires to call attention to the principal items which are essential. First, the annual announcement or catalogue, a bulletin, circular of information, or similar document, should contain a definite and detailed statement of the work done in each branch of medicine. It is very convenient for this purpose that there should be distinct departments in the college and that, under each department, the work offered should be outlined, conveniently in numbered or lettered courses, stating the topics included, the nature of the work, whether didactic, recitation, conference, laboratory, practical or clinical, or two or more of these combined, the number of hours given to each kind of work, and the names of the instructors in charge of the same. It is of advantage to have some term covering a large number of hours, to express the value of the course. For example, in the college with which the writer is connected, a major signifies one hour daily of didactic or clinical work for one-quarter (three months), a total of sixty hours, or two hours daily of practical laboratory or clinical work for the same period. A one-hour lecture or recitation is considered to require two hours of outside study on the part of the pupil and to be equivalent to two hours of laboratory, practical or clinical work, which should require about one hour of preparation.

If such a descriptive statement of the work be set forth in the annual announcement, the credit card of a student need only set forth the courses he has successfully taken, by department and number, in order to convey to any one an exact idea of the credit he has received on the course for the degree.

Second, at the end of the term, quarter, semester, or annual session, as the case may be, the returns from the examinations should be sent by each department to the dean, recorder, secretary, or such officer as has been selected for this service, and by him recorded in a book of records, or on record cards. The card system presents the great advantage of flexibility, as new cards can be inserted at any time, the exact alphabetic order being preserved and no separate index being required. The danger of loss is obviated by the use of perforated cards, kept in place by a steel rod, or by a light wood or metal strip running across the top of one end of the cards and kept in place by lock and key. This record should contain the student's name, res-

idence, age, date of admission to the school, the credentials on which he was admitted,—whether on high-school diploma, college credits or degree, or on examinations, and any subjects on which he was conditioned on the entrance examination. There should also be recorded the date of beginning and ending of his attendance upon each session. The most important content of his record will be the statement of the courses he has taken and the results of his examination in each. In making up his final grade for each course, account should be taken of his attendance, daily work in recitation, laboratory or clinic, the final examination not constituting the sole factor in the event. A system of indeterminate marking is preferable to the numerical system. The chief objection to the latter is the fact that it purports to be what it never can be, mathematically exact. It is exceedingly difficult to draw such fine distinctions as are implied by the numbers 83, 84, 85, etc., on the scale of 100, even when papers are all marked by one examiner. When several examiners are engaged in marking the papers of a large class, such exactness becomes quite impossible. The mark 90 may be given by one examiner to a paper of less value than another receiving only 80 from a second examiner. Such a system as the following is therefore to be preferred, as a rule: "A"—Excellent; "B"—Good; "C"—Fair; "D"—Poor, (must take another examination); "E"—Bad (must take the course over again). In a competitive examination for a prize or other reward, the percentage plan is essential. The use of red ink or some color other than that used for marks above passing grade, for those below grade, greatly facilitates subsequent reference, as it enables one to tell at a glance the general character of a student's work.

The record card may also be conveniently used as a ledger account of the student's financial transactions with the school, though it is usually more convenient to keep these separately. Entries of deportment may likewise be made, and especially should instances of dishonesty in examination, with the penalty imposed therefore, be recorded in red ink. The use of a cheaply bound blank book for examinations has been found of value, both as a convenience to the student in the written examination, and to the examiner, and as a check against cheating. The first page of the cover may contain instructions as to the conduct

of the examination, and lines for the insertion of the department, number of course, date, etc. In large classes, if the papers or books are numbered consecutively, by a numbering machine as they are handed in, the possibility of loss is greatly lessened, or, that which is of more frequent occurrence, the claim by a student, that his paper has been lost, when he did not hand in one.

Third, when the student is allowed some election of his work, the use of a registration card is necessary. One of these is filled out by each student at the beginning of the quarter or session, by inserting in the column reserved therefor, the courses which he desires to take that quarter. These are indicated by number and placed in lines according to the departments indicated. This card must be submitted to the dean for his approval and must receive his signature and stamp. The student prepares this card in duplicate, one card being retained in the office and the other handed to him. From these cards entries are made to the student's record book or card, of the courses for which he is registered, and he is held responsible for these courses. Such registration cards are a great convenience in any school, but are not indispensable excepting where the elective system is in vogue.

Fourth, after the close of each annual session, a credit card or slip should be issued to each student, who has paid his fees in full, maintained satisfactory department, and is otherwise entitled thereto. Such card, which ought, if he requests it, to be made a "card of dismissal," should contain the student's name, date of beginning and ending of the session, and a specific statement of the courses which he has successfully completed during the year. Any condition he has received should be indelibly set down, as should any record against his attendance or department. We have deemed it unnecessary to record the mark received by the student in each course, and thought it sufficient to note only the general average attained, as excellent, good, fair, or poor.

The use of an interleaved credit-slip book, with carbon copy, has been found an efficient protection against the falsification of the record by a dishonest student. The course for the medical degree has come to be so long and expensive, the examinations

so rigid and the value of the diploma so great, as an indispensable requisite in securing a license to practise, that the temptation to forge or alter credit slips is very great and has proved irresistible in several cases which have come under the writer's observation. The preservation in the college office of an exact carbon copy of the slip issued to the student is a perfect safeguard against such dishonesty. It might not be a bad idea for each college in this Association to send to the secretary the name of every student detected in such and similar dishonest practices. Such men should be weeded out of the student body and not allowed to become members of the medical profession, at least, not until evidence of complete reform has been furnished. The black-list proposed would be a very useful means to this end.

Specimens of the documents referred to in this paper—student's record card, his registration card and the credit slip, together with a blank examination book,—are submitted for the inspection of the members of the Association.

Absolute uniformity in the matter of examination records and the like, among the several schools, is hardly possible, is not essential, perhaps not even desirable, but some clear, accurate and intelligible system should be adopted by each college, and the dean, secretary or other officer of each school should have a clear understanding of the methods of other schools from which his institution receives students.

In view of the importance of these matters, I beg to submit the following resolution: *Resolved*, That a committee of three be appointed by the chair to consider the matter of students' records and credits and to report at the next annual meeting. Such committee should:

(1) Secure information from the colleges represented in the Association, as to the methods now in use;

(2) Investigate the methods in vogue in a few of the leading literary colleges and universities;

(3) Consider the possibility of securing some degree of uniformity among the various medical colleges; and

(4) Outline a general scheme for students' records and credit slips, which may be utilized by any college, with such modifications as the local conditions of the institution require.

## DISCUSSION.

Dr. Wm. H. Wathen, Louisville, Ky.:

I have listened with much pleasure to Dr. Dodson's paper because I have observed, as dean of a medical college, the great irregularity in the keeping of records by different colleges. I have deplored the lack of any system that will enable one college to accurately come to the conclusion as to the credits a student from another college deserves. There is no trouble in adopting a system providing we do not adopt what is known as the elective system. If we adopt a regular course it is an easy matter. The work of keeping the books and records of a four-year course is extremely laborious, unless you adopt a very accurate system. Realizing that fact, I prepared a book two years ago in which the following appeared: First, the name of every student, his address, his degree and his credits for entrance, the number of his seat, names and addresses of his references, the amount of money he has paid, the number of his receipt, the subjects upon which he has been examined, and the credits that he has received on each subject, and such other memoranda as may be necessary. These books aire for one year. By this means I can refer within one minute to any individual student's record and give you anything that you want to know, within less than five minutes, in relation to that man. At the end of each session there is held in each department a written examination. The teacher marks his papers carefully and they are then returned to the office of the secretary who records them in this book which is kept indefinitely. The papers are filed away.

What does the student get? If he has passed his work successfully we give him a certificate stating that he has passed successful examinations in certain branches. This is all printed upon the certificate which bears the seal of the school and the signature of the dean. This is given him to admit him to another school. For the first year we only say that he has passed examinations and is admissible to the Sophomore year. The second year we say he has passed final examinations in the branches named and is admissible to the Junior year. For the Junior year we say he has passed examinations and is admissible to the Senior year. For the Senior year we say he has passed final examinations in all the branches and is eligible to have the degree of M.D. conferred upon him. By means of these tickets the dean of any other school can see just what work the student has done. We do not put the averages on the certificates, but we make it a rule that a student must have passed a certain average before he can be considered as having passed a creditable examination. Furthermore, he must have attended a full course of lectures before he is entitled to credits.

Dr. J. W. Holland, Philadelphia, Pa.:

I want to give my testimony to the value of the card-index system, which Dr. Dodson did not refer to. I was recently called into court as a witness to testify as to the medical education of a man who was supposed to have graduated in medicine from our college about ten years ago, before I was dean. I was told to bring all the books bearing on the case. Although many

changes had occurred during that time, I managed to rummage through our old books and I carried quite a stack of books over for the purpose of reporting on the details of that man's education.

At the present time we are using the card-index system and everything concerning that man would be found on one small card. That card is transferred from one year to another, into a box kept for that purpose, and when the student leaves the college it is put into a general box in which the cards are all alphabetically arranged. His name is only entered once which is an immense saving of labor. On one side of the card is a statement of the credentials on which he was admitted, his age, his race, the year when he expects to graduate. On the other side is kept a record of his work in college and his account books. After he has graduated this card becomes an alumnus card. If he does not graduate it goes into what we call a waste heap, but it is kept just the same. If any question should be raised at any time in regard to any of our students, all we would have to take to court now is this little card. We would look him up just as we would a book in the library, and when the card is found, we have the entire history of that man. The system is easily kept in order, requiring but little labor, and I am sure that it will prevail in our colleges.

Dr. John M. Dodson (in closing), Chicago, Ill.:

This may seem perhaps a small matter and might not interest the gentlemen who have nothing to do with the administrative work of the college, but I am sure that the officer of any institution, who deals with the students, will accord with me in the feeling that the matter is one of great importance. It is sometimes extremely difficult to determine just what credit a student is entitled to. Perhaps, he may have been expelled and he goes to some other school with a plausible story where he may be admitted on the supposition that he is all right. If proper records have been kept, they can be at once referred to, and the second school informed as to the facts in the case.

I would like to emphasize what I believe to be important and what might easily be done; that is, the use of the Association, through its secretary, as a bureau of information in regard to these students. No college, a member of this Association, should admit a student who has been expelled by another college for dishonest practices. I do not know how this could be brought about better than by an information and reference bureau of this sort.

## EDUCATION IN HOSPITAL, AND LABORATORY.<sup>1</sup>

BY H. GIBRON WELLS, M.D., Chicago.

The teaching of pathology appears not very well in line with the discussion this afternoon, especially because pathology lies between the domain of the practical and the purely scientific. Pathology is the connecting link between the various branches of science, pure and simple, and the applied sciences of the last two years. For that reason the teaching in different schools is not in accord in point of time at which it is given. In one school pathology is taught in the third year and at another, in the second year. This gives rise to considerable confusion when students go from one school to another. The reason for this lies in the nature of the subject itself. It is utterly impossible for the student to study pathology to advantage unless he has had a thorough grounding in the elementary work of the first two years. It is absurd for the student to take up pathology, as is done in so many institutions, when he has not finished his course in histology, anatomy, and physiology. Likewise it is impossible for the student to begin the study of medicine or surgery before he has had any work in general pathology.

That is the trouble where pathology is taught in the third year. The student starts out with the study of the infectious fevers and reads the pathology of typhoid fever, pneumonia, etc., when at the same time he is just beginning his work in the pathologic laboratory. For that reason it has always been difficult to teach pathology. Probably the ideal way, one which the present method of continuous courses makes possible, would be to devote half of the first quarter of the third year to nothing but the teaching of pathology. Then a man has had all his preliminary work and no other work will suffer. The elementary pathology has practically all been covered in the first six weeks so that when he comes to the study of medicine he has his grounding in pathology. We have not been able to accomplish that in the institution with which I am connected. The difficulty was very marked when the first two years were moved to the University of Chicago. It became necessary to fix a place where pathology

<sup>1</sup> Read before the Association of American Medical Colleges, St. Paul, June 3, 1907.

should be taught, whether in the first two years, or in the last two years; whether to condense it by giving a course in the last half of the second year, or in the first part of the third year, or even perhaps the fourth year, giving the pathology in conjunction with the practical work. This seemed to be the best solution of the difficulty.

The teaching of pathology itself is particularly favorable from the standpoint of the student, who has spent the most of his time in the pursuit of the elementary studies and is now eager to take up something practical. We are all well aware of the eagerness with which the student goes to the clinics where he can see practical work. When he goes to the pathologic laboratory he is studying something practical; he is, therefore, eager to learn and the teacher has absolutely no trouble in occupying his attention and getting good work out of him.

As far as the preliminary work of the student is concerned, he is now ready to learn what original work is and to understand that text-books do not contain all the work known. The student is too apt to believe that a text-book contains everything. He does not appreciate how much there is outside of that. Therefore, we have endeavored, in teaching pathology, not to confine ourselves to one book, assigning a lesson of a certain number of pages, and then adhering closely to the assigned work. That is not the proper way to teach any subject. Instead of that we endeavor not to recommend a single text-book but all those that are standard works. When we assign a lesson we refer to some book where the subject is well presented. For instance, when we come to the study of thrombosis we refer to Welch and when we come to consider inflammation we refer to Allbutt, thus leading the student to see that there is something outside of the text-book.

The work in the Sophomore year is purely elementary and simply prepares the student for what is to follow. Pathology cannot be taught like some other branches. It is neither an applied science, nor an elementary science. Anatomy and physiology can be taught as pure science, and although there has been some discussion this afternoon, as to making these studies practical sciences, I am of the opinion that they are pure sciences. The first two years can be devoted to the sciences without any



reference whatever to their clinical teaching. In teaching pathology it is, of course, essential that there be laboratory work. That at present consists of laboratory work, limited in most institutions, I am sorry to say, to pathologic histology. There is nothing that is more disagreeable to the pathologist to hear than to have some one use the terms pathologic anatomy and pathology synonymously.

The advances in medicine in the past were along anatomical lines, but to-day they are along physiologic lines. At first organs were organs, and they elaborated certain known secretions. Then these same organs began to be studied as cell composite, to which we are now directing our attention. The future of pathology, and in that the future of medicine, must be along the lines of chemic research. We have a gross pathology and a microscopic pathology and now we must direct our attention to the molecule. The teaching of pathology should not be limited to the anatomical side. I am very glad that such text-books as Stengel's, make a distinct division and in the discussion of every topic refer to pathologic anatomy and pathologic physiology.

Laboratory work in pathology should consist not only of teaching the mere features of pathology, but should also teach the man to observe morbid conditions, just as he has been taught to observe normal conditions in physiology and anatomy. There is only one way in which to teach observation and that is to make him write and see. One essayist to-day has mentioned drawing as an aid in teaching anatomy. This is even more applicable in teaching pathology. Any one who has made a drawing of a specimen will agree with me that he has profited more from that than from simple observation through the microscope. It teaches concentration of thought.

I present to you herewith the books which are used by our students and which will show you how we teach pathology in our college. The advantage of didactic teaching in pathology is very much a matter of personal opinion. I was educated in a school where they teach in the old-fashioned method and where they believe in didactic work. The lectures in pathology can take up the point which the text-book does not contain and dwell on it at some length, considering it in all its phases. You can use stereopticon pictures, which are vastly superior to text-

book illustrations, and thus give the instructor a chance to bring his personal equation into play.

We make our preliminary work optional, but the student must take 240 hours of pathology. We give this option for the purpose of encouraging and stimulating the student to do research work. We assign advanced topics to such students as are inclined to do this work. This will accustom them to looking up medical literature and teach them where things can be found. Some of the best things in medicine can only be found in the literature.

After the Sophomore year the work should consist in taking a case in the clinic or at the bedside, following it through its various clinical features, if it can be done, doing all the bacteriologic work that may be necessary, and, if possible, procuring some of the diseased tissue of which the student will make sections. We allow the students to do such work under the immediate supervision of the heads of the department. We endeavor to have all the men get practical work; therefore, we offer special courses in the study of tumors, and of infectious diseases where the teaching of bacteriology comes in quite naturally.

In the pathologic laboratory we have a splendid opportunity of observing how well a man is able to apply his knowledge,—apply what he has learned in his preliminary work.

With reference to the schools that teach the first two years of medicine only, I am free to say that those are the very best men when it comes to applying their pure scientific knowledge. Pure scientific teaching is the best for the student when it is entirely divorced from practical work.

#### DISCUSSION.

Dr. A. P. Ohlmacher, Galliopolis, O.:

The hour is so late that these important remarks of Dr. Wells cannot be fully discussed. I am sorry also that I am not at present in a position where I can give much thought to the teaching of pathology, but the doctor has touched upon certain matters which I hope I shall have the pleasure of hearing him consider further. One question is in relation to the teaching of bacteriology and pathology. Another is, what technical instruction the student should have when he begins the study of pathology? What line does he consider best adapted as a preparation for laboratory work in pathology? How much bacteriology and how much pathology technique he should have before taking up laboratory work in pathology?

Dr. Wells (closing the discussion):

Unfortunately I have not sufficient time to answer Dr. Ohlmacher's question in regard to the relation between bacteriology and pathology. In some schools they are being taught separately and in others in relation to medicine. I believe all branches that can be should be made pure sciences. Bacteriology is one of them and in that study a man gets the best technical preparation. After he has taken his course in general pathology, and when he comes to working up cases, then he can apply his pathology and bacteriology to practical ends. That, I believe, is the ideal way of teaching bacteriology.

## A SIMPLE METHOD OF TEACHING HISTOLOGY BY MODELS AND OUTLINES.<sup>1</sup>

BY J. S. FOOTE, M.D., Omaha, Neb.

The object of this paper is to simplify the ordinary medical course in histology by the presentation of a system of models and outlines which shall represent some particular type of structure more common to the animal body than any other. Object lessons are of great advantage to first-year students, the greater part of whose knowledge has been acquired by simple observation. The beginner who reads a text-book on this subject nearly always has more or less difficulty in finding, with the microscope, those parts which are described. He sees a picture as a whole and not in detail and is satisfied with the general survey and the act of mounting the specimen. A peculiar adaptation of the sense of vision is necessary in order to see detail structure under a microscope and a sort of nervous impatience develops after the first glance which leads to other specimens in rapid succession. During a quiz the teacher is often conscious that the student's knowledge is derived from the book as a matter of memory rather than from the specimen as a matter of comprehension. In his answer he anxiously endeavors to locate some page and some part of the page of the book and if he succeeds and gives an answer as contained in the text his countenance at once clears up with the evident satisfaction that he is right and it does not seem to occur to him that the specimen before him has much to do with what is actually going on. The result is, he soon forgets what he has learned and the subject of histology has no real place in his general fund of medical knowledge. It is a medical luxury. The relation between it and the practice of medicine is not stated in the book and therefore is not apparent. Some difficulty also arises when the teacher attempts to point out some particular part of the specimen and he never knows really whether or not he has succeeded; pointing out an object under the microscope is very much like pointing out a star in the heavens, and may or may not be successful. A plan of instruction which presents the subject-matter in the form of

<sup>1</sup> Read before the Association of American Medical Colleges, St. Paul, June 3, 1901.

object lessons, whereby the parts concerned may be seen and handled, is desirable. Now the structures of the animal body may be divided for the sake of convenience into simple and compound, the simple structures being the cells and tissues, the compound being the organs. Models of cells of the different tissues may be made, of some suitable material and painted to resemble the double stain. These cells may be put together and tissues made, and likewise tissues may be combined and organs made. In all the compound structures or organs the tube plan predominates. Nearly all the viscera are built on this plan, as, for example, the alimentary canal, respiratory, genital, urinary, secreting, and circulatory systems, so that if the student has the tube idea in his mind, he has something to start with. Having gained a knowledge of the four tissues, he may devote the rest of his time to the arrangement of these tissues in tube form so as to best perform the function of the part under consideration. Although the tube is widely distributed throughout the body, yet in structure it is much the same everywhere; the parts are usually spoken of as coats and it may have one like a blood capillary, two like a small duct, three like the trachea, or four like the alimentary canal; at any rate a one-, two-, three- or four-coated tube will cover most of the groundwork of structure. An outline of the organ considered may be written on the blackboard and then the organ built up by models according to the outline. The first or outside coat in all tubes is essentially the same, that is, a basement membrane or connective tissue; the second is usually muscular and may have one, two, or three layers; the third is the submucous and in most cases is areolar tissue containing blood vessels, nerves, lymphatics (with or without secreting glands); the fourth is the mucous with or without the muscularis mucosæ, and varies according to location. In most all cases the muscle is smooth—exceptions—upper part of respiratory apparatus and esophagus. In most all cases the submucosa does not contain secreting glands,—exceptions—respiratory tubes, esophagus, and duodenum. The mucosa is the part which varies most often and this variation locates the organ. Thus we see that the important viscera are made up of tubes, the three outside coats of which are pretty much the same everywhere; and the inside coat is the characterizing part.

This can be shown by the models, for in building up almost any tube, the mucous coat only has to be changed. The first advantage of the tube models is that each part or coat may be demonstrated separately. Beginning with the outside, we may lay down the first or connective tissue coat, making such remarks concerning its variations as we see fit to make; then the muscular coat giving the varieties and number of layers, and variations in thickness; then the submucous, stating in what tubes secreting glands are found; and, lastly, the mucous, presenting such explanations as the part demands. In this manner a plan is revealed which makes the tube a reasonable structure. It may be built up and taken to pieces many times, or until the student understands it thoroughly. The very process of construction by the addition of one part after another establishes a system of parts which belongs to a united whole. The student may take the models and construct an organ himself, and what he builds he remembers. It is not so much the accuracy of detail shown by the models as the plan of structure.

The detail work is done with the microscope. In many instances when I have asked the structure of an organ, as the duodenum, the student throws together in his reply a mass of tissues without regard to form or arrangement; that is, he would say the duodenum is composed of connective tissue, epithelium, villi, crypts, secreting glands and muscles, showing that he knew really nothing about the organ as an organ, but had a vague idea of a number of things which ought to enter into the composition of almost anything; as long as his memory held out he repeated words which he had seen somewhere and when he came to the end of the words remembered, he came to the end of his structure. A second advantage is that a good deal of ground may be covered in a short time. The entire tube structure of any system may be shown in a few minutes. The alimentary canal may be shown to be a four-coated tube having, in the cardiac stomach three layers of muscle, and in the pyloric a thick circular muscle; in the esophagus, upper part striped voluntary, lower part smooth; having in the esophagus and duodenum secreting glands in the submucous coat; in the ilium, Peyer's patches; in the whole intestine, solitary glands; and having in the mucous membrane, the stratified pavement epithelium of the

esophagus; the compound tubular glands with short necks, long bodies—chief and parietal cells of the cardiac stomach; the compound glands with long necks, short bodies—chief cells of the pyloric stomach; the villi and crypts of the small intestine; the crypts of the large intestine; the lymphoid tissue and incomplete crypts of the appendix—and the whole canal becomes a unit of structure which makes an impression upon the mind which can be recalled without much effort.

A third advantage is that a number of small toy sets of models can be made of cardboard and printed to resemble the large ones, and sold or loaned to students during laboratory hours; with these they can build up the important organs. Having once actually constructed them, they would have a more intelligent idea of a day's work in histology than could be derived from the majority of text-books. It is somewhat remarkable that the majority of text-books do not have plates of complete structures, but only of parts. The mucous membrane is pictured while the remainder of the structure is merely described. The wall of the esophagus is usually pictured entirely.

A fourth advantage is that the models are inexpensive in comparison with projection apparatus. I have used the models in teaching for two or three years, and believe that they have the advantages above spoken of. The plan followed is this:

*First*—Outline of the organ—word picture.

*Second*—Construction of the organ with models—model picture.

*Third*—Study of the section with the microscope—real picture.

ASSOCIATION OF AMERICAN MEDICAL COLLEGES.  
 MINUTES OF THE ELEVENTH ANNUAL MEETING, HELD AT ST.  
 PAUL, JUNE 3, 1901.

AFTERNOON SESSION.

The Association convened in Parlor A, Ryan Hotel, and was called to order at 2 P.M., by the president, Dr. Albert R. Baker, Cleveland.

The following delegates and guests were present :

Bailey, Wm.,	Visitor,	Mem. Kentucky State Board of Health.
Bentley, Edwin,	Delegate,	Med. Dep't, Arkansas Univ.
Bodine, J. M.,	"	Univ. of Louisville, Med. Dep't.
Brown, H. H., Pres.,	"	Illinois Med. Coll.
Bryant, D. C., Dean,	"	Creighton Med. Coll.
Caglieri, Guido E.,	Visitor,	San Francisco.
Carr, W. P.,	"	Columbian Univ. Med. Coll.
Clanahan, H. M. M., Treas.,	Delegate,	Omaha Med. Coll.
Conley, A. T.,	Visitor,	Cannon Falls, Minn.
Cook, Joseph E.,	"	Cleveland, Ohio.
Danielson, Chas.,	"	
Dannaker, C. A.,	Delegate,	Medico-Chirurgical Coll., Kansas City, Mo.
Dodson, John M., Dean,	"	Rush Med. Coll.
Earles, W. H., Dean,	"	Milwaukee Med. Coll.
Egbert, Seneca, Dean,	"	Medico-Chirurgical Coll. of Philadel- phia.
Ellis, W. Bert,	"	Coll. of Med. Univ. of South California.
Eve, Paul F., Dean,	Visitor,	Med. Dep't, Univ. of Tennessee.
Fitzpatrick, T. V., Dean,	Delegate,	Cincinnati Coll. of Med. and Surg.
Frank, Louis,	"	Kentucky Univ., Med. Dep't.
Friedenwald, Harry,	"	Coll. P. and S.
Gelletin, Wm. J., Sec.,	"	Toledo Med. Coll.
Grout, H. H.,	"	Hospital College, Louisville, Ky.
Hall, C. Lester,	Visitor,	Medico-Chirurgical Coll., Kansas City, Mo.
Hall, Winfield S.,	Delegate,	Chicago Med. Coll. (N. W. Univ. Med. School).
Hamann, C. A.,	"	Med. Coll. Western Reserve Univ.
Harlan, Herbert,	"	Woman's Med. Coll. of Baltimore.
Holland, Jas. W., Dean,	"	Jefferson Med. Coll.
Hubbard, G. W., Dean,	"	Meharry Med. Coll. of Walden Univ., Nashville.



Humiston, Wm. H.,	Visitor,	Med. Dep't of Western Reserve Univ.
Ingals, E. Fletcher,	"	Rush. Med. Coll.
James, Sam. C., Dean,	"	Univ. Med. Coll., Kansas City, Mo.
Jenkins, Geo. F., Pres.,	Delegate,	Keokuk Med. Coll. P. and S.
Johnston, Geo. B.,	Visitor,	Med. Coll. of Virginia.
Kober, Geo. M., Dean,	Delegate,	Med. School, Georgetown Univ.
La Force, W. B.,	Visitor,	Keokuk Med. Coll.
Lee, Thomas G.,	"	Univ. of Minnesota.
Lester, Chas. H.,	"	Kansas City Med. Coll.
Levings, A. H., Pres.,	Delegate,	Wisconsin Coll. of P. and S.
Levy, Robert, Sec.,	"	Gross Med. Coll.
Lillie, C. W., Sec.,	"	St. Louis Coll. P. and S.
Logan, Jas. E., Pres.,	"	Univ. Med. Coll., Kansas City, Mo.
Loope, J. S.,	Visitor,	Creighton Med. Coll.
Magee, R. S., Sec.,	Delegate,	Kansas Med. Coll. Topeka.,
McCone, James F.,	"	Univ. of California.
Means, W. J., Registrar,	"	Ohio Med. Univ.
Middleton, Wm. D., Dean,	"	Coll. of Med., Iowa State Univ.
Murphy, Franklin E.,	"	Kansas City Med. Coll.
Priestley, James Taggart,	"	Iowa Coll. P. and S., Med. Dep't, Drake Univ.
Reynolds, Dudley S.,	Visitor,	Chairman Judicial Council. Associate Member.
Ritchie, Parks, Dean,	Delegate,	Univ. of Minnesota.
Roberts, W. O.,	Visitor,	Univ. of Louisville, Ky.
Rodman, Wm. L.,	Delegate,	Woman's Med. Coll. of Penn.
de Schweinitz, E. A., Dean,	"	Columbian Univ. Med. School.
Taylor, P. Richard,	"	Hospital College.
Tiffany, F. B.,	Visitor,	Univ. Med. Coll. of Kansas City, Mo.
Tompkins, Chris., <sup>1</sup> Dean,	"	Med. Coll. of Richmond, Va.
Vaughan, Geo. Tully,	"	Georgetown Univ., Washington, D. C.
Vaughan, Victor C.,	Delegate,	Dep't of Med. and Surg. of the Univ. of Mich.
Vaughan, Mrs. V. C.,	Visitor.	
Walker, H. O.,	Delegate,	Detroit Coll. of Med.
Warren, J. N.,	"	Sioux City Coll. of Med.
Wathen, Wm. H., Dean,	"	Kentucky School of Med.
Wells, H. Gideon,	Visitor,	Rush. Med. Coll.
Wenning, Wm. H.,	Delegate,	Cincinnati Coll. of Med. and Surg.
Whitehead, R. H., Dean,	"	Med. Dep't, Univ. of North Carolina.
Williston, S. W., Dean,	"	Univ. of Kansas, Med. School.
Winslow, Randolph,	"	Univ. of Maryland.
Wyman, H. C.,	"	Mich. Coll. of Med. and Surg.

<sup>1</sup> Secretary of the Association of Southern Medical Colleges.

Dr. Parks H. Ritchie, dean of the Medical Department of the University of Minnesota, was then introduced and, on behalf of the University of the State of Minnesota and the city of St. Paul, bid the Association welcome in a few well-chosen words.

The first vice-president, Dr. Wm. H. Earles, then took the chair, while the president, Dr. Baker, delivered the presidential address.

Dr. Wm. L. Rodman, moved that a committee be appointed to consider the recommendations made by the president in his address and report at the evening session. Carried.

The chair appointed, on this committee, Drs. Wm. L. Rodman, P. Richard Taylor, R. S. Magee, Victor C. Vaughan, and D. C. Bryant. Dr. Rodman declaring his inability to serve, Dr. J. W. Holland was appointed in his stead.

Dr. Victor C. Vaughan, Ann Arbor, Mich., read a paper on "What Preliminary Education Best Fits a Man For the Study of Medicine?" Discussed by Drs. W. S. Hall, Chicago; J. M. Dodson, Chicago; L. J. Nolte, Milwaukee; and in closing by Dr. Vaughan.

Dr. C. A. Hamann, Cleveland, Ohio, read a paper on "Teaching Anatomy in Medical Schools." Discussed by Drs. H. C. Wyman, Detroit; and Wm. L. Rodman, Philadelphia.

Dr. R. H. Whitehead, dean of the University of North Carolina, read the following paper: "The Colleges That Do Not Give Medical Degrees." Discussed by Drs. J. W. Williston, Lawrence, Kansas; Seneca Egbert, Philadelphia; J. E. Logan, Kansas City; J. M. Dodson, Chicago; W. P. Carr, Washington; W. H. Wathen, Louisville; D. C. Bryant, Missouri; J. W. Williston, Lawrence, Kansas; Victor C. Vaughan, Ann Arbor; W. J. Means, Columbus; and in closing by Dr. Whitehead.

"On the Importance and Method of Keeping Accurate Records of Students' Work and Issuing Specific Credits," was the title of a paper read by Dr. John M. Dodson, Chicago.

Dr. Dodson submitted the following resolution:

*Resolved*, That a committee of three be appointed by the chair to consider the matter of students' records and credits, and to report at the next annual meeting. Such committee should: (1) Secure information from the colleges represented in the Association, as to the methods now in use; (2) investigate the methods in vogue in a few of the leading literary colleges and universities; (3) consider the possibility of securing some degree of uniform-

ity among the various medical colleges; and (4) outline a general scheme for students' records and credit slips, which may be utilized by any college, with such modifications as the local conditions of the institution require.

On motion of Dr. W. H. Wathen the resolution was concurred in and the chair appointed, on this committee, Drs. R. H. Whitehead, W. S. Hall, and R. O. Beard with instructions to report at the next annual meeting.

Dr. Dodson's paper was discussed by Drs. Wm. H. Wathen, Louis Frank, J. W. Holland, and in closing by the essayist.

In the absence of Dr. Ludwig Hektoen, a paper on "Education in Hospital and Laboratory" was read by Dr. H. Gideon Wells, Chicago. Discussed by Dr. A. P. Ohlmacher.

Dr. J. S. Foote read a paper on "Simple Methods of Teaching Histology."

Dr. Wathen moved that the chair appoint a committee of three to confer with the southern medical colleges with the view of inducing them to join this Association. Carried.

The chair appointed Drs. J. M. Matthews, Randolph Winslow, and Seneca Egbert.

Pursuant to a motion the chair appointed the Nominating Committee: Drs. Parks H. Ritchie, J. W. Holland, and Wm. H. Wathen.

On motion, the Association adjourned until 8 P.M.

#### EVENING SESSION.

The Association reassembled at 8 P.M., and was called to order by the president. Of the fifty-six colleges entitled to vote, thirty-seven were represented and responded to the roll-call of members.

Dr. Randolph Winslow moved that the visitors from the Southern Medical College Association be given the privilege of the floor. Seconded and carried.

The reading of the minutes of the previous meeting being called for, the secretary offered the minutes as printed in the transactions, a copy of which was sent to every member of the Association.

Dr. J. M. Bodine offered the following correction: On page 242, it reads: "motion amended by Dr. Bodine, etc.," which was not the case. And on page 245, "Dr. Bodine moved that amendment by Dr. Ingals be considered by body as a whole," is incor-

rect. Some one moved to adopt report as a whole, and Dr. Bodine amended that motion by insisting on a roll-call.

Dr. De Schweinitz said that the minutes did not show that the protest made by him was presented before the Association.

On motion, the minutes were adopted as read and amended.

Dr. J. W. Holland, chairman of the Committee on Relations of this Association to the National Confederation of State Examining and Licensing Boards, presented the following report :

“ Your committee, appointed to confer with a similar Committee of the National Confederation of State Examining and Licensing Boards as to the advisability of a minimum standard of requirements acceptable to both bodies, report that a meeting was held this day, at which it seemed the sense of the majority that the two bodies had no common ground for action.”

On motion, the report was accepted and the committee discharged.

Dr. John M. Dodson presented the report of the Committee on Amendments to the Constitution, which, on motion, was read by the secretary as a whole.

Moved by Dr. Winslow that the proposed constitution, as amended, be laid on the table. Seconded and carried. Of the thirty-seven members present, twenty voted for, and thirteen against, the motion, four not voting.

Dr. Wathen, moved that the amendment to Article III, of the constitution, as offered by Dr. Dudley S. Reynolds, Louisville, be offered as an amendment to the constitution at the next annual session. No second.

Dr. R. H. Whitehead withdrew the amendment offered by the Medical Department of the University of North Carolina.

Dr. Winslow reported that the Committee on Relations with Southern Medical College Association had interviewed representatives of this Association present at this meeting and had invited them, as well as all other members of that Association, to unite with this body.

Dr. H. O. Walker moved that the report be accepted and that this Association invite the Southern Colleges to unite with us. Seconded by Dr. Bodine and carried unanimously.

The Judicial Council, through its chairman, Dr. Dudley S. Reynolds, reported as follows :

The Kansas Medical College of Topeka, it may be remembered, was sub-

jected at the last meeting of the Association, to a vote of censure. It comes now, through the officers of its faculty, and announces that it had no graduating class for 1901, and that it is honestly and faithfully endeavoring to observe in the most rigid manner, all the requirements of this Association, wherefore, the Council respectfully suggests that the disability be removed, and that the Kansas Medical College be restored to full membership in good standing.

The University Medical College, of Kansas City, Mo., having been suspended from membership at the last annual meeting of the Association, comes now with an avowal by the officers of its faculty, that it is observing all the rules and requirements, and it is the judgment of the Council that the disability should be removed, and that the said University Medical College of Kansas City, Mo., be restored to full membership in good standing.

On the 28th of March, 1901, the Medical Department of Kentucky University, at Louisville, charged the Hospital College of Medicine, Medical Department of the Central University of Kentucky, with having graduated James Vance, of Kentucky, in June, 1899; Elliott Arewine, of Ohio, in June, 1900; George H. Weber, of Illinois, in June, 1900; Michael Caspar, of Indiana, in June, 1900; E. W. Davidson, of North Carolina, in June, 1900; W. S. Smith, of Kentucky, in June, 1900; Henry B. Tileston, of Kentucky, in June, 1900; and Wm. E. Grant, of Kentucky, in June, 1900, in violation of its own published requirements as set forth on page 18 of its annual announcement for 1900, and page 20 of its annual announcement for 1901, all in violation of the rules and requirements of the Association of American Medical Colleges, of which it is a member.

It is charged that the James Vance, aforesaid, was graduated on three courses only; that the Elliott Arwine had never passed the required preliminary examination, and that he attended the Hospital College of Medicine for three months only, and that he had never passed any intermediate examinations in the schools which he had previously attended, and that said Arewine had been refused admission to the Senior class in Kentucky University. The George H. Weber, of Illinois, aforesaid, matriculated in the Hospital College of Medicine on or about June 25, 1900, and was graduated on June 27th, two days after matriculation. That he never attended any lectures or other exercises in the Hospital College of Medicine, and was not examined for the degree in that institution; and that said Weber was solicited to accept the college diploma by the dean, for which he paid the sum of five dollars (\$5.00) only.

The aforesaid Michael Caspar, of Indiana, matriculated in the Hospital College of Medicine in June, 1900, and graduated from that institution on June 27, 1900, without having attended any of the lectures or other exercises in the Hospital College of Medicine, and that he was required to pass no examination whatever. The aforesaid E. W. Davidson, of North Carolina, attended no lectures or other exercises in the Hospital College of Medicine, was not examined, and had not attended but three courses of instruction.

The W. S. Smith, of Kentucky, the H. B. Tileston, of Kentucky, and the W. E. Grant, of Kentucky, herebefore mentioned, matriculated in the Hos-

pital College of Medicine on June 22, 1900, and graduated on June 27, 1900, the three last named being dentists and therefore entitled to but one year of advanced standing, according to the requirements of the College Association.

After due investigation of the evidence submitted in support of the charges and of the answer of the defendant in each case, the chairman of the Council taking no part, expressing no opinion, and casting no vote, the other members of the Council unanimously sustain the charges.

(Signed)

PARKS RITCHIE,  
JOHN M. DODSON,  
RANDOLPH WINSLOW,  
VICTOR C. VAUGHAN,  
WM. W. KEEN.

A great variety of other matters which have been adjudicated during the year in accordance with previous decisions of the Council, all of which having been heretofore approved by unanimous vote of the Association, the Council now submits without reading.

The recommendation regarding the Kansas Medical College was adopted upon motion of Dr. H. O. Walker.

The ruling on the University Medical College of Kansas City was accepted.

In the matter of the Medical Department of the Kentucky University at Louisville, Dr. Reynolds stated that he had refrained from voting on the matter, as the college was situated in his own city.

Dr. P. Richard Taylor, dean of the Hospital College of Medicine, explained the case to the Association, refuting the charges made by the University Medical College of Louisville, whereupon Dr. Wathen moved that "while we recognize the correctness of the Judicial Council's report, we exonerate the Hospital College of Medicine with the assurance on their part that they will not repeat the offenses with which they have been charged." The motion was seconded by Dr. Louis Frank and unanimously carried.

Dr. Taylor expressed his thanks on behalf of the Hospital College of Medicine, for the leniency of the Association.

The report of the secretary was presented by Dr. Holmes, and was adopted on motion of Dr. H. H. Brown.

Dr. Seneca Egbert moved "that the Secretary have printed the Constitution and By-Laws as they stand at the present time and send a copy to each member of the Association." Seconded and lost.

Dr. J. M. Bodine offered the following resolution :

*Resolved*, That no college, a member of this Association, shall be permitted to accord to any one any beneficiary scholarship, except as provided for in the endowment funds of said college. The facts in regard to such a scholarship shall be fully set forth in the annual announcement of the college offering it.

Carried unanimously.

Dr. W. J. Means offered the following :

*Resolved*, That students carrying a condition or conditions, cannot enter another college, a member of the Association, until said condition or conditions are removed by the college giving them, or unless said college gives her consent for another college to do so.

x Lost.

The Committee on President's Address reported as follows :

" Your Committee reports in favor of the hearty approval by this body of the general spirit of the paper and recommends that it be published in the BULLETIN OF THE AMERICAN ACADEMY OF MEDICINE. The Committee further recommends that the various suggestions made in it be favorably dealt with at the proper time." (Signed)

J. W. HOLLAND,  
D. C. BRYANT,  
R. S. MAGEE,  
P. RICHARD TAYLOR,  
V. C. VAUGHAN.

Dr. Jenkins moved that the Judicial Council be empowered to act on the applications of those colleges who have applied for membership and filed credentials. Amended by Dr. Frank that the Judicial Council report to the secretary before the publication of the transactions.

The amendment and the motion as amended were unanimously carried.

The report of the Nominating Committee was then read, as follows :

*President*—Victor C. Vaughan, Ann Arbor, Mich.

*First Vice-president*—Wm. L. Rodman, Philadelphia, Pa.

*Second Vice-president*—H. Burt Ellis, Los Angeles, Cal.

*Secretary*—W. S. Hall, Chicago, Ill.

*Judicial Council*—Thos. Hawkins, Denver, Colo., term expires 1903 ; E. C. Dudley, Chicago, Ill., term expires 1904 ; W. J. Means, Columbus, Ohio, term expires 1904.

On motion of Dr. W. A. Evans, the name of Dr. Bayard

Holmes was substituted as secretary. Carried unanimously. On motion, the report was adopted as amended, and the secretary instructed to cast the ballot, which he did.

There being no further business to come before the meeting, the Association, on motion, adjourned.

ALBERT R. BAKER,

*President.*

BAYARD HOLMES,

*Secretary.*

The following members have paid their dues for the present year :

Arkansas Industrial University, Med. Dep't,	Little Rock, Ark.
University of California, Med. Dep't,	San Francisco, Cal.
Gross Med. Coll.,	Denver, Colo.
University of Colorado, Med. School,	Boulder, Colo.
University of Denver, Med. Dep't,	Denver, Colo.
Yale University,	New Haven, Conn.
Columbian Univ., Med. Dep't,	Washington, D. C.
Georgetown Univ., Med. Dep't,	Washington, D. C.
Howard Univ., Med. Dep't,	Washington, D. C.
National Univ., Med. Dep't,	Washington, D. C.
College of P. and S.,	Chicago, Ill.
Illinois Med. Coll.,	Chicago, Ill.
Northwestern Univ. Med. School,	Chicago, Ill.
Northwestern Univ. Woman's Med. Coll.,	Chicago, Ill.
Rush Med. Coll.,	Chicago, Ill.
Fort Wayne Coll. of Med., Taylor Univ.,	Fort Wayne, Ind.
Med. Coll. of Indiana,	Indianapolis, Ind.
State Univ. of Iowa, Med. Dep't,	Iowa City, Iowa.
Keokuk Med. Coll.,	Keokuk, Iowa.
Sioux City Coll. of Med.,	Sioux City, Iowa.
Kansas Med. Coll.,	Topeka, Kans.
Hospital Coll. of Med.,	Louisville, Ky.
Kentucky School of Med.,	Louisville, Ky.
Univ. of Louisville, Med. Dep't,	Louisville, Ky.
New Orleans Univ. Med. School,	New Orleans, La.
Baltimore Med. Coll.,	Baltimore, Md.
Baltimore Univ. School of Med.,	Baltimore, Md.
Coll. of P. and S.,	Baltimore, Md.
Johns Hopkins Med. School,	Baltimore, Md.
Kentucky Univ., Med. Dep't,	Louisville, Ky.
Univ. of Kansas,	Lawrence, Kansas.
Univ. of Maryland, School of Med.,	Baltimore, Md.
Woman's Med. Coll. of Baltimore,	Baltimore, Md.
Coll. of P. and S.,	Boston, Mass.
Univ. of Mich., Dep't of Med. and Surg.,	Ann Arbor, Mich.
Detroit Coll. of Med.,	Detroit, Mich.



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| Mich. Coll. of Med. and Surg.,                 | Detroit, Mich.     |
| Minneapolis Coll. of P. and S., Hamline Univ., | Minneapolis, Minn. |
| Univ. of Minn., Coll. of Med. and Surg.,       | Minneapolis, Minn. |
| ' Kansas City Med. Coll.,                      | Kansas City, Mo.   |
| Univ. Med. Coll. of Kansas City,               | Kansas City, Mo.   |
| ' Barnes' Med. Coll.,                          | St. Louis, Mo.     |
| St. Louis Coll. of P. and S.,                  | St. Louis, Mo.     |
| - John A. Creighton Med. Coll.,                | Omaha, Neb. .      |
| Omaha Med. Coll.,                              | Omaha, Neb.        |
| - Univ. of Buffalo, Med. Dep't,                | Buffalo, N. Y.     |
| Syracuse Univ., Coll. of Med.,                 | Syracuse, N. Y.    |
| ' Univ. of North Carolina, Med. Dep't,         | Chapel Hill, N.C.  |
| Cincinnati Coll. of Med. and Surg.,            | Cincinnati, Ohio.  |
| - Medical College of Ohio,                     | Cincinnati, Ohio.  |
| Miami Med. Coll. of Cincinnati,                | Cincinnati, Ohio.  |
| - Western Reserve Univ., Med. Dep't,           | Cleveland, Ohio.   |
| Cleveland Coll. of P. and S.,                  | Cleveland, Ohio.   |
| Ohio Med. Univ.,                               | Columbus, Ohio.    |
| Starling Med. Coll.,                           | Columbus, Ohio.    |
| ' Toledo Med. Coll.,                           | Toledo, Ohio.      |
| Willamette Univ., Med. Dep't,                  | Salem, Oregon.     |
| - Jefferson Med. Coll. of Philadelphia,        | Philadelphia, Pa.  |
| Medico-Chirurgical Coll. of Philadelphia,      | Philadelphia, Pa.  |
| - Woman's Med. Coll. of Pennsylvania,          | Philadelphia, Pa.  |
| Western Pennsylvania Med. Coll.,               | Pittsburg, Pa.     |
| - Meharry Med. Coll., Walden Univ.,            | Nashville, Tenn.   |
| Milwaukee Med. Coll.,                          | Milwaukee, Wis.    |
| - Wisconsin Coll. of P. and S.,                | Milwaukee, Wis.    |

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# CONSTITUTION OF THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES.

## ARTICLE I.

This organization shall be known as the Association of American Medical Colleges.

## ARTICLE II.

SECTION 1.—Any medical college conforming to the requirements of the Association, as expressed in this constitution and in the by-laws of the Association, is eligible to *membership*.

SEC. 2.—Any medical college desiring membership in this Association shall make *application* to the secretary and pay the annual dues of five dollars. This application shall be accompanied by evidence that the college applying is conforming to the requirements of this Association. The application and all evidence and information in relation to the college applying shall then be put into the hands of the Judicial Council, to be reported to the Association favorably or unfavorably, at the annual meeting, at which time the college shall be elected to membership if it receives the favorable recommendation of the Judicial Council and the favorable ballot of a majority of the colleges represented in the meeting. The neglect of the Judicial Council to report on the application of a college shall not be a bar to election.

SEC. 3.—Each college is entitled to one *representative* at all meetings of the Association, and to one vote on all questions. The dean of the college will be its accredited representative in the absence of any other delegate.

SEC. 4.—The dues are five dollars a year, payable in advance.

## ARTICLE III.

SEC. 1.—Each college holding membership in this Association shall require of each student, *before admission* to its course of study, an examination, the minimum of which shall be as follows :

1.—In *English*, a composition on some subject of general interest. This composition must be written by the student at the time of the examination, and should contain at least 200 words. It should be criticized in relation to thought, construction, punctuation, spelling, and handwriting.

2.—In *Arithmetic*, such questions as will show a thorough knowledge of common and decimal fractions, compound numbers, and ratio and proportion.

3.—In *Algebra*, such questions as will bring out the student's knowledge of the fundamental operations, factoring, and simple quadratic equations.

4.—In *Physics*, such questions as will discover the student's understanding of the elements of mechanics, hydrostatics, hydraulics, optics, and acoustics.

5.—In *Latin*, an examination upon such elementary work as the student may offer, showing a familiarity usually attained by one year of study ; for example, the reading of the first 15 chapters of Cæsar's Commentaries,

and the translation into Latin of easy English sentences involving the same vocabulary.

SEC. 2.—In place of this examination, or any part of it, colleges, members of this Association, are at liberty to recognize the official *certificates of reputable* literary and scientific colleges, academies, high schools, and normal schools, and also the medical student's certificate issued by any state examining board covering the work of the foregoing entrance examination.

SEC. 3.—Colleges, members of this Association, may allow students *who fail in one or more branches* in this entrance examination the privilege of entering the first-year course, but such students shall not be allowed to begin the second course until the entrance requirements are satisfied.

SEC. 4.—Colleges, members of this Association, are free to honor official *credentials issued by medical colleges of equal requirements*, except in the branches of study embraced in the last year of their own curriculum.

SEC. 5.—Candidates for the degree of Doctor of Medicine in the year 1899 and thereafter shall have attended at least *four courses* of medical instruction, each course of at least six months' duration, no two courses of which shall have been in the same calendar year.

SEC. 6.—Colleges, members of this Association, are free to give to students who have met the entrance requirements of the Association additional *credit for time* on the four years' course as follows: (a) To students having the A.B., B.S., or equivalent *degree* from reputable literary colleges, one year of time; (b) To graduates and students of colleges, of *homeopathic or eclectic* medicine, as many years as they attended those colleges, provided they have met the previous requirements of the Association and that they pass an examination in *materia medica* and therapeutics; (c) To graduates of reputable colleges of *dentistry, pharmacy, and veterinary* medicine, one year of time.

SEC. 7.—A college not giving the whole four courses of the medical curriculum, and not graduating students, but otherwise eligible, may be admitted to membership.

#### ARTICLE IV.

SEC. 1.—In addition to the representatives of colleges in attendance at regular meetings, who are termed *active members*, there shall also be associate members and honorary members. *Associate members* shall consist of former representatives and representatives of post-graduate medical schools and members of state boards of medical examiners. Distinguished teachers in medicine and surgery may be elected to *honorary membership*.

SEC. 2.—Only duly delegated and accredited active members in actual attendance whose annual dues are paid shall have *voting power*, but associate and honorary members may participate in all other proceedings and duties and may be elected to any office.

#### ARTICLE V.

SEC. 1.—The *officers* of this Association shall be a President, Senior and

Junior Vice-presidents, Secretary and Treasurer, and a Judicial Council of seven members, all of whom shall be elected annually by ballot and serve until the election of their successor.

SEC. 2.—The *President*, or one of the vice-presidents in the absence of the president, shall preside at all the meetings, and perform such duties as parliamentary usage in deliberative assemblies and the by-laws of this association may require. The seven members constituting the *Judicial Council* shall serve three years each. Vacancies by expiration of term shall be filled at the annual election of officers. Vacancies by death or resignation shall be temporarily filled by the surviving members of the Judicial Council.

SEC. 3.—The *Secretary* and *Treasurer* shall record the proceedings of the meetings, conduct the correspondence, receive dues and assessments from members, disburse the funds of the Association as provided by resolution, issue certificates of membership, and perform such other duties as the by-laws may require.

SEC. 4.—The *Judicial Council* shall investigate and determine all questions of violation of the rules and regulations of this Association, and all matters of dispute between the members of this Association. All charges or complaints shall be preferred formally in writing, and referred to the council. The council shall make written report at the next ensuing session of the Association upon all matters received for adjudication.

#### ARTICLE VI.

SEC. 1.—The stated *meetings* of this Association shall occur annually on the Monday preceding the Tuesday on which the American Medical Association convenes.

SEC. 2.—A majority of the active members whose dues are paid shall constitute a quorum.

#### ARTICLE VII.

This constitution shall not be altered or amended, except by written notice to all members at least 30 days previous to a stated meeting, and by a vote of two-thirds of all the active members present at such meeting.

#### BY-LAWS.

SECTION 1.—The presiding officer shall, on calling meetings to order, call for the reading of the minutes of the previous session, which, when approved, shall be recorded in a book kept for that purpose, signed officially by the secretary and approved by the president.

SEC. 2.—After approval of the minutes, the secretary shall announce the colleges represented at the meeting, and an adjournment of ten minutes shall then follow to allow other representatives present to register and pay their dues.

SEC. 3.—Order of business :

1. The reading of the minutes of the previous meeting.
2. Roll-call of membership.
3. Reports of committees.

4. Secretary and treasurer's report.
5. Report of Judicial Council.
6. Papers and essays.
7. New business.
8. Adjournment.

SEC. 4.—These by-laws may be altered or amended at any time by unanimous consent of the members present, or by written proposition, to so alter or amend, being read in open session and receiving the approval of a three-fourths vote of all the members present at an adjourned session of any stated meeting; provided, however, not more than twenty-four hours shall have elapsed between the time of the proposition to amend and the final vote thereon.

SEC. 5.—That no college, a member of this Association, shall be permitted to accord to any one any beneficiary scholarship, except as provided for in the endowment funds of said college. The facts in regard to such a scholarship shall be fully set forth in the annual announcement of the college offering it.—(Adopted June 3, 1901.)

## RULES OF THE JUDICIAL COUNCIL.

I. All complaints charges, and other questions must be submitted in writing, through the secretary of the Association, or directly through the chairman of the council.

II. All complaints of violations of rules and regulations must be in the form of written charges and specifications, signed by the complainant.

III. All charges and specifications must be presented to the accused for answer. In all cases the written answer must be filed with the chairman of the council within 10 days from the receipt of the copy of charges by the accused.

IV. All counter charges must be submitted to the accused for answer, and pleadings in the same manner as the original charges, and the council will take no notice of any evidence not submitted through its chairman in regular form and order.

V. As the strictest formality is necessary to insure justice equally, all decisions of the council must be rendered in writing, signed by each member taking part in the determination of any question.

VI. In the intervals between the annual meetings, the council may act upon all matters submitted in due form by its chairman, each member communicating his decision to the chairman who shall immediately, or within 10 days from the date of any decision, file a certified copy with the secretary, and notify all the parties interested.

VII. It will be the duty of the chairman of the council to file and preserve all original complaints, charges, and other matter referred to the council, and to deliver them to the secretary on the first day of each annual meeting next ensuing the date of final decision.



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