ASSOCIATION OF AMERICAN MEDICAL COLLEGES

PROCEEDINGS OF THE TWENTIETH ANNUAL MEETING HELD AT BALTIMORE, MD., MARCH 21ST AND 22ND, 1910

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PRESIDENT'S ADDRESS.

PRINCIPLES OF MEDICAL EDUCATION.

By GEORGE HOWARD HOXIE, A.M., M.D., Kansas City, Mo., Professor of Internal Medicine and Dean of the Clinical Department, University of Kansas.

Because of its effect on our membership and on the standard of medical education in many of our states, our action on the report of the curriculum committee will be the most important event of this meeting. As you all know, the membership of our Association is determined by a curriculum standard; and if we raise that standard beyond the reach of any schools now in our membership, we should of course lose them from our list. And, on the other hand, the legislatures of several states have seen fit to adopt our standard as that by which they judge the claims of the various medical schools. You will pardon me then if for this reason I spend some time in a discusssion of the principles upon which we should act in this matter.

In the first place, I believe that we should start from the premise that our schools of medicine are designed primarily for the education of practitioners of medicine. This means that the investigation of new laws, new facts, and in general the so-called research work must take a subordinate place in the average medical school. It is necessary for us then to consider the law of supply and demand with regard to medical practitioners in the United States; and in considering this subject, we cannot do better than to take the statistics collected by the Carnegie Foundation for the Advancement of Teaching who have shown us that there is one physician on an average of 568 people in the United States. If now, we accept the view of the Carnegie Foundation that one practitioner of medicine should be able to care for 1,000 people, then we must admit that there is no great demand for an increase in the number of practitioners and in fact that the average quality of the profession would be raised if we were to decrease the number of practitioners. Considering again the ratio of increase, we find from these same statistics that our

a fully adequate training in medicine was evidenced in those graduates whose preliminary education was not more than that obtained from a high school course. Further, on observing successful candidates after their entrance to the medical corps of the army—an observation which was quite extended, as I was for seven years Professor of Military Surgery in the Army Medical School and for ten years commandant of army general hospitals, I fully confirmed the opinion formed upon examining these men—*viz.*, that the men who had high school training only did fully as good work and showed themselves as capable as did those men who had had college education. In fact, I came to the conclusion that where the question of preliminary education was taken into consideration no conclusion could be reached from the fact of preliminary education as to the capability or efficiency of graduates in medicine." Another dean gives this practical view: "It has been my experience that the best students and those who made the best doctors did not come to us directly from secondary schools or colleges, but were men of good education who had engaged in some other work since leaving school and had become settled and matured and knew why they were studying medicine. These men were usually equipped with high school or normal school training. One or two years of college work at their time of life would in my opinion bar them from our profession; because law and engineering are certainly equally attractive; and the requirements would not be prohibitive."

On the matter of the length of the course in the medical school proper, the answers to my circular were somewhat ambiguous, but I believe I am justified in presenting the following summary: Nine would like to see a four years' course plus a year of hospital work required. Eight others would require a five year's course in a medical school proper, based on a high school graduation as a standard of entrance. Four others favor a five years' course without any qualification. Finally, eleven of the thirty-two are decidedly opposed to the five-year proposition in any form.

In this connection it has been suggested that one way out of the difficulty would be to have two degrees in medicine as they do in engineering; and grant those students who have only a high

school course and four years of medical school work, the degree of Bachelor of Medicine; and reserve the Doctor of Medicine for those who have the two years in college; the four years in a medical school, the one year in a well-regulated hospital; and have presented a thesis. One of our schools suggests that to this latter group of men there should be granted federal licensure which would enable them to practise in any part of the United States. With this proposition for the double degree, I am heartily in sympathy and would suggest that this Association consider seriously its feasibility; for I believe that it would solve many of the problems now confronting our system of medical education. An argument in favor of its feasibility would be the experience of the engineers; and perhaps more to the point, the experience of Great Britain.

When now, we look at this question of standards as a whole we can easily see that for this Association to adopt at this time the international requirement would be to disrupt our organization into two parts. In the one group we should have the University medical schools and the few endowed private medical schools; and in the other, we should have the great number of the long-established private medical schools. In view of this fact, we must ask ourselves the question whether the best interests of medical education in the United States would be furthered by such a disruption of this Association, whether the evolution of the standard American medical school would be advanced more by an association of the university medical colleges or by the continuance of this larger Association in which would be gathered practically all the reputable medical schools of the United States.

As President Ward has pointed out two years ago, medical education as well as general education is in a chaotic state in America. We are in a transition period when the forms and methods of our work are being differentiated and crystallized. Not only do we have to reckon with different conditions of industrial and economic life, but also with communities of different stages of advancement, and therefore of different intellectual and social ideals. Therefore when we plan to make our Association national in scope, we must not limit our membership

by setting up standards that cannot be reached by some sections of our country. In other words, we must use a minimum rather than an ideal standard. In fact, I believe that it would be wiser to base our standards of membership on the quality of the work done in the schools and the character of the men who dictate the policy of the schools, rather than on quantitative standards as at present. For, the question is not how many hours of study have the students had before entrance to the school, but rather, Does the school demand as high standards as its environment will permit? and secondly, Does it make the most out of the material given it?

Another aspect of the question should not be forgotten in this discussion; and that is, that in spite of the opinion expressed by some of our university medical schools, there is a decided danger that the public may not follow the medical profession in further advance at this time. In answer to my letter of inquiry on this subject, eighteen of the thirty-two deans expressed themselves as fearing such a revulsion of public opinion either now or in the immediate future. This is, we must realize that we cannot go forward more rapidly than the people and the state governments are ready to support us.

The last century has been notable for its advance in technical details, with the result that it has been a century of specialization. Hence, the lay mind has come to consider medicine as a technical calling rather than as a profession. Even our university colleagues who teach the natural sciences seem to believe that a knowledge of sciences is all that is needed to make a good physician. We physicians know better. We know that the *savoir-faire* is more important to our success than a knowledge of technical details; that we must know human nature as well as the technique of the laboratory; that we must have a broad view of our work; that we must see it in perspective; with the proper fore-shortening if we are to be successful as practitioners or as sanitarians. Therefore, the student who has had the broad training that includes the humanities as well as the sciences may lack some of the knowledge of the details of technique possessed by those who study only the sciences, but will have the freshness

and eagerness for work and a perspective that will more than compensate, even while in the medical school, for their lack. You know that Liebig preferred for his students those who had had no chemistry; because they had a zeal and energy beyond their competitors; and besides, had not been spoiled by poor teachers of bad methods. Other great masters have been willing to work with men with good minds and general training. In fact they even preferred them to those who had been serving an apprenticeship under other masters. I would urge therefore that when we have the opportunity to advise prospective medical students as to their preliminary studies, we advise them to secure a good, broad foundation of general culture rather than a narrow and technical scientific training. I would urge that the preliminary college years now being added to our courses be directed toward making men rather than artisans—that the languages, philosophy and the arts be given a proportionate place in their curriculum.

Summing up the whole matter, of medical standards then, it seems wiser to me for us not to take radical action at this time, but to continue our own present standards. I am the more willing to take this position because I believe that the work of this Association is not concerned so much to-day with the legal and economic aspects of medical education, as with its pedagogics. There is needed a great deal of investigation and discussion leading to the establishment of pedagogic principles; and in such investigation and discussion, the advice, and cooperation of teachers of medicine who have been active for so many years, even though laboring without salary and under great difficulties, will be of immense value.

And again, in this matter of establishing a standard American medical college, we must remember that we cannot reach our goal in a moment; that we must content ourselves with working toward an end, or as Goethe says: "Die Welt soll nicht so rasch zum Ziele, als wir denken und wünschen. Immer sind die retardierenden Dämonen da, die überall dazwischen—und überall entgegentreten, so dass es zwar im ganzen vorwärts geth, aber sehr langsam."

But this very slowness of growth and development makes all the more necessary our defining clearly our goal and purpose.

Another matter pertaining to the adoption of a new curriculum is that referring to the number of hours that may be required of medical students. I take it for granted that you will all agree that we should not give so many hours of study that the students will be physically exhausted; nor, on the other hand, should we give so much mental labor that the students become stale. And yet, I find a great discrepancy between the number of hours laid down in general higher education and the number that is given for us in our present curriculum. For, in the better universities, no student may take more than four hours a day, that is, eighteen to twenty hours a week; but in our schools we demand that the students shall have at least thirty hours a week. Is this discrepancy due to our belief that medical students can do so much more work than general students? or, is it due to a difference in standards, or terms? My own idea is that it is due to a neglect to investigate the amount of work that medical students can do with the best results; and also to the fact that an hour in the medical school does not mean as much as an hour in the unive sity. For instance, in the University of Kansas every recitation presupposes two hours of preparation; and every laboratory period of two hours presupposes one hour of preparation. In other words, each didactic exercise is equivalent to three hours of work. Now, I believe that many medical schools do not require any preparation for their class exercises; and therefore count the scheduled hours as the total work done by the students. As we shall see later, I believe this to be wrong; and that it would be far wiser for us to define our standards more carefully; and wherever the recitation method is employed, or wherever preparation for lectures is required, this extra work should be reckoned into the total of 1,000 hours per annum. Thus, a student who does recitation work to the third part of his course should not be required to have more than 700 hours of class exercises in a year, instead of 1,000.

I believe that two bad results have come from our lack of attention to this detail. In the first place, those schools which

have not required any preparation for their class exercises and have given the student all his work in the class-room have turned out as a general thing students incapable of active, aggressive, individual nvestigation—men who were unable to think deeply by themselves on original or new lines. They are men who have learned to do things by rote, to follow the rules that their teachers laid down.

On the other hand, those schools which have interpreted the 1,000 hours to mean 1,000 hours of class exercises and have required their students to prepare for these exercises by outside work, have turned out men who are mentally stale. They have been so crammed with work, so fatigued with study, that they are tired at the thought of anything medical; and it akes such men two or three years to re-establish their appetite for new thought and effort.

I recommend therefore that in stating our curriculm this year, we carefully investigate this point and make clear in our statement whether the hours enumerated are total hours of study or simply hours of class-room exercise.

I believe that our curriculum can be improved in still another way; and that is, by giving att ntion to the law of variety and monotony. I would state the principle somewhat as follows: In each day the student should have exercises of sufficient variety to excite his attention, but not so many as to dull his interest. The tendency of the present time, following the suggest ons and recommendations of the various bodies now interested in medical education, is to inject into our curriculum many coördinate subjects—subjects which are but special details and which from the pedagogic standpoint should be subordinate to the major branches of which they are but a part. The effect of this injection of isolated units has been to have six to eight different periods a day of unrelated and uncoördinated study. In other words, it has given the student a jumble of all sorts of material—a smattering of knowledge with a mastery of no one branch. The revolt from this extreme diffuseness has been the so-called condensation method where the student devotes his whole time for a given period to one subject. This, however, seems to me to

violate the principle as much as does the other extreme. I am inclined to believe that we should follow the methods used in the literary and scientific departments of the better universities and give our students only two to four different subjects each day. If we take the former standard, each half-day would be devoted to one branch. If we take the latter, we may give a greater variety by using one-hour periods, instead of two- or three-hour-laboratory or clinical periods.

In the pre-clinic subjects, this principle has been more generally observed than in the clinical, for the employment of salaried instructors in anatomy, physiology, pharmacology, etc., has caused the curriculum o be divided into the everal great subjects and has done away with the employment of many coördinate teachers, each giving one hour a week. We are ready now to put the method in force in the clinical school; and I would suggest that we try to arrange our curriculum along the line of the three great branches of practice, *viz.*, medicine, surgery, and obstetrics and gynecology. For, pediatrics is but a branch of internal medicine; orthopedic surgery is but a detail in general surgery; neurology is but a part of internal medicine, and these subjects may fall into their correct relation only when they are taught as parts of the greater subject and under the direction of the one head of the major department. The clinical laboratory should be but a phase of the work in medical, surgical and gynecologic diagnosis. It should not be a separate department, but a place where these various teachers carry out part of their work.

Of course this reform cannot be carried out completely or thoroughly until we all realize that the curriculum of the clinical department must center about the hospital. No school of medicine is adequate for present-day needs unless it is possessed of a hospital of its own. To have simply a temporary control of one or two staff positions in some hospital is not sufficient for an adequate teaching of medicine; and I believe that the Carnegie Foundation is right in stating that a hospital of 150 to 200 beds is essential for every complete school of medicine.

One more point in the arrangement of a curriculum should be

considered; and that is that effort on the part of the student is necessary for the acquisition of real knowledge. The conception of the medical student as an open vessel into which the instructor pours knowledge more or less flavored and diluted according to his own taste, is becoming rapidly obsolete. Its bad effects have been shown in those schools where complete systems of private quiz work have grown up in order to give the students this essential teaching work. In those schools the actual control of the education of the students has fallen into the hands of these private quiz masters, instead of remaining where here it should be in the hands of experienced and far-sighted professors. It is so much easier to demonstrate a patient than it is to guide a student in his long and tedious efforts to arrive at a diagnosis. It is so much easier to give a lecture than it is to conduct a recitation that most of our medical teachers have fallen into this habit. Theoretically, most of us agree that we should conduct recitations, that we should use the Socratic method in giving our clinics, but the most of us are so oppressed in the struggle for existence, so hounded by the necessity to earn our living in private practice, that we have not the time nor strength to prepare ourselves adequately for this work. Hence, a reform in this matter and the following out of this principle will demand the subsidizing of some at least of our clinical professors.

In this connection I would call your attention to Dean Christian's suggestions made in his Leland-Stanford speech last year; *viz.*, that we employ in our clinical department two types of instructors. The men of the one type should give the greater part of their time to the school work and receive therefor compensation sufficient to enable them to live. The men of the other type would give only a small part of their time to instruction and would receive no compensation. This suggestion seems to me a practical one—one that might be carried out in nearly every school of medicine. Such an arrangement would prevent our schools from being manned by mere theorists; and would, on the other hand, secure sufficient time from the instructors on whom the drilling and training of the students must fall. It would put

the burden of teaching on paid men who could afford to give it the requisite time and attention; and finally, it would give a unity and homogeneity to the work of the institution, because it would enable the administration to direct the work of the instructors even in details.

To illustrate the effect of putting into force this principle of teaching—a principle which, by the way, would make of every student an investigator—permit me to outline a general course in internal medicine. First, would come the teaching by text-book and recitation of the vocabulary and principles of medicine. This done, the class would be divided into small groups and taught to examine patients, to take case histories, and draw conclusions. The students, still in those small sections, would then be assigned individual cases and be required to write up the entire case history and the argument for the diagnosis. This written work is of great importance, because it clinches the teaching and tends to insure accuracy and logical reasoning in the student's work. The work from beginning to end should be under the general supervision of the one master in order to secure proper gradation and consistency. Finally, the students should be assigned cases by themselves in the wards of the hospital for which they must make all the customary examinations and use the therapeutic measures.

In other words, we give preliminary didactic courses covering

(*a*) Technique and terms of diagnosis.
(*b*) Names and character of therapeutic agents.
(*c*) Names and character of disease forms.

Then, in sectional clinics we teach the individual students

1. To make physical examinations.
2. To take the history.
3. To make the laboratory examination.
4. To compare present findings with text-book descriptions.
5. To present the facts and his deductions accurately and logically.

Finally, the student must be put in actual charge of patients in the wards in order to acquire skill in the exercise of his technique and also in the art of handling patients.

I of course understand that this method would prohibit our herding students in great droves through our medical schools,

but, it would be of decided advantage in the fact that the instruction would become individual and the students would be taught to work independently and to look upon each new case that he meets as a research problem. The method is logical because the number of unknown factors has been gradually increased from the beginning, so that at the conclusion of the course the student is able to confront a case with equanimity, even though the number of unknown factors be distressingly large.

Finally, if courses arranged on this principle were adopted, the Confederation of Licensing Boards could no longer say that practical examinations could not be adopted in America, because the type of clinical teaching is not practical enough.

In conclusion, permit me to make one recommendation; and that is, that we work in the closest harmony with the other organizations now interested in medical education: but that we represent in the discussions with these organizations, medical pedagogics; that we take their suggestions and recommendations and examine them in the light of our own experience and in the light of pedagogics. If then, they prove worthy of acceptance, that we adopt them and put them into practice. And, as the first practical step in this direction, I recommend that we hold our next meeting on the same week as the Conference on Medical Education of the Council on Medical Education of the American Medical Association, and in the same city. I believe that the Council, being less bound by constitutional provisions than we, will be glad to arrange with us for it. This will attest our sympathy with their work and also enable our members to be present and hear the discussions in both meetings.

THE ADVANCEMENT OF MEDICAL EDUCATION.

By G. Milton Linthicum, A.B., A.M., M.D., President Medical and Chirurgical Faculty of Maryland. Professor Physiology and Rectal Surgery, Baltimore Medical College.

In the name of the Medical and Chirurgical Faculty of the State of Maryland, I bid you welcome to our city and home. The entire profession of medicine extends to you the glad hand of fellowship, and thanks you for thus honoring Baltimore and Maryland by its selection as the meeting place of your association.

We feel it truly fitting that you, who represent the very best in medical education, shall be welcomed at this time in our new Medical Library. From yon wall gazes down upon you the face of one who has been a most potent influence in the uplift of the profession, and we are justly proud that this Faculty and fraternity has given Osler to the highest medical honor in our mother country. Then, too, we have as a member of this historical organization, Dr. Wm. H. Welch, who to-day stands preeminent as a teacher and investigator, and who doubtless yields a greater influence in the medical profession than any other living authority in America. His supreme merit, both as a scientist and as a man, has been recognized by the entire national profession, in his selection as the President of the American Medical Association, the highest honor in the gift of our profession.

This ancient, historic and honorable Faculty in whose name we now greet you passed its one hundred and eleventh anniversary on the twentieth day of January. The principles of its charter indicated the dual purpose of its founders, first of "alleviating calamities and miseries of their fellow citizens," and second for the very purpose for which you have convened here to-day, "to prevent the citizens from risking their lives in the hands of ignorant practitioners or pretenders of the healing art." This was further fortified by incorporating in its charter the establishment of a Board of Examiners, to consist of " 12 persons of the greatest chirurgical abilities in the state."

Thus the Faculty has always stood for the highest and greatest ability in the profession.

A further reason for felicitation on our part in welcoming you here is as that of a mother welcoming her children to their birthplace, for we feel, indeed, that this great association had its conception in this Faculty, and you will pardon me my just pride in recalling to you that the call for the elevation of medical education originated here in Baltimore, and through the labors and efforts of an ex-president of this Faculty, Dr. Eugene F. Cordell. A meeting of prominent members of the profession was called, through his undivided efforts, by obtaining ninety-six signatures to a petition. This led to a meeting of the representatives of the four medical schools, resulting in the sending of a petition to the various colleges throughout the country, signed by Dr. Aaron Friedenwald as President, and Dr. Eugene F. Cordell as Secretary. This letter to the schools was sent out March 20, 1890, twenty years ago almost to this day, resulting in the formation of your association at Nashville, May 21, 1890. I therefore feel that I may truly call Baltimore your native home, and Dr. Eugene F. Cordell the father of this organization which now yields the most beneficent influence, and is a power in the land.

The practice of medicine which for ages has been associated with the giving of medicines is undergoing vast changes. These changes are due to the recognized value, by the profession and the public, of the preventability of disease. Much of this has been brought about in spite of great opposition on the part of the public, but they now realize its value and the great majority can be depended upon to uphold the laws enacted to prevent disease. Only recently in our General Assembly, there was introduced a bill, at the request of a so-called faunal naturalist, to repeal the law of compulsory vaccination. The bill was very promptly reported unfavorably.

This field of preventive medicine must be cultivated by trained men, and should be a department of medical schools and universities, and be so arranged and taught as to cover the entire field of public, state, municipal and personal hygiene.

This department must and should educate the "biologic engineers," those whose duties are to study conditions which militate against or aid in the development of the highest efficiency of the individual, and thereby increase the vitality and strength of the entire people and country.

The people themselves are beginning to realize more and more the value of the agencies of exercise, of good nutritious food, bathing, air and sleep. This opportunity has been neglected in a large measure by our profession, and to-day we have the chagrin of seeing valued lives committed to the care of professional trainers, rather than the medical adviser. This lack of knowledge upon such matters on the part of the profession is due to the fact that it is rarely, if ever, adequately taught in the medical schools. Such a department established in our medical schools would be of inestimable value, and would receive substantial encouragement from the people.

The lack of this one field of education in medical schools is a self-evident conviction that the highest ideals of modern medicine are not being striven for in a practical way. We must accept what hygiene the youngest biologic science has taught, and repudiate the fatalistic doctrine of mortality, demanding a regular, definite sacrifice each year at the present established rate. To the contrary, we have Pasteur telling us that it is in the power of man to rid himself of every parasitic disease. The optimistic writings of Metchnikoff and others are proving the possibility of increasing the years of life. Taken thus with the practical results already obtained by preventive medicine, it is evident that all that is needed is education. This education must be first of the teachers and advisers, the physicians, the philosophers of health. The new field of biology, as suggested by Sir Francis Galton, the science of Eugenics, the study of hereditary conditions which influence human vitality, has already demonstrated its great value. The research fellowship established at the University of London by him has given us most valuable contributions by Karl Pearsons and other colaborers, to the study of human decadence and degeneration: the effect of tuberculosis in the race, the number of offspring comparatively taken,

and the proportion of selective mating, so that similars marry.

If these advance movements are carefully studied and conservatively taught, the great power for the good of the people in the increase of personal and national vitality will be inestimable. The teachers and investigators should by all tradition and experience be found in the medical profession. The physician with his keen insight into human frailties, and his knowledge of disease, is in a far better position to understand the causes and factors which produce departure from the normal than any other trained scientist. The research work to be done in the Rockefeller Institute, the study under the Russell Sage Fund for Investigating the Diseases of Old Age, and the Memorial Institute for Infectious Diseases, all contemplate the work being done in points of advantage, contiguous to the subject of investigation.

The large medical schools with equipment and means, associated with large and diverse hospital advantages, must of necessity do this work aided, as they will be, by virtue of merit and results obtained, by the generosity of friends and endowments, by philanthropic individuals, appropriations by progressive and enlightened States, and by the trustees of research funds. Thus such a policy will in itself be retroactive; it will attract men and means to those places where the facilities are provided, and the reputation so obtained will add to the income and resources by increased student body, of a higher intelligence and imbued with the real spirit of the true physician.

To review the advances made in medical research and investigation would be to recount the history of modern medicine. You are already acquainted with the epoch-making work of Pasteur, of Lister, of Koch, of Von Behring, and many others in the study of the causes of disease. The application of these principles to medicine and surgery have, by the modern scientific physician and surgeon, brought untold blessings to the human family, and saved to the nation countless lives.

The treatment of disease by sera and the prevention by vaccination are now as scientifically utilized and with almost the same precision as that of a chemical reaction. The absolute accuracy obtained in suitable cases by the X-ray has made the surgeon

as precise and as accurate in adjusting the fragments of a fractured bone as the joiner in fitting two pieces of wood in the manufacture of a cabinet.

The possibilities of replacement of diseased organs in the human animal by healthy ones is more than suggested by the experiments made in the transposition of organs from one lower animal to another. The recent advances in surgery of the brain, the citadel of reason, has opened the vista of the near probabilities of a relief and a cure in epilepsy and other allied mental afflictions.

All of these great advances have had the tendency to lift medicine from the dark mysteries of the past to a new and refulgent horizon, for an enlightened people, lay and professional, to gaze upon with wonder, amazement and gratitude. Conjointly with this has the progress been noted in the training of medical men. From the apprentice system of a century ago, to the two-year, then the three-year, now the four- and five-year college course. From the barber, who might in his leisure hours take a medical course and graduate as a physician, and practice with all the rights of a university prepared man, to-day a definite, reasonably prepared, not less than a high school course is required before being permitted to enter the recognized medical school. Still more is yet to be demanded with all the minutiae, with all the detail now required not as a matter of graduation, but as a mental equipment for the well and adequately trained physician. It is now well recognized that only the trained mind can be expected to master our profession. The physicians themselves demand a higher standard and a higher intelligence in matters scientific.

No longer will the plea be made that the sparsely settled districts need poorly trained physicians, because well trained and highly educated men will not locate in such places. There are men to-day of fine intelligence whose love of nature, whose close fellowship with mankind lead them to prefer the country to the urban life. They are to-day doing as good work, with the same degree of accuracy of diagnosis and treatment, as their city brothers. Further, the spread of the medical society organiza-

tion with rapid communication of travel and telephone has brought remote places to the very door of the large city; thus no longer is a man isolated, though he live in a most distant place.

This inexorable law of progress and evolution in medicine must and will be met by a definite, adequate provision by the teaching institutions. The segregated, independent and unendowed institution cannot meet the conditions which are essential. The training is now four times the cost of ten years ago. The actual cost per student, if calculated, giving the teaching body a reasonable compensation, would approximate from $500–750 per year. While a few years ago the one laboratory, the anatomical, with its several demonstrators, was deemed sufficient in a fairly well equipped school, to-day the laboratories needed are six, with well trained men in charge, men who must devote all of their time to this work. The teaching was formerly done in large classes; now it is, to a large degree, personal, and in consequence thereof, a greater number of teachers are required.

The lengthening of the medical course, in my judgment, has reached a point beyond which it seems unsafe to go. The generally accepted theory that the best work of a man is done before the age of forty indicates that we must leave at least fifteen years prior to this life period for the advancement of one's individuality and the laying of the foundation for a competency for the care of oneself and his dependents.

Society has a right to demand of every individual, if possessed of a good physical and mental equipment, the reproduction of his kind and the proper care and preparation of their offspring for the future betterment of the human race. It is not, therefore, fair to the individual to demand the expenditure of too many of his years in the preparation of his life's work. It then becomes incumbent upon the thinkers to evolve a plan for the education of men in an adequate way in a reasonable time, for which reason it appears contrary to the economics of the human life to extend the medical training beyond the present generally adopted course of four full-term years. I can, however, see no reason why the vacation should not be shortened and the time thus increased.

I feel that the demand of a college degree as a requirement is not essential, as it may only carry with it a literary training, which, in itself, is doubtless of value, yet not commensurate with the value of time spent in its obtaining.

The mere adding of years to the training for medical studies is incompatible with the laws of physiology, and the experience of teachers of science will refute its wisdom. It has been the observation of teachers in scientific laboratories that the graduate of a high school will grasp the details and observe with more precision, and draw as valuable conclusions as the student who has spent several years in purely literary pursuit.

The muscles of the musician must be cultivated in all the movements of precision and delicacy before the plasticity is lost, so also must the living, vital cells of the brain whose growth in size practically ceases at fifteen years of age, and whose density increases and plasticity decreases as old age approaches. The student with the broad general subjects may perhaps make the good, pleasant, agreeable family doctor, but the man whose specialization begins early in life, with the pursuit of scientific subjects, will make the truly scientific, precise, accurate, evenly balanced, keen-eyed and close observer; the eye trained to detail, the ear trained to accuracy, and the brain trained to minutiae will be the successful, renowned medical adviser.

The suggestion of President Nicholas Murray Butler some years since, that the college course should terminate with the Sophomore year, and that the Junior and Senior should be distinctly years of professional education, would force each student to decide for himself on a vocation in life during his Sophomore year. Either this view must be adopted, or the first two years of the present college course must be done in the secondary or high schools. The increased number of medical studies must be met with the lengthening of the professional school course, in addition to the college course; but the course must, as has been suggested, be lengthened backwards into the college course, and the college must provide for the training of their students in the preliminary courses, granting the degree of B.A. or B.S. at the end of their term.

The teaching of such subjects as comparative anatomy, biology, chemistry, physiology and botany should be a part of the college preparatory course, and need not be dealt with in the medical school except as to their relation with research and clinical application.

Should such a student who had received this scientific training instead of the usual Latin and Greek course elect to follow pursuits other than medicine, his training would be of equal value to him as a mental gymnastic.

The humanizing of the individual by such a training would be of vast importance to him in any field of usefulness. Could there be anything of greater value to the political economist than to know the relation existing between the animate and so-called inanimate?

The sociologist with the true conception of the evolution of life, the laws of nature, must realize the relationship between individuals and races, peoples and nations.

The divinity student would take the weakness of mankind to be in a sense a physical disease, with spiritual involvement and manifestation. Thus there can be no loss should this training not be followed in the line it would naturally lead, to further biologic study, normal and abnormal.

Thus it occurs to me that the four-year course should be maintained, and even possibly shortened, and more time left to the pursuit of medical studies.

The teaching of these scientific subjects would then of necessity be taught by men specially trained, who devote all of their time and attention to them, and would be paid salaries commensurate with their labors. This would remove it largely from the medical curriculum, *per se*, and thereby shorten the necessary years in the medical school, or give more time to medicine and surgery. The other alternative is to teach such subjects in the first year of the medical schools, increasing the term to five years, but granting one off for previous training, if already taken in a preliminary course.

I have endeavored in a cursory way to briefly outline the needs of future medicine. It seems also fitting that I might say

something as to the problems in medical education in Maryland at the present time, and to express in the abstract the possibilities of the immediate future and the probabilities of no great distant period. The solution is, indeed, not an easy task, for the diversity of opinion on the one hand to its feasibility, and on the other hand as to its real value and necessity.

I therefore request that my remarks be taken with the comprehension of the warning of Marcus Aurelius: "Remember all is opinion."

The first principle to be realized by all in this State as in others, that the readjustment in the intellectual world at large must be compensated and met by a similar readjustment and adoption in the academic and medical world.

Concentration in all matters is a law of modern development, and a high degree of excellence is only to be obtained through concentrated elements of mental activity, with the proper appreciation of resources.

Throughout the world there has been the concentration and consolidation in all industrial lines: trades organizations, labor organizations, combined manufactories, all obeying a well-defined social economizing law; all realizing the strength of many when taken as a whole, and the weakness of the individual. Economy, strength, and increased efficiency are the three potent factors gained by mergers. There is now a movement to correlate and confederate the various educational institutions of the state.

There exist public schools, high schools, academies, literary colleges, law schools, and some six medical schools, partly supported by the state and partly by the city, some by both, and others by private corporations, receiving State aid, all working for education, but each a separate entity. It is believed that could this whole number of bodies be taken under charge by a liberal-minded, broad and intelligent board of trustees, who would submerge, regulate and bring together the whole system under the caption of a State University, great good could be done the people, much time saved the pupil, and a system of education would result to the benefit and advancement of the entire state.

It is, however, realized that in conformity with this thought, the first essential step to be taken is the merging of the predominant, segregated schools of medicine here in Baltimore.

Located in Baltimore, aside from the medical department of the Johns Hopkins University, which by virtue of its university connection and endowment is able to fill its halls with selected men, and to train and graduate them with a good mental equipment, its future is well assured though its work is given some handicap by its none too liberal income.

The three medical schools recognized by the Association are the Maryland University Medical School, the College of Physicians and Surgeons, the Baltimore Medical College, and also the Woman's Medical College, a recognized school and one of the earliest to adopt the four-year course. Besides, there are the Maryland Medical College, a school of ten years' life, which is endeavoring to do creditable work but with limited income, the Homeopathic School of Maryland, and a disgrace and a reflection upon the laws of the state—the Medico-Chirurgical, Theological College and Law School of Christ's Institution, run by illiterate negroes whose incorporation papers were signed by a cross mark.

The three recognized schools and the Maryland Medical College in their combined plants represent at least a million dollars, each having a very small endowment. Their student bodies represent at least twelve hundred students, with an income of about $180,-000 in fees, and receiving usually State aid to the extent of $4000 per annum each, each duplicating the course of the other, each duplicating the expenses of administration, and all working independently with an honest desire to elevate the standards with a success that is marvelous, and a credit to the respective faculties. Yet can this advance movement continue in our schools, can the faculties maintain their present standing and follow the demand for a higher preparation and higher efficiency?

The recent advances in the elevation of standards of medical education are so positive that the only hope and solution for the medical schools of this city is the absolute union of them. The agencies throughout the land for higher standards are as sure of bringing about a condition where the school cannot stand and

maintain a reputation such as the men now associated with them demand in conformity with their professional standing in the community.

The schools that do not seek the haven of solidarity, homogeneity, unity and secure organization, will be as impotent as the single snowflake without the strength of the multitude. This is the day of progress, of high efficiency and strong vitality, and this in the industrial and commercial world has been made possible by strong mergers and combines.

Whether such monopolies and organizations, unions and communities, are productive of such dominant control that harm is often done the individuals in greater proportion than the good done the whole people, I am not prepared to argue. But there can be no doubt in the mind of any one, lay or professional, that a higher medical equipment will inure to the good and benefit of the whole people, and to the harm of none.

This reason is sufficient in itself in predicting the ultimate elimination of the weak school and the building up of the medical school as an integral part of a State University here in Maryland. The mere affiliation with a university is itself only a convenience, and the benefit of the same trustees not obtained. This demand of the best in medical training, as in all other things, is the real basis of the increase of standardization. The ractors which will bring it about are already at work, and the results accomplished during the past few years are simply astounding.

Such agencies as the medical faculties themselves, the American Medical Association, the examining boards and the general trend of education is for better and higher things. The Carnegie fund for investigating education and its best methods will be a strong agent in this fight.

Mergers in five different centers demonstrate the recognition of the need of such consolidation—Louisville, Cincinnati, Iowa, Los Angeles, Leland Stanford. Five years ago 166 medical schools were to be counted in the United States; to-day 148; 43 were closed and 25 new ones organized. Of the 43 closing, 16 went out of existence entirely, while the balance merged and formed 12 large, well-equipped and efficient schools. The in-

crease of the entrance requirement by numerous state boards is such that the schools will, of necessity, have smaller classes. Then is it not wise to send out the warning to various educational institutions, the great diminution of disease and the curtailment of the general practitioner's income?

Only a few days ago I was talking to a prominent member of our profession who practises with his father, who told me ten years ago the income from typhoid fever alone was about $1,500 per year; to-day it will average about $300.

The number of medical students will decrease because of the increased standard and corresponding increase in cost, and many more will be discouraged by the family physician in their desire to study medicine.

The modern method of teaching medicine with numerous teachers, expensive laboratories and equipment, make the yearly cost of a medical student's training prohibitive to many, so that it will become impossible to collect the fees, as the average man is unable to pay this expense. It becomes incumbent, therefore, with the present management for the teachers to serve without pay.

With a Board of Trustees covering the entire system, endowments could be secured, while no one gives to an institution which they believe, although erroneous, is for the good of the Board of Directors. A large institution would receive the help and sympathy of the citizenship of the state, the legislature would appropriate generous moneys for equipment and maintenance here as they do in other states. The need of such endowment is apparent to every one, and it will come when the people realize that they have an integral part of their educational system, a university which ranks with the best in the land. The people will feel a sense of proprietorship and sympathy with all its workings.

The whole community at large will realize the bigness of such a medical department; the laboratories combined in suitable buildings, all working under a directorship, will bring the results of concentration of mind and energy that will surpass the proudest expectations. The combined hospital facilities will give to the

student a training equal to the best of the land. The student in his last year should live as a dresser or assistant in the hospital.

All hospitals and dispensaries receiving aid for the care of the sick either from the city or state should in return open their doors to the training of medical men. The large state hospitals for the care of the insane and epileptic would furnish material to the student for the study of these diseases. Research work for those who desire to delve into the mysteries of the human mind gone awry would be made possible.

We to-day know the cause of many diseases, yet the working of the vital nerve forces is as little understood as the mysteries of the hereafter. Let one but stop and think of the great burden that would be lifted from the hearts of those whose dear ones are bereft of reason, and from an economic standpoint, let the state and the world realize that mental diseases are increasing, and the solution not even conjectured.

The humanitarian institution for the care of the insane has lengthened the life of the patient, so to-day with the increase of the cost and the increase in the average life of the insane, it increases rapidly the burden upon the people.

The residency of students in the State Hospital for Tuberculosis would give an insight into the various phases of this disease and possibly would result in greater progress in the study for its cure and prevention.

Thus can only good come to the people from better doctors, better institutions, better care of the patients, even far beyond this the possible development of the research worker, one whose soul is stirred, whose mind is trained and whose heart is big. Should such a system lead to the discovery and development of another Lister, a Pasteur, a Koch, or a Metchnikoff, the good to humanity could not be measured in our day or world, but its benefits would extend to the end of time. The practicability of such a merger could be easily evolved if such schools would leave the question of self-interest, and with a result that would work no injustice or unfairness to any teacher in the schools.

Let there be a trusteeship of the representatives from the several

faculties, they to take over all the holdings and to manage the affairs, adding to the board men of ability, efficiency, business and executive qualities, who will coöperate with the medical men in the management; thus the welding together will gradually be brought about with the relationship of each teacher preserved. The field of teaching is so large that not a teacher need be displaced, but every one will be needed, as the teaching will necessarily become more personal. The clinics, medical and surgical, will be attended by small groups in close proximity to the patient; each teacher will be strengthened by the queries of the class, and each class taught by the sense of seeing, hearing and touch, instead of the former two from the long distance amphitheatre. As the men retire from the faculty, their places may be filled or not as the judgment of the trustees may elect to do. Such schools should pay well equipped men for teaching laboratory studies, and the men who receive large fees in conjunction with their clinical branches should be paid less if at all. Each should receive commensurate with advantages he gives or receives from the institution. Such consolidation could only result in good to all; neglecting to do so will result only in postponing the inevitable.

To-day Maryland schools rank well throughout the land; let not their reputation be beclouded by crippled resources and illy equipped graduates, who will eventually come to schools not maintaining the highest standards.

Such combination would eliminate competition, expense of administration, promote higher standards, and attract a higher grade of students. The unsurpassed clinical possibilities would be features which would attract students from all points.

I would at the same time establish, as in New York, an examining board, before whom all candidates should appear and give evidence of training before being allowed to study medicine; indeed the other professions should also be regulated.

All candidates to practise medicine should appear before a state board and give proof of their ability and qualification as a regular physician. This should include every sect of practitioner, Homeopath, Osteopath, The Christian Scientists and what-not.

A most important factor in advancing medical education is by the medical society, which by its library continues to promote the habit of reading and study; by its meetings, brings together men, elevates their minds and softens their hearts, smooths away jealousies and promotes harmony. It is the clearing-house of erroneous impressions and concepts, and the store-house of scientific knowledge. It is the post-graduate school of the students who are alert for the advancement of medicine and science. The hospitals of other cities visited, and other operators and clinicians seen would aid and develop our knowledge. The general meetings of the state and National Association lift each of us away from our little world and show how vast are the number of workers in the vineyard of health and happiness.

817 Park Ave.

THE CONCENTRATION PLAN OF TEACHING MEDICINE.

By HENRY A. CHRISTIAN, M.D., Dean of the Faculty of Medicine and of the Medical School, Hersey Professor of the Theory and Practice of Physic, Harvard University.

Your secretary extended to me a very cordial invitation to attend this meeting and asked me to open a discussion of the concentration plan of teaching medicine. Both invitations are highly appreciated, and I thank you, Mr. President, for them. The subject assigned to me might be approached in one of two ways: I might discuss concentration study abstractly as a pedagogic principle having certain inherent advantages and disadvantages, or I might describe a specific application of the principle which has been tested in actual operation with some discussion of those features that have seemed to merit criticism, favorable or adverse, from those who have shared in and watched the application of this method to the curriculum of a given medical school. The first would seem more appropriate for a trained pedagogian, and will not be attempted by me. The second path of approach I will utilize, discussing the form of concentration teaching used in the Medical School of Harvard University

Concentration is employed in two portions of the medical curriculum at Harvard; each differs somewhat from the other and concerns quite divergent subjects. The first group of subjects in which the concentration plan of teaching is employed includes the subjects of the first year and a half of the medical curriculum, anatomy, histology and embryology, physiology, biologic chemistry, bacteriology and pathology (including neuropathology and surgical pathology). These subjects are so arranged that a student studies only two of them in a given period of time. In this year and a half of study his time is divided among these subjects as follows:

Anatomy 377 hours Histology and embryology 264 hours	1st half of 1st year.
Physiology 377 hours Biologic chemistry 280 hours	2nd half of 1st year.
Bacteriology 160 hours Pathology 477 hours	1st half of 2nd year.

FIRST YEAR—FIRST HALF YEAR.

	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
9-10	*October.* Anatomy. Lecture. *November, December.* Demonstrations and Laboratory Work.		*Oct., Nov., Dec.* Anatomy. Lecture.	*October.* Anatomy. Lecture. *November, December.* Demonstrations and Laboratory Work.		*Oct., Nov., Dec., 9-11.* Histology. *January, 9-11.* Anatomy. Lecture.
10-1	*October, November, December, January.* Anatomy Demonstrations and Laboratory Work.					*Oct., Nov., Dec., Jan., 1-11.* Anatomy. Lecture.
2-6	*January.* Anatomy Lectures, Demonstrations, and Laboratory Work.					
2-2.30	*October, November, December.* Histology. Lecture.					
2.30-6	Histology. Laboratory.					

FIRST YEAR—SECOND HALF YEAR.

Physiology. February.

	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
9–10	Lecture or Demonstration.					
10–1	Laboratory experiments.					
	March, April, May.					
9–10	Lecture or Demonstration.					
10–12.15	Laboratory Experiments.					
12.15–1	Thesis or Lecture or Laboratory Experiments.					
	Biological Chemistry.					
2–3	Lecture. Daily except Saturday.					
3–5.30	Laboratory.		Laboratory and Conference.	Laboratory.		

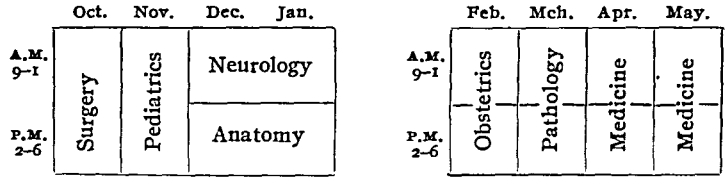
SECOND YEAR—FIRST HALF YEAR.

	October.	November.	December.			January.
9–12	Pathology. Laboratory.		1 week. Pathology. Laboratory. Daily.	2 and 3 weeks. Pathology of certain Parasitic Diseases. Laboratory. Daily.	9–10	Monday, Wednesday, and Friday. Surgery. Clinical Lecture. Boston City Hospital.
					9–12	Tuesday, Thursday, and Saturday.
					10.30–12	Monday, Wednesday, and Friday. Pathology. Laboratory.
12–1	Pathology. Lectures. Daily.				12–1	Pathology. Lectures. Daily.
2–3	Bacteriology. Lectures. Daily except Saturdays.		Pathology of the Nervous System. Laboratory.		Daily except Saturday. Surgical Pathology. Laboratory.	
3–5.30	Bacteriology. Laboratory. Daily except Saturdays.					

The student occupies his forenoons with one subject and his afternoons with another, with the exception of one month of the first year in which the entire day is devoted to Anatomy, and two months of the second year, in which the entire day is devoted to Pathology, general and special, as shown in the foregoing tabular view.

Each group of two subjects is completed and the examination held before new subjects are begun. This arrangement of studies was adopted beginning with the year 1899–1900, and has been but slightly modified since then.

The second portion of the curriculum to which the concentration plan is applied includes all of the subjects of the fourth year of medical study. The fourth year's work in the Harvard Medical School is entirely elective, while all work up to that time is prescribed. Each elective course offered in the fourth year consists of one month's work occupying a minimum of 125 hours. Usually but a single subject is being studied in a given month, and not more than two subjects may be studied at one time. Two types of courses are offered; (*a*) courses occupying the entire day of one month, and (*b*) courses occupying either the forenoons or afternoons of two months. With this arrangement of courses a student may select as many as eight, but not more, different subjects of study during his fourth year, or by taking a single subject for more than one month, he can reduce this variety in accordance with his tastes and his plans for his life's work. A fourth-year student's electives chosen at random will illustrate how this system works out:



This year 46 such elective courses are offered covering practically all branches of medical study. This plan of elective work was adopted for the class entering in the autumn of 1902, and

consequently the session 1905–'06 was the first in which it was in operation, that being the fourth year of medical study of the class entering in 1902.

The concentration plan of study used to-day is used at the Harvard Medical School in two and a half of the four-year curriculum. It is not used in the one and a half year's work beginning with the second half of the second year and ending with the third year, that portion of the curriculum devoted to the preliminary and more general study of medicine, surgery, obstetrics, pharmacology, therapeutics, and the specialties.

Having presented now in outline the plan of concentration study in operation at Harvard, let us inquire into its practical working. As the concentration plan for the first year and a half of medical study has been in operation practically unmodified for ten years, and the fourth year elective system for five, it may be claimed that the system has been given a fair trial at Harvard. In order not to present to you a purely personal opinion of the system, I have sought statements from the members of the Medical School faculty as to their opinion of the effect of the system as applied to the teaching of their own subjects and as to the general effect on the students as judged from their observation of students in the medical school since the adoption of the system. Thirty-nine medical members of the faculty (the Faculty of Medicine at Harvard consists of all professors, associate professors, assistant professors, demonstrators and instructors, appointed for three years or more in the medical school, in addition to the representatives of the dental school) have cooperated in this, and I will attempt to give you a criticism of concentration teaching based on a summary of their various expressions of opinion.

At the outset it should be stated that certain contributing factors have acted to prevent the trial of the concentration system from being a pure experiment for almost coincident with its adoption the personnel of the student body was greatly changed by the adoption of higher entrance requirements. Furthermore, the resources and equipment of the school have greatly increased during this decade, and instruction throughout the curriculum

without respect to concentration has been made more personal and more practical by subdividing the class into small groups and bringing them into intimate contact with the subjects of their study. Allowance must be made for these changes in considering the effect of concentration teaching.

No system evolved by man may be expected to suit all that come under its influence. So with the concentration system at Harvard; it has not as a system met with universal favor at the hands of those teaching in the medical school. Again it may be said that rare indeed is that system which survives unmodified the test of fair and long trial; the majority of the Harvard faculty seem now to favor some modification of the concentration plan, and so it seems fairly clear that as the result of observation of its working at Harvard the faculty has gradually come to the opinion that to suit all present needs in medical education some slight modification of the concentration plan as at first adopted should now be made. The majority of those expressing an opinion believe that the concentration plan with certain modifications is a desirable pedagogic method in medicine. There is considerable range and diversity of opinion as to what changes are needed to make concentration teaching more suited to present-day problems in the teaching of medicine. Lastly, since the various subjects of medical study differ much from each other, both in general principles and in methods employed, it is not to be expected that any one system of instruction would be equally suited to all subjects. Inquiry has shown that there is vastly more adverse criticism of the method applied to certain subjects than to others.

The concentration system was adopted for the first part of the curriculum in the belief that it would enable the student to concentrate his energies to a much greater advantage than he can when his attention is divided among several subjects. Furthermore, it seemed evident that it would increase the amount of time actually available for study of these subjects since the time formerly occupied by the student in going from one laboratory or lecture room to another in some more or less remote part of the buildings would be available for actual work, since the con-

centration system involved consecutive work for a half-day in one laboratory. Another saving of time would come from the fact that much of the work of the first year and a half of the curriculum was in the laboratory and involved use of apparatus requiring time for setting up, which apparatus when once set up could be used for several experiments, or use of materials which deteriorated so as not to be used to greatest advantage unless consecutive hours on consceutive days were available. Again it was urged that it was the natural way of work for a man when he had a task to perform to concentrate his energies on it, if possible, until it was completed. Commentors on this part of the concentration plan at Harvard very generally concede that the student does save time by the method and in a given number of hours acquires more knowledge of a given subject. What, then, are the disadvantages urged? The main ones are that with all of the work crowded into a short space of study ending completely and rather abruptly before another subject is begun, the correlative relations of subjects are lost sight of, and the student tends to study the next subjects with too little relation to the preceding, and to the subsequent subjects; that the student works under too high a pressure, and either as the result of this, or of the lack of opportunity for review, as was afforded when subjects were continued over longer periods with more subjects studied at one time, the knowledge acquired is less well retained; and that a certain monotony of subject matter under the concentration system leads the student to lose interest and enthusiasm in the latter part of a course. These objections to the system are not so much objections against the system itself as objections against the too rigid application of the system and in the minds of most these disadvantages are outweighed in actual practice by the advantages previously enumerated. Moreover, if the concentration plan as at present practiced were slightly modified to introduce somewhat more variety of study, either within a given subject or by not limiting the number of subjects studied at one time strictly to two, some of these objections would be easily met. Again, if, with the concentration plan retained, certain hours for lecture and demonstration were omitted

during the actual time of concentration study and this time was subsequently used for those particular things especially related to subsequent subjects of study, the correlative defect might be largely removed. Just what modification could be made along the above lines would depend to a great extent on local conditions, but some change of this nature seems desirable.

The above discussion relates to the concentration plan as a general system. Let us now consider briefly the individual subjects. Its application to pathology, bacteriology, physiology, biologic chemistry, histology and embryology gives very general satisfaction, and by almost all of our teachers its retention, with some slight modifications, would be favored. With anatomy there is no such general satisfaction. Expressions of opinion with regard to anatomy have come from those teaching surgery as well as from members of the anatomic department. They do not consider the limitation of the study of anatomy to one period of time a success. Much of the study of anatomy being a feat of memory, a second period of study seems desirable. Concentration study in two periods rather than in one, with subsequent correlative lectures and demonstrations in connection with surgery, would seem to them preferable to the present method. Not all of the criticism of anatomy, however, is criticism of concentration teaching, but is also a claim for more hours for the study of anatomy. If anatomy has too little time, that is not necessarily a fault of the concentration plan, but rather of the division of time in the curriculum, a subject not now under discussion; still dissatisfaction based on the latter must be separated from that based on the concentration plan itself, when we are considering the advantages of the latter.

The other part of the curriculum of medical study at Harvard involving concentration study concerns the fourth-year electives. This system was adopted in order that the occasional student desirous of training for highly specialized work (let us say that of a man who intends to become a biologic chemist in a medical school) might have the opportunity to arrange his last year of medical study for this particular end, and that all students could select their work to meet their particular needs and tastes.

As a very large majority of Harvard graduates enter general practice, it was thought that most students would so choose their subjects that their fourth year of study would conform quite closely to the former prescribed course of fourth-year study. An examination of the appended tables of electives chosen during the five years in which the plan has been in effect clearly shows that to be the case.

TABLE I.—NUMBER OF HALF COURSES ELECTED FROM 1905 TO 1909, INCLUSIVE.

	'05–'06.	'06–'07.	'07–'08.	'08–'09.	'09–'10.	Total.
Anatomy	36	42	49	35	33	195
Comparative Anatomy	..	0	0	3	0	3
Embryology	..	0	3	..	..	3
Physiology	..	8	10	2	4	24
Comparative Physiology	..	0	2	0	0	2
Biochemistry	..	2	5	1	2	10
Bacteriology	3	0	0	1	1	5
Pathology	15	6	14	36	33	104
Neuropathology	5	3	0	3	3	14
Comparative Pathology	..	..	2	3	5	10
Hygiene	4	6	1	0	2	13
Pharmacology	..	..	0	0	9	9
Clinical Medicine	71	108	84	77	112	452
Theory and Practice	28	28	45	59	60	220
Pediatrics	63	72	70	48	74	327
Surgery	66	113	102	84	100	465
Genito-Urinary Surgery	..	6	6	3	1	16
Orthopedics	35	16	19	22	17	109
Clinical Pathology	..	2	6	..	0	8
Clinical Surgical Pathology	4	7	2	0	1	14
Surgical Pathology	8	2	2	0	2	14
Obstetrics	39	59	58	52	59	287
Gynecology	28	19	25	24	25	121
Dermatology and Syphilis	13	8	3	8	1	33
Neurology and Psychiatry	14	19	28	11	22	94
Ophthalmology	3	0	9	2	3	17
Otology	..	1	7	3	1	12
Laryngology	8	9	16	13	15	61
Roentgenology	..	..	..	..	1	1
	443	536	568	490	586	2623

TABLE II.—PERCENTAGES.[1]

	'05–'06. Per cent.	'06–'07. Per cent.	'07–'08. Per cent.	'08–'09. Per cent.	'09–'10. Per cent.	Total. Per cent.
Anatomy	8.12[1]	7.83[1]	8.6[1]	7.14[1]	5.63[1]	7.51[1]
Histology and Embryology: Comp. Anat.	....					
Histology and Embryology: Embryology	....	0	0.52	0.64	0	0.22
Histology and Embryology: Cytology						
Physiology: Physiology	....	1.49	2.10	0.4	0.68	0.98
Physiology: Comp. Physiol.						
Biochemistry	....	0.37	0.88	0.2	0.34	0.38
Bacteriology: Bacteriol	0.67	0	0.35	0.84	1.02	0.57
Bacteriology: Comp. Path.						
Pathology: Pathology	4.50	1.66	2.46	7.98	6.15	4.57
Pathology: Neuropath						
Hygiene	0.90	1.11	0.17	0	0.34	0.49
Pharmacology	...	...	0	0	1.55	0.34
Medicine: Clin. Medicine	22.34	25.73	23.71	28.12	29.34	25.91
Medicine: Theory, Practice						
Pediatrics	14.22	13.43	12.32	9.77	12.62	12.45
Surgery: Surgery	16.78	23.86	19.67	17.78	17.74	19.38
Surgery: G.-U. Surgery						
Surgery: Surgical Path.						
Orthopedics	7.90	2.98	3.34	4.48	2.90	4.15
Obstetrics	8.80	11.0	10.21	10.64	10.68	10.17
Gynecology	6.32	3.54	4.4	4.89	4.26	4.61
Dermatology	2.93	1.49	0.52	1.66	0.17	1.29
Neurology and Psychiatry	3.16	3.54	4.92	2.26	3.75	3.58
Ophthalmology	0.67	0	1.58	0.4	0.52	0.64
Otology	...	0.18	1.23	0.64	0.17	0.45
Laryngology	1.80	1.67	2.81	2.68	2.55	2.32
Clinical Courses						83.59
Laboratory Courses						16.42
Clinical Courses + Anatomy + Pathology						97.41

Further study of these tables shows that a large per cent. of the students take clinical courses rather than laboratory courses. Two laboratory courses are particularly favored by the student as being most closely related to his clinical work, namely, courses in anatomy and pathology. If the percentages for these be

[1] The figures given in the column for each year represent the ratio in percentages of the number of courses elected in a given subject to the total number of courses elected for the year, and in the "total" column the ratio to the total number of courses elected during five years.

added to those of the clinical courses, approximately 97.5 per cent. of the electives come from this group. If the subjects be divided in accordance with the general plan of curriculum of this society, it will be seen that nearly 42 per cent. of the electives come in the group comprised under medicine, which includes pediatrics and neurology, whereas about 24 per cent. come in the group of surgery, including the special branches of surgery and gynecology. If these tables be considered from another view-point, it will be seen that a very large per cent. of the men in a class select actually two months of medicine, one month of surgery, obstetrics and pediatrics, while about half of a class select two months of surgery, and two-thirds of a class select one month of anatomy, one-third of a class select one month each of pathology, orthopedic surgery, gynecology and neurology, while very much smaller fractions of a class select other subjects.

Neglecting the occasional student, then, for whom the system is manifestly an advantage, let us consider what advantages for the usual student, if any, this system has over a prescribed curriculum. First of all, it allows to a very considerable extent the student to choose his own instructor, for in many subjects several courses are offered, and the student knows in advance who will teach him. This is an advantage, as the student gets much from the personality of his teacher, and when the teacher is personally agreeable, this is accentuated. Again, it allows the student to balance up his work, for it almost always happens that a student arrives at the end of his third year conscious of certain defects in his training, either the result of accident, personality of instructor or faults in his courses. The needs of the man who is to practise medicine in the place where he must treat every ill of his patient are different from those of the man who is to practice within easy access to consultants in special branches, and he can by his selection of courses more or less anticipate these varying needs. The elective system has given an easy division of the students into small groups, rendering possible individual instruction and intimate contact with patients that has improved almost every part of the instruction of the fourth year.

These advantages are largely advantages of the elective system, but the elective system in this form has been made possible by concentration.

The expression of opinion from the teachers is very strongly in favor of the fourth-year electives as a general plan. Certain defects in it, however, seem apparent to a number, but these are remediable, and they involve no essential change in the system. The result of the operation of the fourth-year elective system as at present in use is that the fourth-year class never meets as a body, and certain lectures and demonstrations fully as well given to an entire class as to a small group lack the effect of the inspiration and stimulus of the larger audience on the lecturer, and these exercises necessarily repeated for succeeding sections are not so well given the third or fourth time as the first. The instruction, largely individual and practical, is given more by the younger men, and the fourth-year student loses the ripe experience of the older teacher at a time when it would be most valuable. Modification of the system to bring together the entire class for certain work would meet these objections, and preserve the other good features of the fourth-year electives.

In certain subjects a course occupying one month takes a larger proportion of a student's time than he can afford to devote to that subject, and so he must leave it entirely out of his plan of study. Practical ophthalmology for the man who wishes to acquire the ability to use the ophthalmoscope intelligently in general medicine is an example of this. For these subjects shorter courses are desirable. Already this need has been provided for by offering for next year such shorter courses (quarter courses instead of half courses) in addition to the longer ones.

The fourth-year elective system necessitates crowding the third year with many courses, and this is not desirable. However, it seems unavoidable, and the success of the fourth-year electives justifies a continuation of the general plan, even if it makes the third-year work less satisfactory than formerly. Probably certain changes might, however, reduce these defects of the third year.

As a result of ten years' trial of concentration teaching at

Harvard in the subjects of the early part of the curriculum, and five years' trial of concentration in a fourth-year elective plan of study, the consensus of opinion is favorable to it. Trial has made certain modifications seem desirable, and these are along the lines of giving elasticity to the system—a too rigid application of concentration teaching is not believed to be best suited to the medical student of to-day. More modifications of the plan in application to anatomy seems desirable than for other subjects, as there is less satisfaction expressed with the present concentration teaching in anatomy than with the other subjects.

In this discussion concentration study has been considered entirely from the point of view of the effect on the student. It undoubtedly has its effects on the instructor, too, but I take it that this body is primarily interested in the student and his opportunities for acquiring knowledge; not so much interested in the comfort of the instructor and his opportunities for investigation, though we all believe the latter should be encouraged in every way. Concentration teaching undoubtedly has its bearings on the instructor and his investigations, but I have purposely refrained from discussing them at this time in order not to cloud the subject before us. Though the above statement represents, so far as I can determine, the views of a very large part of the Harvard Faculty of Medicine, it is not to be understood that each member would assent to them; a few do not favor the concentration plan at all. Personally, I regard it with favor as a system, but believe it should be slightly modified to increase its elasticity and particularly that in applying the concentration plan of study a course should not end abruptly, but certain correlative exercises should be continued after the main facts of a subject have been acquired by concentration study. The amount of modification made should vary with the different subjects of study, more being needed with some than with others, and should be adopted to the local conditions of each institution, for to my mind, no greater mistake can be made than to build a so-called ideal plan for medical instruction and attempt to

force into it every institution with no consideration of its individualism of teachers, buildings, equipment and surroundings.

DISCUSSION.

Dr. Frederic M. Briggs (Tufts College):

We have tried the concentration plan at Tufts and found it very successful. In the first and second years we followed the Harvard plan, except that we carried it through the entire second year. The first year is the same. In the second year we put pathology and bacteriology in the first semester, and pharmacology, materia medica and therapeutics with physiologic chemistry in the second semester. Our third and fourth years differ from the Harvard plan. The third year is required. The fourth year is partly elective and partly required. We require clinical medicine and clinical surgery all through the third and fourth years. We think that is much the better system in many ways than to allow the student to graduate at the end of four years, with the possible chance of not having had that experience which we think the general practitioner should have. Our fourth-year required courses are begun in October, November and December. In January we give didactic work and the elective subjects stop the first of April.

THE FIVE-YEAR COURSE.

By JOHN W. SCANE, Assistant Professor of Pharmacology, McGill University, Montreal, Canada.

I need hardly preface my remarks by saying that the question of medical education is one of interest to all thoughtful members of the profession. It is of still greater interest to those of us who are more intimately associated with its problems.

It is the desire of each one of us to see an improvement in the standards of educational methods and it must be a source of satisfaction to all to feel that never before in the history of this question has there been shown a greater degree of enthusiasm in the determination to solve these probelms than at the present moment. Recent years have seen the formation in this country of no less than four associations whose membership is made up of your ablest educators and whose common aim is the uplifting of the standard of medical education.

This country cannot afford to be behind other countries in this important matter, but we must admit that we have still something to learn from the older countries. In a report furnished by the Council on Medical Education of the American Medical Association, we find that the majority of foreign countries demand either a five- or a six-year medical course, and in some cases this long course is preceded by a year's work in natural science subjects. In this country, up to within very recent years, we have been content with a four-year course, and the natural science subjects formed a part of the entrance requirements of but few of our schools. How are we to explain this difference in standards? Is the mental calibre of our students so much higher that they can master in four years what it takes students of other countries six or even seven years to accomplish, or do we actually demand a lower standard, and are the men sent out from our colleges with deficient equipment in comparison with graduates of Great Britain, Germany, Italy and many other countries?

These are questions which arise from a comparison of the educational methods of the United States and Canada with those of the countries mentioned. I do not say that the *quality* of our teaching necessarily suffers from such a comparison; from the standpoint of the subject of this paper it is altogether a question of time.

I think it must be conceded that the time standard set by our competitors of other lands is none too high, especially when we consider the great advances made in medical science and the consequent additions to the curriculum of the medical course.

Time was, and that not so very long ago in some of our colleges, when three years sufficed for the making of a doctor. Up to within a very few years ago four years appeared more than ample, and if we judge by the brilliant careers of many of our graduates, these shorter courses have not been entire failures. But these men will tell us that they had plenty to do in their student days, and they are amazed when they contemplate the overcrowded curriculum of the present-day course.

Ten or fifteen years ago laboratory courses were, in many colleges, practically unknown. Now we demand some hundreds of hours for such subjects as physiology, physiologic chemistry and pharmacology, to say nothing of the more recently developed subject of biologic chemistry. The didactic courses in these subjects have not *given way* to laboratory work; the latter has been *added to* the former, thus practically doubling the teaching hours in each subject. These practical courses, all necessary and valuable in themselves, have been crowded into an already congested curriculum at the expense of the student's reading and recreation hours. Yes, and even at the expense of his meal hours. College work used to begin at nine o'clock and by four or five at the latest the student was free to seek a little mental relaxation. Now, his work begins at eight, and goes on till six, with one hour (grudgingly given) for lunch. He is driven from lecture room to laboratory and from laboratory to clinic and is put through a process of forced feeding with no time at all for digestion, absorption, or assimilation.

That the medical course should be extended beyond the four

years seems pretty well agreed, both in this country and in Canada. The great problem seems to be how shall we provide more time; and how much more time shall we provide? Shall the added year be devoted to the primary branches, including the preliminary scientific subjects, or to increased clinical work in the hospitals?

Many of the schools of this country seem to have solved the problem to their own satisfaction by demanding a high standard of preliminary education, and by requiring the student to devote a year or more to the subjects of biology, chemistry and physics before entering upon the medical course proper. Some of your schools go even farther and require the full academic course of four years.

No one doubts the value of a broad general education as a preparation for the study of medicine. But looking at the question from the standpoint of time, is it not possible to overdo it, and make the student spend too many of the most valuable years of his life within the four walls of a college? If he begins his studies at the age of six, devotes twelve years to preliminary work, four years to the academic, and four years to the medical course, to say nothing of a possible year in a hospital, he begins his life's work at the age of 26 or 27—too late in my opinion for the best results.

Perhaps the fault lies in the preliminary work and the lack of correlation between it and the work of the medical course, but the fact remains that we are apt to lay too much stress on preparatory work, and in planning our elaborate schemes of educational reform, to forget that at least a fair proportion of the student's best mental years *should* be spent in acquiring a knowledge of the science which is to form the basis of his life's work.

One or, at most, two years in the academic course should be sufficient, and most of that time should be spent in the study of science subjects.

But it is not enough to prescribe a certain period in the study of biology, chemistry and physics. These subjects should be taken up intelligently, having always in view their bearing on the subjects of anatomy, histology, physiology (including physiologic and biologic chemistry), and pathology.

The ordinary work of the academic course in the science subjects is not as a rule extensive enough, nor is it suited to the special needs of the medical student. Definite courses in these subjects should be arranged, and if they are not given by teachers who have had special training for the purpose they should at least be designed with the advice and collaboration of medical teachers.

In McGill our students come to us largely from the country districts where they have obtained their education in the public schools and have been prepared for college in the high school or the academy. The standard of general education in these preparatory schools is excellent but their facilities for giving instruction in the science subjects are very meagre. Chemistry and physics form a part of the requirements for entrance into our medical department, but we do not demand, nor do we expect, anything beyond the most elementary knowledge of these subjects. Biology is not on the list of required subjects.

It is felt, therefore, that owing to the short period over which instruction in these important subjects extend the courses should be arranged with the definite purpose of emphasizing their bearing on the basic subjects of anatomy and physiology.

In the discussion which preceded the adoption of the five-year course by the Faculty of Medicine of McGill University, this idea held a prominent place. The courses in the preliminary sciences, although they are for economic reasons given in the academic departments, have been especially designed for students in medicine. The students themselves feel that there is a vital connection between these subjects and those which follow, or in some cases run concurrently with them. They feel that their first year is as much a part of the medical course and as necessary to their future success as their final year spent in the study of clinical subjects in the hospital.

Of course the question arises—can the student acquire a sufficient knowledge of these important preliminary subjects in one year to be of permanent value to him? There are those who will answer that he cannot, and if we regard the question solely from the standpoint of general education we must agree with them. But if the student is to graduate in medicine, say at the

age of 24, or at the latest 25, we have only five or, at most, six years to fit him for his life's work, and it does not seem reasonable to devote more than one year or at most two to preliminaries.

And then again we must not forget that chemistry is continued on into the second and in many cases into the third year of the medical course so that a very fair proportion of the student's time is given to that subject. The same may be said of physics and biology, for although they are not carried on beyond the first year as separate subjects, the application of the knowledge gained in the first year to the subjects of physiology, pharmacology and anatomy, serves to impress it upon the mind of the student and to make it of lasting value to him.

Perhaps it might be of interest to the members of this Association to hear something of the curriculum which McGill has adopted in this extended course. Two main objects have been kept in view, *i. e.*, to increase the number of hours devoted to the preliminary science subjects and to give as much of the additional time as possible to bedside work in the hospital. The curriculum of the first year comprises the following: Biology, including embryology, general chemistry (theoretical and practical), physics, anatomy, histology and elementary bacteriology. In the second year, anatomy is continued throughout the session; histology is also continued and is concluded at Christmas. Physiology is introduced for the first time and is continued throughout the session; organic chemistry is taken up in the first half of the session, and in the second half the recently developed subject of biologic chemistry. There is also a short course in pharmacy in this year.

In the third year physiology (including physiologic chemistry) is continued throughout the entire session. There are also extensive courses in pharmacology, pathology and bacteriology. Shorter courses in clinical microscopy and clinical chemistry are also given. In this year the student visits the hospital for the first time, instruction being given in physical diagnosis and in surgical methods and minor surgery. Once a week throughout the session instruction is given in the performance of autopsies.

In the fourth year systematic courses of lectures will be given

in therapeutics and materia medica, medicine, surgery, obstetrics, gynecology, medical and surgical anatomy and pediatrics. The number of didactic lectures in these final branches have been reduced to a minimum and in some of the special branches the lectures will be given as a part of the clinical work. Instruction will also be given to fourth-year students by means of theatre clinics and ward classes in medicine and surgery. During this year, too, each student will be required to take an active part in the performance of at least six autopsies and the autopsy material of each week will be systematically demonstrated to groups.

In the fifth year most of the student's time will be spent in the hospital. Without wearying you with details I may simply say that there will be theatre clinics, ward classes to groups, and outdoor instruction in the general hospitals and in the maternity hospital, while small groups will receive instruction in infectious diseases. In this year there will be didactic and a practical course in hygiene and short courses in medical jurisprudence and mental diseases (*museum teaching*).

In our experience thus far we have been beset by one great danger, that of overcrowding the curriculum: the danger of too much spoon-feeding and of not giving the student sufficient time to think for himself. I will not take up your time by recounting the evil results of such methods. They are apparent to all. We have endeavored to avoid them as far as possible and hope by continued study of the problem and by the elimination of non-essentials to make the best use of the student's time.

But apart from the educational question altogether there is a practical reason for the adoption of the five-year course. The medical curriculum is nowadays practically under the control of the licensing boards. We may have our ideals of medical education and may arrange our curricula according to these ideals but the last word is always spoken by the licensing board and to it we are forced to lend an attentive ear. The licensing boards not only prescribe the subjects to be studied but in many cases they fix the number of hours to be devoted to each subject.

The boards in Canada have always set a high standard of education. One of the Provinces has now for a number of years required a fifth year, spent either in a hospital or with a general practitioner, before the final examination may be taken. During the past year a second province has increased its requirements to five years, and arrangements are now going forward through which four of the western Provinces will follow suit. And so although we took the step before any pressure was brought to bear it could not have been long deferred.

That it is a step in the right direction has been demonstrated to us in many ways. The first year of the five-year course began with the session of 1907–1908 and, coming as it did immediately after the disastrous fire of April, 1907, which destroyed about half our buildings and equipment, we anticipated a great reduction in the number of students. We were not disappointed. The first session saw a registration of only some fifty odd students. The next session, however, gave us an increase to something over sixty and this session we have over eighty in the first year.

But we must not judge of the success of this move by the number of students enrolled, nor should we base our estimate upon the number of hours in the curriculum. We should look to final results, and in obtaining these results the quality and fitness of our teachers should form the most important factor.

Let us hope that while we are advancing our standards both in time and in general efficiency we ourselves will not fail to grasp the opportunities and that we will give our students the best that is in us.

DISCUSSION.

Dr. Eli H. Long, of University of Buffalo:

Although I have had no experience with the five-year course, it has been my privilege to confer with those who have had such experience. Besides McGill, Toronto University has adopted the five-year course, and from what can be learned our Canadian brethren seem to be on the right track, if the fifth year is made obligatory. In our own country some experiments have been made. If you will refer to the proceedings of the last meeting of this Association, in the discussions on the papers by Drs. Zapffe and Rogers on this subject, you will find that Dr. Lefevre, speaking for Bellevue, stated that they had an optional fifth year, but that it was not a success. Dr.

Seneca Egbert also stated that the Medico-Chirurgical College had an optional fifth year, but it, too, was unsuccessful. Another institution of prominence has been testing the fifth-year optional course for five years, allowing considerable latitude in the election of the kind of course the student shall pursue during his fifth year. He may elect to take it in the earlier years or he may take it by serving an internship in a hospital. Nevertheless, I have been informed that during these five years there have been only thirty applicants for the *cum laude* degree, and that only one degree has been allowed. So that it would seem that the experiment in that case is not a large success.

Some difficulty arises in some places in connection with making the fifth year a hospital internship. The state boards of some states require that a hospital interne shall be a regularly-licensed practitioner of medicine within the meaning of the medical act. Hence, in these states it seems impossible for the colleges to carry out the plan of a fifth year to be taken in a hospital. Nevertheless, it seems as though a fifth year will be inevitable, and, from the experience of the colleges referred to, it seems that it must be made compulsory, not optional, with the student.

Right here I think we must not forget in all our discussion of advances in medical teaching, advances in requirements, and advances in qualifications for practice, that the student has been playing his part in the evolution that is taking place. Those of us who can look back for thirty years know that at that time it was the exception for the recent graduate to spend an additional year or a year and a half in a hospital. Most graduates went into practice at once. Now the contrary is the case. I have no doubt that today at least one-half of recent graduates take hospital internships. The fact is that the best students add a fifth year to their training. They feel the need of proper preparation and voluntarily take a fifth year as internes in hospitals.

It seems to me that in discussing this subject we ought to take the student into consideration. If the fifth year is to be made obligatory, the faculty ought to determine what the course shall be because the student, at the beginning of his college course, is not competent to say whether he shall take the extra year at the beginning or at the end of his course.

I would like particularly to emphasize that if we require the fifth year it should be obligatory and not optional with the student; and, as Dr. Scane pointed out, in providing for the fifth year we must avoid crowding the student. What is most needed now is to give the student more time for study, that he may properly arrange in his mind, and correlate, what he has learned; therefore, any addition of time should take into consideration the needs of the student in that direction.

Dr. A. Ravogli, of Ohio State Examining Board:

I was graduated in Italy after six years of study, and therefore I would not have any objection to lengthening the course to five years. But, after a

man has reached his 24th or 25th year, he wants to go out into the world and earn his living. He cannot continue being a student. Besides, it is impossible that we can teach all there is to learn of medicine in five or even six years, or, for that matter, in a lifetime. I admire greatly the law of Germany, which prohibits the student after taking his degree to practise medicine. He must spend one year in a hospital or under a preceptor and continue his studies under the guidance of some one. After that he is admitted to practise.

This is really the best way to arrange this matter. A student who has graduated in medicine and immediately goes out to practise is very much frightened when he sees his first patient. He does not know what to do. From my experience of many years on the staff of the Cincinnati Hospital I know that our internes go out with confidence in their ability to practise and they do it well. Therefore I advocate that the fifth year of the medical course be made obligatory, not in the college, but in a hospital or under the guidance of a preceptor.

Dr. Egbert Lefevre, of University and Bellevue Hospital Medical College:

This is a most important question. At the outset we must ask ourselves what is this fifth year for? Is it an advance in medical education or is it an advance in preliminary education? Is it to meet the advance in preliminary requirements by putting a fifth year at the beginning of the medical course, or is it really intended to be an increase in the time devoted to technical education? Before this question is settled definitely these points must be met.

In the first place, is there a demand for an advance from the technical side as far as the student body is concerned? There are things that belong in the medical curriculum. With the advance of the high school development we will soon be able to demand chemistry and physics of the high school as part of the general educational system, which will relieve the curriculum of the medical school considerably. When it comes to biology, we will be able to give a certain amount of training in that subject, but this advance is not directed toward new subjects or toward special work which the student must apply during his lifetime.

When we demand two years of college work for admission to medical schools, that demand must rest on these two propositions. First, are we demanding two years of college work for the cultural side, or second, are we demanding it for the technical side? If we say for the cultural side, all right. If for the technical side, it is a false demand because we are demanding two years of preliminary work at too great a loss of time; if the cultural side predominates, however, there is a defensible side.

When we endorse the fifth year, where are we going to add it? I think the Canadians have met this question very definitely. They have done better

than they did in England where they have the five-year course, but they put it in the primary years so that a man cannot finish in five years but must go on to six or seven years.

Are we ready for the fifth year on the technical side? Before we decide this subject we must consider what is our function as a medical school and as medical instructors. We can never hope to turn out a finished product in medicine. Our function is to so train men that they will be safe men, men possessed of a foundation on which they can build throughout the active years of their life. I am afraid that we are going to err just as definitely by increasing our curriculum on the clinical side as we are from the preliminary side. If a man does not get his theoretical training in the medical school, he probably will never get it, so that attemps that are being made to increase the amount of clinical teaching at the expense of the theoretical training is wrong in principle. We must remember that students must, while in college, receive their training in the science of medicine.

That is why I believe that when we come to the consideration of the fifth year in medicine we must look at it from that point of view. Shall it be purely and simply a hospital year for technical training, or is there a legitimate demand for more training in the sciences.

That brings up a mooted point. We are not to train scientists in any particular line. One of my recreations in summer is navigation, and I always think of it in its relation to pure science. All the advance in navigation has come through pure science. Navigation would be away behind in the race were it not for the scientist. When we engage a navigator we want a man sufficiently trained in science to apply what he must use in the navigation of a vessel. This same attitude must be maintained in the medical curriculum. If we must lengthen the course, it must be on the science side. I believe we are coming to the five-year course.

Should the fifth year be obligatory or optional? What is an optional course? Optional for the college or the student? If it is optional for the student, if the state does not demand it, then I am going to get my degree and work out my professional future as I see fit. You cannot force a man to take five years as long as the law says four years. Any school that will go into it will have a meager attendance; men will go into the weaker schools, and the last stage will be worse than the first because we have lowered the general standard. When the legislatures and the people say that there shall be five years, then there will be no question about five years. Every school must then be on the same plane.

I hope in the near future to see this association arrange a five-year curriculum, but I think that at the present time it is impossible; but we must have this thing in mind so that when the time comes we will be ready for it.

Dr. J. W. Holland, of Jefferson Medical College:

Listening to this discussion I was reminded of an episode which has great significance. It was the consideration of what was called the standard curricu-

lum by a Committee of One Hundred selected because of their standing as teachers and as physicians, reporting through ten chairmen, at a meeting with the Council on Medical Education of the American Medical Association. They had been requested to draw up an ideal curriculum with the understanding that the so-called biologic branches—chemistry, physics and biology—should be left out, it being understood that instruction in these subjects would be secured in the preliminary training before entering on the study of medicine.

The committee arranged a curriculum in hours. They were told to so arrange it that there would not be more than 1,000 hours in each of the four years of the medical course. The report summed up 4,600 hours, and demands were immediately made to trim it down. Each chairman was asked if he could not abate his demand. The eye, ear, nose and throat men thought that the gynecologists were absurd in their demand; the surgeon thought that medicine was given too much time, and so it went on. Every man magnified his subject so that it was impossible to reduce his demand for hours. And still every one agreed that the student could not do more than 1,000 hours of work in each year.

I ventured the suggestion that we scale down the number of hours for each department so as to make the total equal 4,000 hours. That was a most unwelcome suggestion. Not a man agreed with me. Then it was obvious that it was a matter of conscience. Every man insisted that he should have that many hours or he would not stand for it at all. He would repudiate the whole thing.

Then I proposed the only alternative, an increase in the number of teaching years. If no one would concede to a cut in the number of hours, and it was manifestly impossible to teach 4,600 hours in four years of 1,000 hours each, it was plain that we must have a five-year course. That suggestion was even more unwelcome than the other. Only one man agreed to that. They said that that would cut out the biologic year which must be taken in the State university. That had not struck me as being the necessary thing. I could not see why one or two things in the State university were of more importance than 600 hours in medical instruction. It was perfectly plain to me but no one agreed with me.

If they put 600 hours in one more medical year it would give 400 hours to those biologic subjects that had been pushed out into the State universities. No more time would be taken out of the student's life. The day when he begins his bread-and-butter career was not postponed at all. It simply meant that that work which had been relegated to the State university as a preliminary year preparatory to the study of medicine would be made a medical year.

There is a vast difference between work done in the college or university and work done in the medical school, so that it seems to me that if we are as conscientious as the committee on standards, if we insist that there must be 4,600 hours, and I think that they were right there, because we do not

have enough time for medical instruction, we force the students and cram them at the expense of the product. It is a question of policy whether the student will stand for it and whether the public and the profession will stand for it and back us up in our demands.

What are the facts with respect to the period of time that the average student spends in preparing himself for practise? In certain schools in the East the majority of students take five years after they matriculate in the medical school and before they enter on the business of life. From 60–80 per cent. of the graduates in medicine in Philadelphia go into hospitals for at least a year, some of them for eighteen months. Any student in Philadelphia who wants a hospital position can get one. The practical difficulty would not be very great if we required all of them to do the same thing. Of course, the student must support himself for one year more, but if that year is taken in a hospital, he is supported without any effort on his part to earn money, so that factor is eliminated.

It seems to me to be a practical economic suggestion that if a number of the colleges agreed among themselves—I know it would be a dangerous experiment for a single institution to do this, but if a sufficient number of colleges agreed that at the beginning of the 1911 course they will demand five years in medicine—the scheme or plan could be carried out. The year in the hospital could be listed as the fifth year, and at the end of such service the student would receive his credits and graduate in medicine. In order to meet the state board objection that hospital internes must be licensed practitioners of medicines, these students could be certified to having passed the theoretical work successfully, but that the diploma would be withheld until they had fulfilled the requirements of the clinical work, and that requirement could be met by serving a year as hospital interne.

Dr. E. P. Lyon, of St. Louis University:

The school I represent is one of those that has adopted one year of college work as preliminary to the medical course, beginning with the session of 1910. When this was done I was strongly of the opinion that this additional year should be spent in the college and not in the medical school, but I have changed my views entirely so far as our institution is concerned. I am of the opinion that this year should be given in the medical school. In other words, that our school shall become a five-year medical school.

I am led to this belief for several reasons. The first is that the literary colleges on which we are dependent are not prepared to give instruction in chemistry, physics and biology, and even if they were prepared to do so these subjects would be better taught in the medical school. Second, the medical student desires to be regarded as a medical student and to do this work as directly leading to medicine. Therefore, while we have not as yet definitely put this on paper, I am willing to say that the St. Louis University

will make the preliminary year definitely one in the medical school, taught by professors in the medical school.

In regard to the hospital year. I recently had occasion to look over the laws of all the states. The laws read that in order to practise medicine one must be a graduate in medicine or have a diploma in medicine, but in only three states is there any declaration that he must be the possessor of an M.D. degree. In other words, there is this way open to any institution which desires to require for graduation a year in a hospital. The student must be a graduate in medicine in order to take this position, but not necessarily an M.D. Therefore, at the end of the regular course the school could give him a diploma showing that he is a graduate in medicine or an M.B., but that the M.D. degree would be conferred only after having served one year as interne in some hospital. That is the only solution which I can offer for that problem at the present time.

Dr. Leartus Connor, of Detroit, Mich.:

I would not train a trotting horse and expect him to draw a dray; nor would I train a dray horse and expect him to win a trotting race. That is exactly the situation in medicine to-day. There are specialists and family physicians. Neither one can well be the other. If the medical colleges are to make family doctors, then the training of the specialist should be taken out of the medical school and placed in some institution that is especially equipped for such work. The years of medical study would be better spent and to better purpose than they are now. I am a specialist, but I see the other fellow who comes out of college not at all prepared to meet the needs of the people. That is the reason why the optometrist flourishes. He is prepared to do what the family physician cannot do because of lack of training. Therefore, I say, let us train our students to do all such work as their patients will demand of them, and let the specialist take care of himself.

Dr. Isadore Dyer, of Tulane University:

At Tulane 10 per cent. of the students take a position in the Charity Hospital for two years, making a six-year medical course. Many more would take advantage of this if the opportunity were offered. If the fifth year is made voluntary and the hospital opportunities are great enough, it will not be a question of urging the students to take the additional year. They will be glad to take it.

Dr. W. B. Hill, of Marquette University:

If we could add one month to each year we could easily get rid of the 600 hours. Most students do not need as long a vacation as they get now. In fact they waste time after they return from their summer vacation getting back to work. Our school children do not have such long vacations. They

get only ten weeks and our medical students get twenty weeks, and they are great big strong men. I would like to see the curriculum enlarged sufficiently to embrace all that is necessary to be taught in the medical school, but I do not like to see the curriculum arranged in the form of hours but in work done. Many hours are wasted, and certain things must be done. It is a well recognized pedagogic principle in all institutions, except medical schools, that we must develop the faculty of the student rather than help him to accumulate a mass of facts. It is necessary so to train the student's faculties that he will be enabled to develop himself later on. If we can so develop the student in four or five years, we will have done a great work, but if we have merely tried to prepare him for his life's work by the acquisition of facts, we have made a dismal failure of our work. I think that we could do effective work in four years if we taught our students along these lines and if we lengthened the individual course, shortening the vacation period, so that the student would not get out of the habit of studying.

Dr. William L. Rodman, of Medico-Chirurgical College, Philadelphia:

I was very much interested in Dr. Scane's paper. I happen to have been one of the Committee of One Hundred, referred to by Dr. Holland. Not only is the condition as bad as he says it is, but the president, in his address, called attention to the fact that you must give credit to the time that the student spends in preparing for a class exercise, as well as for the recitation. If you add that to the time scheduled, you will find that the condition Dr. Holland spoke of will be much worse than it now is. You will be requiring more than five thousand hours of the student. Therefore, it seems to me that the conclusion is an irrefutable one, that the condition can be met only by a five-year medical course.

As Dr. Welch stated, none of us believe in cramming. The student should be well taught. He should be sound in his learning. Our object is to make practical doctors. I, for one, believe that it cannot be done unless we have a compulsory five-year medical course.

A number of us have referred to the optional course. We were among the first to adopt a fifth optional year, four or five years ago, but it did not amount to anything. Only a limited number of students have taken it, because students will not take five years if they can get a diploma in four years.

It seems to me that Dr. Holland has outlined what should be done or what can best be done; that is, to have a required five-year course, the last year to be a clinical year. Nearly all the students can get a hospital position. The trouble with us is that we cannot get enough residents for our hospitals. If you cannot get a position for every student in a hospital, you can take them into the wards of some hospital and give them an entirely satisfactory clinical course.

It has also occurred to me that this five-year medical course could be so

arranged as to help men along in their subsequent career. Nearly always, by the time of graduation, a man decides whether he will be a general practitioner or a general surgeon or a specialist. Arrangements could easily be made in hospitals that if a man is going into special work he can be assigned to that work during his fifth year, rather than to take general service. I know that that plan works well in several hospitals in this country. It has been carried out in the Presbyterian Hospital in Chicago for many years, and the clinicians tell me they get very much better service from their internes.

It seems to me that we will be doing the best possible for the profession if we will require a five-year medical course. The time has come when the success and the credit and the good name of American medicine require the additional year.

Dr. Charles William Dabney, of University of Cincinnati:

I have taken more or less interest in medical education for twenty-one years, and during the past year I have been Acting Dean of a medical college. If you are going to make a good family doctor, you must have a good man to begin with. You must give him a good high school training and part of a college course. You cannot make a good doctor unless the man has a certain amount of culture and training and habits of close observation and power of thought along certain lines. The ordinary boy from the high school does not have this training. I do not see how you can make a good medical man out of such a boy, because the two or three years in college have given him laboratory training in the sciences of chemistry, physics and biology. I should like to have him take the better part of a B.A. or B.S. course.

I do not see that the five years is going to do it all, unless a man studies according to right methods, no matter whether it is in the university, in the medical school, or after he graduates. He must be given the opportunity, and facilities must be provided for him to digest knowledge.

The university medical college is the medical college of the future. If that is true, we ought to be able to give the man a little more than an ordinary B.S. course. While he is taking his training in the sciences and acquiring habits of observation, why should he not take biology, chemistry and physics, and some human anatomy or comparative anatomy? Why should he not study histology, some embryology and bacteriology? Those are good training subjects, and I do not see why the college cannot recognize that in a B.A. or B.S. course. The man preparing for medicine would have a good deal of his work done while he is still in the college course. The medical student of to-day has at least 30 or 40 per cent. more work to do than he should have, or than any other professional student has. I believe that they should do something during the vacation period. The medical student must not only get his laboratory and clinical training, but he ought to have practice.

It has been suggested that we ought to place the student in contact with

the patients much earlier than we do. It seems to me that during the preliminary course it would be eminently proper for the student to take work in pharmacies and in sanitariums. Why cannot we combine this practical work with the work in colleges?

Dr. Scane (closing):

It has been a great pleasure to hear so much discussion on this subject. The five-year course must be obligatory, not optional; otherwise it is left at four years. Dr. Welch's point to bring students in contact with patients early is well taken. The students should be taken into the hospitals no later than the third or even during the second year. We do this at the end of the second year. If it takes five years to make a general practitioner, and it takes more to make a good general practitioner, why not cut off the time devoted to the study of specialties? We should not endeavor to make specialists. We should confine ourselves to the training of general practitioners, and with that as a basis a man can easily develop into a specialist.

THE MEDICAL CURRICULUM.

By WILLIAM H. WELCH, M.D., LL.D., Johns Hopkins University, Baltimore.

One of the fundamental things is to inquire, What is the object of medical education? To make good doctors. There is no question that that should be the underlying conception in our schemes for medical education, and unless you can define a given course as bearing on that training, it has no place in the medical curriculum. If the training in physiology cannot be shown to be to make good doctors, it is not defensible. The same thing can be said of pathology or any other subject in the curriculum. The ultimate aim of medical education is to make good practitioners of medicine.

Another inquiry which confronts us at the start of any consideration of a medical curriculum is, What kind and what amount of knowledge can the student acquire during the four years of his medical education?

It has been stated, and accurately so, that it is impossible to impart the entire contents of medical and surgical science to the student. You cannot even impart the contents of any single subject in the curriculum. The most you can expect is to give to the student a fair knowledge of the principles of the fundamental subjects in medicine, and the power to use the instruments and the methods of his profession; the right attitude toward his patients and toward his fellow-members in the profession; above all, to put him in the position to carry on his education, because his education is only begun in the medical school, and therefore our aim should be to enable him to complete his education, which goes through all the remainder of his life. I think, therefore, that, with that point of view in mind, we cannot hope to teach the student the entire contents of the study of medicine. The student does not go out a trained practitioner, a trained pathologist, or a trained anatomist, or a surgeon. Looked at from the point of view of mere knowledge, he has only a smattering. The training of his powers and methods of study

is the important thing. He should be put in the position to continue his own education.

Then, again, after all, What is the curriculum? It is only a means to an end. It is the machinery, the system—very important, but you may have an admirable system and very poor results. On the other hand, you may have a bad system and results good out of all proportion to the character of the system. I think we are short-sighted to a certain extent in our criticisms of the old-fashioned medical schools. Considering the badness of the system, the results were good out of proportion to it. I was trained under that system myself. One could not sit under John Dalton without getting an education, an inspiration, a stimulus for the rest of one's life. It demands personality on the part of teachers to make a system of any value, so that we must not look on the medical curriculum as anything more than a method of attaining certain ends.

The tendency in late years has been to try to standardize the curriculum—some such expression is used—but I would not make that synonymous with fixing standards. Standardizing the curriculum designates what subjects should be contained in the urriculum and how many hours or periods should be devoted to each subject. I think there is a great danger in the efforts to undertake this work of standardizing the curriculum. In the first place, we are not in a position to-day to standardize our curriculum. If we attempt to do it, the implication is that we have reached something more or less final in methods of education. We ought to recognize that we are only in a transitional stage of medical education. I do think that there is a considerable danger in attempting to set up anything in the way of a rigid, uniform curriculum; in fact, I think it is nothing short of a calamity for State Boards of Health to undertake in their requirements for licensure to state in detail the standards of a curriculum. Medical colleges should protest against efforts of that kind. I think there is no real advantage to be gained from such standardizing. I am very hostile to all efforts to make uniform standards, rigid curricula, which will be applied to all our medical schools. This thought, of course, could be elaborated very much. But I hope it

does not require any elaborate arguments to make you sympathize with that point of view. This was the point of view which the Committee of the Council on Medical Education of the American Medical Association took in formulating their recommendations for a curriculum. They were finally led to offer their views as being merely suggestive. Of course, there is no objection to that. Indeed, they may be very useful, but I would not give them any further weight of authority than that of mere suggestion.

The question as to what shall be the content of the medical curriculum is an important one. I think the seven principal subjects still remain the backbone of medical education—anatomy, physiology, pharmacology, pathology, medicine, surgery, and obstetrics with gynecology, but with the growth of medical knowledge so many subjects have been added which it is desirable to have represented in the medical school that at least we should furnish opportunities to students to study these subjects. It seems to me that we must include, therefore, in the curriculum not only obligatory courses, but occasional or elective courses. Nothing is more attractive in the German universities than that almost everything in medicine can be studied there. You can have special courses in this subject or in that subject. Of course, it is beyond the possibilities for our average medical school to extend its curriculum so that it can take in all these subjects. The medical schools which are in a position to do so should have provision for training in all of the important subjects. Take, for instance, the subject of hygiene. It is impracticable to give all students thorough obligatory training in hygiene. He should have much more than he gets to-day. Hygiene should be far better represented in the curriculum of the medical school to-day. The same thing may be said of the various specialties. So that the contents of the medical curriculum, looked at as a combination of required and optional or elective courses, must be extensive and elastic.

I hope the time has come for nearly all the schools to exclude from the medical curriculum studies which should be preparatory to the study of medicine, such as general chemistry and

physics. They have no place in the medical curriculum. Where the requirements for admission are not such as to include proper training in general chemistry, I dare say it is still necessary that it be taught in the medical school, but everybody must regard that as an impediment, and aim to exclude from the curriculum general chemistry and physics.

It is also my belief that the curriculum should not be too crowded, that the student should not be over-burdened, so that he has no time for reading, for exercise, and for the digestion of knowledge. Efforts to crowd the curriculum beyond the proper capacity of the student are very objectionable.

As regards this matter of the elective or optional course, it has, of course, long been the custom to make the courses in the specialties come in the fourth year, and to make them more or less optional. At Johns Hopkins we have undertaken to extend this elective study throughout the four years of the course; that is, of course, based on the idea that there is a certain minimum for certain subjects which all students must acquire. That portion of the work is obligatory and in giving to any subject a certain number of hours the problem is the same—What is the irreducible minimum in that subject without which you would not let the student get his degree? Having fixed that, our effort has been to provide in that and other subjects a number of elective or optional courses. They are quite extensive and run through the entire four years. I think that, on the whole, the students find this satisfactory and profitable, and without developing that thought further I will simply say that that is a direction of improvement in the medical curriculum which is open to the endowed medical school. The other medical school must fix on an average curriculum which is adapted to their students. Its opportunities and resources may not permit it to go beyond that, but that does not represent the ideal, which is a much more elastic, comprehensive and fuller curriculum, in which there are certain courses which are obligatory and a large number which run through practically all the years of the course, which are optional. They can be designated as minor and major courses, and the student may be given the opportunity to take a major,

say, in ophthalmology or pediatrics. Another student may want only a minor in these subjects, and a major in some other subjects. There are only a small number of medical schools at present that can construct their curriculum according to these principles, but I present it to you for what I regard it to be—the ideal curriculum, one which includes required and optional courses, some of which are minor and some major.

We have been led to the adoption of the trimester system and the student can enter on his work at any one of these periods.

As regards the arrangement of the curriculum, the general consensus of opinion is that the so-called laboratory subjects—most inappropriately called the scientific subjects, because medicine and surgery are equally as scientific—should occupy the first two years, and the clinical courses the last two years. It is a question which may fairly be debated; it is still an open one, whether the student should not be brought into contact with patients at an earlier period than this, whether there should not be some sort of clinical training before this period? I think that the student should, in the second year, come into contact with patients. We are going to adjust our course, if possible, to this end, so that the student at the end of the second trimester of the second year be introduced into clinical methods, practically, through physical diagnosis. That would enable him during his long vacation to do some work in the dispensaries. It would be a very decided improvement. In France the student begins with clinical work—an old-fashioned way; he comes into contact immediately with patients.

It is an open question whether we have not gone a little far in segregating scientific work, on the one hand, and the clinical work on the other hand. Should not students be brought earlier into contact with patients? You must send them out to practise medicine. That is the fundamental idea.

The character of the curriculum will depend a good deal on the methods of teaching. Laboratory methods of teaching are extremely time-taking, and are applicable only for topics which admit readily of demonstration. The most creditable development in medical education in this country in the last two decades

has been along the extension of the laboratory side. Twenty years ago this was the weakest—to-day it is the strongest side of the curriculum. Relatively it may have become too dominant. The weaknesses are not there; they are on the clinical side. We have gone farther in the direction of laboratory study than they do on the other side of the water. I do not consider it advisable to give any more time than we are now doing to the laboratory method which, superior as it is, has its defects. You can in that way teach only those parts of the subject which are susceptible of demonstration in the laboratory. They are not the whole content of the subject. Take pathology, for instance; if all the student learned of it is what could be shown in the laboratory his knowledge would be fragmentary and lacking in perspective; he loses sight of the general principles. We must supplement that teaching to some extent by recitations, lectures, reading, and so forth, so that the student will have a broader and more comprehensive view of pathology. We cannot devote more time than we are devoting to-day to laboratory methods. We must improve the curriculum in the clinical departments. Tribute is due to the type of medical school coming out of the old-fashioned proprietary schools, without any resources except the fees of the students, which has raised its standards as far as opportunities and resources will permit.

Of course, the great need of our medical schools to-day is the proper relation to hospitals. It is certainly a most difficult thing to establish an entirely satisfactory relation between a medical school and a hospital, separately endowed, with independent management. If hospitals saw their interests, I think they would establish a closer relationship with the medical school. The ideal is for the school to have its own hospital, and that, I think, is the most urgent need of medical education to-day, so that students can study diseases at the bedside. This idea of having a rigid curriculum with fixed hours—how can it be made to apply where you assign a student to the study of certain patients, where they have free access to hospital wards at all hours of the day? That is the ideal. It is the best thing

for the student, but that work is not divisible into hours. I do not see how you can express in terms of hours that kind of training which is unquestionably the best of training. My plea is for a flexible curriculum, and not for a uniform, standardized, rigid curriculum, which you set forth as an ideal. I think it is a mistake to aim at that. My belief is that we have not reached that period of medical education in this country where it is possible. Of course, you will all agree with me that it is very important to have the medical curriculum so constructed as to do away with cramming. The impetus to that is the existence of examinations for hospital positions and for state licensure, and although some of that may be a necessary evil, the student ought to be made broadly interested and enthusiastic in his subject. That is the keynote, and if you can inspire the student with real interest, it will be easy for him to learn. That is the kind of spirit we should try to inculcate in our students. The drill-master system of marks and examinations is, to my mind, a very objectionable one, and every effort should be made to do away with it. Give as few examinations as possible and let these include practical tests of the student's power.

The state boards of examiners have had their influence on the character of the medical curriculum. We all feel that the establishment of these examinations has been of very great value to medical education. It has crowded the poorer schools to the wall, and has raised the standards of those that survived. At the same time, we must feel that the character of the examinations to-day is not one which is adapted to develop the best sort of a medical curriculum. Our efforts should be to give students knowledge and power, not simply to cram their minds with facts, and the state board examination does not bring out the essential quality because the examinations are not practical.

STATE BOARDS AND HIGH ENTRANCE REQUIREMENTS.

By HERBERT HARLAN, M.D., of Baltimore, President Maryland Board of Medical Examiners.

About a year ago I received in my office a delegation of three men from one of the southern counties of this state. The spokesman was a storekeeper, the others farmers. They were well enough dressed and looked prosperous. The geological survey map shows their neighborhood to be mostly salt or fresh water marshes. Roads are generally bad, and in the winter almost impassable. I knew something of the locality. The catching of muskrats, oysters and fish in the different seasons, and tilling whatever soil there is above tidewater are the occupations of the scattered inhabitants.

Their local doctor had received a political appointment and moved to the city. Their appeal to me was to allow an unlicensed man, who had failed in several state board examinations, to locate among them, at least temporarily. He had been practising there without registration and had given satisfaction. They said they had been unable to get anybody else. I happened to know that several physicians had visited the neighborhood and had declined to settle there, not on account of any lack of paying patients, but because of the isolation, of the absence of any refined and educated people with whom one could associate.

Since that time I have had a number of letters showing like conditions in other places.

The deans of the three medical schools in the city graduating the largest classes have each told me that such letters are common from laymen in rural districts asking that the graduating class be advised of the good opening for a doctor in their locality.

In general, there is a superabundance of doctors, one to, say, 600 people throughout this country, but there is a growing scarcity of men willing to settle down and live and raise their fami-

lies where all the people are plain, rough, uneducated, uninteresting, and for the most part in very moderate circumstances, some of them poor.

Four state boards now require that before an applicant can come before them he must have a diploma from a medical school which requires the equivalent of one year's college work preliminary to the beginning of medical studies. They are Connecticut, South Dakota, Colorado and Kansas. And three others, Indiana, Minnesota and North Dakota require two years in college.

Now, given a young man who has money enough to see him through such a medical course, that young man has been used to some of the comforts and conveniences. He has had at least the five or six years of town life, an occasional bath, etc., and is he likely to be willing to spend the rest of his life in such a region as I have described? I think not.

And how about the people of remote country districts? Are they to depend upon the patent medicines they can purchase at the smallest stores, and is all their obstetric practice to be done by a very poor class of midwives? There are a good many such people, and are we who do so much for humanity, and are proud of it, and somewhat inclined to boast about it—are we to give them no consideration?

We know how the standards of medical schools have been raised during the last 20 years. We know how low it still is in many schools. The chairman of the Council on Medical Education recently told us that 20 schools have been merged with others or have been discontinued, that there are still 140 left in the United States, and that half of these are not acceptable.

We know that state examining boards were established to make the bad schools improve or go out of business. We know that if there were only the right sort of medical schools there would be no occasion for any state examining boards.

We know that while examining boards are far from perfect, that they have done, are doing, and will do good and effective work. We know that there are and ought to be a few richly endowed medical schools taking high ground, admitting only

students who are well advanced and giving them every possible advantage, but we of the boards, and you gentlemen of this Association, are not concerned with these. It is those at the other end of the line that require our attention. Our duty is to fix and maintain the minimum standard of medical education. The maximum should have no limit.

We have seen standards of nurses' training schools raised, chiefly, it has seemed to me, along higher educational and particularly along social lines, until the R. N. ranks so high that another class, the practical nurse, has had to be found. Are we, perhaps, to be forced to provide for the licensing of practical doctors?

It is my opinion that no one thing will do as much to raise the standard of a medical school as a high entrance requirement. Yet it is also my opinion that the present one of a completed course in a good 4 years' high school is at this time sufficient, and that boards and associations, councils and committees on medical education will have full scope for all their energies if they devise an effective way to strictly enforce the present standards of entrance requirements. If is for this opinion that I ask your consideration.

DISCUSSION.

Dr. Augustus S. Downing (Education Department, State of New York):

In order that there may be no misunderstanding of what I shall say, let me state at the outset that I speak only as a representative of the Board of Regents of the State of New York. I represent our locality. Every man here must determine certain questions for himself and for the locality in which his school is located.

Lest in the heat of argument our language be misinterpreted, let me say that I believe in every institution having as high entrance requirements as may be possible in the state or in the community in which that institution is located. Personally and officially, I stand for the very highest educational requirements for the practice of any profession and every profession that is possible. I am not opposing advanced requirements for the study of medicine, whenever such advance is possible in any locality. On the contrary, I stand for the advancement of requirements in every locality; in New York, as well as anywhere else, wherever it is possible that such an advance can be made.

In discussing Dr. Harlan's paper, let me ask you to discriminate as to standards. There are two distinct standards: first, a local standard, which applies to the entire state; and, second, an institutional standard, which is applicable to the institution only. As far back as 1224, Frederick the Second, in establishing the medical college at Naples, laid down the fundamental principle, that for seven hundred years has governed all medical practice acts in Europe and in this country. This was that the state, for the benefit of the people, should control medicine and pharmacy; that there should be an educational requirement; that there should be an examination; that there should be an experience, because after graduation the student was obliged to study one year with a regularly practising physician, so that he acquired experience, and then local recommendation; that is, the registration by oath of the medical practitioner that he would live up to the tenets of his profession; that he would charge a reasonable fee where persons were able to pay for services, and that he would treat the poor people gratis. Those were governing rules and the ethics of the profession as laid down in the founding of the University of Naples, in 1224.

The question has been raised as to the value, the necessity, of the state board. Frederick laid down the principle that the government must control, that the institution cannot control because it is an interested party. If the institutions are allowed to control, they will set certain standards that will lead to the demoralization of the profession. Therefore, the state must control, and the result is our state board. The function of the state board is, first, as I see it, to interpret the statute. The people make the statutes and the medical colleges. If the medical colleges can influence the people, well and good. But the people in Senate and Assembly assembled shall determine what shall be the legal standard for the practice of medicine in that particular state.

Austria-Hungary has perhaps the best medical practice act in the world, but Hungary has had to recede from the Empire proposition, that the whole government shall lay down a law which shall be applicable to the whole Empire, and go to state control. It is likewise impossible in a government like ours, with a central national government, and forty-eight states that they will accept any ruling laid down by the central government with regard to the practice of medicine in any state. There will and must be local standards all over the country. We now have it a state matter, and we will always keep it a state matter. I do not believe that the time will come for a century at least when there can be a medical practice act, enacted by Congress, that shall be operative all over this country. Therefore, each medical board must first know its statute, and insist on the enforcement of that statute in its state. They must know the conditions that obtain among the people because they are the representatives of the people. At the same time, they must conserve the interests of the profession and they must have their finger on the pulse of the situation, so that, as the situation clears up, they may from time

to time advance the standards. That is a second function of the state board. You can by an examination as a state board make a school either strong or weak. A school will fall down to the level of the state examination unless it has a tremendous amount of moral stamina at the head and throughout the teaching force. It will surely fall down to the level of the examination which its students have to pass.

We have standardized our secondary schools in New York State. We grade them as junior, middle, senior and high. A junior school can do so much work and no more, because it has neither the equipment nor the force. It can do only one year of high school work. A middle school can do two years of work. The senior school does three years of work, and the high school four years of work. That is what all the states must come to. They must know what every secondary school in the state is worth as to its instruction. In New York we ask, What does the high school or the two years of college work mean? There are certain colleges in this country which grant an A.B. degree and yet we rate them as secondary schools. The man who comes from that college with an A.B. gets the same credit as the boy coming from one of our own high schools. When you say two years of college work or one year of college work, tell me the college from which the man comes, and I will tell you whether it is the equivalent of a secondary school education or not. There are several colleges, so-called, in this country whose degrees are granted after two years, on top of eight years of elementary school work, so that when we talk about standards we must know from what college the credits come. There are many one and two years of college work requirements in this country that are merely on paper. Wherever a locality can put up a standard, and wherever the law will bear it out, and wherever the condition of the institution will warrant it, by all means raise the standard. But remember, as members of this Association, that you cannot ask for a general rule in this country.

It is not fair to the medical college in this country to rate them as one, wo and three, because of the success which surrounds the institution in its particular community. In New York we require four years of high school training for admission, and we would be glad to see every college in the state go above that legal standard. When a school has the means and the power to do university work in medicine, it should do so. It should not be doing the same grade of work that the proprietary school is doing.

I think, moreover, that for a number of years to come the proprietary school is bound to adhere to the lowest requirements. Why? It has always been the history of medicine that the requirements have advanced from the thickly populated centers out into the less thickly populated districts. It has always been so. New York State is bound to hold to that minimum for some time to come, because it cannot get away from the great influx of people who reach this country through its port. We must have physicians who will cater to the physical needs and ailments of these immigrants.

As to the proportion of physicians to population, I have gathered together some data which are rather interesting and which, being based absolutely on statistics, contradict the statements recently made, that there are now more physicians *pro rata* to the population than there were fifty years ago. The ratio is about the same:

THE RATIO OF PHYSICIANS TO POPULATION, 1850 TO 1900, IN THE UNITED STATES AND IN NEW YORK STATE.

United States.

Year.	Population.	Physicians.	One physician for
1850	23,191,876	40,765	569 persons
1860	31,443,321	55,159	570 "
1870	38,558,371	62,448	617 "
1880	50,155,783	85,671	585 "
1890	62,622,250	104,805	598 "
1900	75,568,686	132,002	572 "

New York State.

Year.	Population.	Physicians.	One physician for
1850	3,097,394	5,060	612 persons
1860	3,880,735	6,235	621 "
1870	4,382,759	6,810	644 "
1880	5,082,759	9,272	548 "
1890	5,997,853	11,139	538 "
1900	7,268,894	12,895	564 "

So long as the standard of education is up to the legal standard, see to it that the men who are not prepared do not get into the profession. That is another function of the state board. One country alone sent seventeen men to our examinations for licensure, and every man was rejected. They were rejected because they could not understand what the questions meant in English.

In conclusion, there are therefore two standards—the legal standard, which is right for it is set by the state itself, and it should not be left to the boards to determine: a standard which is made by the Legislature and interpreted by the boards in the interest of the people and not in the interest of the institutions. Second, there is the standard of institutions. The legal standard should be made just as high as possible, as high as it will serve best the people's interests, while the institutional standard should be made as high as the institution can carry. When you determine standards, however, bear in mind that you must know just how the standard is administered and by whom, so that you can say definitely just what it is worth.

THE COLLEGE ASSOCIATION STANDARD.

By Abraham Flexner, New York.

The Association of American Medical Colleges is, if I understand its purpose aright, an organization formed for the purpose of elevating and maintaining the standards in medical education through the voluntary action of the medical colleges themselves. Its activities and purposes touch a variety of points, with only one of which I am to-day concerned. I propose briefly to discuss the standard for admission to medical colleges agreed on by the colleges which are parties to the Association of American Medical Colleges and to show how this standard is now working.

The rules of the College Association very properly state that the entrance standard agreed on shall be the minimum requirement for admission to the medical course. In the light of common practice in the medical colleges of the United States it is highly important to pause on the word "admission." An admission standard is required in order to insure a minimum degree of maturity and fitness prior to the student's beginning his medical education. It is supposed that a previous education of a certain type and extent will equip him with the necessary knowledge and will develop his faculties to the necessary point. I shall in a moment state the amount of education which is supposed to be required in order to bring about these conditions. The medical curriculum is constructed as to both its content and its arrangement upon the supposition that students who undertake to master it have enjoyed the education in question and therefore enter the medical school with a preliminary equipment of knowledge and power. If this supposition is to be made good, it is perfectly clear that the education in question, whatever it may be, must have been received prior to the beginning of the medical course. Its sole virtue depends upon its priority. Very properly, therefore, the rules of the Association emphasize in italics the word *admission*. The rules do not

say that a student must have procured the education in question before graduation or before registration by the state board or at some other point in the course of his medical career, because in those cases it would not have insured his fitness to *enter* the medical school. The educational value and propriety of the requirement depend wholly upon its preliminary character as guaranteeing the requisite degree of intelligence and seriousness and knowledge, at the moment when the student undertakes the difficult task of mastering in four years a modern medical curriculum.

Having now perhaps sufficiently emphasized the preliminary nature of the educational requirement, what of its contents? It is, I think, the manifest intention of Article III of the constitution of this Association that a four-year high school standard shall be upheld by its members. This standard is usually described by the colleges themselves as a four-year high school education or its equivalent. There is little difference of opinion between medical teachers that the four-year high school standard is probably as low as a school can safely go without greatly impairing the range and quality of its instruction. It has, as you know, been proposed in this Association and elsewhere to raise the minimum requirement. For the purposes of this paper it is not now necessary to enter into a discussion of that point. Our question is simply as to whether this Association actually enforces a high school standard. I allude to the problem of elevation simply by way of showing that the four-year high school standard is at best not altogether satisfactory; and that while many would argue against forcible elevation beyond that point, few would care publicly to maintain that a lower standard is feasible, permissible, or desirable.

I may therefore very safely state that the College Association, in the matter of entrance requirements, is committed to a standard that involves the definite completion of a preliminary education covering a four-year high school course or an actual equivalent thereof. There were in March, 1908, fifty members of the Association. About fifteen of these are operating on a standard from one to four years in advance of the

minimum requirement of the Association. They require from one to four years of college work for admission and, subject to a varying number of conditions, they are actually living up to their standards. There remain something like thirty-five institutions upon the minimum basis prescribed by the constitution of the Association. In general, these institutions are not now enforcing the standard to which this organization is pledged. Their requirements are not preliminary, and they do not as a rule represent a four-year high school education or its actual equivalent.

The rules themselves are no doubt partly responsible for their own defeat in the matter of a standard that is really preliminary. They permit admission with conditions amounting to not more than six points—that is, one-fifth of the entire requirement. A moment's reflection will show the unwisdom of such a concession. The first year in a medical school is an extremely arduous one. The young student is heavily taxed with both the amount and the difficulty of the work he has undertaken to do. He must be a fortunate and gifted youth who finds the first year easy; and yet it is precisely the student who, by reason of defective preliminary training, would naturally find the work hardest, that is allowed to increase his inevitable difficulties by working off one-fifth of the preliminary requirement during this already heavily overloaded first year. As a matter of fact, the conditions are not always worked off within the time set by the Association rules. Students not infrequently gain the additional credits needed year by year for several years. To the extent that this is permitted, the preliminary nature of the requirement is sacrificed. Nothing is preliminary that has not been achieved before the student crosses the threshold of the medical school.

Of the thirty-five schools under discussion few, and only a few, outside New York, where the Regent's certificate effectually safeguards the standard, actually manage to secure a uniform four-year high school matriculation basis, even waiving altogether the point that I have just made in the matter of its preliminary achievement. Undoubtedly, four-year high school

graduates are found in all these schools; so, by the way, are students who have had more or less college work. But the actual standard of any institution is the minimum basis upon which it is willing to admit students.

The enrolment of most of the thirty-five schools here in question is divisible into three different classes of students. The first class comprises those who graduate from accredited four-year high schools. The word "accredited" or "approved" is constantly used in medical schools quite without the definite meaning that actually attaches to those terms. An approved or accredited high school is one that has been officially recognized by some competent educational authority. In New England, for example, the approved or accredited high schools are those which are to be found upon the list of the New England College Entrance Certificate Board. In the Middle West, the approved or accredited high schools are those recognized by the North Central Association. In states that have developed state universities, the approved or accredited high schools are those which have been found capable of giving the education required by the state university for admission, a list of which is to be found in the office of the university itself. No high school that does not find a place upon some such list is an accredited or approved high school; and no medical school that is a member of the Association of American Medical Colleges can, without violation of Article III, Section 1*b*, accept a diploma representing a four-year high school education that does not come from a high school stamped as accredited or approved in the way which I have described. The thirty-five schools under discussion contain, all of them, a certain proportion of students from actual accredited or approved high schools; and in so far as they do, their enrolment represents an actual four-year high school standard.

The second class is composed of those who enter by examination. It is the theory of the Association requirement that the examination represents an achievement practically equal to that represented by the diploma from an accredited high school. I believe that I am well within the facts when I state that no medical school which admits students by examinations held under

its own auspices or by examiners designated by the state board or by the state superintendent actually enforces a four-year high school standard. There is, of course, considerable variation. I am omitting medical schools which, as organic parts of universities, admit students only by examinations conducted by the academic authorities. I am for the time being speaking only of those schools which hold separate examinations or which accept certificates issued by outside examiners who hold the examinations in question; and it is of these institutions that I say, that so far as I have been able to discover, none of them actually reaches a four-year high school level. The examinations held, for example, in the State of Ohio, have not thus far even attempted to cover a four-year high school period, though I am assured by the examiner that a step toward this end will be taken in the coming fall. The examinations held under the auspices of the State Board of Michigan come nearer a four-year high school standard, in consequence of which they are taken by very few candidates. Those held in Kentucky represent something like two or three years of a high school course, at the outside. In several states—Illinois and Maryland, for example—the written examination provided for by the College Association rules has been transformed into an informal confabulation between a single student and the examiner—appointed in Illinois by the State Superintendent of Education, in Maryland by the coöperative action of the schools. The functionary in question has an informal interview with the candidate, who comes before him not prior to his matriculation nor at the beginning of the actual study of medicine, but at any time he pleases, bringing with him such evidence as he may have as to the extent of his education and replying with such cleverness as he may possess to random questions on a dozen different topics, fired at him in the course of the interview. The interview may last thirty minutes; it may last two hours. At its conclusion the student may find himself accepted without condition, rejected without condition, or admitted with conditions of one sort or another which he will subsequently remove in a similarly informal fashion. He may even be conditioned in one

subject and remove it by making a stab at another. The same sort of performance is witnessed in Missouri, and is there taken to satisfy the examination requirements of the College Association. In Nebraska and in the District of Columbia, the procedure is slightly different. Here the college may refer applicants with their credentials to a preparatory department, where defective candidates are brought up in this subject or in that. Subsequently these candidates report at the medical college with certificates that give them a clean bill of health. One school refers candidates to a teacher connected with a local preparatory school, who, after determining the student's deficiencies, acts as his tutor and shortly after issues a certificate which is accepted in satisfaction of the requirements. In its actual operation, therefore, the examination method described in paragraph *c* and the certificate method described in section *d* run into each other; for if the student is found defective in an informal examination and his defect is cured subsequently by a certificate from the same authority that found him defective, it is clear that it is impossible to draw the line between the two methods in question. In so far, moreover, as certificates from different instructors are accepted, the four-year high school standard is still further sacrificed.

Not all institutions, by any means, deal in these miscellaneous certificates. The stronger schools deal with diplomas and examinations; but the high school diplomas accepted are by no means limited to the accredited list, and the examinations, as I have pointed out, practically never cover the four-year high school curriculum. In one school, for example, with a Freshman enrolment of something like 150, only little more than half come from actually accredited or approved high schools. Of the remainder, some are graduates of non-accredited high schools, admitted on diploma; others are non-graduates, admitted without diploma; still others had passed not less than three out of six subjects, representing altogether less than two years of a high school course. The weakest showing is made by the certificates from reputable instructors accepted in lieu of some board examinations. In the first place,

these certificates are not necessarily acquired prior to entering the medical school; in the second place, it is impossible for any one to know their actual value. In so far as these certificates, whether from instructors or from county superintendents, are accepted, the entrance requirements are simply nominal. They are in common use in Maryland, Illinois, Missouri and Tennessee, and are, from the standpoint of a genuine entrance requirement, absolutely valueless.

It is clear, I think, from the foregoing recital that the minimum standard of colleges that belong to this Association is not necessarily a four-year high school education or its academic and actual equivalent. Nor do I believe that anything like such a standard can be enforced so long as the College Association rules are in their present shape. If the College Association, however, wants to draw the line at the four-year high school and to admit to its membership only institutions that enforce a four-year high school requirement or better, it will be necessary to devise a very different form of machinery than it now uses. The question involved is a question in secondary education, and no one but an expert in secondary education can pass upon it. So long as the enforcement of an entrance requirement of this nature is left either to the deans of medical schools or to officials appointed by the schools or by the state boards, chaos will continue. I do not charge that any one has been insincere in this matter. I have not undertaken to impugn any one's motives. I am dealing objectively with the situation as it is. The colleges have not, in most cases, enforced their professed standards and they lack the machinery with which to enforce them. The question which naturally comes up in passing upon these credentials are questions which are answered every day in the week in the registration office of every well-conducted academic institution. There are in these offices the data upon which to pass intelligent judgment and action, and there are competent individuals whose entire time is given to the settlement of just these problems. If the College Association wishes to enforce a four-year high school standard, it must in some way make a connection with the institu-

tions that are thus capable of handling the matter intelligently. It would, I think, be easily possible to throw the entire question into their hands without prejudice to the interests of any medical school that wishes actually to enforce the standard. Let us for a moment suppose that the College Association took the ground that credentials, to be acceptable, must emanate from the academic department of the institution to which the medical school belonged, or from the state university, or from an institution belonging to the Association of American Universities. Here are several definite ways of evaluating a certificate or of holding an examination. An academic institution capable of meeting one or the other of these conditions and therefore capable of acting in the capacity of reviewing authority is to be found in every state in the Union except Rhode Island, and in Rhode Island there is no medical school to be influenced by our decision one way or the other. In order, however, to be really effective, we must get the state boards behind the College Association. For the enforcement of a respectable educational preliminary, that is really preliminary, as part of the practise requirement, will strengthen the hands of the schools and make it easier for them to be virtuous. And though virtue for its own sake is a fine thing, it is a wise man who fortifies his own virtue by not forgetting the policeman. The Association may therefore fairly ask the state boards to agree on a definite policy. In several states the laws already countenance such coöperation. These boards should, in every state, delegate the function of evaluating entrance credentials to a competently organized institution of learning. In many states, the state university could very properly perform this duty; elsewhere, an equally suitable arrangement could be made with an endowed institution. Whatever the standard fixed, it would thus be intelligently enforced. The school catalogues would then announce that no student could be matriculated whose credentials were not filed within ten days of the opening of the session, and that no M.D. degree could be conferred until at least four years subsequent to complete satisfaction of the preliminary requirement. The credentials, sent at once to the secretary of the state board, would be by him turned over to the registrar

of the state or other university, whose verdict would be final. A state that desired to enforce a four-year high school requirement could specify as satisfying its requirements:

(1) Certificate of admission to a state university requiring a four-year high school education.

(2) Certificate of admission to any institution that is a member of the Association of American Universities.

(3) Certificate of the Regents of the University of the State of New York.

(4) Certificates issued by the College Entrance Examination Board for 14 points.

In exchange for such credentials or for high school diplomas acceptable to the academic authorities acting for the state board, a medical student certificate would be issued; in default thereof, the student must by examination earn one of the aforesaid credentials, in its turn to be made the basis of his medical student certificate. In the southern states, the legal minimum would be necessarily below the four-year high school standard; in Minnesota, above it. But the same sort of machinery would work everywhere. The schools would have nothing to do with it except to keep systematically registered the name of the student and the number of his certificate; the state board or the university acting for it would keep everything else open to inspection.

This is substantially what takes place in New York, where the State Education Department superintends the process. What is wanted in other states is an agency similarly qualified. For the present, nothing can so well perform the office within a given state as its state university, or, in default thereof, the best of its endowed institutions. This suggestion is perfectly fair to all institutions, for the credentials would pass through the hands of the state board to the reviewing authority without information as to the purpose of the applicant. The directions required would take up less space in the medical school catalogues than the complicated details they now contain. It should be further provided that the original credentials of every student be kept on file in the office of the state board or of the appointed university

and that they shall be open to inspection, without notice, by properly accredited representatives of medical and educational organizations.

For my own part, I am persuaded that at present the College Association would be unwise to raise its standards, not because higher standards are not desirable, but because the College Association has just now another work to do. Particular institutions may in that matter do as they please. They deserve to be encouraged to go ahead. So do the states which, like Minnesota and Indiana, are leading the way to better things. But the general situation now needs order, organization, and real values more than anything else; and it is with the general situation that this Association is called on to deal. I believe it to be the plain duty of every medical school that wants to do right, whatever the consequences to its own fortune, to enter this Association and to aid it; not first to force a higher apex while leaving the general confusion only worse confounded, but to secure legally and educationally the actual four-year high school standard as a basis from which genuine and general progress can be made. Harvard and Minnesota and Rush and Pennsylvania and Johns Hopkins abandon nothing when they thus associate themselves in this membership for the sake of safeguarding the foundation. For until an actual high school basis is everywhere enforced, higher standards may characterize this institution or that state, but the general level—well, there will be no general level. We shall continue substantially as we now are, with the bottom in many places just about as low as it has ever been; and with the not unfamiliar spectacle of schools that announce the requirement of a year or two of college work without actually getting as much as a four-year high school education. The precondition to a general and substantial upward movement is security and sincerity as the foundation which, in theory, all accept. The task to which, in my judgment, the College Association should address itself is to secure and to enforce as really preliminary to admission to any medical school, the possession of an actual four-year high school education.

DISCUSSION.

Dr. W. J. Means (Starling-Ohio Medical College):

We are under many obligations to Mr. Flexner for the exposition of the weaknesses, if we may call them such, of the Association entrance requirements. I have no apologies to make for my own State. We have a legal requirement which is enforced by the state medical board. I presume Mr. Flexner got his information from the examiner. When the law was first put in force there were quite a number of examinations to be made, and we had an examiner in Cincinnati, one in Columbus and one in Cleveland. We soon learned that this brought about trouble, so that now there is only one examiner in the state. In fact, the applications for examination are now few in number, probably not over half a dozen each year. We enforce the high school standard absolutely, because it is the basis of entrance to our State University. Mr. Flexner knows that the standard is all right, and that it is simply the method of examination that may be wrong.

We had a large number of young men who were school teachers, men who had taken their education in the normal schools. They were strong young men and they wanted to study medicine. They came before the examiner. We all know that the high schools have some frills that add very little to the strength and character of the medical student. These young men were examined. They were not up in the two years of Latin, and the examination was made on a less number of points than was required in the high school. That has gradually gone out of existence, and I believe that our examiner will this fall conduct an examination that will in every way be the equivalent of the four-year high school requirement.

We have been fighting about our standard for some time, but it was a legal standard and therefore the conditions were permitted to go on.

I believe that this Association should not adjourn the present meeting until a resolution is passed favoring the adoption of an absolute four-year high school requirement for all colleges. The matter should be put in the hands of a committee, who should be instructed to look into it carefully and thoroughly, and, if possible, present a resolution at the next meeting that may be adopted as a constitutional amendment.

Dr. Augustus S. Downing (New York Education Department):

It is a feasible and easy thing for this Association to do. Take it in Delaware. We wanted to enter into reciprocity with Delaware. The first thing we tried to learn was whether the secondary schools of Delaware are of the same grade as the secondary schools in New York. That is the only condition in our law on which we can reciprocate. We wrote to the State College of Delaware and asked the president whether he would certify absolutely to a four-year high school course in the case of men coming

from Delaware. We send every credential from Delaware to the president of the State University and ask him to vouch for it. When he returns the credentials with his endorsement we accept it. That is the end of it. You must have a man in every state with a reputation who will not falsify when he signs his name to a certificate; his certificate that the school is of high school grade and that the student presenting the credentials graduated from such a school after four years of study therein. As conclusive, such procedure as this will determine the standard of every secondary school in any state. This can be done, and under existing circumstances is the only way in which it can be done.

TEACHING OPHTHALMOLOGY.

By Albert Rufus Baker, M.D., Cleveland, O.

In the rapid evolution of our medical colleges during the past two or three decades, we seem to have almost lost sight of the real excuse for our existence, that is, the making of doctors of medicine. We have been making learned anatomists, physiologists, chemists, bacteriologists, embryologists, histologists, pathologists, pharmacologists, indeed almost every kind of ologists, but the one thing we are supposed to be doing—that is, making doctors to cure sick folk—we are not doing. I will challenge any one who is old enough to know to say that the graduate of thirty or more years ago, who had his medical training mostly in a preceptor's office, was not better prepared to treat sick people than the highly educated recent graduate of our best medical schools to-day.

In the early years of my practice it was customary to say that the reason people went to quacks was because of lack of educated doctors, but now we have educated doctors and the people go to quacks and laymen more than ever. In the language of the late, lamented, Artemas Ward—"Why is thus, thusly?" When people are sick they do not stop to inquire whether the doctor has a knowledge of Latin and Greek, whether he has been sufficiently grounded in the higher mathematics, and how wide an acquaintance he has with all the ologies. They employ the doctor to relieve the pain, to make them well, and there is not much more sentiment about it than there is about employing the butcher or the baker. If the layman can cure the patient as well, or even better, than the doctor, the sick soon know it and I don't think we doctors have any right to object to their going where they can get the best service.

These preliminary remarks are applicable to nearly every department of medicine but are especially pertinent at the present time to ophthalmology. The eye doctor is fast coming to have the same relation to the general practice of medicine that the

dentist did forty or fifty years ago. The dentists being out of touch with the general profession, separated and established their own schools. While there have been some advantages, yet I think it would have been better if the dentists had continued to have been a part of the medical profession. There are many sins of omission and commission practised by dentists that would not be tolerated by the medical profession. And the end is not yet.

If there is to be no separation of the ophthalmologists from the general profession then there must be better and more adequate teaching of ophthalmology in our schools. The Council on Medical Education of the American Medical Association recently recommended that out of a total of 4,478, fifty should be devoted to the teaching of the diseases of the eye. Think of it; fifty hours to the entire study of ophthalmology, the most important special department of medicine! Is it any wonder that a layman who has taken a six weeks' course in eye diseases knows more about fitting glasses than the average doctor? Is it any wonder that a third of the all blind continue to be the result of ophthalmia neonatorum, a needless sacrifice to the ignorance of physicians?

If I were to say that one-tenth of a medical student's time should be devoted to the study of the eye and its diseases I would not be overstating the importance of the subject, and yet we have so lost sight of the relative proportion of things that if I should request of my faculty 500 hours for teaching ophthalmology I would be laughed out of court. But because this reasonable request would not even be seriously considered is an evidence that there is something wrong with our medical curriculum.

Before suggesting a remedy it will be necessary to make a diagnosis—I fear not an altogether pleasant task. If I were to decide whose fault it is that ophthalmology is not better taught, I would say the teacher. The average teacher of eye diseases has been contented to make a few cataract extractions before the entire class, to exhibit a few patients with obscure diseases of the eye, and point out the difficulties of diagnosis. His didac-

tic lectures were mainly devoted to teaching the student not to meddle in eye diseases but send them to the specialists, and then, as did an old teacher of mine, fold his arms, inflate his chest, and blow through his whiskers, "be damned careful what specialists you send them to." I am glad that kind of a teacher has about had his day, but the amount of knowledge of eye diseases imparted to the medical student of to-day is little better.

The average professor of ophthalmology has been so glad to get the title of professor that he has been quite content to pick up a few crumbs that the other chairs begrudgingly gave him, and when the Council of the American Medical Association proposed to cut his already meagre allowance down to 50 hours I do not hear a single protest. If there is to be a reform in this matter it will not come from the college professor. His is too snug a position to do much kicking, which is liable to land him outside the walls to make room for a more pliant teacher. When I was a medical student, medical colleges had a professor of odontology. Where is he now? It requires no prophet to see that a professor of ophthalmology may soon be a thing of the past if present tendencies are permitted to continue.

But there are still other considerations. In the olden time the professor of surgery was about the only one to profit by his medical college connection, consequently he loomed large and generally dictated the policy of the school. But in these modern days of endowed schools and medical departments of state universities it is the laboratory men that receive all the salaries and reap nearly all the benefits of the medical college connection! Consequently they are on the job all the time, they dictate the policy of the school, make and unmake professors, and it is largely through their influence that medical colleges are fast ceasing to be places to teach medicine but are becoming great institutions for teaching all the ologies which may or may not have a relationship to the art of medicine. These laboratory teachers, many of whom have never had a medical education, much less any experience in the practice of medicine, but whose bread and butter comes from their teaching alone. The more prominent they make their department the more hours—the

more hours the more pay—and thus crowd out the teachers of real medicine. And as the teacher of practical medicine gets no pay and has to earn his living he is often willing to give up time to a laboratory man that he ought not.

The trouble with our medical teaching is that we are teaching horizontally and not perpendicularly. We give the student a layer of anatomy, of physiology, of chemistry, of pathology without any reference to what goes before or what comes after. He has no perspective. His chemistry or physiology is complete in itself and in the student's mind has little more to do with the practice of medicine as taught than would astronomy or geology.

We would make better doctors if we followed the example of our old preceptors and showed our students patients the first day they commenced the study of medicine. Show a Freshman a typhoid patient and when he examines his urine, his chemistry will mean something. His temperature chart and pulse rate, his blood tension and count will all have more than academic interest and the autopsy and pathologic findings will awaken such enthusiasm that our medical students will again lose all interest in football, mandolin and glee clubs, secret societies, and all the various time-consuming expedients of the undergraduate schools.

The remedy, then, is to teach the anatomy, histology and embryology of the eye to the Freshman and I know of nothing more interesting if taught by an ophthalmologist, but so far as my observation has gone, the time is simply wasted, there is no good reason why even these Freshmen should not see eye patients; refraction cases are abundant and would lend zest to the study of physiology in the Sophomore year. Sophomore students should be thoroughly grounded in physiologic optics. I know of no subject better for a culture study, and if we are going to insist upon some additional physics before entrance in the medical school why not this? But in any event the student should be made familiar with accommodation and refraction. The numbering and properties of lenses, they should be taught to neutralize them, they should be required to use the ophthalmoscope and retinoscope on the schematic eye. They should also be re-

quired to make tests for color perception, measure fields of vision with the perimeter, and should become familiar with the ophthalmometer; and above all they should be assigned to the dispensary in small classes. Then when they come up to their Junior and Senior years the professor of ophthalmology will not be obliged to spend two-thirds of his time teaching these elementary subjects as he does now.

I think I can best present my thoughts as to the best way of teaching Junior and Senior students by detailing briefly the method pursued for the last twenty years in the Cleveland College of Physicians and Surgeons. Junior and Senior students are divided into classes of five or six each. They are required to spend one hour daily from four to six weeks in the dispensary. One student is required to take a record, make brief notes of the history and record the ophthalmoscopic and refraction findings; in other words, the charge of the case records which are kept on card indices. Another student is assigned to make local applications to the lids. Syringing the lachrymal sac, instilling mydriatics and making such minor operations as opening chalazia, etc. Two or more are sent into the dark room to make ophthalmoscopic and retinoscopic examinations, and as soon as they have completed these examinations they are required to use the trial case and test lenses for each patient. The students do all the work, the instructor simply directing them, and he can easily take care of five or six or even more at one time, if necessary. At the end of five or six weeks daily instructions of this kind, I would rather trust myself, or my patients, to be examined for spectacles by any one of these students than by the best spectacle peddler, optician, or optometrist I ever heard of. Each student is obliged, as a part of his work, to make a sketch of the fundus of the eye, and I am usually surprised at the facility with which the medical student of to-day makes them. In addition to this daily dispensary work, our Senior students are given one hour a week throughout the year, which is about equally divided between clinical and didactic lectures, quizzes, and written tests.

They are also assigned to hospitals in small groups of five or

six each, for three months, the same as to the dispensary, for one hour a week, witnessing and assisting in operations. Thus it will be seen we give our students about 72 hours in the dispensary, about 32 hours in didactic and clinical lectures, and 12 hours in hospital service, making 116 hours altogether. This is sufficient time to prepare students to meet the requirements of the Michigan State Board, which, as you know, exacts a practical test with the ophthalmoscope and trial lenses. If our students come up to the Senior year with the preparation they ought to have, it would be sufficient to prepare them for any reasonable test. All of our graduates can use the ophthalmoscope and can do simple refraction, many of them buy trial cases and numbers of them have written letters thanking me for advising them to do so, and I am sure none of them refer their patients to opticians to have their glasses fitted. If all medical schools did the same there would be no need for optometric legislation. The family doctor would do all the work.

THE ECONOMIC VALUE OF FAMILY PHYSICIAN REFRACTING.

By LEARTUS CONNOR; A.M., M.D., Detroit Mich.

Family physicians, as a class, lack a working knowledge of simple refraction. The wisdom of this condition is questioned, and the suggestion made that they be qualified to readily do the work now in the hands of opticians. It is urged that refracting is a part of medicine and should be practised by medical men only; that simple refraction can be mastered by medical students and practiced by family physicians, without disturbing the balance of other studies or practice, and abundant proof exists that this is actually done by many family physicians. It is admitted that most medical colleges fail to teach a working knowledge of simple refraction, so that its mastery compels the student to train himself or secure other teachers, but as some have surmounted these obstacles, others can also if so minded. Further, it is believed that the medical colleges would gladly supply this training if they realized its necessity in enabling their graduates to secure a state license and meet the needs of the people.

With this situation before them, the boards of registration in Michigan, Utah, Vermont, Nebraska, have decided that the people's interests call for physicians who are able to manage simple refractive troubles. Hence they have notified medical colleges that hereafter a working knowledge of simple refraction will be a condition for granting a license. These boards hold that while a family doctor may not do major surgery, he must be qualified for minor surgery; in a like manner, while he may not do complicated refraction, he must be qualified to do simple refraction. It is the same principle that guides all their examinations; expert knowledge is not exacted in any branch, but family physician working knowledge in every branch. (It is hoped that soon each specialist will be examined both in his "family physician" and "specialist" qualifications.)

Since the question is new, reversing past professional practice, it merits careful study. Hence attention is directed to some considerations in the economic value of the family physician refracting. In general this aims to accomplish two objects, first, the best vision, and second, relief from eye stain disabilities. As a fact many hyperopes, myopes, and presbyopes are made comfortable and given excellent vision by spheric lenses, but if these fail and the physician is unskilled in using cylinders and prisms, then the case naturally goes to the ophthalmologist. Thus is evident the natural dividing line between "family physician" and "expert" refraction. The first does all he can, while attending to his other studies and practice; the second carries the management of any particular case to the limit of existing knowledge and technique. We shall seek to estimate the economic value of family physician refracting from the following standpoints; our estimate may be too high or too low at any particular point, as necessarily exact data are lacking, but our contention is that such refracting has a positive value, reserving for future studies to settle its definite amount.

First. The economic value of a working knowledge of simple refraction to the *family doctor.*

The American Medical Directory gives the number of physicians in the United States as one hundred and thirty-five thousand, three hundred and seventeen. We shall assume that one hundred thousand of these are family physicians and the rest specialists of divers sorts. If these one hundred thousand acquired a working knowledge of simple refraction, each could touch his patients with a new power. How many patients needing refracting, would come to each doctor, we can only estimate from known facts. Of the many family physicians, practicing simple refraction, the writer has exact knowledge in the eye work of two. Both are middle aged, live in small towns, mastered by themselves simple refraction about a year and a half since, and their records show that during the first year of their new practice they averaged one new eye patient per week. Later they did better, but for our purpose we assume that the entire one hundred thousand doctors would make a like record.

Granting that to each patient was given improved vision, and less discomfort, the doctor has made either new friends or more closely cemented old ones. Multiply these fifty-two patients by one hundred thousand, and there appears yearly five million two hundred thousand new friends for the profession, an asset of no mean proportions.

Farther, each doctor has made fifty-two new clinical studies, each quickening his powers of observation and correct reasoning; his deftness in handling patients and improving his technique. He feels a mental uplift from his new power, in serving patients, so that obstacles merely drive to a re-study of books and cases; and thus simple refracting develops many faculties, otherwise dormant. Multiply this individual development by one hundred thousand and we have another factor in the economic value of simple refraction.

Financially, the family doctor receives fees from fifty-two more patients yearly. Cases calling for cyclopegia would exact several visits; others would need one or more treatments, so that it is fair to assume that five dollars would be a minimum average fee; or for each doctor two hundred and sixty dollars yearly. Multiply this by one hundred thousand and we have a total of twenty-six millions of dollars as the economic value of simple refraction, to the profession of the United States during a single year.

Second. The economic value of family physician refraction to the ophthalmologist.

Assuming that every family physician refracts all the hyperopes, myopes and presbyopes in his families, it follows that the habit leading to their detection will insure a close study of the eye symptoms in every other patient. This habit will enable him to detect some cases calling for a skill in diagnosis and intricate technique in management, only possessed by the ophthalmologist, then realizing that his standing with his families depends on the outcome of each case, he seeks the aid of an expert. In this way the family refractionist is always on the watch for cases, some of which only the ophthalmologist can manage, and so is his natural ally—connecting him with the people. In the past

the ophthalmologist has been hampered by family physician ignorance of simple refraction preventing his recognition of grave eye cases at the stage when treatment was most effective. Unable to understand the ophthalmologist, he refuses to listen to his papers at medical society meetings, consorts with opticians, aiding them to steal special medical privileges through state legislature. If family physicians had a working knowledge of simple refraction, it would form a point of contact with ophthalmologists, and render mutual discussion thereof both pleasant and profitable. Each would learn to respect the other's capacity to manage cases, the simple ones be referred to the family doctor and the complicated to the ophthalmologist; so centering about simple refraction, all eye cases would be managed by educated physicians, and none left for opticians. The ophthalmologist has everything to gain by encouraging family physicians to qualify for doing simple refraction.

Third. Economic value of family physician refracting to the *organized profession.*

Modern conditions have made organization essential to medical prosperity. Organization will be strongest when every individual has some common working knowledge of each branch in medicine. When the mass loses such working knowledge, of any branch, then the branch drops off (as is the case with dentistry) and organization is by so much the weaker. Family physician refraction is the only bond by which organization can hope to retain the full power of ophthalmology. It can create between ophthalmologist and family doctor a common interest, in papers at societies, in the problems of hospital service, medical education, medical legislation, and unite on a common policy at the countless points where the organized profession should touch the world's pulsating life. Family physician refraction is a condition essential to most effective medical organization.

Fourth. The economic value of family physician refracting to the *victims of eye troubles.*

These victims are everywhere, and unless their condition be promptly recognized and wisely managed, more or less irrepara-

ble damage ensues. Their loss of time, comfort and efficiency in the sturggles of life can be minimized only as the watch-dog family physician is trained for their detection. The following observation is suggestive: Some time since, when traveling in the West, the writer was asked to examine the colonel of a United States regiment, because of his growing blindness. This was so extreme that a fifty-foot flag could not be seen at an elevation of one hundred feet. For weeks his sight had been so bad that his wife was compelled to make out his reports. The army post was in charge of a medical officer accomplished in all else except simple refraction. In the post equipment was found only an old Lebreich ophthalmoscope, no atropin, no homatropin, or even cocain. A solid extract of belladonna was found, the pupil dilated, and by the archaic ophthalmoscope an albuminuric neuroretinitis was observed. Inquiry revealed that he had been compelled to rise frequently at night to pass urine. This was found loaded with albumin and casts. In spite of the utmost haste to place him under rational management, the colonel suffered many severe convulsions ere it was accomplished. It is clear that had the post medical officer been trained in a working knowledge of simple refraction, he would have investigated the beginning failure of vision, detecting its cause, and given the distinguished officer a better chance for regaining sight and retaining vigor. Armed with a working knowledge of simple refraction, the family physician could detect cases allied to this and give them that prompt and rational treatment essential to best results.

That eye-strain may disturb cerebration, produce headache, irritability, indigestion and otherwise interfere with normal activities is admitted. That this interference may, and often does, occasion failure in business, in social life, sometimes disrupt happy homes, emphasizes the economic loss from lack of family physician refraction. The loss spreads from the sufferers to their families, business associates, neighbors, just as the ripples in ever-widening circles from a pebble thrown into a lake. Business failures, divorces, misery, vice and crime of many varieties have been precipitated or aggravated by unrecognized

eye-strain operating in unstable persons, all of which could have been checked if not prevented by the general operation of family physician refracting. The great transportation companies have grown to appreciate the economic value of good vision, and insist upon it in every employe as actually determined by an expert. Experience has taught them that defective vision led to the mistaking of signals, train orders, the condition of switches and numerous other operations necessary for the safe operation of boats or trains. Unquestionably similar mistakes occur in private business—only to be safeguarded by family physicain refraction.

That the schools are greatly crippled by the defective eyes of both teachers and pupils is widely recognized. Various methods have been suggested for correcting these defects, as examinations by teachers, or medical examiners, but their lack of knowledge and limited time mar the results. The real remedy is family physician refraction, through which the little folks would be assured by their own doctor that they were able to safely do the work of the schools.

Fifth. The economic value of family physician refraction to the *art of ophthalmology.*

It will be granted that, were every eye case handled by educated physicians, ophthalmology would be profited more than if half of the cases were in the hands of laymen. Were family physician refracting universal, it is certain that some would make observations of value; and the early transference of complicated cases to experts would increase the latter's contributions to ophthalmology. It must not be overlooked that all earlier ophthalmology was contributed by family physicians, as there were no specialists, and that the same quality of "thinking machines" are as likely to produce desirable results now as then. But our present arrangements absolutely bar any possible contribution from family doctors to ophthalmology; family physician refraction would remove such bar and multiply the workers, in this field. Farther, relieved of an excess of simple cases, and given an abundance of complicated ones in their incipiency, accompanied by an intelligent history from

the family physician, the ophthalmologist would have a better chance to make important contributions to his art.

Sixth. The economic value of family physician refracting to *general practice.*

Since a working knowledge of simple refraction compels the family physician to study the eye symptoms in every case, he becomes increasingly deft in noting their variations, tracing their origin, utilizing them for more accurate diagnosis, prognosis and treatment. Thus, finding a young man with frontal headache, injected conjunctiva, red edges to the lids, corrugated brows, he may benumb the sensitive nerves with a narcotic or trace the headache to its source; if the former, the headache reappears under similar conditions and the patient is in danger of becoming a dope fiend. If the physician has a working knowledge of refraction he will farther inquire as to the relation of the headaches to use of the eyes, and finding them in close relation thereto, he will examine the refraction, before, under and after a cycloplegic. Finding the discomfort vanish under cycloplegia, and remain so by the use of a plus simple sphere, he orders the same for constant use and permanently relieves his patients. In other cases, obstinate vomiting, constipation, indigestion, obscure abdominal pains, malaise and allied symptoms are traced to the same source and cured by the family physician refractionist. Lately, Thayer has shown that cases of nephritis may be detected frequently by extra ocular symptoms long ere fundus changes are present—the family physician's habit of studying eyes in cases of refraction is the method by which the largest returns can be thus secured. Neurologists are most earnest in seeking aid from refraction in unraveling their cases. In a long list of morbid conditions the eye symptoms are prominent, if not absolutely essential for diagnosis; family physician refraction would enable the doctor to detect not a few of these early in their development, and so contribute to the unraveling of many puzzling cases. A distinguished neurologist, as the writer was seeking to interest him in promoting family physician refraction, related the following personal experience: While waiting for patients, on be-

ginning his practice, he got the idea that simple refraction would promote his success. So he took up an ancient volume of Noyes on the eye and mastered its teaching on refraction. He then purchased a second-hand case of trial lenses and began work with his first presbyopic patient. This ending successfully, he got another and another, until it was easy for him to manage the cases of simple refraction. This practice he continued until press of other work compelled its limitation; but he still continues to review the work of specialists, to the advantage of his patients, and his own reputation. His experience harmonizes with that of other physicians, masters of simple refraction—it always brings economic advantage. Lack of space forbids presenting the personal evidence of more than one physician on the economic value of simple refraction. In answer to the query "what economic value simple refraction had been to him" he said: "On October 17th, 1908, I wrote my first prescription for glasses. Since then, to January 27, 1910, I wrote thirty-four, and with two exceptions the patients have been satisfied. These two were young people whom I tried to fit without the use of a cycloplegic and were later fitted by Dr. Gibson, of Vassar, with a cycloplegic. Since this failure I have used a cycloplegic for all young patients. In the sixty-eight eyes I found hyperopia, twenty-two; myopia, eight; astigmatism plus, four; minus, three; compound hyperopic astigmatism, two. Very few of these patients would have gone to an ophthalmologist, but would have taken up with a traveling optician or gone without glasses; my service made them more comfortable than they would have been under such conditions. That the patients were pleased is shown by their recommending their friends to come to me, and by the only other physician in the village sending his patients to me for refraction. My net financial profit was one hundred and twelve dollars. Through this refractive work I believe I have a more nearly complete control of the people I am called to treat; thus broadening my usefulness and incidentally increasing it in other lines. Had these people been compelled to go to some city to have their glasses fitted, it would have put them to a considerable more expense of both time and money,

not only for the first study of the case but for subsequent changes; to many, a real hardship; to others, impossible. Had the traveling opticians sold glasses to these (judging from my observation of their work) little benefit would have come to the patients and some possible harm. Hence, if my study of refraction enabled me to place more correct lenses before the eyes of these people, there has been an increased economic value to be credited to ophthalmology. I use the ophthalmoscope especially in the cases subjected to a mydriatic and am beginning to learn by its aid other things than the conditions of the media. I am the more convinced that the family physician should be qualified for doing this class of work, especially to handle the less complicated cases. I see no more reason for sending every refractive case to a specialist than for sending every obstetrical, surgical or nervous case to specialists."

SUMMARY.

The possible economic value of "family physician refraction" appears in the following particulars:

1. It gives patients improved vision and relieves their discomfort.

2. It makes better doctors, by developing powers, otherwise left dormant.

3. It augments professional income.

4. It bridges the chasm that bars the free coöperation of family physician and ophthalmologist.

5. It strengthens professional organization.

6. It furnishes prompt relief to all victims of eye disorders.

7. It brings the largest returns to ophthalmology by providing an educated physician competent to study every eye case.

8. It improves general practice by furnishing family physicians trained to detect the significance of eye symptoms in every disorder.

Why shall not the profession harvest these economic values for the people and itself; for ophthalmology and general practice?

DISCUSSION.

Dr. J. Thorington, Philadelphia:

I have often had doctors tell me that what they wanted to learn most was refraction work, because the opticians in their town were doing what they could not do, and the opticians were getting rich doing it while they were not. That is true in every village and city in this country. Why? Because the medical man comes out of the medical school educated as a practitioner of medicine, but with no very definite knowledge of refraction work. If the colleges taught this refraction work, how much more the medical man would stand for better things in his community! Now he must either send his patients away or see some optician attempt to do what he should do. The majority of doctors send their patients away to some eye specialist for work which every general practitioner ought to be able to do himself. Sometimes these patients take the matter into their own hands and go to an optician. The refracting optician and the osteopaths work hand in hand. Both are opposed to the practice of medicine. If we could teach our students how to do refraction work, this state of affairs would not obtain, and it would be to the interest of the doctor as an individual, and to the medical profession as a whole for doctors to do refractive work. The medical colleges should gladly yield to the demand to teach refraction work. Let us make the demand. I am glad to state authoritatively that the University of Pennsylvania, The Jefferson Medical College and the Medico-Chi of Philadelphia, as also the Hahnemann Medical of the same city, are now teaching refraction to their students so that they can go out and do refraction work, and these same graduates are ready to take the examination on refraction from any state board of examiners which may require this examination for a state license.

ASSOCIATION OF AMERICAN MEDICAL COLLEGES.

MINUTES OF THE TWENTIETH ANNUAL MEETING, HELD AT BALTIMORE, MARYLAND, MARCH 21–22, 1910, UNDER THE PRESIDENCY OF DR. GEORGE H. HOXIE (UNIVERSITY OF KANSAS).

FIRST DAY—MORNING SESSION.

The delegates assembled in the hall of the Medical and Chirurgical Faculty of Maryland and were called to order by the president at 10 A. M.

The roll-call showed that thirty-three of the forty-nine colleges in membership were represented by delegates:

Georgetown University School of Medicine, George M. Kober.

George Washington University Medical Department, W. C. Borden.

Howard University Medical Department, Edw. C. Balloch.

American Medical Missionary College, R. H. Harris.

University of Illinois College of Medicine, F. B. Earle.

Indiana University School of Medicine, B. D. Myers.

University of Iowa College of Medicine, J. R. Guthrie.

Kansas Medical College, Frank Sanders.

University of Kansas School of Medicine, G. H. Hoxie.

University of Louisville Medical Department, T. C. Evans.

Baltimore Medical College, David Streett.

College of Physicans and Surgeons (Baltimore), C. F. Bevan.

Johns Hopkins University Medical Department, W. H. Welch.

University of Maryland School of Medicine, R. D. Coale.

Woman's Medical College (Baltimore), J. R. Abercrombie.

Tufts College Medical School, F. M. Briggs.

University of Michigan Department of Medicine and Surgery, R. Peterson.

University of Mississippi Medical Department, W. S. Leathers.

St. Louis University Medical Department, E. P. Lyon.

Creighton Medical College, A. L. Muirhead.

University of Nebraska College of Medicine, R. H. Wolcott.

Cornell University Medical Department, J. Rogers.

University and Bellevue Hospital Medical College, E. Le Fevre.
University of Buffalo Medical Department, E. H. Long.
University of North Carolina Department of Medicine, I. H. Manning.
Cleveland College of Physicians and Surgeons, S. W. Kelley.
Ohio-Miami Medical College, E. O. Smith.
Starling-Ohio Medical College, W. J. Means.
Western Reserve University Medical Department, F. C. Waite.
Meharry Medical College, G. W. Hubbard.
Vanderbilt University Medical Department, J. A. Witherspoon.
Medical College of Virginia, C. Tompkins.
Marquette University Medical Department, W. B. Hill.

The following delegates from other colleges, state examining boards, state medical societies and educational organizations were also present:

Tulane University Medical Department, I. Dyer; Harvard Medical School, H. A. Christian; Syracuse University Department of Medicine, J. L. Heffron; University of Vermont College of Medicine, H. C. Tinkham; McGill University Faculty of Medicine, J. W. Scane; University of Tennessee, B. Ayres; University of Cincinnati, C. W. Dabney; Medical Department University of Nashville and University of Tennessee, W. D. Haggard; Memphis Hospital Medical College, F. A. Jones; Medical College State of South Carolina, R. Willson, Jr.; Leonard Medical School, C. F. Meserve; Jefferson Medical College, J. W. Holland; Medico-Chirurgical College, S. Egbert; University of Pittsburg Medical Department, T. S. Arbuthnot; Toledo University Medical Department, A. P. Dickey; Maryland Medical College, W. S. Smith; National Confederation of State Medical Examining Boards, M. G. Motter; Council on Medical Education, A. M. A., N. P. Colwell; Council on Medical Education, American Institute of Homeopathy, J. B. Garrison; American Academy of Medicine, G. Hudson-Makuen; National Educational Association, J. H. Van Sickle; Ohio State Medical Board, A. Ravogli; Education Department, State of New York, A. S. Downing; Nebraska State Board of Health, A. L. Muirhead; U. S. P. H. and M. H. S., W. P. MacIntosh; U. S. A. Medical Corps, C. R. Snyder; Medical

Society of the State of New York, W. B. Campbell; Medical Society, State of Pennsylvania, J. B. Roberts; Medical Society, New Jersey, P. Marvel; Tennessee State Medical Association, J. A. Witherspoon; Ohio State Medical Association, W. J. Means; Massachusetts Medical Society, H. A. Christian; Medical Society of the State of California, W. J. Barlow; Medical Society, State of North Carolina, E. C. Register; Medical Association, State of Alabama, B. L. Wyman; Medical Association of Georgia, W. F. Westmoreland; Indiana State Medical Association, T. C. Kennedy; Maine Board of Registration in Medicine, J. L. M. Willis.

The following officers and members of committees not delegates were also present:

R. Winslow, Judicial Council; F. C. Zapffe, Secretary-Treasurer; H. D. Arnold, J. S. Horsley, G. C. Mosher, Committee on Curriculum; W. S. Thayer, Committee on Pedagogics.

Guests.—Ira Remsen, President Johns Hopkins University; J. Fell, President St. Johns College; A. C. Kane, President Washington College; G. M. Linthicum, President Medical and Chirurgical Faculty of Maryland; L. Connor, J. Thorington, Section on Ophthalmology, A. M. A.; M. Langfeld, Creighton Medical College; C. M. Hazen, Medical College of Virginia; R. E. Skeel, Cleveland College of Physicians and Surgeons; W. R. Stokes, College of Physicians and Surgeons, Baltimore; W. A. Ruble, F. Baker, Georgetown University Medical Department; O. Klotz, C. C. Guthrie, B. A. Cohoe, Medical Department, University of Pittsburg; W. L. Rodman, Medico-Chirurgical College, Philadelphia; F. P. Mall, Johns Hopkins University Medical Department; W. F. R. Phillips, Washington, D. C.

The Secretary read the minutes of the preceding meeting, as published, and on motion of Dr. J. R. Guthrie they were approved as read.

The Chair at this juncture introduced Dr. Leartus Connor, of Detroit, Michigan, the first secretary of the former college association, organized in 1876. Dr. Connor received a hearty welcome and briefly addressed the association.

On motion, the courtesies of the floor were extended to all delegates, visitors and guests.

Dr. G. Milton Linthicum, President of the Medical and Chirurgical Faculty of Maryland, bid the association welcome on behalf of the faculty, and then delivered an address on "Advancement of Medical Education" (see page 524).

Dr. J. A. Witherspoon (Vanderbilt University) responded to the words of welcome, as follows:

Mr. President and Delegates: I assure you that in accepting the hospitalities of the city of Baltimore, every one of us feels that it is heartfelt, and we feel as much at home here as we possibly could feel anywhere. Everybody knows of the well-known hospitality of this city. I have appreciated very highly the remarks made by Dr. Linthicum along the line of improving educational conditions. Every college in this association stands for the things he has recommended and by unity of action and concerted determination the elevation of standards will bring about a condition very much to be desired in this country.

The time has passed when the doctor can go out into the world and practise medicine on the old plan. The time is also past when a medical school without proper equipment, without proper teaching facilities and without proper professional abilities can expect to exist. It should not be said of the United States that they have as many medical schools as the remainder of the civilized world. I feel, however, that we are on the road to better conditions and in coming to Baltimore we have much to incite us to better things. I believe that it was in this city that the first public library in the United States was opened to the people. The example of Johns Hopkins of giving large donations of money for the purpose of medical teaching has served as an impetus for that which is so necessary, if medical teaching would fulfil its true mission, to prepare young men to practise in a field in which human life and human happiness are so absolutely wrapped up.

Therefore, we accept your hospitality with a great deal of pleasure. We feel that knowing this city as well as we do, knowing of her reputation for attracting scientifie men, leading, as she does, in medical education in this country, knowing of the possibilities to be had here, we can do no better than to come here

and sit at the feet of such men as Welch and Osler, listen and learn. It has always been known, too, that the ladies of Baltimore are the most beautiful in the world, and beautiful women make chivalrous men. Therefore, we expected the hospitality we have received, and we accept it gladly and with open arms.

The report of the Secretary-Treasurer being now called for, Dr. Zapffe submitted the following report:

REPORT OF THE SECRETARY-TREASURER.

The ever-increasing influence of the Association has never been so apparent as during the past year. The Secretary's office has firmly established itself as a bureau of information, and has done much to definitely and permanently establish the Association as one of the greatest factors in medical education. While the membership of the Association apparently is small, it must be remembered that not very many colleges are still eligible to membership, and that rejections and suspensions from membership have made it impossible for many colleges to come into the Association at this time. A reputation has been established for earnest, conscientious and effective work, and so long as the present state of affairs continues the Association is bound to make itself felt through its labors in establishing standards which can be met by all colleges that are willing to do so. As a matter of fact, by far the greater majority of the colleges in membership have adopted standards that are very much higher than the minimum standards of the Association. This is as it should be, because it is better to go too high than not high enough.

RATING OF COLLEGES.

The most important matter which presents itself at this time is the rating of colleges. A number of organizations have for several years past been making inspections and ratings, and while these findings do not agree in all particulars, there is, in the main, a uniformity which makes these inspections valuable. There can be no question that many inspections will eventually do much good, not only for the poorer schools but also for the better ones.

Dr. W. Jarvis Barlow, of Los Angeles, during the past year did a very valuable and interesting piece of work, consisting in the establishment of a basis for rating the medical colleges in the State of California. Whether this basis of rating is absolutely correct is not pertinent at this time, but if it is not correct, it certainly will serve admirably as a foundation for better work. It would seem advisable that there be appointed a committee to take up this work, or that the present Committee on Medical Education be enlarged to include a representative from each state in which medical colleges are located, or that the Secretary undertake this work, by no means a small task. This would furnish the Association with data which can be published and made use of by everybody. Such data exist at the present time, but they lack authorization for publication, so that if the Association will authorize the collection of these data and their publication, a report can be made at the next annual meeting. The Secretary would suggest that the Association take such action.

PEDAGOGICS.

Another matter of very great importance is that of teaching. It is becoming more evident that medical teaching is not as far advanced as teaching in other subjects, and that some steps should be taken to encourage medical pedagogics. Inasmuch as the President's address this year considers this question, no lengthy discussion of it will be made here, except to call attention to the necessity of taking some steps for securing regulation of medical teaching.

None of the colleges in membership were visited by the Secretary during the year, nor were any bulletins issued, because of lack of sufficient funds. A very active campaign was made by mail, and it has been effective beyond all expectation. It is very gratifying to note that colleges—good, better, best—are appreciating the necessity of allying themselves with the Association, banding together with other colleges in the uplift of medical education, but the number of rejections of applications probably always will exceed in considerable number the

acceptances. At the same time, even a rejection may work wonders, and if a college applies for membership and no action is taken on such application, the Association is placed in the position where it can render valuable assistance in bringing the college up to Association standards.

Your Secretary desires at this time to express his profound appreciation of the excellent work done by the Council on Medical Education of the American Medical Association. The influence of the Council has made itself felt particularly in the direction of calling the attention of the medical profession to the low standards held to by some colleges, thus compelling these institutions either to rise to a higher plane or to receive the unqualified condemnation of every one. The Council, by reason of its position, can do much—directing attention to conditions which are sadly in need of improvement and pointing out how such improvements can be made. Your Secretary would suggest that the next annual meeting of the Association be held in Chicago and that the Council be invited to hold its next annual conference at that time. This would insure coöperation and perpetuate the harmony and uniformity of opinion that now exist in all matters pertaining to the elevation of standards in medical education.

The Carnegie Foundation for the Advancement of Teaching has during the past year been actively engaged in the inspection of medical colleges from the standpoint of their educational value. The results of this work are already apparent. Colleges are alive to the worth of the recommendations made by the Foundation—and it may safely be said that conditions are better now than they were before the Foundation undertook to do this work.

The Council, the Foundation and this Association are working together harmoniously and for the good of all.

APPORTIONMENT OF WORK.

As the result of a consultation, held soon after the last meeting of the Association, it was deemed advisable to apportion the work of the Judicial Council among the membership. This

was accomplished, as follows: Each member was asked to assist a certain definite number of colleges in every possible way, and he was asked to keep a surveillance over these colleges in their relations to the Association. The purpose was to bring the colleges in closer touch with the Association and to increase its effectiveness. The divsion was by states in which colleges in membership are located, as follows: Indiana, Michigan, Ohio, W. J. Means; Illinois, Iowa, Wisconsin, North Dakota, H. B. Ward; Massachusetts, Maryland, New York, Egbert Le Fevre; Virginia, West Virginia, District of Columbia, R. Winslow; Nebraska, Kansas, Oklahoma, Missouri, W. P. Harlow; California, Colorado, A. A. D'Ancona; Mississippi, Kentucky, Tennessee, North Carolina, C. M. Jackson.

The plan is still too new to determine definitely its feasibility, but its practicability cannot be denied.

A similar plan was outlined for the Committee on Medical Education, each member of the committee being asked to keep in touch with educational matters in the district assigned to him, and to render aid in every possible way, with the view toward the recognition of the Association standards and the establishment of uniformity. Thus reciprocity in medical licensure would become more wide-spread in its administration and more easily possible. Districts were created as follows:

W. J. MEANS—Ohio, West Virginia, Pennsylvania, New York, Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire, Maine.

J. R. GUTHRIE—Montana, Wyoming, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Iowa, Louisiana, Arkansas.

W. F. R. PHILLIPS—New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida, District of Columbia.

W. P. HARLOW—Washington, Oregon, California, Nevada, Idaho, Utah, Arizona, Colorado, New Mexico, Texas.

F. C. ZAPFFE—Minnesota, Wisconsin, Illinois, Indiana, Missouri, Kentucky, Tennessee, Mississippi, Alabama.

The committee is requested to put the plan into operation during the coming year.

CURRICULUM.

Pursuant to instructions given by the Association at the last meeting, the membership of the Committee on Curriculum was increased from 7 to 23 (see Transactions, p. 105).

Dr. H. D. Arnold, of Tufts College, was appointed sub-chairman and placed in charge of the construction of the curriculum of the third and fourth years of the course. This committee has labored hard and well, as its report will show, and has merited much praise. Through an oversight the names of Drs. Mosher and Marvin were omitted from the list published in the Transactions. Drs. Kober and Heidingsfeld have been added to the committee since then. That portion of the committee to which was assigned the reconstruction of the work of the so-called clinical years is as follows:

SUB-COMMITTEE ON CURRICULUM FOR THE CLINICAL YEARS.

Chairman.—H. D. Arnold, Boston, Massachusetts.

Surgery.—J. Shelton Horsley, Richmond, Virginia. Harry M. Sherman, San Francisco, California.

Orthopedic Surgery.—J. L. Porter, Chicago, Illinois.

Gynecologic Surgery.—Reuben Peterson, Ann Arbor, Michigan.

Medicine.—J. B. Marvin, Louisville, Kentucky; C. L. Dana, New York City (Neurology); S. W. Kelley, Cleveland, Ohio (Pediatrics).

Obstetrics.—George C. Mosher, Kansas City, Missouri.

Rhino-Laryngology.—C. C. Coakley, New York City.

Otology.—John F. Barnhill, Indianapolis, Indiana.

Ophthalmology.—Edward Jackson, Denver, Colorado.

Hygiene, Medical Jurisprudence and Medical Economics.—George M. Kober, Washington, D. C.

Dermatology and Syphilis.—M. L. Heidingsfeld, Cincinnati, Ohio.

Owing to Dr. Dawson's withdrawal from medical teaching,

the President appointed in his place Dr. E. P. Lyon, this action meeting with the approval of the chairman of the committee.

SECTARIAN COLLEGES.

Considerable correspondence passed between your Secretary and the Secretary of the Council on Medical Education of the Institute of Homeopathy, with the end in view of bringing into membership such homeopathic colleges as may be eligible to membership in this Association. These schools appear to be willing to consummate such an affiliation, but seem to fear the existence in the rank of the regular colleges of a feeling against the so-called sectarian colleges. In the interest of higher and uniform medical education, it is desirable that these schools come into membership, and it would seem that a mere difference of opinion in the therapeutic management of disease should not stand in the way of such an affiliation.

In reply to a letter from Secretary W. A. Dewey, your Secretary endeavored to make clear the attitude of this Association toward the so-called sectarian colleges, pointing out the common interest in medical education, the sameness of medical education in all colleges, barring therapeutics, and the absence of any antagonism. This letter was very well received and was published in full in the January issue of the *Medical Century*. The days of sectarianism have passed, and it is to be hoped that this will be made manifest by the union of all medical colleges in the promulgation of higher and uniform standards in medical education.

OSTEOPATHY.

The Association is confronted at this time by a problem which has steadily grown in magnitude and which threatens to involve some state examining boards in serious difficulties. This is the matter of the recognition of osteopathic colleges. It is neither here nor there what construction is placed by medical men on what the osteopathic college is or what it is not, because, discountenancing for the time being all argument *pro* and *con* that might be presented, it must be conceded that in fifteen states the highest judicial authorities have declared that oste-

opathy is the practice of medicine. In ten states (Washington, Utah, Oklahoma, Kentucky, Oregon, California, Wisconsin, Iowa, Texas and Indiana) the osteopaths have representation on the examining board. In two states (Colorado and Maryland) the osteopaths are exempt from the operation of the medical act. In twelve states (Wyoming, Arizona, Illinois, Alabama, Ohio, South Carolina, Virginia, District of Washington, West Virginia, Delaware, New York and Massachusetts) osteopaths are examined by the regular examining board, but are licensed as osteopaths, and in only seven (Nevada, New Jersey, Rhode Island, Mississippi, Maine, Georgia and New Hampshire) is there no regulation of osteopathic practice. In seventeen states (Montana, North Dakota, Florida, Arkansas, Connecticut, Pennsylvania, Idaho, South Dakota, Louisiana, North Carolina, New Mexico, Minnesota, Michigan, Nebraska, Missouri, Tennessee and Vermont) the osteopaths have their own examining boards.

The question now is, Is any teaching institution which conforms in every particular to the requirements of this Association eligible to membership? What help, if any, can be given to an examining board which by law is forced to recognize osteopathic colleges in medical colleges, and which, also by law, must measure colleges by the standards set by this Association? If the osteopathic college in such a state conforms to these standards, it is evident that the board is tied hand and foot by the law. This state of affairs is not suppositious. It is a fact, as the members of such boards can bear witness.

This matter is brought to our attention not only by a state official, but also by an osteopathic college which applied for recognition by this Association during the past year. Your Secretary begs of you not to misconstrue his remarks as a defense of osteopathy nor as a plea for the recognition of osteopathic colleges as medical colleges, but solely as a statement of existing facts, which should receive the careful attention and consideration of this Association, to the end that a solution may be arrived at and your Secretary be instructed in conformity with your wishes.

MEMBERSHIP.

Little change has taken place in the membership, which now numbers 49. The merger of the Miami Medical College with the Medical College of Ohio, announced at the last meeting, became effective with the present session, the new college taking the name Ohio-Miami Medical College. The membership in the Association of the Miami College was transferred to the new institution. There have been no resignations.

Applications were received from the Tulane University Medical Department, Harvard University Medical Department, Universities of Nashville and Tennessee Medical Department, University of Vermont Medical Department, Maryland Medical College, Syracuse University College of Medicine, and the Memphis Hospital Medical College. These applications are in the hands of the Judicial Council. Applications held over from last year are those of the Illinois Medical College, now the Medical Department of Loyola University, and the Medical Department of Toledo University.

TRANSACTIONS.

After mature deliberation, the officers of the Association reached the conclusion that the wishes of the membership for greater publicity of the proceedings of the annual meetings could best be met by publication in some well-known medium which reaches those most interested in and concerned with the problems of medical education. The Bulletin of the American Academy of Medicine seemed best to meet the requirements, and through the kindness of its editor, Dr. Charles McIntire, satisfactory arrangements were made. This assured a circulation of about 900, and, in addition, 200 reprints were mailed by the Secretary to persons who were not likely to receive the Bulletin, thus giving us a total circulation of about 1100 copies. The additional cost of this unusual distribution was met by the special assessment levied at the last meeting.

Copies of the resolutions adopted with relation to state board examinations were mailed to the secretaries of these boards, and copies of the resolutions adopted dealing with preliminary

education were mailed to the state superintendents of public instruction in each state, each accompanied by an individual letter setting forth the attitude of the Association as expressed at the past two meetings. A further report will be made later on the results of this propaganda.

MATRICULATION RECORD BLANKS.

It is quite evident that the adoption of these blanks has caused colleges to be more careful in measuring the credentials of prospective matriculants, and also to keep more accurate records. At the same time it is apparent that even greater care should be taken to report in detail. It may not have occurred to the colleges that excellent use might be made of these reports by having them serve as a means for securing from the Secretary data which will facilitate the acceptance of students going from one college to another. It has been said that colleges in membership in the Association presume no such a relationship to the other colleges to the extent of demanding free and unquestioned exchange of students. Inasmuch as entrance standards vary widely, even among the colleges in membership, such a free exchange is not possible. However, it will certainly be made more easy, if information regarding the applicant's entrance qualifications can be obtained directly from the Secretary, instead of from the college officials. In other words, the office of the Secretary of this Association ought to be the bureau of information in all matters pertaining to admission and course of study. The question arises whether it might not be well to go even farther and have every college in membership file at the end of each year a report on the standing of every student. Such a procedure would obviate the possibility of any student presenting fraudulent credentials when seeking admission to another school. A favorable report from the office would thus be made the *sine qua non* for securing a transfer. And, inasmuch as such a report would be based entirely on records placed on file by each college, their correctness could not be questioned.

The Carnegie Foundation very kindly consented to review the records for the 1909–'10 session, and the results of this ex-

amination will be presented by Mr. Flexner, of the Foundation, later. He will point out where colleges can make this work easier and how its effectiveness can be increased. The value and importance of these records cannot be gauged too highly. Much latitude has been given colleges in this regard, with the expectation that in a little while the purpose for which these blanks originally were devised would be fulfilled.

The treasurer reported as follows:

Receipts	$1605.50
Disbursements	1530.90
Cash on hand	74.60

(Signed) FRED. C. ZAPFFE.

On motion, the accounts of the Treasurer were referred for audit to an Auditing Committee, on which the Chair appointed Drs. J. R. Guthrie and E. H. Long.

The suggestions and recommendations contained in the report of the Secretary were referred for consideration to the Committee on Medical Education, with instructions to report at a subsequent session.

Dr. W. J. Means then presented the following report of the Judicial Council:

REPORT OF JUDICIAL COUNCIL.

The Judicial Council has been passive in its work during the last year. No important questions have been presented that require active consideration. The chairman has had the usual number of inquiries from colleges, state boards and individuals relative to the regulations of the Association. These were along the line of college requirements and interpretation of the constitution.

While the Council has not been active in the consideration of general work, it has kept in touch with the doings in medical education in the United States. The Council has been particularly interested in the investigation being made by the Carnegie Foundation and the Council on Medical Education of the American Medical Association.

We are not in a position to report the findings of the former, as they relate to colleges members of the Association. The report, we understand, will be published some time in May or June and will no doubt be received with considerable interest. Many things concerning medical education and medical colleges will be brought to light that may startle the college world. We hope the report will be constructive in its effect on the colleges members of this Association.

The report of the findings of the American Medical Association committee was read at the conference in Chicago, February 28, March 1 and 2, and made a profound impression on the representatives of colleges and other organizations connected with medical education and the medical profession. The report showed that out of 140 colleges in the United States only 68 were found acceptable and worthy of full recognition. Thirty-eight were classed as B colleges. These were not hopeless, but were short in certain things that could be improved. Thirty-four were found hopeless, and state boards were warned against accepting graduates from them.

We have made diligent effort to get the data on which this classification was made, but so far have not succeeded. The College Association has its own system of investigating and rating colleges members of the Association, and also those seeking membership. We are satisfied that our system of examination is quite as good and as equitable as the examinations made by other examining bodies. Therefore, until the reports of the American Medical Association and the Carnegie Foundation are made public so that we may analyze the data on which this

classification is based and be given an opportunity to make investigations of our own so that we may compare our findings with others, we do not feel that the Council can give the matter either publicity or final consideration.

The Council wishes to offer in this connection the following recommendation:

That the Judicial Council be given authority to order an investigation of the colleges now members of the Association that have been reported on adversely by the American Medical Association Council of Education, and to investigate any other colleges members of the Association that may be subjected to like criticism by other examining or inspecting bodies.

Further, That these investigations be made by two persons selected by the Judicial Council and that each college inspected shall bear the expense of such inspection. And,

Further, That other educational bodies interested in examining colleges be invited to participate in said inspection and examination.

APPLICATIONS FOR MEMBERSHIP.

The following colleges have made application for membership: Tulane University Medical Department; Harvard Medical School; Toledo University School of Medicine; Maryland Medical College; Medical Department Universities of Nashville and Tennessee; Loyola University Medical Department; Memphis Hospital Medical College.

The Council recommends that Tulane University Medical Department and Harvard Medical School be accepted into full membership.

The Council recommends further that action on the applications of Toledo University, Medical Department Universities of Nashville and Tennessee, Loyola University Medical Department and Memphis Hospital Medical College be postponed for one year.

The applications of the Medical Department of the University of Vermont and the University of Syracuse were received during the session, too late to be considered. In the absence of an inspection report on the Maryland Medical College no action

could be taken on this application. A report on these three colleges will be made at the next meeting of the Association.

(Signed) W. J. MEANS, *Chairman*,
EGBERT LEFEVRE,
R. WINSLOW,
H. D. ARNOLD, *pro tem*,
F. C. WAITE, *pro tem*,
W. B. HILL, *pro tem*.

On motion, the recommendations contained in this report were considered *ad seriatim*.

The recommendations of the Council that the applications for membership of the Medical Department of Tulane University and of the Harvard Medical School be accepted and the colleges be elected to membership was concurred in and, on motion, the Secretary was instructed to record this action.

The recommendations that action be deferred for one year in the matter of the applications of the Toledo University Medical Department, Loyola University Medical Department, Medical Department of the University of Nashville, University of Tennessee, and of the Memphis Hospital Medical College was also concurred in.

On motion, the suggestion of the Council with reference to making an inspection of certain colleges in membership was concurred in, and the Secretary was instructed to notify these colleges of such action as soon as definite information can be obtained, and that an inspection would be made, the expense of such inspection to be met by the college inspected. It was considered unwise and uncalled-for to undertake an investigation at this time of any college which is said to have been subjected to criticism until authoritative information is received as to the correctness of such statements.

On motion, the report was adopted as a whole.

In the absence of some of the members of the Judicial Council,

the Chair appointed Drs. F. C. Waite, H. D. Arnold and W. B. Hill members of the Council, *pro tem.*

At this juncture the Vice-President, Dr. Witherspoon, took the chair, while the President delivered his address.[1]

On motion of Dr. LeFevre, the address was referred to the Committee on Medical Education, with instructions to consider the recommendations contained therein and report at a future session.

The Association then adjourned until 2 P.M.

AFTERNOON SESSION.

The Association re-assembled at 2 P.M., and was called to order by the President.

The Chair appointed the following Nominating Committee: Drs. T. C. Evans, E. P. Lyon, and F. C. Waite.

The report of the Committee on State Medical Boards was called for and read by the chairman, Dr. F. C. Zapffe.

REPORT OF COMMITTEE ON STATE MEDICAL BOARDS.

National Confederation of State Medical Examining and Licensing Boards.—The annual meeting of this Association was held in Atlantic City, June 6, 1909, and was attended by Drs. Means and Zapffe. The principal topic under discussion was that of conducting practical as well as theoretical examinations for state licensure, and considerable unanimity of opinion existed as to the advisability and feasibility of such examination. The Confederation also finds it necessary to take steps to improve the clinical instruction in colleges, and as the result of animated discussion on the subject, a committee of five was appointed to investigate and report on this subject at the next meeting. Your Secretary was appointed a member of this committee.

As to the advisability of holding divided examination, that is, one examination at the end of the second year of the college course, and another at the end of the fourth year of the course, the Confederation did not believe that to hold such examina-

tions was to the best interest of students and the medical examining boards, for reasons which are well known, having been stated many times, so that it is unnecessary to consider them now.

The Confederation placed itself on record by resolution as being in favor of mixed examination, oral, written and practical, and recommended that the various state boards now restricted as to their methods of conducting examinations take proper steps to secure amendatory legislation to enable them to conduct mixed examinations.

The Confederation also urged the examining boards to confine examination questions in the subjects of materia medica and therapeutics to a consideration of the most important preparations of the more important drugs, believing that in this way the examinations can be made a more effective test of the applicant's knowledge in these subjects. On the whole, the Confederation stood for more effective and more practical examinations that are now being held in most states, which is in accord with the resolutions adopted by this Association at the last meeting.

The American Confederation of Reciprocating, Examining and Licensing Medical Boards.—At the 1909 meeting of the Confederation, no particular change was made in standards, and the discussion was, in the main, on the advance in medical reciprocity. The report made by the Committee on Preliminary Requirements at the 1908 meeting was adopted. The academic value of a high school diploma was determined to be as follows:

REQUIRED GROUP.

Minimum, 40 counts. (Total of 60 counts.)

	Credits accepted.	
	Minimum counts.	Maximum counts.
English	10	15
Mathematics	10	20
Latin	10	20
Physics	5	5
History	5	15
Totals	40	75

ELECTIVE GROUP.

Maximum, 20 counts.

Greek	4	10
French	8	10
Spanish	8	10
German	8	10
Chemistry	4	5
Botany	2	5
Zoology	2	5
Biology (see note 5)	4	5
Physiology and Hygiene	2	5
English Literature (see note 3)	4	5
Trigonometry (see note 3)	2	2
Solid Geometry	2	2
Physical Geography	2	5
Drawing	2	2
Astronomy	4	5
Geology	4	5
Total elective		35

INSTRUCTIONS.

1. As used in this table, a count is the measure of the work successfully completed in a secondary or high school pursued an entire school year of 36 weeks in one weekly recitation period of not less than forty-five minutes.

2. The required group, 40 counts, must be presented by all applicants. Sufficient counts to make a total of 60 counts required may be selected from the elective group. The credit which will be accepted in the several studies is shown by the printed figures.

3. English literature of the elective group may not be counted unless a year has been given to that subject in addition to the required ten counts in English, and trigonometry may not be counted unless it is in addition to the required ten counts in mathematics.

4. Civics is not accepted as a subject, but may be counted as a part of American history.

5. Biology is the equivalent of botany and zoology, and it can be given no credit if an applicant is credited with botany or zoology.

6. The scope of the course is recorded under minimum standard of preliminary education.

At the 1910 meeting, held in Chicago, March 3rd, the Confederation appointed two very important committees, a Committee

on College Inspection and a Committee on Registration. The Committee on College Inspection consists of seven members, representing the several schools of medicine, whose duty it is to investigate the medical institutions and secondary colleges of the country, with a view to having all the state boards in the country adopt the report to be made by this committee and adopted by the Confederation.

The Committee on Registration will consist of two representatives from each state, one to be appointed by the Confederation, and one by the governor of each state. It is the duty of this committee to draft a uniform medical law which, when accepted by the Confederation, will be submitted for passage to the various legislatures. This committee also was instructed to consider the advisability of making investigations of the methods of the various examining boards.

It is extremely probable that the American Confederation and the National Confederation will amalgamate in the near future, and a committee was appointed by the American Confederation to confer with a similar committee from the National Confederation at the meeting of the latter to be held in St. Louis, in June. Such an amalgamation will increase the effectiveness of the work that is now being done by both organizations.

Respectfully submitted,

(Signed) FRED. C. ZAPFFE, *Chairman*,
WILLIAM J. MEANS,
J. R. GUTHRIE.

On motion, the report was received and ordered published in the *Transactions*.

The delegate (Dr. Zapffe) to other educational conferences and organizations then reported as follows:

REPORT OF COMMITTEE ON CONFERENCE.

Council on Medical Education, American Medical Association.—The fifth annual conference of the Council was held in Chicago, April 5, 1909. Pursuant to the custom adopted by the previous

conferences, the representation consisted of delegates from state medical societies, the government services, state medical examining boards, associations of medical colleges, and universities and colleges. The meeting was well attended. The program was an excellent one. The chairman, Dr. Bevan, reviewed the work of the previous conferences and outlined the policy of the Council, stating that its function was to suggest and not to command. The Secretary, Dr. Colwell, reported on the status of entrance requirements, licensure examinations, reciprocal registration, and the results of the inspection made by the Council of the medical colleges of this country. It was evident that much progress has been made in the advancement of standards and in the improvement of facilities and equipment for teaching.

The Council's Committee on Medical Curriculum presented a very full report, which does not in the main differ from the curriculum now in force in this Association. The division of subjects is somewhat different, and, as to be expected, the number of hours allotted to each subject are not exactly the same as in the Association curriculum. The report of the committee has been published in the *Journal of the American Medical Association* and in the proceedings of the Conference.

As is well known, these meetings are purely conferences, so that no action can be taken on any matter presented. The meetings are held for the benefit and enlightenment of the Council, and any suggestions formulated by the Council are based, in the main, on the sentiment expressed at these meetings. The value of the work that is being done by the Council cannot be measured in words. Its influence for good—for the betterment and elevation of medical education—is tremendous and should therefore be appreciated by all those who are interested in this work.

The sixth annual conference of the Council was held in Chicago on February 28, 1910. The program was an excellent one. The papers read gave a most valuable survey of the status of

medical education, and much profit will be derived from a careful reading of the report when it is issued.

Many of the committee reports were of special interest, particularly those made by the officials of the state examining boards, who agreed almost unanimously as to the value and practicability of practical tests for licensure examinations. Dr. Matson, the secretary of the Ohio board, presented some very valuable statistics, which seem to prove conclusively the necessity of practical examinations.

The report of the chairman, Dr. Bevan, contained the Council's rating of the medical colleges of this country. He stated that sixty-eight colleges are acceptable, thirty-seven may prove to be acceptable when certain improvements are made, and thirty-three colleges are not acceptable. This report will be published soon after the June meeting of the American Medical Association.

American Academy of Medicine.—The second mid-year meeting of the Academy was held in Chicago, March 25, 1909. Many excellent papers were read, some of them discussing subjects of interest to the medical college. Inasmuch as these papers have been published in the Bulletin of the Academy, which is sent to all the colleges in membership in this Association, it is not necessary to refer to them in detail at this time. However, the delegate cannot refrain from commending the Academy for the excellent work it is doing and ventures to express the hope that it will lend its influence and aid to this Association for the good of medical education. While the Academy is more particularly interested in medical sociology, its influence has been felt in the sphere of medical education, and the membership of the Academy is such that its aid and coöperation cannot fail to prove of value.

At the annual meeting of the Academy, held at Atlantic City, in June, 1909, Dr. Charles McIntire, who represented the Academy at the last annual meeting of this Association, was pleased to state in his report that with the spirit now shown by the col-

leges in membership in this Association, there is a field for increasing usefulness on the part of the Association, and that the requirements are such that there should be the helping coöperation of all worthy medical schools. Dr. McIntire recommended the appointment of a delegate to this meeting, in which recommendation we heartily concur.

(Signed) FRED. C. ZAPFFE.

On motion, the report was received and ordered published in the Transactions.

The report of the Committee on Medical Research was then called for, and read by the chairman of the committee, Dr. Egbert Le Fevre.

REPORT OF THE COMMITTEE ON MEDICAL RESEARCH.

A communication was addressed to the members of the Association in the different states requesting information of any attempt to introduce into the legislature of the state in which the college was situated, any bill to control animal experimentation in medical schools or research laboratories. Responses received from schools in the following states showed that no bills had been introduced during the present legislation: California, Illinois, Indiana, Iowa, Maryland, Michigan, North Carolina, Ohio, Virginia and West Virginia. In Wisconsin and Missouri bills have been introduced.

The storm center of the Anti-vivisectionists seems to be New York State, where bills have been introduced along practically the same lines: 1906–7, one bill; 1907–8, two bills; 1908–9, two bills; 1909–10, one bill. There seems to be less general public interest, however.

"A new feature has now been injected into the situation by the introduction into the legislature of a bill providing for the appointment by the governor of a commission to serve for one year for the purpose of making a complete investigation of animal experimentation in this state and of recommending possible legislation." This bill has been so recently introduced that it is impossible to form any opinion of the sentiment of the legislature regarding it.

We wish, however, to call attention to the rules that have been recommended by a similar committee of the American Medical Association to be posted in all laboratories. These rules should be adopted by this Association also and be posted in all laboratories where animal experimentation is carried on and also that those performing animal experimentation should comply not only with the letter but the spirit of the rules.

RULES REGARDING ANIMALS.

I. Vagrant dogs and cats brought to this laboratory and purchased here shall be held at least as long as at the city pound, and shall be returned to their owners if claimed and identified.

II. Animals in the laboratory shall receive every consideration for their bodily comfort; they shall be kindly treated, properly fed, and their surroundings kept in the best possible sanitary condition.

III. No operations on animals shall be made except with the sanction of the director of the laboratory, who holds himself responsible for the importance of the problems studied and for the propriety of the procedures used in the solution of these problems.

IV. In any operation likely to cause greater discomfort than that attending anesthetization, the animal shall first be rendered incapable of perceiving pain and shall be maintained in that condition until the operation is ended.

Exceptions to this rule will be made by the director alone and then only when anesthesia would defeat the object of the experiment. In such cases an anesthetic shall be used so far as possible and may be discontinued only so long as is absolutely essential for the necessary observations.

V. At the conclusion of the experiment the animal shall be killed painlessly.

Exceptions to this rule will be made only when continuance of the animal's life is necessary to determine the result of the experiment. In that case, the same aseptic precautions shall be observed during the operation and so far as possible the same care shall be taken to minimize discomforts during the convalescence as in a hospital for human beings.

DIRECTOR OF THE LABORATORY.

(Signed) EGBERT LE FEVRE, *Chairman*,
A. S. WARTHIN,
C. M. GREENE.

Dr. J. W. Scane (McGill University Faculty of Medicine) read a paper on "The Fifth Year in Medicine."

This paper was discussed by Drs. E. H. Long, A. Ravogli,

Egbert Le Fevre, J. W. Holland, E. P. Lyon, Leartus Connor, Isadore Dyer, W. B. Hill, W. L. Rodman, Charles William Dabney, and, in closing, by Dr. Scane.

Dr. William H. Welch (Johns Hopkins University) read a paper entitled "The Medical Curriculum."

Dr. H. A. Christian (Harvard Medical School) discussed "The Concentration Plan of Teaching."

This paper was discussed by Dr. F. M. Briggs.

On motion, Dr. Baker's paper on "Teaching of Ophthalmology" was read by title, and ordered published in the Transactions.

Dr. Leartus Connor was invited to open the discussion on "The Economic Value of Refraction Work Done by the Family Physician."

The subject was also discussed by Dr. Thorington.

The Association then adjourned until Tuesday morning at nine o'clock.

In the evening the delegates assembled in the banquet hall of the Hotel Belvedere as the guests of the Baltimore colleges and enjoyed what was recognized as the most pleasurable affair ever participated in by them. Dr. Randolph Winslow acted as toast-master. Responses to toasts were made by Dr. Remsen, president of Johns Hopkins University; Dr. Fell, president of St. Johns College; Dr. Kane, president of Washington College; Dr. Charles William Dabney, president of the University of Cincinnati; Dr. Herbert Harlan, president of the Maryland Examining Board; Dr. George H. Hoxie, president of this Association; Dr. Augustus S. Downing, of the Education Department of the State of New York; and Dr. J. A. Witherspoon, of Vanderbilt University. A rising vote of thanks was extended to the Baltimore colleges for their hospitality and good fellowship.

SECOND DAY—MORNING SESSION.

The Association reassembled at 9 A.M., and was called to order by the President.

Dr. Herbert Harlan, president of the Maryland State Board

of Medical Examiners, read a paper on "State Boards and High Entrance Requirements."

The paper was discussed by Dr. Augustus S. Downing.

The report of the Committee on Curriculum was then called for, and Dr. F. C. Waite, chairman, and Dr. H. D. Arnold, sub-chairman, reported as follows:

REPORT OF THE SUB-COMMITTEE ON CURRICULUM FOR THE CLINICAL YEARS.

HORACE D. ARNOLD, Chairman.

The Problem.

Although it is the function of this sub-committee to report a curriculum for the clinical years, there are certain fundamental considerations in regard to the curriculum which should be considered and must be accepted as a basis for action.

The curriculum is a part of the constitution of this Association, and membership in the Association is contingent upon living up to its requirements (Article V, Section 1, and Article IV, Section 2). It must then be a *minimum* requirement reasonably within reach of the present members and of those schools whom we desire as members. However desirable it may be to construct an ideal curriculum, that is not the function of this committee. On the other hand, our standard should not be set too low. It should be the *maximum* that the average good school can attain by reasonably earnest endeavor. Anything less than this would jeopardize progress in medical education.

For the present we must construct our plan on the basis of a four-year course in the medical school. The length of the annual course varies in different schools. This Association requires (Constitution, Article III, Section 5) a minimum of "thirty teaching weeks." It is generally accepted that in estimating the number of weeks in the school year vacations are excluded. On this basis the standing of the members of the Association is shown in the following table (statistics from the report of the Council on Medical Education for the year 1908–'09, *Journal of the American Medical Association*, Aug. 14, 1909):

TABLE I.—NUMBER OF WEEKS IN THE SCHOOL YEAR (EXCLUSIVE OF VACATIONS).

Weeks.	Schools.	Weeks.	Schools.	Weeks.	Schools.
36	4	33	4	31	1
35	11	32	21	30	3
34	4			28	1
	19		25	Total,	5
					49
Approximately,	40 per cent.		50 per cent.		10 per cent.

Ninety per cent. of our members are now requiring at least 32 weeks. The proposition to amend the constitution so as to make 32 weeks the minimum is therefore a reasonable one. Forty per cent. of our members require at least 34 weeks. It is recommended that the Association urge its members to adopt a school year of at least this length.

Although the committee believes the Association will adopt 32 weeks as the minimum, it will still make its recommendations on the basis of 30 weeks of actual instruction. It believes that, however valuable the time may be to the student that he spends in examinations and in their immediate preparation, this time does not properly represent actual instruction given by the school to the student. It is rather to be compared to the time spent by the student in study outside of the prescribed curriculum. The simplest way seems to be to adopt the arbitrary figure of two weeks as an estimate of the time thus spent, and to reckon that a school year of 32 weeks is equivalent to 30 weeks of actual instruction.

Another consideration that should guide us is the capacity of the student to do effective work. It is easy enough to pile up hours of instruction, but unless the student is able to digest and assimilate this mental pabulum, it is largely wasted for the purpose of building up a sound medical education. Many thoughtful educators are convinced that the medical student to-day is suffering from overfeeding and indigestion. The curriculum must not take up so much time that a proper allowance is not left for rest, nourishment, and a reasonable amount of exer-

cise and recreation, and especially for time to study and assimilate the subjects taught during the prescribed hours of school work. On this basis 1000 hours in 30 weeks (an average of $33^1/_3$ hours per week) would seem to be the maximum that should be required.

Nevertheless, the demand for more time by every department of the school is so imperative—and reasonable—that the committee believes that the minimum requirement of the Association should be 4,000 hours, divided into four years of approximately 1,000 hours each. Therefore, it is recommended that Article V, Section 1 of the Constitution be amended by the omission of the words "or over 10 per cent. in the total." The effect of these words is to reduce the minimum requirement to 3,600 hours.

The number of hours assigned to any subject should mean the number of scheduled hours for *each* student. The introduction into some medical schools of the university idea of "credit" hours will lead to some confusion in this matter. This subject should receive attention in the near future.

Our Association is not the only body of men working over the problem of the curriculum, nor is all the wisdom on this subject confined to any one group of men. It is important that we should be able to compare one with another the ideas of these different organizations, but that can be only done with ease when the different schedules are arranged on the same plan. In order to facilitate such comparison we have accepted the grouping of subjects recently adopted by the Council on Medical Education. It is as follows:

Group	I.	Anatomy.
"	II.	Physiology, Organic and Physiological Chemistry.
"	III.	Pathology and Bacteriology.
"	IV.	Pharmacology, Toxicology and Therapeutics.
"	V.	Medicine.
"	VI.	Surgery.
"	VII.	Obstetrics and Gynecology.
"	VIII.	Diseases of the Eye, Ear, Nose and Throat.
"	IX.	Dermatology and Syphilis.
"	X.	Hygiene and Medical Jurisprudence.

(This grouping is adopted by the committee for purposes of comparison and study. It is felt that another grouping of these subjects into 7 general divisions (see Report of General Committee on Curriculum) is better for administrative purposes and efficiency of instruction.)

The General Committee on Curriculum has agreed to recommend the distribution of 4,000 hours among these groups as follows:

Groups I–III.	Laboratory Subjects	1725
" IV.	Pharmacology, Materia Medica and Therapeutics	240
" V–X.	Clinical Subjects	2035
Total		4000

The special duty of the sub-committee on the clinical years is to make recommendations as to the best distribution of 2,035 hours among groups V–X.

Statistics.

What are the better medical schools doing—or rather claiming to do—at the present time? A knowledge of this will give us some idea of what may reasonably be required in our curriculum, and it will also show where improvement is needed. Reliable statistics in this connection were not at hand, so the committee proceeded to gather them.

We desired statistics from only the better medical schools. For lack of a better criterion at that time, the standing before state boards was taken, as published by the Council on Medical Education. The first two classes were taken, comprising those schools which had less than 20 per cent. of failures. To these were added a few members of our Association with more than 20 per cent. of failures. This made a total of 81 schools to whom circulars were sent, asking for the desired information. Replies were received from about 65 schools. Many reports were unsatisfactory either in whole or in part. On every point inquired into we received satisfactory replies from about 50 schools, so that our resulting averages represent a composite picture of the better medical schools based on the evidence of 50 such schools.

Special blanks were prepared for securing these statistics, a separate blank for each group of subjects. The main subdivisions were indicated, and each school was requested to record on separate lines such further subdivisions into courses as the school employed. Information was asked as to the amount of time in each course planned for *each* student. This was recorded by college years and also classified as to the method of instruction.

In seeking information as to the methods of instruction, it seemed best to adopt a classification as simple and general as possible. School exercises were divided into four groups:

I.	Didactic Exercises:	Instruction of all kinds *without patients*, given in the form of lecture, recitation, quiz, conference, "case method," etc.
II.	Clinical Lecture:	Any exercise for the whole class (or a large body of students) at which patients are exhibited.
III.	Section Clinics:	Clinics where the students (in small sections) can individually study cases. (This includes ward visits in *small* sections.)
IV.	Clinical Pathology:	Laboratory work in connection with clinical subjects. (Didactic exercises, even if upon clinical pathology, should be included under I.)

One thing stands out plainly from the reports obtained on these blanks, namely, the very marked difference in the use of terms applied to the various courses of study and the methods of instruction. This difference is so great that it has been impossible to classify the returns except as to the main groups and the chief sub-divisions. It is clearly essential, for a more careful comparative study of the curricula of the various medical schools, that these terms should have a definite meaning that is commonly accepted. This subject of a proper terminology for courses and methods of instruction should receive prompt and thorough study. This is an essential preliminary to further progress in this direction.

We recognize that it is unwise to try in the curriculum to regulate the courses too much in detail, and that there is an advantage in leaving much for each school to decide in the best utilization of its own resources—both of teachers and clinical oppor-

tunities. But this problem is in no way interfered with by coming to a definite agreement as to the meaning of such terms as "Physical Diagnosis," "Applied Therapeutics," "Minor Surgery," "Clinical Lecture," etc.

This is a difficult problem and for its solution there is needed the advice and coöperation of a large body of medical teachers. The committee would recommend not only that the Association undertake the solution of this problem, but that it invite the co-operation in this work of all other bodies that are interested in the question.

The present curriculum of the Association may be reduced to the following form, to conform with the American Medical Association groups:

Group	V.	Physical Diagnosis	100
		Practice of Medicine	540
		Pediatrics	100
		Mental and Nervous Diseases	120
		Electro-therapeutics	60
		Dietetics	30
			950
"	VI.	Surgery	540
		Genito-Urinary Diseases	60
			600
"	VII.	Obstetrics	160
		Gynecology	160
			320
"	VIII.	Eye and Ear	60
		Nose and Throat	60
			120
"	IX.	Dermatology and Syphilis	40
"	X.	Hygiene and Public Health	30
		Medical Jurisprudence	30
			60

In the following table the present curriculum is compared with the American Medical Association curriculum and with the statistics from 50 medical schools:

TABLE II.

Group	V.	Medicine, including Pediatrics and Nervous Diseases.
"	VI.	Surgery; General and Special.
"	VII.	Obstetrics and Gynecology.
"	VIII.	Diseases of Eye, Ear, Nose and Throat.
"	IX.	Dermatology and Syphilis.
"	X.	Hygiene, Medical Economics and Medical Jurisprudence.

TABLE III.

Column 1, Curriculum of Association at present.
Column 2, Curriculum recommended by American Medical Association.
Column 3, Curriculum as per statistics of 50 schools.

	By hours.			By percentages.		
	Ass'n.	A. M. A.	50 schools.	Ass'n.	A. M. A.	Schools.
V.....	950	890	857	45.5	41.8	40.0
VI.....	600	650	714	28.7	30.5	33.3
VII.....	320	240	295	16.3	11.3	13.7
VIII.....	120	140	139	5.7	6.6	6.6
IX.....	40	90	79	1.9	4.2	3.7
X.....	60	120	58	2.9	5.6	2.7
Total.....	2090	2130	2142	100.0	100.0	100.0

There is a striking agreement in the figures of these three columns. If we classify Dietetics in Group X instead of Group V, the correspondence between our present curriculum and the American Medical Association standard is even more striking. When we remember that our present curriculum was established five years ago on the recommendation of a committee headed by Dr. Kober, and that the American Medical Association curriculum was published only one year ago and was the product of the activity of over 100 of the leading teachers of the country, we may well congratulate our former committee on the excellence of their work and on their progressive foresight.

Another gratifying thing is shown by our statistics, namely, the way in which the better medical schools have responded to the standards thus set up for them. We believe that the teachers in these better medical schools are honestly striving to do their best under the limitations of present conditions, equipment, etc. However, it is well known that there is a good deal of difference between what the medical schools claim they are doing and the instruction actually delivered to the students. In

many instances the authorities are unaware of this discrepancy, because they have not studied the actual performance in a critical spirit, to see whether each student is actually getting the course laid out for him on paper. This Association would accomplish a great step in the advance of medical education, if it would take some effective measures for compelling its members to give to each student the actual amount of teaching that it plans for him on paper.

This situation is but another illustration of the fact that in general we plan better than we perform. It must be recognized, therefore, that the reports received from the schools represent their plans rather than their performances. But perhaps the statistics are (for our purposes) of all the greater value on this account. May they not be accepted as representing what the great body of medical teachers of the country believe may reasonably be demanded from the medical students at the present time, and under present conditions? Minor improvements can, of course, be made, but the general agreement of the figures in this table would seem to indicate that the present committee will not find that great or radical changes are needed in our present curriculum.

Many of us started into this statistical investigation of the present condition of the curriculum with the preconceived idea that we should find it illy balanced and that there would be much to criticize. This undoubtedly is true of a very large number of individual schools—it would be more so if we critically scrutinized the performances of the schools. We got this idea from our knowledge of the way in which in individual instances the curriculum had been built up—sometimes as a matter of temporary expediency or opportunity, sometimes determined by the personal feeling of some dominant personality. Such growth is necessarily unbalanced—and yet the composite picture of all these individuals is strikingly like the curriculum which the Council on Medical Education has suggested as "ideal." This is the one encouraging note in the turmoil over medical education to-day. It means that the large body of medical teachers in the better (not merely the best) medical

schools are imbued with an earnest, conscientious spirit, to do their best under existing circumstances to meet any reasonable "ideal" that is set before them. However poor the performance may have been so far, this spirit certainly exists. With proper ideals set before them and suitable means for accomplishment, they have the spirit to make the ideals realities. In this lies the hope of medical education in the future.

These statistics from 50 medical schools have been tabulated more in detail in Table III. Here the groups are divided into their main sub-divisions and the amount of time given to each form of instruction is stated. Of course, the more we study into the details of our "composite picture" the more points we find in it which differs from our ideal—and especially from the ideal that each earnest teacher has set up for his own little part of the general plan.

No teacher is worth his salt who has not ambition to make his course better than it is. He must advance if he is to keep abreast of the advance in medical knowledge and if he is to meet the reasonable demand for better medical education. The easiest way is to demand more time for his subject. But here he comes up against two serious obstacles: First, the medical student is already overwhelmed by the results of concessions to this demand for more time for the individual courses. At least this is true in the schools that conscientiously try to give to the student what they plan on paper. Secondly, whatever increase of time one teacher can get, it must be taken from his colleagues. In asking for more time, then, the individual teacher must give good and sufficient reasons why the student should stand an added burden or why his colleagues should surrender the time now allotted to them. Not only is this true, but the committees cannot even allot the amount of time to each course that is given in Table III, for the total there demanded is 2,142 hours, and we have only 2,035 hours to distribute. In the solution personal considerations must yield to the general good.

Since the committee cannot meet, as it would like to, the requests for more time in the various courses, it would point out that improvement—and a great deal of it—may be secured in

other ways. We believe the time has come for improvement in the quality of medical teaching rather than in increase in its amount. If the teachers would plan their instruction more systematically, would give the essential matters only, and would put the material in such a form that the student can easily grasp it—many of the courses would be improved in efficiency fifty per cent. without further extension of time. More attention by medical teachers to the principles of pedagogics is desirable. We have a very definite opinion as to the size of the intellect of the layman who attempts to administer medicine without the slightest conception of the principles of materia medica, but how many of us stop to wonder what the real teachers think of us doctors who freely administer large and varied doses of lectures to the students without the slightest knowledge of pedagogy.

Therefore the committee is of the opinion that under present conditions no medical teacher should ask for more time for his particular course until he is prepared to demonstrate that he is already putting his present allowance of time to the best and most effective use.

We must remember that we are dealing with undergraduate teaching, not post-graduate. We must not forget that no single human intellect—much less that of the average doctor—can master the whole of our medical knowledge in a whole lifetime. We can only hope in four short school years to place within the limited capacity of the average student's mind the more essential and fundamental facts of medicine, to teach him how to think rationally about diseased conditions, and to give him a reasonable experience in the practical application of curative measures to the sick. The function of the medical school is to train general practitioners for the proper care of the sick public. In its undergraduate department it should aim first to teach with sufficient thoroughness a knowledge of the common things every doctor must be able to do to meet the every-day demands of the public. Beyond this as much may be taught as time permits and the capacity and preparation of the individual student warrants. It follows that some things now included in "required" courses should be made post-graduate or optional

It also follows that the amount of time a student is allowed to put into the fascinating field of research work should be closely watched. He should, as a matter of training in method, have a little of this work, but neither this nor anything else should be allowed to interfere with a well-rounded, well-proportioned training in the fundamental subjects. The too early limitation to one field of study by those who think they want to become "specialists" is especially to be decried, and not encouraged. We recognize that some of this sounds reactionary, and does not seem to be entirely in harmony with some recent developments that have been considered advances in medical education. But we believe a serious condition exists and that it demands a remedy. An important step is to separate more clearly in our mind what belongs to undergraduate teaching, what to advanced courses, and what to research investigation. All three are legitimate functions of a medical school, but it is not legitimate for any medical school to mix these ingredients indiscriminately and serve the combination out to the trusting and inexperienced students. The doctor produced by this kind of teaching to-day is often more ill-balanced than the medical curriculum.

Changes Recommended in the Curriculum.

The Sub-committee for the Clinical Years recommends that the number of hours allotted to each group be as follows:

TABLE IV.

			Hours.	Per cent.
Group	V.	Medicine	895	44.0
"	VI.	Surgery	600	29.5
"	VII.	Obstetrics and Gynecology	300	14.75
"	VIII.	Diseases of Eye, Ear, Nose and Throat	120	5.8
"	IX.	Dermatology and Syphilis	45	2.2
"	X.	Hygiene and Medical Jurisprudence	75	3.75
Total			2035	100.0

We believe that the number of hours assigned to the various groups should be regarded as a necessary minimum amount and should not be reduced. (See, however, notes later in reference to exchange of time between subjects.) The various schools

should be allowed to add to these amounts according to their best judgment, yet the committee would urge that the percentage values of the different groups should not be materially altered as that would disturb the balance of the curriculum, which we regard as important.

Table V shows in more detail the complete picture of the curriculum as now taught in 50 of the better medical schools. The main sub-divisions of the groups are given and also the average number of hours devoted to each of the four methods of instruction.

TABLE V.—SUMMARY OF STATISTICS FROM ABOUT 50 SCHOOLS.

Group.	Subdivision.	I Didactic exercises.	II. Clinical lectures.	III. Section clinics.	IV. Clinical pathology.	Totals.
V.	(*a*) Medicine	240	166	178	66	650
	(*b*) Pediatrics	40	27	34	4	105
	(*c*) Nervous Diseases	45	36	19	2	102
	Totals	326	229	231	72	857
VI.	(*a*) Surgery	197	225	141	32	595
	(*b*) Orthopedics	16	14	16	2	48
	(*c*) Genito-Urinary	26	19	24	2	71
	Totals	239	258	181	36	714
VII.	(*a*) Obstetrics	112	19	27	2	160
	(*b*) Gynecology	55	51	27	2	135
	Totals	167	70	54	4	295
VIII.	(*a*) Eye	21	20	21	..	62
	(*b*) Ear	11	8	12	..	31
	(*c*) Nose	9	5	9	..	23
	(*d*) Throat	9	5	9	..	23
	Totals	50	38	51	..	139
IX.	(*a*) Dermatology	16	16	15	..	47
	(*b*) Syphilis	11	12	9	..	32
	Total	27	28	24	..	79
X.	(*a*) Hygiene	37	...	...	..	37
	(*b*) Jurisprudence	21	...	...	..	21
	Totals	58	...	...	..	58

(*c*) Medical Economics.—Out of 53 schools tabulated, only 19 mentioned Medical Economics as a separate subject. These gave an average of 9 hours to the subject.

Grand totals.....	I.	II.	III.	IV.	
	866	623	541	112	2142
Per cents.....	40.4	29.0	25.2	5.2	100

We would recommend the allotment of hours to corresponding sub-divisions as follows:

TABLE VI.

Group	V.	Medicine (1).....	640	
		Pediatrics (2).....	150	
		Nervous and Mental Diseases (3). ..	105	
		Total.....		895
"	VI.	General Surgery (4).....	510	
		Orthopedic Surgery.....	45	
		Genito-Urinary Surgery.....	45	
		Total.....		600
"	VII.	Obstetrics (5).....	195	
		Gynecology (including (6) abdominal Surgery in part).....	105	
		Total.....		300
"	VIII.	Diseases of the Eye.....	60	
		(6) Diseases of the Ear, Nose and Throat.....	60	
		Total.....		120
"	IX.	Dermatology and Syphilis.....	45	
		Total.....		45
"	X.	Hygiene, Public Health and Dietetics (1).....	45	
		(7) Medical Jurisprudence and Economics.....	30	
		Total.....		75
		Grand total.....		2035

The proposed curriculum probably does not contain a single item that is considered satisfactory by that member of the committee who is specially interested in that subject, and yet we have all agreed to recommend it as the best thing we can devise under

the limitations we accepted at the outset. We believe it is a wise apportionment of about 2,000 hours for the purpose of training general practitioners. We have given preference to the subjects in proportion as they are likely to form part of his every-day practice, yet we have tried to allow him time also to learn the fundamentals of the special subjects. This, we believe, is the best way to get a well-proportioned curriculum.

The question of how rigidly a school should be held to these minimum requirements will be discussed in the report of the general committee. The sub-committee on the clinical subjects, however, feels that even more elasticity must be allowed in the clinical subjects than in the laboratory subjects. Only in this way can the resources peculiar to each school be developed and utilized to the best advantage.

NOTES.

A few brief explanations will be in order, and there are certain exchanges of time that we wish to specially mention as possible and under certain conditions advantageous:

(1) With the elaboration and growing importance of the sub-divisions of medicine a greater proportion of time must be given to these sub-divisions, yet we must retain an abundant allowance for a broad foundation and thorough training in this, the most important of the clinical subjects.

Fifteen of the 640 hours in medicine are designed for the teaching of dietetics as applied to diseased conditions—practical dietetics. In Group X 15 more hours (out of 45) are allowed for the more fundamental consideration of dietetics and its relation to health. This is taught in connection with hygiene and public health. The personnel of a faculty may be such that the full time for the subject (30 hours) would better be given to the professor of hygiene, or to the professor in medicine, or to some other man. This should be permitted. We believe the subject of dietetics is one of growing importance and should receive more attention than it usually does.

(2) The allowance for pediatrics is intended to include instruction in the exanthemata. In many other ways medicine and pediatrics overlap. Useless repetition can be avoided only by a proper understanding between the teachers of these two subjects, and a certain elasticity should be allowed a school for the purpose of assigning time to one subject or the other according to where the borderland subjects can best be taught. In the same way pediatrics and surgery touch and overlap. In one subject or the other the surgery peculiar to children should receive attention. Valuable suggestions in relation to the teaching of pediatrics will be given in an appendix to this report.

(3) Proper coöperation between the teachers of medicine and nervous and mental diseases will also be necessary, to prevent the waste of time, as these subjects overlap also.

(4) In the required curriculum instruction in surgery should be confined to what the general practitioner needs. More special work should be provided for by advanced or post-graduate courses.

(5) The time allotted to obstetrics does not include the time spent in the care of confinement cases. This time can hardly be fairly calculated. We feel that each student should personally manage at least five confinement cases.

(6) The relations of gynecology and surgery constitute a dangerous ground, full of pitfalls. On this point we quote the remarks of the American Medical Association Committee as follows: "The committee discussed the present status of gynecology and its relation to obstetrics and surgery, but no definite conclusions or recommendations could be made.... . The proposal to make gynecology a department of surgery was not approved."

We do not propose to attempt a decision of this knotty question. However, it seems clear that gynecology as now practised is not the limited specialty that it was some years ago, that in many instances the men best qualified to teach gynecology proper are also expert abdominal surgeons, many hospitals having developed along the lines of combining gynecology and abdominal surgery, and consequently many valuable teachers and clinical opportunities might be lost if these subjects are not sometimes combined. The question is one of conditions in a given locality rather than one of principle.

We have therefore given the amount of 60 hours to Group VII, with the idea of permitting the combination of part of the teaching of abdominal surgery with gynecology. In case gynecology does not include any abdominal surgery or very little of this subject, the whole or a part of the 60 hours should be transferred to surgery, where the subject should be taught.

(7) The allowance for Group VIII, diseases of the eye, ear, nose and throat, cannot be increased over that in the present curriculum. Desirable as it may be to teach simple refraction, it can hardly be done within the 60 hours of ophthalmology without taking the time away from some equally important study of the eye. Any school, however, may require such a course outside of the 4000 hours in the course.

(8) Few schools are to-day giving much attention to medical economics. We think more attention should be paid to this subject. It may be included in the time allowed for medical jurisprudence.

METHODS OF INSTRUCTION.

It seems unwise at the present time to attempt (in a *required* curriculum) a detailed division of the time allotted to each clin-

ical subject among the four methods of instruction tabulated: I. Didactic exercises; II. Clinical lectures; III. Section clinics; IV. Clinical pathology. Much will depend upon the character of the clinical opportunities and also on the personal qualifications of the teachers. Each department of the school may be allowed to determine the best use of the time allotted to it, but the following remarks and recommendations are pertinent.

Our statistics show that too little time is given to section clinics, and still less to clinical pathology. By the latter term we mean the employment of laboratory methods in the study of clinical cases, or laboratory instruction in connection with clinical subjects. The time spent on such work, especially in connection with the study of cases, cannot always be accurately estimated. Therefore it seems best merely to recommend (1) that in Group V to IX not over 50 per cent. of the allotted time be spent in didactic exercises and clinical lectures together; (2) that as far as possible the students be given opportunities to study individual cases; (3) that suitable provision be made for laboratory investigation in connection with these cases; (4) that the students be required to use this equipment in the study of cases.

DIVISION OF TIME ACCORDING TO SCHOOL YEARS.

In general, the clinical subjects should be taught in the third and fourth years. It is desirable, however, that elementary instruction in medicine and surgery be given in the second year, and also that pathology, and especially therapeutics, be extended into the third and fourth years.

PHARMACOLOGY, TOXICOLOGY AND THERAPEUTICS.

This group of subjects belongs to the borderland between the laboratory and the clinical subjects. The report of Dr. Sollman's committee in the American Medical Association curriculum is so excellent that our committee has adopted its recommendations with slight modifications in the terminology and in the number of hours so as to conform to a thirty-hour basis.

The following schedule is recommended:

	Year in course.								
	II.	III.	IV.	Total.	Didactic.	Cl. lect.	Section clinics.	Laboratory.	Total.
(*a*) Pharmacology, Pharmacodynamics, Materia Medica and Prescription Writing.	90	..	..	90	30	..	..	60	90
(*b*) Applied Pharmacology, Therapeutics and Prescription Writing.....	..	90	15	105	105	..	..	..	105
(*c*) Non-Pharmacal Therapeutics	..	15	..	15	...	..	15	..	15
(*d*) Therapeutic Clinics.....	..	..	30	30	...	30	..	..	30
	90	105	45	240	135	30	15	60	240

I

HYGIENE AND DIETETICS.

GEO. M. KOBER, M.D.

Hygiene, which is the foundation of sanitation, cannot be regarded as an independent science like anatomy or chemistry, it is the application of the teaching of physiology, chemistry, physics, meteorology, statistics, sociology, pathology, epidemiology, bacteriology and sanitary engineering to the maintenance of the health and life of individuals and communities. Whoever appreciates the great number of problems of economic, social and ethical importance will readily concede that hygiene should be given a distinct place in the curriculum of medical schools, as it is difficult if not impossible for the student to abstract and correlate this knowledge from the other departments mentioned. In no other way can the future physician discharge his duties to the public imposed upon him in Sections 1 and 2 of Chapter III of the code of ethics of the American Medical Association.

The present standard curriculum also assigns thirty hours to dietetics, which may be regarded as important not only from the standpoint of hygiene but also in the treatment of disease. It is believed that the best interests of the student will be subserved by incorporating the subject of alimentation and dietetics

in the department of hygiene and allow a total of sixty hours to the teaching of these subjects. While the importance of the subjects would require more time, there are subjects of equal importance which a graduate in medicine should know, and the time allotted will really suffice to acquaint the Junior student with the fundamental principles of hygiene and dietetics. In addition to the didactic instruction it should be remembered that the professor of chemistry devotes special attention in his laboratory work to sanitary chemistry. This includes the practical examination of the various forms of matter which affect, either directly or indirectly, the general health. It is intended in this course that such a knowledge shall be imparted to the students as may enable them to differentiate between wholesome articles of food and drink. The various food products, particularly milk, cheese, bread and meats, should receive careful consideration. The examination of air in rooms, the velocity, condition and quality of air currents are considered under the head of ventilation. The organic analysis of water and its various forms of pollution, together with the examination of soils, should also receive attention.

The professor of bacteriology should give attention to water, milk and soil bacteria, and the instructor in medical zoology gives practical laboratory exercises in microscopical examination of meat for trichinilla spiralis and of feces for determining the presence of parasites. In addition to the regular course which is outlined below, visits are paid to the museum of hygiene, the hygienic laboratory of the Public Health Service, the filtration plant and sewage disposal station.

LIST OF LECTURES—

(1) Introductory lecture, giving a résumé of the history and achievements of hygiene, economic cost of disease; saving through conservation.

(2) The hygienic importance of sunlight.

(3) The atmosphere, chemical composition and physical properties, atmospheric impurities, dust and micro-organisms.

(4) Air in relation to health and disease. Influence of temperature, humidity, fogs, altitude. The air is a carrier of infection.

(5) Requisites for the purity of the air. Determination of impurities.

(6) Climatology continued, characteristic of arctic, temperate, sub-

tropical and subtropical climates—tropical hygiene—ocean and mountain climates—special climates with reference to health and disease.

(7) Soil in relation to health and disease—constituents of soil—physical properties of soil—pore volume—permeability of soil—capacity of water—soil air—soil water—soil temperature.

(8) Soil pollution—soil bacteria. Soil in relation to certain diseases. Sanitary measures for the reclamation of unsanitary soils.

(9) Water in relation to health and disease—sources of water—rain-water, snow-water, springs.

(10) Water, continued. Shallow wells, driven wells, deep wells, pollution of wells, wells near marshes and seashore, filter galleries.

(11) Surface water—streams, rivers, ponds and lakes. River pollution. Turbidity and bacteria. Significance of intestinal bacteria in water. Self-purification of rivers. Prevention of river pollution.

(12) Lake-water—protected water sheds—small and large lakes. Marsh-water—ocean-water.

(13) Classification of water from the sanitary standpoint. Quantity of water required for community purposes. Water storage and distribution. Action of water on lead pipes and other metals.

(14) Ice and artificial carbonated waters. The hygienic importance of water. Water-borne diseases. Typhoid fever—the influence of water supplies on typhoid fever death-rates. Examples of typhoid fever epidemics.

(15) Water-borne diseases continued. Cholera, dysentery and diarrheal diseases, parasites and drinking water—Metallic poisoning, relation of water supplies to malaria—tuberculosis and other infectious diseases.

(16) The economic importance of pure water—Characteristics of pure water. Purification of water—domestic methods—boiling and distillation—Chemical treatment—Domestic filter—Removal of hardness, removal of iron.

(17) Purification of water supplies on a large scale by the ozone method. The Fisher system—Mechanical filtration. Slow sand filtration, bacterial efficiency of the different systems. Illustrations showing typhoid fever death-rates in communities supplied with unfiltered water, spring water and with water purified by different methods.

(18) Alimentation—General considerations on nutrition and metabolism. The nutritive value of foods. Amount of food necessary.

(19) Composition of foods—proteids, fats, carbohydrates—Organic acids, Inorganic salts—their functions in the economy—Accessory foods.

(20) Animal Foods. Meat and Fish, composition of. Nutritive value of red and white meat. Beef, pork, veal, mutton, lamb, poultry, etc. Preparation of meats—raw meats—effects of cooking, digestibility, fried meats—Gravies, boiled meats and broths.

(21) Beef extracts and meat juices. Special concentrated meat products—Carne pura. Pemmican—Emergency rations. Sausages and other meat products.

(22) Keeping qualities of meat. Meat preservation by cold, by heat, by desiccation, by smoking, pickling, canning, by chemical preservatives.

(23) Meat, fish and meat products as a cause of disease. Ptomaine poisoning, parasitic diseases, transmission of infectious disease by meat and fish, tuberculosis, typhoid fever, cholera, glanders, anthrax.

(24) Sanitary Control of the Meat Market and slaughter houses; Eggs and lard.

(25) Milk and milk products. Composition of cows', goats' and mares' milk. Specific gravity and reaction of milk, composition of cream. Changes in milk and cream provided by micro-organisms; digestibility of milk.

(26) Dietetic and therapeutic uses of milk. Milk cures, milk wines, principal preparations of milk, and milk products. Abnormal milk, by reason of color, odor, taste, consistency and improper feed. Colostral milk. Significance and danger of milk sediments. Poisonous milk.

(27) Milk as a factor in the spread of disease. Milk from diseased cows. Milk infected after it leaves the udder of the cow. Typhoid fever. Scarlet fever. Diphtheria, Cholera and Cholera Infantum.

(28) Adulteration of milk. Preservation of milk. Milk inspection and the methods of detecting adulteration and chemical preservatives.

(29) Production of pure milk. Control, management and inspection of dairy farms. Butter, oleomargarine and cheese composition, digestibility and nutritive value of and their agency in the transmission of disease. Cheese as a cause of poisoning.

(30) Vegetable foods—The cereals, composition and nutritive value of, deterioration, impurities and adulterations in flour—Examination of flour. Preparations of wheat flour, bread, cakes, crackers, etc., baking powder digestibility and nutritive value of cereals; cereals and bread as a cause of disease—Examination of bread. Farinaceous preparations, sago, tapioca, arrow root, legumes, composition and nutritive value—digestibility, preparation of.

(31) Potatoes, tubers and roots. Herbaceous plants. Tomatoes and other vegetable fruits. Composition and nutritive value. Edible and poisonous mushrooms. Fruits—composition and nutritive value. Shell fruits. Vegetable oils. Honey and sugar. Confectionery.

(32) Accessory food: Condiments. Chloride of sodium, vinegar, mustard, pepper, cinnamon, nutmeg, vanilla, spices, alcoholic beverages, whiskey, brandy, rum, gin, cordials, wines, fruit wines.

(33) Beer, alcoholic beverages, coffee, tea, cocoa, soft and medicated drinks. The nostrum evil. The alcohol and tobacco question.

(34) Preservation of food, storerooms and pantries. Preparation of food for cooking. Cooking and eating utensils. Dietary standards.

(35) Combination of foods. Importance of good cooking. Temperature of food and drink. The consistency of food. Volume of food. Meal hours. Importance of good teeth. Ordinary subsistent diet. Diet suitable for laborious work. Diet according to climate and season.

(36) Institutional dietaries. Army and Navy rations. Hospital diet. Diet of fever patients. Diet in wasting diseases. Diet in diabetes, obesity. Fat producing diets.

(37) Care of the skin—Ablutions and baths. Public baths. Clothing—Clothing as a cause of disease.

(38) Exercise, fatigue, rest and sleep—Bed and bedding.

(39) House sanitation. Building sites and building materials, foundations, walls, floors, ceilings, roofs, stairs, and halls—interior arrangement and decorations.

(40) The air of habitations—household dust and micro-organisms. Natural and artificial ventilation—heating.

(41) Lighting, natural and artificial. Varieties of illuminants. Impurities given off in lighting. Plumbing—Plumbing tests. House diseases. Sanitary inspection of habitations.

(42) The hygiene of the sick room. General and special hospitals.

(43) Isolation hospitals, homes for convalescents, for the aged and infirm—Incurables—Institutes for the insane, feeble-minded, deaf, dumb and blind.

(44) The hygiene of prisons, railway and marine travel—Naval Hygiene.

(45) Hygiene of infant asylums, foster homes and foster mothers. Day nurseries. Orphanages. Kindergartens.

(46) Hygiene of schools—Medical inspection of school children and the prevention of permanent disabilities in childhood.

(47) Hygiene of communities. Morbidity and mortality in urban and rural population. Town and city. Planning. Selection of town sites. Laying out of streets and public parks. Pavements.

(48) The collection and disposal of refuse. Dry methods. Disposal of excreta collected by the dry methods.

(49) The water carriage system. Sewers and sewage disposal. Methods for the purification and disposal of sewage.

(50) Public comfort stations. Collection and disposal of garbage and other refuse.

(51) Military hygiene. Disposal of the dead. Earth burial and cremation on the battlefield.

(52) Transmissible diseases and their epidemiology. Vital causes dissemination of disease germs. Relation of insects to human diseases. Portals of entry.

(53) Mixed infections. Prevention of infectious diseases. Disinfection, physical agents. Chemical disinfectants. Gaseous disinfectants.

(54) Practical Disinfection—Vaccination and other preventative inoculations.

(55) Social and moral prophylaxis.

(56) Hygiene of occupations. Morbidity and mortality of wage-earners. Indoor occupations. Occupations involving exposure to irritating

dust. Metallic and mineral dust. Vegetable dust—Animal dust—infective matter in dust.

(57) Occupations involving exposure to poisonous dust. Lead dust—Arsenical dust. Occupations involving exposure to irritating or poisonous gases or vapors. Sulphur dioxide—acid fumes. Ammonia—Chlorine—Iodine—Bromine. Turpentine. Petroleum, Benzine, Carbon monoxide. Carbon disulphide. Naphtha.

(58) Nitro-benzol—Dying and cleaning—Rubber industry—Aniline vapors. Wood alcohol—Workers in brass—Mercury—Phosphorus. Occupations involving exposure to extremes of heat and cold, sudden changes and abnormal atmospheric pressure. Occupations involving constrained attitudes and over-exercise of parts of the body.

(59) Occupations involving exposure to machinery—Mining operations and accidents. Railway accidents and their prevention.

(60) Employment of women and children. Infant mortality in relation to female labor. Measures for the protection of wage earners. Sanitation of workshops. Prevention of accidents. General welfare measures.

The professor of state medicine in the School of Medicine of Georgetown University is Dr. William C. Woodward, who is also the health officer of the District of Columbia, and a graduate in law and medicine. He has prepared an outline of a course of thirty lectures which it is believed not only covers the most important problems which come before courts of law usually treated of under medical jurisprudence but also the relations of the medical practitioner to the state, public health, patients, etc. In fact, it covers all the principles enunciated in the code of ethics and provides for adequate instruction in medical economics, business relations and organization.

OUTLINE OF A COURSE OF THIRTY LECTURES IN STATE MEDICINE.

Note.—The term state medicine is used as a general designation pending agreement upon a better caption.

1. On the status of the medical profession in the social organization, past and present.
2. On the relation of the physician to the State. Control by the State of medical education and licensure.
3. On the relation of the physician to the State (continued).
   Obligation of the physician to the State with respect to the reporting of births, still-births, diseases, deaths, and criminal offenses coming to his knowledge in the course of his professional work.
4. On the relation of the physician to the State (continued).
   The physician as a witness.

5. On the relation of the physician to the State (continued).
   The physician as a witness (continued).
   Privileged communications.
   Dying declarations.
6. On the relation of physician and patient.
   Character of relation.
   Restraint of patients.
   The right to examine or to operate.
   Express contracts.
7. On the relation of physician and patient (continued).
   Implied contracts.
8. On the relation of physician and patient (continued).
   Malpractice.
9. On the relation of physician to pharmacists and of pharmacists to the public.
   On the relation of physicians to nurses and of nurses to patients.
10. On the relation of physicians to one another and to charlatans.
    Organization.
    Ethics.
11. On the practice of medicine as a business.
    On life, accident and health insurance.
12. On the relation of the State to the public health.
13. On the governmental control of communicable diseases.
14. On the governmental supervision of schools.
15. On sanitary inspection, including housing and factory inspection, and the sanitation of travel.
16. On the supervision of the water supply.
17. On the supervision of the food supply and of drugs, including the regulation of the sale of poisons.
18. On refuse disposal, including sewage, and the disposal of dead bodies.
19. On vital statistics.
20. On identity.
21. On injuries other than wounds, including the traumatic neuroses.
    On wounds.
22. On wounds (continued).
    On blood stains.
23. On poisoning.
24. On asphyxiation, including drowning, hanging, etc.
25. On death by heat, cold, electricity, and starvation.
    On sudden death from natural causes.
26. On the evidences of death and the changes subsequent to death.
    Autopsies.
27. On sexual relations.
    Impotence, Sterility, Sexual perversion. Unnatural offenses.

28. On sexual relations (continued).
    Rape. Abortion. Infanticide.
    Prostitution. Marriage and divorce. Eugenics.
    Asexualization.
29. On insanity.
    From the standpoint of public health.
    From the standpoint of the law.
30. On alcoholism and other drug habits.
    From the standpoint of public health.
    From the standpoint of the law.
    On the legal effect of somnambulism.
    On hypnotism.

II

OPHTHALMOLOGY.

DR. EDWARD JACKSON.

(1) Of the two thousand hours devoted to clinical instruction not less than sixty can be fairly assigned to ophthalmology.

The essential sub-divisions are:

(*a*) General knowledge of the ocular functions, vision, refraction, movements and their common disorders, which dominate so much of ocular pathology.

(*b*) A working knowledge of the diagnosis and treatment of "simple errors of refraction." This is required to enable the young graduate to give relief to a very large class of patients; otherwise commonly neglected, except in those communities and social ranks that avail themselves of the services of a specialist.

(*c*) An acquaintance with *common accidents* to the eyes, their more important dangers and immediate treatment. These will come as emergency cases to every medical practitioner.

(*d*) Acquaintance with the "*simple inflammations*" of the eye, which the laity expect every physician to treat; and ability to discriminate between these and the more serious ocular diseases that would properly claim the attention of a specialist.

(*e*) A knowledge of the *ocular symptoms of* those *diseases* usually *treated by physicians and surgeons* not paying especial attention to ophthalmology, as the paralyses of ocular movements, reactions of the pupil, limitations of the field of vision, pathologic conditions revealed by the ophthalmoscope.

(2) Sixty hours is the least number "absolutely essential" for the topics to be presented. And this time will only be sufficient for students who have been previously taught the anatomy and physiology of the eye—students who have acquired a practical acquanitance with the normal eye-ground by use of the ophthalmoscope, and who have been thoroughly trained in physiologic optics.

(3) It is "advisable" to have a course of ophthalmoscopic study of diseased conditions, as a part of the training in general pathology, and especially the pathology of the vascular and nervous systems. The ophthalmoscopic picture, seen under-magnification of about 20 diameters, stands intermediate between gross and microscopic appearances. It is really work in microscopy with a low power. But it is work on the living body, suited to correct the erroneous impressions arising from working exclusively upon dead organs and sections.

(4) The ideal presentation of ophthalmology is such an extensive subject, and so far removed from the work of the present committee, that I will not here undertake to state it.

You will gather from the above that I agree to the assignment of 150 hours to Group VIII of the eye, ear, nose and throat.

Now as to the presentation of the subject of ophthalmology. The smallness of the eye and the minuteness of the operations practised upon it exclude the ordinary *clinical lecture* to large classes; or make it equivalent, or inferior, to the didactic lectures properly illustrated. I would divide the time into twenty didactic lectures and demonstrations, 36 hours clinical work in small sections, not more than 6; and 4 hours work in clinical pathology.

The *didactic work* should cover a systematic and theoretic presentation of the errors of refraction and defects of ocular movements, such general subjects as acuteness of vision, color blindness, the field of vision, theory of the movements of the pupil, and the general principles of ophthalmoscopic diagnosis, to be demonstrated from colored plates of the eye-ground.

The *clinical section work* should include (*a*) the general examination of patients 6 hours, (*b*) the working acquaintance with simple errors of refraction 10 hours, (*c*) practice in simple manipula-

tions of the eye, and study of the more common eye diseases 10 hours (this will naturally be associated with (*a*)), (*d*) study of ocular symptoms of general diseases 10 hours. This clinical work must be left more or less indefinite to be modified by the opportunities opened, and the habits and preferences of the teacher.

The work of clinical pathology should include bacteriologic examination of cases of conjunctivitis and corneal ulcers, and examination of nucleated eyeballs.

III

PEDIATRICS.

DR. SAMUEL W. KELLEY.

In preparing a report and recommendations for the department of pediatrics I may be allowed to make use of some study of the subject made during a number of years previous to my appointment on this committee, as well as during the past year. "Notwithstanding that great advances have been made in the teaching of pediatrics, it cannot be denied that even in advanced institutions of learning conditions are not yet in an ideal state, while at the other end of the scale of medical colleges they are sadly in need of improvement to make them only tolerable."

"For one thing, there is no uniformity of excellence, nor of standards of excellence in the matter of teaching, but the greatest inequality in this respect among the various schools. Is it necessary that there should be uniformity? There cannot be absolute uniformity nor is that necessary. But it seems to me a degree of uniformity is necessary and a standard is imperative. Pediatrics should not claim too much of the student's time and attention, and it should not tolerate too little. A few colleges have brought the department of pediatrics up to a high standard of completeness and efficiency, while there are others which have no department or pediatrics at all, and the remainder, by far the largest number of schools, occupy all the gradations between these extremes. The causes of these conditions are various. Quite frequently it is because faculties have not kept apace with the march of progress. Some do not realize nor appreciate the

scope of modern pediatrics. In many colleges the time allotted to the subject is too short. In some the department of pediatrics is a mere appendage to some other chair which is perchance occupied by a teacher who cares little about it and gives it scant attention. Some teachers of pediatrics lose a part of their scanty time allowance by teaching general medicine in their pediatrics whereas the student should know his general medicine before he undertakes pediatrics. With inadequate time many teachers of pediatrics altogether omit taking up the anatomy and physiology of the developing period. These also the student should have had in his work upon anatomy and physiology, or else due time should be allowed to the department of pediatrics to prepare the student in these branches. Many schools now teach in the anatomic course the special anatomy of the nervous system, of the eye and ear, of gynecology and perhaps other special departments, but I venture to assert that few, if any, give the anatomic department any special attention to the anatomy of infancy and childhood. The same may be said of the physiology and of the pathology of the child.

As to the surgery of infants and children—the whole field, large and important as it is, is the worst ignored, the most neglected in the department of pediatrics if not in the entire world of medicine to-day. I need not consume your time in presenting proof that surgical diseases of infants and children are as dstinct in their peculiarities as are their medical diseases. It is equally true in surgical pediatrics as it is in medical, that some disorders are found at no other time of life, and also that there are others which, although they occur in adults as well as in children, when they are found in the latter, present different pathologic phenomena, run a different course, require different treatment and arrive at a different result from what would be usual in the same disease in the adult. It is seen at a glance that a considerable group of affections, including the congenital malformations, the early evidences of hereditary syphilis, traumatic separation of epiphyses, croup, and with it aeroporotomy in its varieties—intubation, laryngotomy, cricotomy, cricotracheotomy, etc., rickets with its numerous deformities require

surgical attention, eneuresis, cancrum oris and noma, as well as certain herniae and certain varieties of tumors, are found only in infancy and childhood. Another group, for example, intussusception, prolapse and polypus of the rectum, hip-joint disease, post-nasal adenoids, enlarged tonsils, foreign bodies in the nose and ear, and cervical adenitis, although not exclusively occurring in children, belong practically to the surgical diseases of children. A third group, in which may be mentioned the fractures and dislocations and empyema, includes nearly the whole remaining list of surgical abnormalities which occur in adults as well as in children, and yet are sufficiently different when occurring in the young subject to be worth special classification and study. And I have not yet mentioned the subjects of shock and hemorrhage, of anesthetics and antiseptics, of inflammation, degeneration, of the processes of repair and recuperation, of bandaging and dressing, of the use of medicine and diet in surgical cases, and many other topics which present peculiarities and which require study in a class by themselves. And yet how dimly do these facts seem to stand out in the minds not only of the profession generally, but of many who profess to have given special attention to the diseases of children!

In 1896, I made inquiries along this line among teachers of pediatrics. Replies were received to these questions from sixty-three colleges. To the question, "Does the teacher individually consider that pediatrics includes the surgical as well as the medical diseases of children?" forty replied in the affirmative and thirteen in the negative, while the remainder either left the question unanswered or answered indefinitely. So there was a very positive expression of opinion that surgery is well within the scope of pediatrics. But how is this conviction carried out in practice? Of the sixty-three colleges only twenty-six professed to teach surgical as well as medical pediatrics, thirty-seven acknowledging that they taught only the medical side of the subject. How complete the course on surgical subjects in the twenty-six colleges I did not at that time venture to investigate. With the usual time allowance I do not see how it could be very thorough.

"Clinical facilities are the greatest lack of many schools, and year after year the farce is enacted of 'teaching' pediatrics by didactic lectures only, without demonstration upon the patient, without meeting disease face to face, without ever learning by actual experience the natural history of either normal or pathologic conditions, or applying therapeutic means for their relief. In some schools there would be pediatric material enough if it were properly allotted, but it is kept in the departments of general medicine and surgery, and not used for teaching purposes by any one disposed or perhaps trained to study and demonstrate its peculiar features. There should be perfect coöperation between teacher and clinician when the teacher himself has not entire control of the material.

"In some cities there would be plenty of clinical material, but it does not get into the hands of those who would utilize it for teaching purposes. It is seen only by practitioners who either do not appreciate its value to a teacher or investigator, or who do not take enough interest in the welfare of the profession to place the material where it would be utilized. In other instances good material for study and demonstration is absorbed by unqualified 'dispensaries' and private 'clinics' carried on for the private benefit of their owners or promoters.

"The foregoing are but general statements. Yet they can be verified by close examination into the situation.

"Now I hope no one will misunderstand my statements. That no doctor and no newspaper representative will venture to assert that I have said that the diseases of children is a branch invariably badly taught in this country, or that there are no colleges which teach it excellently, or that there is disharmony in faculties or between teachers and clinicians concerning the subject. I have said nothing of the kind. I have said and do say that there is no college in which the ideal teaching of pediatrics has been reached; and that there are many where it is not well taught. I claim that this is a matter which can be remedied."[1]

The Association of American Teachers of the Diseases of

[1] President's address before the Association of American Teachers of the Diseases of Children, Chicago, June 1, 1908, by Samuel W. Kelley.

Children, seeing the necessity, took up this matter at its meeting held in Chicago June 1, 1908, and appointed a committee "To secure detailed information as to the present status of the teaching of pediatrics in this country; to define its proper scope; to determine an ideal and also a minimum syllabus for the teaching of pediatrics in our medical colleges; to confer with the Association of American Medical Colleges, with the Council of Medical Education of the American Medical Association, and with the organizations of state boards of examination and registration, with a view to securing adequate place and time in college curricula and state examinations in this branch, and to regulating the conditions of the clinical facilities and the equipment necessary for the proper teaching and study of children and their diseases."

The committee consisted of the following teachers: S. W. Kelley, Cleveland College of Physicians and Surgeons; A. C. Cotton, Rush Medical College, Chicago; H. M. McClenahan, University of Nebraska, Omaha; W. C. Hollopeter, Medico-Chirurgical College, Philadelphia; W. W. Butterworth, Tulane University, New Orleans.

This committee made a report at the meeting of the Association held in Atlantic City, June 7, 1909. The report embraced very numerous data collected from teachers in forty American medical colleges, and from other sources, and fully corroborated the statements hereinbefore presented in general terms, but its details are too voluminous for insertion here. The report was received and adopted unanimously by the Association. The undersigned was appointed a committee to represent the Association of American Teachers of the Diseases of Children at the meeting of the Association of American Medical Colleges, and to convey to you the concluding summary of that report, and I therefore beg leave to present it here, as follows:

"Every medical college should have a chair of pediatrics. It should be a full professorship, quite independent, *i. e.*, not subordinate to any other chair.

"Pediatrics should be compulsory, *i. e.*, required for graduation.

"The number of the men on the teaching staff may vary in differ-

ent schools according to the number of students, but the teaching force should be large enough to devote personal attention to the work of each student.

"Exact time-allowance has not been presented precisely from our data collected from teachers, as their reports vary in terminology. It should be as much as that devoted to any other practical branch. Ten per cent. of the third and fourth years, or certainly not less than 190 hours, should be the minimum.

"Pediatrics should be studied in both the Junior and Senior years, the course being graded.

"The course should include the anatomy and physiology and all the ordinary abnormal conditions of infancy and childhood, both medical and surgical. When preferred, the surgical side may be taught in the department of surgery, but it should not be ignored or only casually referred to as it usually has been.

"At some future time it may prove expedient to introduce a special course in anatomy into the department of anatomy, as some colleges are now giving special attention in the anatomic department to surgical anatomy, brain and nerve anatomy, etc.; it is quite as essential that the special anatomy of the developing period should be presented.

"Didactic lectures still have a useful place, but a large part of the teaching should be clinical, both in hospital and dispensary. The class should be divided into sections of not more than ten or twelve students for most effective clinical teaching, giving the student actual experience, under the teacher, in handling the cases.

"Clinical cases in ample numbers and variety to illustrate the hygiene of normal infancy and childhood and all the ordinary malformations, injuries and diseased conditions, including the contagious diseases, are a necessity. We find more schools open to criticism for lack of clinical material and its proper utilization than for any other shortcoming. This lack of clinical facilities is most frequently noticeable in regard to the contagious diseases. No college without a hospital and a dispensary for children is prepared to teach pediatrics.

"A separate laboratory of pediatrics is not a necessity, but

laboratories for general medical and surgical examinations should be available and be supplemented for the pediatric work.

"The anatomic and pathologic museums should be supplied with specimens, and the college library with text-books, reference books and periodicals on pediatrics."

This picture of present conditions and this judgment of teachers on the subject as to what should be done to improve the conditions are sufficiently clear and definite for the guidance of the Committee on Curriculum. There can be no question of the importance of the subject of pediatrics to the practitioner whether considered from the standpoint of the number of patients or of the peculiarities and the difficulties encountered in their cases.

In recent discussions upon the curriculum it has frequently been said that "the medical college should not endeavor to turn out specialists, but general practitioners." This is true and generally acknowledged. But it is also well known that while pediatrics is classed as a special branch it is so important and so commonly required as to be called "the specialty of the general practitioner." This position of central importance must be, and is, recognized even by men chiefly interested in other departments.

"*The Average Doctor's Practice.*—The cases treated by the average doctor are mainly in the departments of medicine, obstetrics, children, minor surgery and the specialties, in the order named." Observe the important position accorded to children. If there could be any question raised as to the order in which the subjects are here placed it would be whether children should not come in second instead of third place. If considered from the view-point of the number of cases it would come before obstetrics.

A great many facts could be brought forward showing the rapid growth of our knowledge of pediatrics and increase of its literature and of its useful resources in practice, but I think enough has been set forth to show that the present time-allowance of 100 hours as required by your Association is entirely inadequate and behind the times. The average time now given

to this branch is considerably above 100 hours, being in the neighborhood of 120 hours, while some of the best schools have advanced 60 or 70 per cent. beyond your present requirement. The Council on Medical Education, American Medical Association, recommends 180 hours. I would especially commend to your attention the resolution of the Association of American Teachers of the Diseases of Children in which *190* hours is the time-allowance recommended as a *minimum*. Adequate time would be 200 hours. These hours might be divided approximately as follows: Didactic exercises 60, class clinics 90, section clinics 40, laboratory 10. In schools whose classes number more than twenty the figures for class clinics and section clinics should be reversed, the former 40 and the latter 90. The division of the time between the didactic, clinical class, and clinical section, and laboratory teaching is very difficult to manage in detail. Great latitude in this respect should be allowed each school and each teacher, always requiring, however, that a large part of the teaching be clinical. One teacher may be a fine demonstrator, while another excels as a lecturer, a third may be skilled in the Socratic method, and a fourth may possibly be able to use all methods. One case may be better suited to illustrate a lecture, while another serves well for a clinical conference.

By far the greatest improvement that could be made in the study of pediatrics would be in giving time and attention to the surgical side of the subject. Many schools claim to teach the surgical as well as the medical side, in the department of surgery if not in the department of pediatrics. Yet in none, or almost none, does the subject receive more than casual or incidental attention. This offers an opportunity for this committee to take a positive step in advance of anything that has yet been done toward improving the course of study in the practical branches of the third and fourth years.

REPORT OF COMMITTEE ON CURRICULUM.

Your Committee on Curriculum feels that it should express certain general principles on which are based the tabulation that follows:

1. The present status of the ideas as to what constitutes the best medical curriculum is such that it is impossible to establish any curriculum that can be termed ideal. The best we can do is to express he resultant of many opinions as to what seems a fair minimum that can reasonably be demanded of schools that are entitled to membership in this Association.

2. It seems fair that a minimum of 4,000 hours, without any allowable diminution, should be demanded.

3. The number of scheduled hours in any division must represent the actual number of hours scheduled for each student. It does not seem possible to equate the relative educational value of an hour devoted to different kinds of student exercises, be these hours devoted to lecture, recitation, quiz, laboratory, amphitheatre, clinic, section clinic, dispensary work, or bedside work. We realize the difference in the demand on the energy of the student in these different methods of teaching, but we cannot take account here of the time used by the student for preparation outside of his scheduled hours, and such study time is not included in the 4,000 hours recommended.

4. It is not the function of this report to distribute the subjects in different years. There is a certain natural sequence of subjects, but distribution of time in years is to some extent subject to local conditions.

5. While the distribution of time between didactic and laboratory instruction in the laboratory subjects is here recommended, it does not seem possible to distribute time in clinical subjects among the various kinds of exercises. This must be done by each school to suit its own conditions. In general, in clinical subjects not more than one-half the time devoted to any subject should be devoted to didactic and clinical lectures. At least one-half of the time should be devoted to section or individual work.

6. Since this is a minimum curriculum and must apply to some schools where inorganic chemistry is not required for entrance, it follows that time must be allowed for this subject. Where this work is required for entrance the time thus released

should be distributed to other subjects in the same division or to other divisions.

7. It seems best to group the work in seven divisions. The subjects within each division are closely related and the time here stated for each large division should not be diminished. Except inorganic chemistry is secured as an entrance subject, then the time for the division of physiology and chemistry may well be diminished by 100 hours and this time distributed to other divisions.

8. Within each division the distribution of time may well be given much latitude and in this way elasticity can be secured without improving the balance of the great fundamental divisions of the medical course. The good faith and wise judgment of each medical faculty must be relied upon to work out the details of the curriculum. The absence of sharp boundaries between subjects makes it impossible and unwise to lay down a fixed number of hours for any subject or division of a subject.

9. We recognize that the expression of medical training in terms of hours is unsatisfactory. The number of hours of instruction is but one of many factors in a student's medical efficiency. The capacity of the student, the equipment, the material at hand, the capability and force of the instructor are all factors equally important, but unfortunately are less capable of quantitative expression. We are therefore compelled to express the factor of the number of hours of instruction and to give it a prominence which is not entirely warranted.

With these principles in mind, the committee recommends the following distribution of 4,000 scheduled hours of instruction for each student as representing the minimum amount of instruction to be given by schools which are members of this Association:

DIVISION I.—ANATOMY, 720 (18%).

	Hours.	Lect. Rec. dem.	Lab. wk.
(*a*) Gross Anatomy (including Applied Anatomy).....	510	120	390
(*b*) Histologic and Microscopic Anatomy.....	135	30	105
(*c*) Embryology.....	75	30	45

DIVISION II.—PHYSIOLOGY AND CHEMISTRY, 600 (15%).

	Hours.	Lect. Rec. dem.	Lab. wk.
(*a*) Inorganic Chemistry	180	60	120
(*b*) Organic Chemistry	75	30	45
(*c*) Physiologic Chemistry	105	30	75
(*d*) Physiology	240	140	100

DIVISION III.—PATHOLOGY, BACTERIOLOGY AND HYGIENE, 450 (11¼%).

(*a*) Bacteriology	135	30	105
(*b*) Hygiene and Gen'l Dietetics	45	45	...
(*c*) Pathology	270	60	210

DIVISION IV.—PHARMACOLOGY, MATERIA MEDICA AND THERAPEUTICS, 240 (6%).

(*a*) Pharmacology	105	40	65
(*b*) Materia Medica and Pharmacology	80	?	?
(*c*) Therapeutics	55	?	?

DIVISION V.—MEDICINE AND MEDICAL SPECIALTIES, 970 (24¼%).

(*a*) General Medicine (including Clinical Microscopy)	640	...	...
(*b*) Pediatrics	150	...	...
(*c*) Nervous and Mental Diseases	105	...	...
(*d*) Jurisprudence, Ethics and Economics	30	...	...
(*e*) Dermatology and Syphilis	45	...	...

DIVISION VI.—SURGERY AND SURGICAL SPECIALTIES, 720 (18%).

(*a*) General Surgery	510	...	...
(*b*) Orthopedic Surgery	45	...	...
(*c*) Genito-Urinary Diseases	45	...	...
(*d*) Eye	60	...	...
(*e*) Ear, Nose and Throat	60	...	...

DIVISION VII.—OBSTETRICS AND GYNECOLOGY, 300 (7.5%).

(*a*) Obstetrics	195	...	...
(*b*) Gynecology (including some Abdominal Surgery)	105	...	...

As chairman of your Committee on Curriculum, I move the adoption of this report, and that it be referred to the standing committee on medical instruction, with direction to frame and present at the next meeting the proper constitutional amend-

ment, and further, that your appointed Committee on Curriculum be discharged. (Signed)

F. C. WAITE, *Chairman.*

On motion of Dr. Waite, the report was accepted, the appointed Committee on Curriculum discharged, and the report referred to the Committee on Medical Education, with instructions to formulate a constitutional amendment, to be presented at the next meeting of the Association.

On motion, Drs. Waite and Arnold were placed on the Committee on Medical Education, this committee thus being increased from five to seven members.

At this juncture Dr. Connor presented the following resolution:

WHEREAS, Twenty-two States have legalized optician eye practice because family physicians were untrained to meet the people's refractive needs;

WHEREAS, To eliminate this disqualification the Section on Ophthalmology of the American Medical Association urges that medical colleges teach and state boards of registration require for license a working knowledge of simple refraction, and appointed a committee on its promotion;

WHEREAS, Michigan, since April, 1909, has made such a requirement and Nebraska, since 1909, Vermont will in July, 1910, and Utah in January, 1911, while other States have the matter under consideration; therefore, be it

Resolved, That the Association of American Medical Colleges urge its members to equip their students with a working knowledge of simple refraction.

On motion of Dr. Dyer, this resolution was referred to the Committee on Medical Education for consideration and disposition.

The Association then adjourned until 2 P.M.

AFTERNOON SESSION.

The Association reconvened at 2 o'clock, and was called to order by the President.

Mr. Abraham Flexner, of the Carnegie Foundation for the Advancement of Teaching, read a paper entitled "The Entrance Standards of the Association of American Medical Colleges."

The paper was discussed by Drs. W. J. Means and Augustus S. Downing.

Dr. B. D. Myers (Indiana University) moved that the subjects discussed in Mr. Flexner's paper be referred to the Committee on Medical Education, with instruction to investigate and formulate a constitutional amendment, to be presented at the next annual meeting. Carried.

Dr. Means, chairman of the Committee on Medical Education, presented the following report of the committee with regard to the recommendations contained in the address of the President and the report of the Secretary.

REPORT OF COMMITTEE ON MEDICAL EDUCATION.

The committee has no special report to make on its own investigations along the line of medical education. Its work, therefore, has been confined largely to the recommendations and suggestions contained in the papers of the Secretary-Treasurer and President, which were referred to this committee by your honorable body.

First, we wish to call your attention to the recommendation of the Secretary and also of the President that at the next meeting of the Association the Council of the American Medical Association be requested to meet with us at the same time and place. We heartily approve of this suggestion, and recommend that the Secretary be instructed to communicate with the Council of the American Medical Association to this end.

Second, we heartily approve of the suggestion that this Association invite the coöperation of other organizations that are studying medical education in this country. The committee recommends that the suggestion be approved and that arrangements be made to have representatives at our next meeting from all these organizations, and also from the state medical associations and colleges for general education.

Third, the suggestion of the Secretary that a complete record of the standing of students of each college of the Association be filed with the Secretary is perhaps ideal, but from a working standpoint is scarcely practical. (1) The colleges would object

to the expense of making a transcript of their records. (2) The work entailed upon the Secretary would require all of his time or that of an assistant.

We fully endorse the present system of matriculation records and wish to emphasize the importance of a faithful compliance on the part of the colleges.

We wish to call your attention particularly to that portion of the President's address referring to higher requirements as a prerequisite to the study of medicine and propose the following:

That the Association reaffirm the resolution adopted last year, with an addition to paragraph 4.

WHEREAS, In the evolution of medical education during the last decade it has become apparent to those interested in the problem of higher and broader attainments for graduates in medicine, that more time should be devoted to a liberal education before beginning the study of medicine; therefore, be it

Resolved, That the Association of American Medical Colleges, recognizing the growing need and sentiment for extended entrance requirements, earnestly advises and recommends that the present minimum standard be increased as soon as practicable; and, be it further

Resolved, That the Association calls the attention to the state medical boards and other educational organizations to the fact that the minimum entrance requirements of the Association are not higher than those of many states where medical colleges are located, and, therefore, would respectfully suggest that an effort be made to raise the standard in these states to meet the present minimum standard of the Association.

The committee also recommends that the Association place itself upon record by emphasizing the importance of the standard public high school, as evaluated in its schedule as a natural educational basis on which to build, when it becomes feasible, additional educational requirements, and that the colleges of the Association pledge themselves to a strict enforcement of the present standard.

The committee further recommends that the Association recognizes the importance of standardizing the secondary educational system of the country, and places itself on record by asking the individual colleges, members of the Association, to pledge themselves to lend their influence and support to all the educational forces looking to this end.

The committee recommends that the Association, in accordance with its position favoring additional preliminary educations beyond the present standard as a prerequisite to a medical course, as soon as practicable, endorse and encourage the combined baccalaureate and medical courses now given by many universities.

The committee further recommends that there should be concerted action on the part of the colleges of the Association along the lines of the two standards mentioned with the view of adopting them at the earliest possible time.

We further recommend that the committee be authorizcd to submit a schedule for the five-year course at the next meeting.

After a careful consideration of the suggestion of the President to the effect that a curriculum that is based in part on the concentration plan of teaching would be desirable, we feel that it should be recommended to the colleges as a correct pedagogic principle. This subject has been considered by several gentlemen at past meetings of the Association, but no definite action has even been taken by way of recommending the adoption of such a plan. We feel now that the time is ripe for the Association to place itself on record as favoring the concentration plan of teaching. The Committee on Education would therefore recommend that the committee be instructed to prepare for consideration at the next meeting of the Association an outline of a plan contemplating the adoption of the so-called concentration plan of teaching.

(Signed) W. J. MEANS, *Chairman*,
FRED. C. ZAPFFE,
GEO. H. HOXIE.

On motion, the report was adopted.

Dr. Zapffe, chairman of the Committee on Equipment, submitted the following report:

REPORT OF THE COMMITTEE ON EQUIPMENT.

The Committee on Equipment begs to report that it has carefully considered the reports made in 1908 and 1909, and that it does not at this time consider it necessary to make any changes

in the standard of equipment. The committee would suggest, however, that this standard, which was adopted tentatively at the 1908 meeting, be adopted as a by-law, so that it can be enforced, which under present conditions is not possible.

There can be no question that there must be some definite prescribed standard of equipment. The time has passed when the term "sufficient equipment" can be, or should be, accepted as meaning anything or as being determined by the judgment of any one man or a committee. It will be remembered that the American Confederation of State Examining Boards adopted the equipment standard of this Association in 1908, and that the Michigan State Board of Registration in Medicine is enforcing this standard to-day. This Association cannot, therefore, any longer assume a tentative attitude, but must declare itself in favor of a definite equipment standard. Just how definite this standard can well be is open to discussion, but after careful consideration your committee is convinced that the present standard is by no means too definite, and that it is not asking too much of any medical college to enforce it. The committee therefore recommends that the colleges in membership in this Association enforce the present standard.

(Signed) FRED. C. ZAPFFE, *Chairman*,
W. H. WARREN,
W. L. DUDLEY,
DAVID STREETT,
A. R. BAKER.

On motion, the report was received and ordered published in the *Transactions*.

In the absence of the chairman of the Committee on Pedagogics (Dr. H. B. Ward), the Secretary was instructed to publish in the *Transactions* any report that the committee may have prepared.

On motion, Dr. Henry B. Ward was unanimously elected to associate membership in the Association, in accordance with Article VI, Section 1.

The Secretary was instructed to notify Dr. Ward of his election.

At this juncture the Auditing Committee reported that the accounts of the Treasurer had been duly audited and found correct. The report was accepted.

Action was then taken on the following amendments, in accordance with the notice given in the call for the meeting:

The Secretary read the amendment offered by the University of Wisconsin, which provides that for the Latin requirement there may be substituted four years of either high school French or German, or its equivalent, provided a satisfactory examination is passed in the elements of Latin grammar (Article III, Section 1).

On motion, the amendment was adopted as read.

The amendment by the Western Reserve University (Article III, Section 5), providing for an increase in the college year from thirty to thirty-two weeks, was read and adopted, on motion.

The amendment offered by the University of Maryland School of Medicine (new By-Law, Section 13) was read, as follows: No college, a member of this Association, shall employ any paid solicitor for the purpose of inducing the attendance of students, nor shall any such college offer to any one, either directly or indirectly, any reward or inducement for securing the attendance of students.

On motion, the amendment, as read, was adopted.

The amendment offered by the University of California (Article III, Section 1 (*e*)), providing that the university matriculation certificate of the members of the Association of American Universities may be accepted as a minimum requirement for admission, was read and adopted.

The Nominating Committee then presented the following report:

President, Dr. J. A. Witherspoon, Vanderbilt University; Vice-Presidents, Dr. H. D. Arnold (Tufts College), and Dr. Charles R. Bardeen (University of Wisconsin); Secretary-Treasurer, Dr. Fred C. Zapffe (University of Illinois); Judicial Council (term to expire in 1913), Dr. William J. Means (Starling-Ohio Medical College), Chairman, and Dr. Randolph Winslow (University of Maryland), Dr. J. H. Guthrie (University of Iowa), to fill unexpired term (1911) of Dr. H. B. Ward.

On motion, the report was adopted, and the Secretary was instructed to cast the ballot of the Association for the election of the nominees to the offices named, which he did, and they were declared duly elected for the ensuing year.

The President was instructed to cast the ballot of the Association for the election of Dr. Zapffe as Secretary-Treasurer, which he did, and Dr. Zapffe was declared duly elected.

On motion of Dr. Guthrie, a vote of thanks was extended to the retiring president, Dr. Hoxie, for the ability, faithfulness and zeal displayed by him in the administration of the duties of his office.

On motion, a vote of thanks was extended to the Baltimore colleges, members of the Association, for their hospitality and for many courtesies shown, and to the Medical and Chirurgical Faculty of Maryland for the use of its elegant quarters, and to the Committee on Curriculum for the splendid manner in which it performed the duties assigned to it.

On motion of Dr. Waite, the Secretary was authorized to call for an assessment to defray the expense incident to the publication of the proceedings of the Association in such form as to give them the widest possible publicity.

Pursuant to the suggestion as to place of meeting, made by the President and Secretary, the Judicial Council, on motion, was authorized to make arrangements for the next annual meeting, and announce the place chosen for such meeting as soon as possible.

The Chair here appointed Drs. Arnold and Waite to induct the President-elect, Dr. Witherspoon, into office, which they did. Dr. Witherspoon briefly addressed the Association.

There being no further business to come before the Association, at this time a motion to adjourn, subject to the call of the President, was made and carried.

FRED. C. ZAPFFE,
Secretary.

GEORGE H. HOXIE, *President.*

ASSOCIATION OF AMERICAN MEDICAL COLLEGES ROSTER—1910-1911.

OFFICERS.

President, J. A. Witherspoon, Vanderbilt University.
Vice-Presidents, Horace D. Arnold, Tufts College; Chas. R. Bardeen, University of Wisconsin.
Secretary-Treasurer, Fred C. Zapffe, University of Illinois.

JUDICIAL COUNCIL.

William J. Means, Chairman, Starling-Ohio Medical College.
Randolph Winslow, University of Maryland.
C. M. Jackson, University of Missouri.
A. A. D'Ancona, University of Califorina.
Egbert LeFevre, University and Bellevue Hospital Med. College.
William P. Harlow, University of Colorado.
Jas. R. Guthrie, University of Iowa.

COMMITTEE ON MEDICAL EDUCATION.

William J. Means, Chairman, Starling-Ohio Med. College.
Fred. C. Zapffe, University of Illinois.
George H. Hoxie, University of Kansas.
W. P. Harlow, University of Colorado.
H. A. Christian, Harvard University.

COMMITTEE ON EQUIPMENT.

Fred C. Zapffe, Chairman, University of Illinois.
William L. Dudley, Vanderbilt University.
William H. Warren, Washington University.
Albert Rufus Baker, Cleveland Coll. of Phys. and Surgeons.
D. Streett, Baltimore Medical College.

COMMITTEE ON STATE MEDICAL BOARDS.

Fred C. Zapffe, Chairman, University of Illinois.
William J. Means, Starling-Ohio Medical College.
J. R. Guthrie, University of Iowa.

COMMITTEE ON CURRICULUM.

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Egbert LeFevre, University and Bellevue Hospital Med. Coll.
R. D. Coale, University of Maryland.
C. M. Jackson, University of Missouri.
H. Albert, University of Iowa.

P. M. Dawson, Johns Hopkins University.
A. S. Warthin, University of Michigan.
H. D. Arnold, Subchairman, Tufts College Medical School.
J. Shelton Horsley, Medical College of Virginia.
Henry M. Sherman, University of California.
J. L. Porter, University of Illinois.
R. Peterson, University of Michigan.
S. W. Kelley, Cleveland College of Physicians and Surgeons.
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C. G. Coakey, University and Bellevue Hospital Med. Coll.
J. F. Barnhill, University of Indiana.
Edward Jackson, University of Colorado.

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COMMITTEE ON MEDICAL TEACHING.

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Charles R. Bardeen, University of Wisconsin.
E. P. Lyon, St. Louis University.
J. A. Witherspoon, Vanderbilt University.
William S. Thayer, Johns Hopkins University.

MEMBERS.

California.

Leland Stanford Junior University, College of Medicine, San Francisco.
University of California, Medical Department, Berkeley, San Francisco and Los Angeles.
University of Southern California Medical Department, Los Angeles.

Colorado.

University of Colorado, School of Medicine, Boulder.
Denver and Gross College of Medicine, Medical Department, University of Denver, Denver.

District of Columbia.

Georgetown University School of Medicine, Washington.
George Washington University, Department of Medicine, Washington.
Howard University, Medical Department, Washington.

Illinois.

American Medical Missionary College, Battle Creek, Mich., and Chicago.
University of Illinois, College of Medicine (College of Physicians and Surgeons), Chicago.

Indiana.

Indiana University, School of Medicine, Bloomington.

Iowa.

Drake University, College of Medicine, Des Moines.
State University of Iowa, College of Medicine, Iowa City.

Kansas.

Kansas Medical College, Medical Department of Washburn College, Topeka.
University of Kansas, School of Medicine, Lawrence and Rosedale.

Kentucky.

University of Louisville, Medical Department, Louisville.

Louisiana.

Medical Department of the Tulane University of Louisiana, New Orleans.

Maryland.

Baltimore Medical College, Baltimore.
College of Physicians and Surgeons, Baltimore.
Johns Hopkins University, Medical Department, Baltimore.
University of Maryland, School of Medicine, Baltimore.

Massachusetts.

Harvard Medical School, Boston.
Tufts College Medical School, Boston.

Michigan.

Detroit College of Medicine, Detroit.
University of Michigan, Department of Medicine and Surgery, Ann Arbor.

Mississippi.

University of Mississippi, Medical Department, Oxford.

Missouri.

St. Louis University, School of Medicine, St. Louis.
University Medical College, Kansas City.
University of Missouri, School of Medicine, Columbia.
Washington University, Medical Department, St. Louis.

Nebraska.

John A. Creighton Medical College, Medical Department, Creighton University, Omaha.
University of Nebraska, College of Medicine, Lincoln and Omaha.

New York.

Cornell University Medical College, Ithaca and New York.
University and Bellevue Hospital Medical College, New York.
University of Buffalo, Medical Department, Buffalo.

North Carolina.

University of North Carolina, Department of Medicine, Chapel Hill.
Wake Forest College, School of Medicine, Wake Forest.

North Dakota.

University of North Dakota, College of Medicine, University.

Ohio.

Miami Medical College, Cincinnati.
Starling-Ohio Medical College, Columbus.
Western Reserve University, Medical Department, Cleveland.

Oklahoma.

State University of Oklahoma, School of Medicine, Norman.

Tennessee.

Meharry Medical College, Medical Department Walden University, Nashville.
Vanderbilt University, Medical Department, Nashville.

Virginia.

Medical College of Virginia, Richmond.
University College of Medicine, Richmond.

West Virginia.

University of West Virginia, College of Medicine, Morgantown.

Wisconsin.

University of Wisconsin, College of Medicine, Madison.

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Dr. Henry Y. Bowditch, Boston, Mass.
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