Association of American Medical Colleges

PROCEEDINGS OF THE NINETEENTH ANNUAL MEETING HELD AT NEW YORK, N. Y., MARCH 15TH AND 16TH, 1909

PRESIDENT'S ADDRESS.

FUNCTIONS OF THE MEDICAL SCHOOL.

By ELI H. LONG, M.D., University of Buffalo, Medical Department.

With full appreciation of the honor attending the privilege of addressing you as presiding officer, I invite your attention to the topic announced, "Functions of the Medical School." I cannot hope to present much that is new to medical educators, for your minds have been active and receptive during the recent period of marked advancement in matters of medical education. The aim of this essay must, therefore, be emphasis rather than originality.

The older men among us have been privileged to witness changes that amount to little less than a revolution in the process by which persons are prepared to practise medicine; for the transition from the school of twenty-five years ago, with its two courses of five months each, with no entrance requirements and with no grading of instruction, to the school of to-day with its four years of eight months each, with thoroughly graded instruction and its preliminary requirement of a high school education,' cannot be attributed to evolutionary influences solely.

The main causes of these rapid changes are several. We may name in order, first, the desire and effort on the part of the medical school to remedy its conscious defects; second, the awakening on the part of the profession to the need of better preparation for practice, which attitude finds expression in the enactment of laws regulating the practice of medicine; and, third, the rapid advances in medical science, which have compelled enlargement of the course of study and have stimulated its betterment.

Probably the most revolutionary change, and at the same time the most important, has been the development of state control of the right to practise. In the past two decades the colleges have seen a function, earlier theirs of necessity, transferred wholly to the state. All will admit that this movement was toward the normal. And when we reflect that it meant the divorcement of the educational and licensing powers, depriving the schools of a recognized function, we have ground for congratulation that the beneficent results seen to-day have been attained without serious friction, and that the schools accept the situation as normal and desirable. If, incidental to the transition, the schools have seemed to be objects of criticism that exposed the weaker side of their work to view, this has been of benefit. It was part of a sifting process which is resulting in the separation of unworthy schools and in the relegation of inferior teaching methods. And if the schools have been placed under censorship for the time, let us regard even this as an aid in the very work that we, as an Association, are doing and have been doing for years—the work of elevating the standards of medical education.

But it would be unfair to regard the schools as having been wholly backward, or even passive, in the movement for better control of the practice of medicine. There is evidence to the contrary. Forty-five years ago, when the profession in New York State was thinking in this direction, as the records of the state medical society show, or twenty-six years before the passage of our modern medical practice act, one of the medical schools of the state, by unanimous vote of the faculty, promulgated the following resolutions:

UNIVERSITY OF BUFFALO,
MEDICAL DEPARTMENT,
Feb. 20, 1864.

On motion of Professor Charles A. Lee, seconded by Professor James P. White, it was

Resolved, That the Medical Society of the State of New York be requested to appoint a committee to consider the expediency of, and to report a plan for, the appointment of a state board of examiners for the degree of doctor of medicine, and to report at the next meeting of the society.

Resolved, That the same committee be instructed to bring the subject before the next meeting of the American Medical Association, and that the delegates of this society be instructed to urge the general adoption of the same plan in other states of the Union.

SANFORD EASTMAN, *Dean.*
THOS. F. ROCHESTER, *Chairman.*

The sincerity of this action is indicated in the following quotation from the *Buffalo Medical Journal* (Feb., 1864), then edited by a member of the college faculty:

When the graduation of students in medicine is wholly separated from the duty of teaching and an impartial board of examiners shall decide who shall and who shall not receive the degree of doctor in medicine, very much will be accomplished for the elevation and advancement of the profession. It is striking at the very root of a great evil and will meet with opposition. . . . If this reform now suggested and urged upon the profession by the medical college in Buffalo is favored by the other colleges in the state, we shall soon be redeemed from the power and influence of a system which has disgraced the profession, lowered its standard of attainment, reflected obloquy and contempt upon its degree and come well-nigh reducing medicine as learned and practised to the level of a trade.

The progress made in this direction within thirty years has been such that now every state in the Union has its medical practice act and its examining and licensing board. As we review these attainments, and look forward with hope for their perfection in uniformity of standards and in reciprocity, we can have only words of appreciation for the results thus far.

But what of the medical schools in their teaching capacity? What progress have they made during the period under review? The following incident will aid our appreciation of progress on the part of the schools: It is reported that within the period of thirty-five years past an artisan, passing the college building of one of our foremost medical schools, heard the bell ring to announce a lecture, entered out of curiosity, during that lecture decided to study medicine, and was graduated from that institution thirty months later. To the man educated to-day it seems strange that such an incident could have occurred. But it serves to show that at a time not yet far removed from the present, a medical course of only two years of five months each before graduation, with no questions asked as to prelim-

inary training, was the rule even among the best medical schools. The schools were then simply taking the material that presented and making the best they could out of it; and some of it turned out pretty well. Without a graded course it seemed unnecessary for the student to cover the ground more than twice, so that to many a third year seemed superfluous. But with the rapid advances in medical science from about 1880, we find the better schools voluntarily advancing their standards, enlarging their courses of study and improving their methods of teaching. Their progress was very decided before they had the aid of state enactments, which came as incidents in their upward course and served to give some direction to their efforts, but that progress has been greatly accelerated during the past fifteen years, with the more rapid extension of state control. Aside from the advantageous requirement of a fair education before beginning the study of medicine, we find that college methods and college equipment have been scrutinized from within and from without; and, while voluntary progress had been great in the better schools, they were ready to go further and to promptly adjust themselves to new conditions demanded by state requirements. We may not deny that the colleges needed the stimulus of state control of their product, for in a real sense they have profited by it, but they were in a state of readiness; and they have so easily become adjusted to the requirements and suggestions of state boards as to appear almost subordinate to them. This cannot be admitted to be the actual relation or the normal one, and the next decade should yield a better sense of proportion.

While we welcome state control of licensure and as well helpful criticism by the profession, it is proper at this time to insist upon the dignity that pertains to the high function of preparing men to practise medicine. It is well to remember that state laws may be enacted, modified, repealed, but the physician will always be essentially what the college makes him. Therefore, we must regard the work of the college as fundamental and that of the state board as incidental. This is, in fact, acknowledged in the necessity which some state boards feel of

omitting from their examinations two of the most essential subjects in medicine, *viz.*, practice and therapeutics. It still remains the province of the medical school to determine what shall constitute a medical education and how that education shall be acquired. And because of the state's limitations in this direction, the worthy school, conscious of its independence in the most important part of its work, will lead rather than follow in the march of progress.

But leaving the question of relation to other established factors in medical education, let us discuss some essential functions of the medical school of to-day. Our view will be an introspective one.

It may be said that the scope of the medical curriculum is now pretty well established. Details need perfecting, but we have standardization of subjects and of equipment now in progress, so that the evident demands are in process of being satisfied.

Standardization of teachers will naturally follow. But, just as character in the individual cannot be developed from without but must be the fruit of the reaction of inner forces to conscious impressions, so we may well look within for sources of greater efficiency in the medical school.

We must not forget that many of the schools have faced financial difficulties during the period of adjustment to increased preliminary requirements, because of lessened attendance. This may not apply to the few endowed schools, but it does apply to the average of the better class of medical schools, such as compose this association. The figures show that the number of medical students in attendance in the United States in 1908 was 16.8 per cent. less than the average number five years earlier. But the fact of lessened average income does not seem to have retarded progress in our schools. It is true that some schools gained in attendance during this period, and there are some of the best schools in either column. It is evident that the law of supply and demand has not been wholly determinative during the period, for our population has increased as usual; but there seems to be no present danger

that the supply of physicians will fall short. Still the facts suggest the question of the relation of the medical school to the supply. The practical question will be that of the attitude of the college toward the competency of its graduates, or the quality of the supply it furnishes.

Let us remember that we have the student under observation for four years before his final appearance for license; what our graduates will be at that time depends entirely upon us. This assertion may be denied upon the ground that we cannot put brains into dull students; but I insist that we need not allow the dull, incompetent or lazy student to advance beyond the experimental stage. Herein lies a most important, but too little used, function of the medical school. Certain applicants come up again and again before the licensing board only to fail repeatedly, and no power can prevent. Where is the fault? Such persons ought never to have been allowed to complete their college course. The college is wholly to blame; and any school may well feel humiliated by such a hopeless failure of its graduate in the licensing examination. Therefore, while we may not feel called upon to regulate the supply of physicians, we should see to it that our part of the supply is competent. Self-interest has doubtless prevented a proper regard, on the part of the schools, for the interests of the public and likewise for the interests of the incompetent student. In justice to the public we should not graduate the incompetent man, and in justice to the man we should not allow him to spend four years with us only to face failure. It is gratifying to see that some schools are coming to realize their duty in this regard. It must be held to be an important privilege and function of the medical school to discourage incompetent and to dismiss indifferent students after the trial of the first year.

If we still realize our prerogative to determine what shall be taught and how it shall be taught, we may turn a critical eye upon the details of our work and ask whether we are fully meeting the demands. It is easy to add subjects to the curriculum, and it is probable that amount of instruction has sometimes been emphasized to the neglect of quality. It may be that,

in order to give attention to all of the specialties, we have minimized the importance of a most thorough training in the fundamentals of medicine. In the desire to give opportunity for research we may have been led by some enthusiastic worker to give it undue place in the undergraduate course. The essentials of a medical education have not changed so radically with the progress of the past quarter of a century but that men who were well educated then have been able to follow the advances. It is true that there is more to be learned than formerly. The whole science of bacteriology has been developed and some of the secrets of nature in respect to the pathology and cure of disease have been discovered. The specialties have come into prominence. Nevertheless, the best part of the practitioner's preparation is and always will be a thorough grounding in the fundamental principles of general medicine and surgery.

It is of great importance that the whole course be properly graded and the matter correlated wherever possible, so as to economize the student's time and energy. And, what is just as important, the developmental feature of the medical course should be recognized and made full use of; for, beginning in the first year with the purely scientific branches, passing then to those that may be correlated, permitting the presentation of facts in more concrete form, and then on in the third and fourth years to the practical clinical work, we can hardly imagine a course more perfectly adapted to secure logical mental development. But are we employing this feature to the proper extent? Also, we are to be congratulated upon being teachers of a profession which is a rapidly advancing and expanding one, which not only finds resources in the tomes of past literature, but whose workers may within any month announce discoveries or advances that will greatly change methods and results in practical medicine. Accordingly, with recognition of these features that are vital, an important function of the medical school is that of discrimination as to character and conduct of the course, with a view to realizing in full the normal factors in the development of the medical man. The rapid development of the present course has been the result of necessity and it has occurred

without much supervision by pedagogic authority. What wonder if the emphasis has not been rightly placed? What wonder if the more essential element of development has been sacrificed to the fancied advantage of including every new theory and every method of promise? The curriculum has become crowded. The purpose of these observations is to discount the crowding process and to plead for time for the student to devote to the reading and reflection that are necessary to his best development. A schedule that requires an attendance of eight hours per day with close mental effort will use all of the energy an average student can command. Little opportunity is afforded for individual elaboration of what he has received. What is the result? His facts are ill-assorted, his observations are not thought out, his deductions are apt to be faulty and his whole work becomes superficial. His individuality is restrained and his development dwarfed. The question is whether we shall try to fill the minds of the students with the greatest possible amount of material without giving opportunity for its constructive use, or shall we respect and employ the laws of natural development, securing thereby the best possible development of mental capacity in connection with the necessary acquisition of facts. With the latter in view, any lengthening of the course should be for the purpose of giving the student more time for assimilation and construction, rather than of adding to the amount of matter to be presented.

With the rapidity of transition in some departments the curriculum must always be regarded as tentative in its details. Our excellent model curriculum of 1905, which has secured deserved recognition, should soon be revised. It was to be expected that five years would show the necessity of some changes. For example, it seems questionable to give to so special a branch as electro-therapeutics more time in the regular course than is allotted to dermatology and syphilis. Also it is a question whether dietetics in the abstract is entitled to 30 hours, as compared with hygiene and public health which together are given 30 hours. Other criticisms might be offered, but our discrimination must here be wisely exercised, both in the matter of adding

to our curriculum and of subtracting from it. Permit me to enlarge upon the latter thought, for I submit that as it is our function to add to our course of study, it is likewise our function to eliminate from it.

We have seen our curriculum grow in thirty years from a group of seven fundamental branches and two or three specialties to double that number of distinct courses of instruction. In the same period our total of hours of instruction in the complete course has increased from a usual maximum of 2,000 hours to a present minimum of 4,000 hours. We have been adding and enlarging without stint. But where have we eliminated? It would be strange if the great advances of the same period had not revealed the obsoleteness of some of our past work. It is true that elimination has occurred, but in small units rather than in sections--in details but not in subjects. The process has been one of modification which has gone on steadily. But in one direction it seems high time to eliminate and to eliminate rather mercilessly. I refer to the fifty or one hundred unimportant drugs that have been carried along in our text-books, referred to in an indifferent way in our lectures and, by reason of this recognition, have been retained in considerable number in the U. S. Pharmacopoeia. These practically obsolete drugs have only an occasional use in medicine to-day. Why should we thus encumber our materia medica and subject our students to routine study of substances whose influence upon the system is so feeble as not to be capable of recognition by pharmacologic means? Materia medica is regarded as a dry subject; but there is nothing dry about the study of such drugs as digitalis, opium or strychnine, drugs that have a character that can be known in definite action upon the system Such drugs deserve the time commonly given to the substances of little importance If we could send out our graduates with a thorough knowledge of fifty of the most active drugs, we should soon hear nothing of therapeutic nihilism, or even skepticism. And further, if we were to teach them in detail how to apply and prescribe these same drugs, the days of proprietary specialties would be numbered. Ten years ago the sentiment of teachers

of materia medica and therapeutics toward the elimination of unimportant drugs from the Pharmacopoeia was tested by a committee of the Medical Society of the State of New York. A list of 54 such drugs was submitted for vote as to the advisability of their retention in the next revision. One hundred responses from these teachers gave the following result:

Number of drugs having from 30 to 33 votes out of 100	3
Number of drugs having from 20 to 30 votes out of 100	11
Number of drugs having from 10 to 20 votes out of 100	14
Number of drugs having less than 10 votes out of 100	26

The number of votes in favor of retention of any certain drug varied from 1 to 33.

Thus, approximately one-half of the 54 drugs received less than 10 per cent. of possible votes and only 3 received as high as 30 per cent.—not a very strong endorsement for any.

It is interesting to note that 28 of these drugs were dismissed by the Committee on Revision. The last plea to be made for teaching about these nearly useless substances is on behalf of the state licensing examinations, upon the ground of the necessity of employing them in questions for the benefit of applicants who were educated some years ago. It would be strange if sufficient drugs familiar to every practising physician could not be found to test any candidate's knowledge of medicine. The recognition of these drugs seems also to foster the proprietary abuse, for it is evident that the manufacturers resort to feeble rather than active agents in making up preparations that are pleasing to the senses. We are ready for the proposed elimination.

We have seen marked improvement in teaching methods. The didactic lecture has been to a degree supplanted by the recitation and conference, while clinical teaching has been given the place of prominence in the third and fourth years and the course on the whole has been made more practical. But if we recognize the need of helping our students to develop the largest possible mental capacity, there is something more to be included in the full performance of our teaching function.

In the writer's opinion the greatest deficiency in the conduct of the medical course to-day is the lack of developmental work, meaning by that the failure to train the student to think and to reason out matters for himself. The course is logically arranged to aid the student's comprehension of successive subjects, but the detail of instruction is often faulty. We have deprecated the crowding of the day—what about the hour? The crowding of much material into the hour may seem to be necessary, but it may defeat the best ends of instruction. While the passing of the didactic lecture has rendered the teaching less dogmatic, crowding of the hour may still prevent the best individual work.

We sometimes hear regret expressed for the disappearance of the preceptor factor in the student's preparation, and with good reason. The association of student with preceptor for some months of the year was, in some respects, an ideal relation for the student's benefit, as it furnished that opportunity for detailed observation and discussion of cases with one more experienced, which contributed much toward the development of reasoning power, compensating somewhat for the inferior teaching methods of that day. But with the necessity of giving four years to medicine, with longer college sessions, and with the greatly increased expense of the course, many young men cannot now afford the time to spend with a preceptor. The college ought somehow to make up for this lack. The third and fourth years, and a possible fifth, will be the time to do it. But it cannot be done by simply adding hours. It must be done along lines of development.

There are a few branches that lend themselves particularly to developmental work, and all should employ it to the extent that is practicable; but of all branches, that of therapeutics, which has come to be an uncertain quantity in some quarters, furnishes the greatest opportunity for the development of judgment and reasoning power. In support of this assertion let me remind you that the study of therapeutics, if preceded by proper preparation, does not call for the learning of many new facts. It should consist largely of the putting together and application of previously learned facts. In this view of the

case rehabilitation of the subject is in order; and it is reassuring to know that, while therapeutics as taught by the historic method is losing in favor, applied therapeutics, as a third-year subject, is gaining strong advocacy. In planning for this work, the whole course should be so arranged that the student comes to his third year with the essential facts of materia medica, pharmacy and pharmacology at command; likewise his anatomy, chemistry, physiology and bacteriology, with some knowledge also of pathology. Reversing the old order of things and taking up therapeutics from the standpoint of the condition or disease to be treated, instead of from the drug standpoint, an exercise in the form of a conference will be most profitable. Such conference may be sufficiently informal to permit the students to ask questions as occasion suggests. Freedom of thought and expression should be encouraged, for the main purpose should be to aid the student himself to correlate, construct, adapt and apply. He is thereby enabled to think out rational treatment, hygienic, physical, mental, pharmacologic, or whatever is applicable, and he does it mainly by the use of facts previously learned. The same kind of work can be continued in the clinic and ward class if the teacher will give treatment the place it deserves. The result of carrying the above purpose through all of the practical branches, as far as they admit of it, will be to make our graduates thinking and reasoning men rather than encyclopedic men. Which is better?

Another means of compensating for the lack of preceptorship is found in the hospital interneship. In the progress of events students are coming more and more to feel the necessity of supplementing their college course by hospital training. In one large city that furnishes hospital positions enough to supply all ambitious graduates of its one medical school, it is found that about three-fourths of the graduates voluntarily spend a year or more in a hospital position before engaging in practice. This is approaching what may be considered normal; but it would be better if the near future could see relations of schools and hospitals so adjusted that every graduate could be assured of a hospital position. To go a step further, it would be desirable

to have the college course invariably include an additional hospital year, so that the latter might be given definiteness under college supervision. In these days we are discussing the question of an additional year in medicine. Increase of preliminary preparation by one year is being advocated. No doubt that is desirable. But if the deficiency pictured above is real and the necessity of an additional hospital year is appreciated by the students themselves, would it not be better first to aim at completion of the medical course by adding a hospital year, before increasing preliminary requirements, when those now in force are not yet fully standardized? If to the college belongs the function of determining what shall be taught in the medical course, it seems that upon the question of an additional year somewhere in the period of preparation for medical practice, this association is in a position to speak with some authority.

Another direction in which it should be our function to aid the student is in formation of habits of thought. Because of the constant diversion of thought incident to expansion and rapid progress, there is apt to be loss in power of concentration. This tendency is evident at the present time to a degree that calls for recognition and remedy.

In the dawn of medical history the diffusion of the knowledge and art of medicine centered about great leaders, and habits of thought were acquired by the student without much diversion of opinion, though the view was necessarily limited. Provided, however, that the leader was a wise student and a good thinker, there was a distinct advantage to the pupil in such association. And there are many practitioners in every generation and in every community, close association with whom can contribute essentially to a proper medical education; and they are not all living in the large cities nor enjoying prominence. But we would not go back to Hippocrates or Galen in this day of advancing medical science, nor would we think of entrusting to the best modern practitioner the duty of educating in the various branches necessary to medicine; but there can be no doubt that such associations begot in the minds of the learners a constancy and firm-

ness of conviction that is too scarce an article in the rank and file of physicians to-day.

Of the fact of this deficiency, no stronger proof is needed than is seen in the ease with which the average practitioner forgets our drug standards and our standard drugs, and consents to be re-educated by the detail agent of the manufacturing house. This disgrace to our profession is founded upon causes. They may not all be patent to us, but two causes seem to me to be most prominent, and they bear upon the function of the medical school.

Fundamentally, our habits of thought have become too discursive. We allow new authority and new theory too easily to supplant the old. We allow new ideas to captivate us and we are impressed even by the simple voluminosity of modern literature and of modern statistics, forgetting to "prove all things and hold fast to that which is good." For example, some new chemic or vital reaction, or some new remedy, is reported. It has not had the test of time and extensive trial. It is too early to place it before a body of students, unless with reserve. Yet some teacher will enthusiastically give it equal place with what has been tried and proven. This fault, it is feared, easily permeates our schools, and our students naturally fall into the same habit. What wonder that they listen to insufficient authority and fail to discern the commercial selfishness that would seduce them.

Another cause of the practice of prescribing proprietaries is insufficient training of our students along lines of practical therapeutics and prescribing. This fault is coming to be recognized and will doubtless be corrected; but in connection therewith we see an additional special reason why the materia medica required to be learned should be restricted to the more active drugs and that these be learned thoroughly. This will antagonize discursiveness of thought in that particular branch and will give the student positive and fixed convictions as to the action and value of drugs and the efficiency of our official standards. Prescription conference work in the fourth year can be made a most valuable aid to the development of mental capacity,

to the training of the reasoning powers and to concentration of thought upon definite things. So satisfactory have been the results of the writer's efforts in this special direction that he asks your indulgence in permitting him to devote the closing paragraphs to a definition of the "prescription conference," from actual experience.

The course occupies twenty hours in the fourth year, presupposing earlier preliminary instruction in the form of the prescription.

The hourly exercise includes original work by the student, conference, and criticism by students and teacher, arranged as follows:

1. Original work in the construction of prescriptions (first half hour).

   At each session every member of the class is required to prescribe independently for a case or condition proposed by the teacher[1] without previous announcement. The case may be a clinical one recently seen or a hypothetical one. Four students write upon the board for class criticism, all others write upon blanks with wide margins for corrections.

2. Conference (second half hour).

   The writing completed and the prescriptions gathered up, the class criticizes the four prescriptions upon the board, this forming a part of the conference, led by the teacher, upon the appropriateness of the combinations and upon the general treatment of the case or cases proposed.

   Incompatibles, vehicles, pleasant prescribing, etc., are also discussed as occasion presents.

3. Criticisms (between sessions).

   The class having been formed into voluntary groups of three in each, for criticism work, each week one group, in regular turn, takes charge of the prescriptions written by the whole class (except those on the board). The group reviews these prescriptions critically during the next few days, making corrections and criticisms in *blue* pencil upon the margin. They are then returned to the instructor, who reviews both the prescriptions and the criticisms, using *red* pencil for his corrections, marks them according to merit, and returns them to the writers at the close of the next session, making at that time any comments upon special points.

[1] NOTE.—Two cases may be proposed, giving the students in the seats a choice, but with the main purpose of covering a larger number of conditions in the conference work. Of the four students at the board, the first and third would be asked to prescribe for the first case, the second and fourth for the other.

Writing for proprietary substances is discouraged by requiring the student, who writes for such, to give the composition and describe the action of the same.

The metric system is used exclusively.

This course taxes the student's resources in many directions. He must use his knowledge of drugs, their actions, their solubilities and incompatibles, and indications for their use in treatment; it drives him to the Pharmacopoeia in his criticism work, and he learns the inutility of proprietaries; it enables him to make his mistakes before friendly critics, and it gives him exactly the kind of experience that would require several years of practice to gain. He gains a degree of confidence in prescribing and is guarded against serious errors.

Gentlemen: In the exercise of our high privilege—that of teaching young men to become physicians—let us not lose sight of the man. Let us see in him the possibility of becoming a better physician than ourselves. And let us exercise the functions of the medical school in such manner that the student shall have the best opportunity to become a thinking, reasoning physician, with the largest mental capacity possible to him.

II.

STANDARDS OF MEDICAL EDUCATION.

By HENRY S. PRITCHETT, Ph.D., President Carnegie Foundation for the Advancement of Teaching, New York.

While the last twenty years have seen a great improvement in the standards of medical education, there is still much to be desired in this matter in the medical schools of the United States. We have at the present time nearly as many medical schools in this country as exist in all the rest of the civilized world. Most of these institutions are commercial in character and are practically forced to keep low standards in order to live. This situation is a most dangerous one to the practice of medicine and to medical education, and in some way we must better it in the next decade if the physicians trained in this country are to be trained in methods of modern medicine.

Another consequence of this great oversupply of medical schools is that we are obtaining each year a larger number of ill-trained men in the profession than are needed—a result sure to depress the quality of the profession and to do injustice to the public who suffer from such conditions.

In view of this situation the Carnegie Foundation for the Advancement of Teaching has undertaken to make a detailed study of the present status of medical education. In order to accomplish this it is inspecting with care every medical school in this country and in Canada. The results of this examination will be laid before the public in the form of a publication as soon as the material can be brought together, fairly discussed and arranged. This will probably occupy more than a year.

Meantime, certain fundamental facts are plain. One is that the public itself is vitally interested in the maintenance of good professional standards for admission to the practice of medicine. A second necessary requisite is that no matter what medical sect practitioners may join, they must be trained in the fundamental sciences which underlie all medical practice, such as physiology, anatomy, pathology, and the like. The

general public cannot possibly differentiate between the various medical sects. The ordinary man has no opinion which is of any value as between allopaths, homeopaths, eclectics, osteopaths, or other medical bodies. The only possible protection he can secure is to insist that the man licensed to practise shall be, first of all, a well-educated man, and secondly that he shall have been thoroughly grounded in the fundamental sciences upon which all medical practice depends.

I was greatly struck with this fact last autumn in visiting a physician in a little western town, who bore the title of a somewhat new and special cult of medical practitioners, and who had had as preparation two years of work in a small western medical school. This man had a large practice, including every variety of disease, trivial and serious, all of which he was treating by the same mechanical means. In a word, it was evident that he had as great need to know the fundamental sciences as any other practitioner, inasmuch as he was passing on all forms of disease.

It is clear that if the rights of the public are to be conserved, medical education must be lifted off the commercial basis and real standards must be enforced.

With regard to the standards at present let me urge that an honest enforcement of the standards adopted is a far greater contribution to medical education than the adoption of high standards which are not enforced. Your association, for example, accepts at the present time as its standard for admission to the medical school the completion of a four-year high school course. You will do far wiser and you will serve medical education far better if you will enforce this standard, than to adopt a higher standard which you cannot enforce. I understand that there is before you at this time a proposition to advance your standards to the requirement of two years of college as a prerequisite for entering the medical school. I believe that this is a reasonable requirement for medicine, but I know perfectly well that you cannot enforce any such requirement in a large part of the country at this time; and I am equally well aware that most of the colleges of your association do not strictly

enforce your present requirement of the four-year high school. Let me urge you, therefore, first to enforce strictly the standard now adopted before adopting on paper a standard which you will find for some years to come impossible. To do any other thing is to cultivate insincerity and superficiality, of which we have already had too much.

While it seems to me probable that medical education will in the end be associated almost invariably with a university, it is nevertheless true that many colleges and universities have injured the cause of medical education in the past by their desire to include a medical school as part of their organization. Many colleges and universities are to-day lending the shelter of their charters and the support of their names to medical schools which are purely commercial. Such a connection is a thorough disgrace to a true college or a decent university. No college has the right to undertake a medical school except from the one motive, namely, to serve medical education and the betterment of medical practice. To undertake a medical school merely for the sake of institutional completeness or to be able to print a few more names in the catalog is a betrayal of education, not a service in its interest.

In this whole matter the colleges and the physicians and the officers of the law who are to deal with the legal requirements for admission to practise need to turn their faces toward common honesty and sincerity and to further the real interests of medicine and the real interests of the public, and these lie along the same road. There is no picture more discouraging in our economic and professional organization than to see the number of ill-prepared and ill-supported physicians who gather in the small towns, eking out a bare living and rendering a service which is in no way proportioned to the state of medical science and medical practice. The day ought to come, when, as in Germany, the man whom one summons as a physician in the small town is prepared in the same medical school as the man whom one consults in a large city.

III.

A MEDICAL STUDENT IN 1867.

By JOHN A. WYETH, M.D., LL.D., New York.

The Medical Department of the University of Louisville was in 1867 one of the oldest and deservedly best known of the medical colleges in the United States. Of those south of Mason and Dixon's Line it was *facile princeps*. The course of study and the standard of requirements then prevailing at this school may be taken as typical of medical education in the United States at that period. There was no preliminary or entrance examination. Any white male who could read and write and who had gone through the rudiments of English, was eligible. I emphasize the white male, as the white female had not then entered the field of medicine and since white is defined as the absence of color, our medical class was essentially white. The constitution of the United States had not as yet established its color line. Neither Latin nor Greek was essential. The requirements for graduation were a satisfactory examination at the end of two college terms of seven months each. The division of subjects was that then prevailing in practically all the medical colleges, anatomy, physiology, surgery, medicine, obstetrics, chemistry and materia medica.

Anatomy was thoroughly taught by the best teacher in this branch I have ever known. Our text-book was Gray, and the lectures upon this usually dry topic were made so attractive that no student ever cared to "cut" one of Professor Bodine's hours. The didactic course was supplemented by dissecting room work of a high class While material was not over-abundant, there not then being the same liberal construction of the law relating to the disposition of the unclaimed dead as now prevails, the activity of our dissecting room janitor kept us in a sufficient quantity of cadavers. How he got them, we did not know, and it was probably just as well that no inquiry was instituted. His name was Peter. Students inclined to disrespect spoke of him as "Old Pete," but those who had been brought

up under the influence of the Westminster Confession baptized him St. Peter, the rock upon which our anatomical church was founded, and to whom it was said the keys of Cave Hill Cemetery had been given. I remember that once a subscription was taken up to reimburse him for his horse and wagon, which had fallen into the hands of the night watchman at this fashionable burial ground for that large and wealthy community. Upon another occasion, a detail was made from the class to take care of this enthusiast, who upon one of his midnight forays while making a precipitate retreat from the cemetery grounds, received in his person the well-distributed contents of both barrels of a shotgun loaded with small shot. It is handed down in the annals of that year that each member of the graduating class carried home as a souvenir a shot picked out of Pete's anatomy.

Professor Bullitt, assisted by the brilliant young Edward Palmer, then not quite twenty-one, lectured to us on physiology, following closely the teachings of Dalton, whose text-book was then much in vogue, and to this was supplemented the brilliant work of the younger Austin Flint, who was just then coming into prominence as one of the greatest teachers of physiology this country has even known.

In surgery, our text-book was Erichsen, and the teaching both didactic and clinical. In the city hospital, and at the college, we witnessed surgical operations and were given lessons in wound dressings and minor surgery in a dispensary which was connected with the university. The surgery of the brilliant, eccentric and lovable Professor David W. Yandell and Professor Bayliss was the best of that period, but as I look back upon it in the light of the great advancement in this department of science now, the work seems exceedingly crude and primitive.

In medicine, our teacher was the scholarly Professor Bell. His favorite theme was malaria, which he pronounced mal-aria so often and insistently that he was known to the class by the endearing title of "Old Mal-aria." He impressed upon our minds the fact that mal-aria was a miasm emanating from decaying vegetable matter at a temperature of from 80° to 90° F.,

for about thirty days, and that those who slept upon the ground floors of buildings in malarial countries suffered most, while those who occupied the second, third and higher floors escaped the baneful effects of this miasm in the direct ratio of their elevation. He used the same comparison also in his lecture upon yellow fever, citing the fact that in the epidemics which had occurred in Louisville, and others to which he had been called as an expert, very few if any persons sleeping upon the upper floors of houses were affected. Knowing as we now do that the mosquito is not prone to fly high, that he infects the lower floors of houses—rarely reaching the third or fourth floors—we can readily understand the error in etiology on the part of our beloved professor of medicine, one of the most earnest and lovable of men.

In obstetrics, we had lectures from the distinguished Professor Miller, whose text-book we adopted. He was a famous accoucheur of that date, and to his great credit be it said that he, in the University of Louisville, laid the foundation of clinical gynecology. While it is true, so far as my experience as a student was concerned, that the foundation was weak and the superstructure unimposing, it is to the credit of this good pioneer that here the beginning was made. It is difficult to repress a smile as I think of this first lesson in gynecology and compare it with the vast material which one sees to-day at our New York clinics and in the great hospitals here and abroad. Our gynecologic clinic in 1867–8 was confined to one patient (who, however, was not single) who came regularly every Saturday afternoon from four to five.

In the department of chemistry, the professor was one of those delightful, easy-going teachers, sensible enough to realize the fact that no student at the university was interested in his subject beyond the demonstration of incompatibles and in those mysterious substances which, when united, either produced a brilliant display of colors or an explosion. Those which exploded with the loudest report were most applauded. The two hours a week which were devoted to this confusing branch of science were usually spent by four-fifths of the class in studying

the geography of Louisville. If we had a text-book recommended to us, the name of its author has long since disappeared in the granular metamorphosis of my memory cells.

In therapeutics, our mainstay was the "United States Pharmacopeia," supplemented by Biddle's "Materia Medica," and this department was made both interesting and instructive.

There was no course of study in microscopy or urinary analysis. When I graduated in the spring of 1869, although I had been looking forward to the day when I should receive my diploma and start out in my career as a practising physician and surgeon, I can never forget the sinking feeling which came over me when I unfolded this sacred document in the privacy of my room and realized how little I knew, and how incompetent I was to undertake the care of those in the distress of sickness or accident. However, like Macbeth, who was so far advanced in blood it was just as easy to go on as to recede, I felt that I might just as well go ahead as my predecessors had done and let the world take its chances. With the remnant of my bank account I purchased a minor surgical operating set for which I paid the enormous price of $25, and a pair of saddle bags which cost $6.50. The contents of the saddle bags added still further to the diminution of my exchequer. There were twelve medicine bottles with glass stoppers all labeled with care so that I might not make the mistake of substitution under the feeble rays of the tallow candle or pine torch which then held the place now given to astral oil in the economy of the households in northern Alabama. There was also a small pair of apothecary's scales, and these I faithfully followed until I became expert enough to determine the dosage upon the point of the spatula which fitted into the saddle bags and came into use at rare intervals when a pill was prescribed. We doctors of that day were veritable "pill-rollers," for the golden age of proprietary and prepared medicines had not dawned.

Another and very important bit of my practitioner's outfit was two pairs of tooth-pulling forceps, in the use of which we had not been drilled beyond the general direction to get a good deep hold and then pull till something came loose. Last, but not

least, was my sign, and I confess now that there have been few prouder moments in my life than when I came back some hours later and saw my name in bright gilt letters upon that piece of tin. Looking backward after all these years of a varied experience, I have often thought that having my sign painted with gilt letters was not altogether without significance, and that the noun might well have been substituted for the adjective. I further confess to a reversion of feeling as I gazed upon this sign, and began to realize exactly what it meant, and when a week later after arriving at my native village in Alabama I had rented a small office it became necessary to attach this sign to the front door, I lacked the courage to do this in the light of day, but waited until "night had let her sable curtain down," when I stealthily approached my own door and as noiselessly as possible drove four tacks in its four corners. Within two months, at about the same hour of night, those tacks were withdrawn by the hand which had placed them there and the sign stowed away in the bottom of my trunk. Two months of hopeless struggle with a Presbyterian conscience had convinced me that I was not fit to practise medicine and that nothing was left for me but go out into the world of business to earn money enough to complete my education. I felt the absolute need of clinical experience, and a conviction which then forced itself upon my mind that no graduate in medicine was competent to practise until he had had in addition to his theoretical, a clinical and laboratory training, was the controlling idea in my mind when, in later years the opportunity offered, it fell to my good fortune to establish in this city the New York Polyclinic Medical School and Hospital.

IV.

THE COMBINED COURSE.

By WM. H. CARPENTER, PH.D., Associate Dean of the Graduate Faculties, Columbia University, New York.

The combined course, as the term is now applied, is a combined course because it not only attempts, but it actually does bring into result a combination of the professional school and the college course. It is not a new thing. It is sometimes called the "Columbia plan," in that it originated at Columbia University, as far back as 1891. As President Eliot, of Harvard University, at the meeting of the Association of American Universities, recently said, it is something that has swept over the country like wildfire. It has, but not because like wildfire it has been detrimental or destructive, but because it has provided a means to clear up, for the first time, a serious difficulty in professional education.

It does not merely affect the medical course. The combined course as it is in use at Columbia, and as it has been in use for a number of years, is in connection with the professional courses of law and medicine, and also in connection with the courses in technology that lead to the degrees of C.E., M.E., E.E., etc. It is something, then, that concerns not merely educational theories, but it concerns very widely the whole professional education of the country in many of its bearings.

It will be well to consider the actual facts of the case before we examine some of its theoretical aspects. What is the combined course as it affects medicine at this time in Columbia University and as it has been adopted widely by the universities of the country because we do not by any manner of means stand alone in our absolute adoption of this combined course as we originally amplified it at Columbia? My statement, however, is for Columbia University, particularly because that is the institution about which I know the most.

The requirements for graduation in Columbia College, which corresponds to the American college elsewhere, the college of

arts and sciences with the traditional college curriculum, are 124 points. We have found it necessary to formulate the matter on the basis of points and we have come to the conclusion after many years of experience that the 124 points should, at least in our estimation, be the amount that a graduating student from the college course should have to his credit in order to secure the degree of bachelor, whether bachelor of arts or of science, because we confer both degrees.

Now, what is a "point?" A point is the satisfactory completion of work requiring attendance one hour a week for fifteen weeks, or one half year, and 124 such points entitle the student who has acquired them to be graduated from the institution with the degree of bachelor.

The Columbia curriculum or course of studies presupposes a number of required subjects. That is to be borne in mind at the very beginning, and the following subjects are prescribed in the curriculum of Columbia College. This is an important matter, because some institutions—and notably one of them—prescribe scarcely anything and allow their bachelors to go out on the basis of a free elective program of study. We do not permit that. There are a certain number of prescribed subject courses in the Columbia conception of the combined course. What are these subjects that it is absolutely necessary to take, unless the equivalent has been offered for admission? French or German, English, history, Latin or Greek, mathematics, philosophy, physical education, natural science (elementary chemistry and physics), and two half-year courses from among botany, chemistry, geology, physics, psychology, and zoology. These are the prescribed studies for the degree of A.B. The prescribed studies for the degree of B.S. are the same with the exception of the omission of both Latin and Greek and the substitution of more natural science. That, however, does not alter the state of the case, except in the substitution of some subjects for some other subjects.

The prescribed courses furnish a total of 64 points. You will remember that the whole requirement is 124 points for the bachelor's degree. The prescribed courses, then, amount to 64

points that every student, no matter whether he stays and takes the whole four years' college course or whether he decides to take the combined course for law or medicine or the technological sciences, is obliged to have to his credit.

Now, confining ourselves to medicine, on what basis is the student allowed to go into the professional school, the student who is yet a student of Columbia College, the college of arts and sciences? The provision is this: When 72 points, including all prescribed work, have been made in Columbia College, a student who wishes to enter on his professional studies before graduation from the college may take the studies of the first year of the College of Physicians and Surgeons, provided he has previously taken in college at least one course in chemistry, one in physics and one in zoology.

Notice how carefully this is done, because we do not consider that it has been taken up or carried out in a haphazard or careless manner. It has been considered most carefully from the very beginning, and it seems to me that we have arrived not only at a rational conception of this matter, but at a real solution of it. Notice carefully, too, that the beginning, the very basis, the foundation, of this whole arrangement is a real one. Here are certain prescribed courses that it is absolutely necessary to take and to accomplish before there is any thought or any combination whatsoever along professional lines of study.

A further consideration in Columbia College is this: The student having fulfilled these requirements may receive the degree of A.B. or B.S. on the satisfactory completion of two years work in the professional course; that is, you have here a six years' combined course, two years of which are actually and absolutely spent in the college on a definite basis. A little latitude is permitted. We prescribe, namely, only 64 points out of the 72 that are required. The student may elect 8 points in almost any direction he chooses, but that is a very small percentage of the whole and otherwise he is placed on a definite basis of study, a definite requirement is made and a definite result is produced.

The combined course has come about through wholly natural

means. Nobody forced it. I was there at the very beginning when the proposition was first taken up, and I remember particularly how this whole thing came about as the result of conditions inherent in American education, and not merely in professional education, because this combined arrangement hits, as you have already seen, in two directions: it hits professional education on the one side, but it also hits back on the college, and both sides had carefully to be taken into consideration in the detailed elaboration of the matter.

What brought about the combined course were particularly these two causes: There was, on the one hand, the desire to secure a more satisfactory foundation for professional work and we saw in this plan a way to secure it. On the other hand, it had become imperative to take into account the various changes that have come into the American college due to increasing the requirements for admission, due to advancing the average age of the student, and due also to changes in the curriculum, because in place of the largely prescribed program of study of the old days there has come in a largely elective program, and in some institutions almost absolutely a free elective program of study.

Now, it seems to us at Columbia University, that there are at the present time only two alternatives in this whole matter. One alternative is to base the work of the professional school simply on graduation from a secondary school and let the college go. Such a procedure, however, does not produce the result that you have in mind for bettering the standards of professional education. That would still leave us high and dry on the old basis, and, as we all know, the old basis is not sufficient. Men who follow the professions of medicine or of law, or the technological professions, must have at this time, in this day and generation, a much more liberal and general training than is offered by the secondary school. That is an obsolete condition. It does not give us enough. President Pritchett, in the last report of the Carnegie Foundation for the Advancement of Teaching, calls attention to these very facts—that there are plenty of men in the business of medicine, there are

plenty of men in the business of law, but there are too few men in the profession of medicine and in the profession of law.

Such a standard of admission to the professional schools is not a reasonable one. It is too low. We cannot very well gainsay that some men have become great lawyers and great physicians without any more preparation than is offered by the secondary schools, but those men are in a very small and vanishing minority. These are sporadic cases, and these men would have succeeded under any conditions. It does not necessarily follow that this is a good state of affairs or that the majority of men under such conditions would arrive at a similar result.

It is too little to base your standard of professional education simply on graduation from a secondary school, and I fancy that the fact is so generally acknowledged everywhere throughout the country that it probably needs no additional argument to support it.

A second, and the only other alternative if this is rejected, is to make all students who enter on the medical course necessarily graduates of a college or a scientific school with a baccalaureate degree. On the surface this is plausible, but it is not tenable. It would apparently give you men amply prepared for their subsequent work. It would seem on the surface to raise the standard of professional education, but I am inclined to think, and I wish to tell you why, that you will have no such result whatever, and that to my mind it would have exactly the contrary effect. This further fact is to be plainly borne in mind. The baccalaureate degree of the American college as a general proposition does not mean anything at all. You cannot possibly make a definition of the baccalaureate degree of the American college that will hold water. It would be an extremely good thing if we had a baccalaureate degree that meant something every time it was bestowed, that could be defined and understood. The *testamonium maturitatis* of the German gymnasium means something, but the bachelor's degree of the American college means one thing here and another thing there, and nothing in some other place. Very frequently the American

bachelor's degree does not mean any more or possibly not as much as the entrance requirements to the good colleges of the country. There are colleges and so-called universities by the score whose degrees cannot be considered worth anything at all outside of their own environment and, of course, not much within it.

This condition of things has come about through the complacency of state legislatures, the easy-going ignorance of the public and the self-interest, often, of educators. Now, we are not always going to be in this slough of despond. I am sure that the bachelor's degree will mean something eventually. The Carnegie Foundation for the Advancement of Teaching has already accomplished wonders in this direction; the Association of American Universities, your own association, are all active toward securing recognized standards of education, and these extremely ragged, indefinable conditions are got going to exist in the United States for many more years. We shall have, bye and bye, a bachelor's degree and a standard by which to measure it. A requirement of the bachelor's degree for admission to the professional school under present conditions is, however, merely a nominal standard and not a real one at all.

Then, there is another point of equal, or of even greater, importance. The adoption of the policy of making a student have his baccalaureate degree first postpones to a too late period his entrance on his professional education. There are a number of arguments that can be brought up here against the requirement of a baccalaureate degree of students who are entering on the professional course. The average age of the student at entering college has greatly increased. There was a time when the student entered at sixteen, and, accordingly, at twenty he would receive his bachelor's degree. At the present time the average age at entering is eighteen throughout the country, and the average age at graduation is twenty-two. Now, to postpone until twenty-two the entering of the student on his four years' course, is to-day a very violent thing, indeed. From certain points of view it would be a fatal thing, because it would rule out a great many students, since at the time of graduation

from the professional course, and when he enters on his professional life, the student would be twenty-six years of age. That is too late. And not only that, but it would postpone to a very late period in his own development the entrance of the student on his professional work. It misses the impressionable time, the psychologic fitness. The student is better adapted at twenty-two to begin his medical studies than at twenty-four from the very nature of the psychologic condition of the man—he is more receptive and more eager to learn. If you postpone that golden time, you do your student a wrong and the profession a wrong, because under better conditions he would go out a better man, and you would have a better practitioner. Young men, then, if they were graduated from college as they used to be at twenty years of age, on the basis of the old curriculum, which was carefully ordered and prescribed, would be in a favorable position to begin their professional work. Conditions, however, have wholly changed. Students are beginning their college life at eighteen years of age and they are being graduated at twenty-two, which is not the old condition at all.

After the prescribed work of the college course has been completed, the student is commonly permitted in the American college to-day to choose absolutely the work of the Junior and Senior years. Why, under these circumstances, should he not be permitted to choose those studies which lead to the work of his chosen profession? The student who wishes to carry his general cultural studies still further before entering on the study of his profession, should certainly be allowed to do so, but to deny to the student who does not his right to begin his professional studies at the close of the Sophomore year is ill-advised and unjust. The smaller colleges—those that have no professional schools connected with them—have decried in this movement an attack upon the four-year college course. This, I think, is the reason why the smaller institutions in some cases have opposed this scheme. There is no intention at Columbia or anywhere else where the combined course is in effect to do away with the old four-year course. That is not the point. At Colum-

bia University we have never been so solicitous as now about the college course. We have investigated it, bolstered it up, strengthened it from every possible point of view, and we propose to retain it to the end of time, so far as I am aware. There is room for the four-year college course, but there is an absolute and wide-spread demand for allowing the student while yet under the auspices of the college not to take those two elective years in the college, unless he wants to, but in the professional school.

Very frequently it is said by the opponents of the combined course that it cheapens the bachelor's degree. Not at all. The student who goes into the combined course is not a man in search of a "snap." He would look in a different direction from the professional school if he were trying to secure the bachelor's degree along the lines of least resistance. I have seen it in Columbia University, and as intimately as in the case of my own son who is taking the combined course in civil engineering. The bachelor's degree in thus allowing the student to begin his professional studies after the second year is immensely strengthened, because it is only the good man who desires to begin his professional work properly equipped who goes into this combination of studies at all. The student who is taking the combined course in law, in medicine, or in the technological school is, from the very nature of the case, a more serious student, a student who does more work than he who goes along comfortably the ordinary four years' course in college. The degree is not cheapened in any direction; it means more under these conditions than it did before.

The separate college, the college that has no professional schools, has felt in some instances that it is being wronged in this matter, and I should like to say one word about that. It is not possible for the generality of the smaller colleges, on account of the cost of such a policy, to provide such work themselves. It is, in point of fact, from this point of view almost absolutely prohibited, because there is in every college only a comparatively small number of men who are going into law or medicine, or the technological courses. It is impossible, be-

sides, for the smaller college, particularly in medicine, on account of the state laws, to do this. Most of the states insist that a man to be admitted to practise medicine must take his studies, all of them, in a medical school. From various points of view, accordingly, it is impossible for the smaller college to give anything like a combined course.

One of the smaller colleges of the state, the University of Rochester, at a meeting of its faculty in April, 1908, adopted a resolution to the effect that any student who wishes to save a year in securing the combined degrees, may enter in any one of the courses for the bachelor's degree, and arrange to complete in three years the prescribed studies of his course; the Rochester faculty will thus receive for credit the equivalent of the last year in a medical school of accepted standard and allow the student in question to return to Rochester to receive his bachelor's degree. I do not know whether this plan will be generally accepted or not, but it seems to meet the difficulties of the smaller college. It involves the college in no additional expense, and is does not deprive the student of membership in his own college, or in his own college class.

If the wide-spread favor with which the combined course has been received is a criterion, it seems to us at Columbia that it will in good time be the common practice. Of the twenty largest universities in the United States that offer instruction in law or medicine, or both, all but two, Johns Hopkins and Harvard, make provision whereby a student may count certain academic courses for the bachelor's degree and the professional degree. In a majority of these institutions the work for the two degrees may be completed by a serious student in six years. This thing, accordingly, is not a theory, but an actual condition that has come into the educational system of to-day. It is here, and it seems to us at Columbia University that it is here to stay.

Let us bear in mind, finally, these fundamental facts: The combined course, as we understand it at Columbia, presupposes that the student who pursues it should take during his two years of college study, in addition to such studies as are

prescribed for all college students, the subjects that will furnish a proper foundation for his professional work. The intending student of medicine elects physics, chemistry, and elementary biology. The intending student of law should elect history, economics, and logic, studies which clearly play into his hands in the practice of his future profession. In thus choosing his studies so as to provide himself, on the one hand, with the necessary, intellectual stimulus, and, on the other, with information that will give him a better foundation for his professional knowledge, he is simply using to the utmost his opportunities of education. The combined course does not weaken the baccalaureate degree, as some of its opponents have maintained, but strengthens it and makes it much more difficult to acquire. It does not interfere, as some have asserted, with the proper standard of professional education, but fixes that standard where it belongs for the individual and for the community. It does not weaken the position of the college, and it strengthens the professional school by giving it a better student, a better man, better material for making a better doctor.

DISCUSSION.

Dr. Egbert Le Fevre (University and Bellevue Hospital Medical College), New York:

What is the advantage or object of this course in the general educational scheme? Is it to advance a man in his purely technical knowledge, or on the general cultural side? Dr. Carpenter claims it is the latter. The object of the combined course, granting two degrees in six years, is to stimulate the man who is going into medicine, giving him a general cultural education rather than a professional education. If we are simply taking it up for the simple technical preparation of men to go into medicine, it does not meet with the view of the men who are looking for higher medical education. This combined course is offered from the cultural side of professional men, and not from the technical side. In all our discussions of educational requirements we must keep these things in mind when we are urging men to study and to take up the purely science subjects. For its cultural value the combined course is a most commendable one, but it should not be urged for entrance into the medical profession. Then, it is a matter of opinion and not of education. We all believe that the medical man should have as much general cultural education as possible, but in the general problem

of medical education we are chiefly concerned in arranging our courses so that the student will be properly prepared in the technical subjects, and not for its general culture.

Dr. W. B. Hill (Marquette University), Milwaukee:

There was one point in the address that appealed to me very strongly. Dr. Carpenter said that the baccalaureate degree merely meant that a man had attended school for so many years and not that he had acquired a certain amount of knowledge. It is the first time that I have noticed men going from the time limit to the merit system. Then I would call attention to the fact that in prescribing 72 points it means that the student will have nearly three years of collegiate work, so that this combined course will appeal to a strong, well-equipped student, and for that reason I think it is the most commendable one.

Dr. J. S. Foote (Creighton Medical College), Omaha:

I presume I belong to the old school. Columbia was my alma mater in medicine, but I cannot quite agree with Dr. Carpenter's paper. I have been teaching for twenty years, and the greatest difficulty I have had has been to establish a proper conception of medicine. It does not seem to be a matter of points or of subjects, but of conception. The medical student should be saturated with medical thought; he should be associated with doctors, inasmuch as he is going to practise medicine. He is going to deal with the sick and not with the well. He is not only going to read papers in scientific societies, but he must go to the bedside and try to do something to alleviate the suffering of the sick. He must comfort his patient as well as give scientific advice. If I were sick I would not have a pathologist, although I am a pathologist, nor would I have a chemist, or a scientific man. I am in favor of saturating the medical student with medicine for four years or more, so that when he graduates he will be able to do what he is supposed to do, heal the sick.

Dr. Randolph Winslow (University of Maryland), Baltimore:

There is no doubt that Professor Carpenter's remarks in regard to the combined course are absolutely true. The students who pursue the study of medicine after having spent two years in an institution like Columbia are undoubtedly better prepared than those who have not been there. However, this does not concern us in any way whatever, except that we are thankful that they can get those two years of instruction in an institution which does not detract from the medical degree. The matter is one that the colleges of arts and sciences must decide. If they are willing to give a degree to a student who has only attended their courses for two years, well and

good. It gives us a better medical student, but not necessarily a better doctor.

Dr. W. F. R. Phillips (George Washington University), Washington:

I am heartily in accord with Professor Carpenter. I have had this matter up for discussion with some of the members of our Arts and Science faculty in my own school, and I have asked them whether they are of the opinion that the student ceases to get culture when he studies anatomy, histology, embryology and physiologic chemistry, which he really would have to get for his A.B. degree in the college course; whether such study has less cultural value when undertaken for utilitarian purposes than when undertaken for no purpose at all. I have always held that education tends to make a man a useful citizen, and not a useless one, and my experience with A.B men who have drifted into the medical school is that they know as little that is useful, that will help to make doctors of them, as any people I have ever met. I would rather take a high school student who had attended a good technical high school than a general A.B. man who has simply elected his course without any reference to what he wishes to use it for. I am confident that the technical high school man has more ability to do things. He gets saturated with medicine very much more quickly and more thoroughly, and has a greater absorbing capacity than the ordinary A.B. student. When a man is required to take two years in the medical college before he is granted the A.B. degree by the Department of Arts and Science, he really has a four-year degree and not a two-year degree. We ought to be in sympathy with anything that will tend to train men better and bring them to us better prepared. Any students who starts out with the deliberate purpose of taking the combined course will be better prepared for medicine.

Dr. F. C. Waite (Western Reserve University), Cleveland:

The elective or group system is enforced in most colleges, and if a man at the end of the Sophomore or Junior year chooses to elect chemistry, physics, and biology, or French and German, or Latin and Greek, or some other narrow group of subjects looking toward teaching, there is absolutely no question about giving him a bachelor's degree at the end of that sort of election. Why should there, then, be any more objection to giving him a bachelor's degree for work done in medicine? There is this further thing which I believe is true in practically every school, that the amount of actual intellectual labor in the first and second years of the medical course is more than the equal of that required of the student who remains in the undergraduate college, no matter how freely he elects. My experience with men who elect medical work and those who remain in the college has convinced

me that the former work harder. Next, there arises the question, whether the members of medical faculties are efficient? If they are not, they should not be retained. If they are efficient, then the work given by them to the student taking the combined course should be accepted as full value without prejudice.

Dr. Seneca Egbert (Medico-Chirurgical College), Philadelphia:

This is largely a question of what is desirable and not of what is necessary. I agree with Dr. Phillips that our medical course as it is to-day in all the good schools is highly cultural in character. No man can watch students develop in a medical school without appreciating the cultural value of medical instruction. It is of as high a character, and in many instances of a higher character, as the instruction in the ordinary four-year college course. The question which will come up for discussion in the future is whether the combined six-year course is more desirable that the five-year medical course. I think that a man taking the five-year medical course will be a better doctor, and have a better cultural education than the man who comes to the medical school from the college. Inasmuch as the bachelor's degree does not amount to anything, it would be wise to give every graduate in medicine a bachelor's degree in addition to his medical degree, especially when he graduates from a school with university connections.

Dr. J. H. Guthrie (University of Iowa), Dubuque:

It seems to me that there was an attempt to establish a conflict between two ideas, that the combined course tends to increase cultural education without detracting from technical education. Anything that will strengthen culture and the power of reasoning and make a better man of the student will also broaden him when he pursues those studies which are considered strictly technical and as applying solely to medicine as a science. The other point elaborated by Professor Carpenter, that if you get a baccalaureate degree that has been earned and not simply conferred, and if it is achieved by a prescribed course which ultimately leads to the medical degree, it certainly cannot be cheapened in value, so that both from the baccalaureate and the technical side this combined course solves an important problem and elevates the science as well as the art of medicine.

Dr. Charles M. Hazen (Medical College of Virginia), Richmond:

All the views presented here have phases of truth in them, aad I do not quarrel with any of them, but I want to bring out one point, and that is that the greatest thing this association has done so far, at least for us in the South, is to bring up the high school to what it ought to be, so that the high

school graduate can enter on the proper study of medicine. This association is interested in the destinies of many medical students, very few of whom will take this combined course. The high school will probably continue to prepare about two-thirds of the men who enter the study of medicine. Therefore, we must not overlook the cultural value of medical study, and the man who possesses only an M.D. degree and not a bachelor's degree is lacking not in cultural but in historical information.

Dr. Carpenter (Columbia University) (closing the discussion):

I agree with everything that has been said, but I think Dr. Foote loses sight of one aspect that I tried to make apparent—we are not subtracting anything from the medical course. The medical course is four years by law, and it will remain so unless you increase it to five years, but that has nothing whatever to do with the combined course. It merely gives an education to those people who are intending to enter on a four-year medical course, and by giving them an absolutely good and proper foundation it will result in the natural selection of good and properly qualified men to enter on that four-year course. We are not taking anything away from the medical course; we are adding to it at the bottom. We are giving you better men, men of greater intelligence and better education.

V.

THE PRESENT STATUS OF MEDICAL EDUCATION.

By FRED C. ZAPFFE, M.D., University of Illinois Medical Department, Chicago.

During the past four or five years educators in general and medical educators in particular have been very much concerned with the educational qualifications of which the prospective student of medicine should be possessed. Much has been said and much has been done, but there has been a notable and deplorable absence of harmony and uniformity. To the impartial and unbiased observer it would seem as though each set or group of workers was bent on carrying out its individual policy without regard to its effect on the others, and yet the same results are achieved by all. Fortunately, however, all things find their own level in time, and of the truth of this as applied to medical education there can be no doubt.

But, what is happening in the meantime? There is a division of interests where there should be unison. There is distrust and ill feeling where there should be trust and good fellowship. We are not working in harmony. We are working at cross purposes, when, after all, we are all striving for the same end, the betterment of medical education. What is the result? Medical education is regarded as a joke by those who have done pioneer work in liberal culture work. They are going on with their work, shaping it to suit their requirements, and the medical educator is left to work out his own salvation. Can he do this? I believe that he can, but time will tell.

Medicine is progressing and medical education must keep pace with this progress, but the pace must not be too fast, it must be an average pace that tends to steady but healthy progression. Too often things are done by fits and starts. Such progress is really retrogression because it is short-lived. Then, there are those who by reason of environment or opportunity can progress more rapidly than others less fortunate, but it is for these more fortunate ones to set a pace that can be kept by all those who are desirous of making progress, even at a sacrifice.

This applies particularly to medical education. Many colleges are in a position to demand the very highest requirements in everything, but, on the other hand, there are worthy institutions that simply cannot keep such a pace. Should they be deprived of the right of existence? Not at all.

When this Association was founded it was for the purpose of setting standards in medical education sufficiently high to disbar from membership any college that was not honest in its administration. It was not seeking to make class legislation; it was merely endeavoring to bring about uniformity and harmony. Its founders were men well versed in educational policies. They had every reason to know that some colleges would exceed these requirements, and even at that time—1890—some colleges had higher requirements than those set by the newly founded association. But, standards are not made for the purpose of holding men down. They ought to be a stimulus to do better.

In a little while the individual states of the Union concluded to do some legislating and they appointed examining boards. These boards set standards which became effective in individual states, thereby creating confusion because in no two states were these standards the same. What was the result? The medical school adopted the standards of the state in which it was located, so that the examining boards of the state which had high requirements held its colleges up to that standard but accepted the lower standards of other states because it could not well do otherwise. Then, confusion became worse confounded when the state universities adopted requirements higher than those enforced by the local examining board, so that there were two standards within the same state. That is the state of affairs to-day. Does it not seem necessary, then, that there should be at work some agency that will bring order out of chaos by endeavoring to establish harmonious relations between these conflicting conditions?

No one who is in the least familiar with conditions will gainsay the desirability of having higher standards, but we must not lose sight of the fact that the standards must be such that the least of the worthy can enforce them. They should not

offer to the unworthy a loophole for evasion. The great defect of most standards is that they are not specific. They are general and therefore allow of the practice of fraud and deception. Specific requirements are always effective and will soon disclose deception. That was the case with the old entrance requirement of a high school diploma. Any sort of a high school diploma was accepted. That necessitated demanding a four-year high school diploma based on an eight-year primary education. In 1905 this Association further specified what that four-year high school diploma should consist of in work and time. The requirements were made sufficiently elastic to allow adaptation to local conditions but to prevent fraud.

Then, everything possible was done to enforce these requirements by means of blanks and personal inspections, and that this work was effective may be seen by comparing the membership of to-day with that of six or seven years ago. Some colleges preferred to sever their connections with the Association rather than to submit to inquiry; others were dropped from membership, while still others in the consciousness of superiority, voluntarily withdrew from membership. Some colleges withdrew from membership because the state requirements were lower than those of this association, but the leveling process was at work.

Progress is a healthy growth and development extending over a long period of time, and while each step in advance may be only a small one, it is nevertheless an advance. But we must bear in mind that it is well "to make haste slowly" because each advance step must be in the right direction so that confidence will not be destroyed. It seems fallacious to demand two years of college work for admission to the medical school without also specifying what shall have gone before. And it is not shooting wide of the mark to say that advantage is taken of this. Just as the high school diploma may mean much or little, so the higher requirement may mean something more than high school work or not even as much. This is well recognized by the colleges that demand a certain preliminary education and specify what work must have been done, even when the

requirement is as high as a baccalaureate degree. Such colleges are setting an example that is worthy of emulation. But, how many colleges are in a position to do that? Very few.

This Association has always aimed to be fair. Numbering among its membership colleges from many states, where many standards are in vogue, and actuated solely by the desire to advance medical education, it became necessary to formulate requirements that were sufficiently high to conserve the best interests of medical education without demanding the impossible. It is the "possible" that we are after and as soon as we can get more we will ask for more. By asking for more than we can get, we encourage the practice of fraud and deception. Take, for instance, a medical college situated in a state whose educational facilities are limited. Even if that college were willing and eager to demand a high requirement of its students, it could not do so because of local conditions. In such cases the Association has directed its efforts toward enforcing the minimum standard and endeavoring to raise the state standard. In several instances these efforts have been crowned with success.

The attitude of this Association must not be misunderstood. It will not admit to membership nor retain in membership colleges that cannot or will not conform to the requirements. In fact, a criticism made by the dean of a southern state university was that the Association admitted to its ranks only the better schools and rejected the "weak sisters." The Association is always ready to investigate any charge made that the requirements are not being enforced, but, unfortunately, those who are in a position to have this knowledge are not always willing to prefer charges. Then the Association is charged with an unwillingness to investigate or of carrying out a "do nothing" policy. The odium of such an accusation is far-reaching and productive of more harm than can be conceived of by those who are not actively engaged in the work of conducting the affairs of the Association.

A few colleges have preferred to remain aloof from any active affiliation with the Association because their requirements are higher than the minimum. That such colleges have the

interests of medical education at heart is evident, but, unfortunately, the forcefulness of such examples is lessened by reason of their isolation. No single factor has proved so potent for good as the fact that some schools with very high requirements have felt it their duty to retain membership in the Association. On the other hand, some very inefficient colleges trade on the fact that some colleges with high requirements are not in membership. Not long ago a college with very poor facilities and practically no standards applied for membership in the Association. An inspection revealed the true state of affairs and the applicant was rejected. The college hid its chagrin by claiming companionship with such excellent institutions as were not in membership from choice.

Any coterie of men can obtain a charter to organize a medical college and grant the degree of M.D., so that the fact that a college is chartered is of no significance as a measure of worth. Nor does recognition by a state examining board always carry weight, because in many states "legally chartered" medical colleges must be recognized, no matter how inefficient they may be. And, it is said, that some colleges are powerful politically, enough so to be able to force recognition from an unwilling board. In such instances as these, it is well for the board to entrench itself behind some power that commands respect by reason of impartiality and fairness. I believe that whenever this is possible the boards are ready to avail themselves of the opportunity to do so. This Association has been exceedingly fortunate in having the coöperation of so many examining boards that are anxious to maintain the highest possible standards, and that act promptly on information based on fact. To these boards much credit is due for what has been accomplished. Association with them has been a pleasure as well as a duty.

Again, there are still states that do not require graduation from a medical college for licensure, therefore do not recognize any medical college. Examination is the sole test of efficiency, and examinations, such as these, do not gauge a man's efficiency or knowledge. Exhaustive examinations, especially when the examiner comes in personal contact with the applicant for hon-

ors, are valuable, but even then they should not be deemed a sufficient test for judging of personal worth. The best men fail in written examinations, and the most inefficient men may pass them. Even now medical schools are conducting state board quiz classes for the purpose of preparing their students to pass these examinations. One of the very best colleges in the country has such a class, and there may be others of which I have no personal knowledge. That is one of the evils that follows in the wake of examinations.

Under the existing conditions, is it possible or feasible to raise the entrance requirements to medical colleges? If not, what is the best course to pursue? Is it wiser to raise the entrance requirements or to lengthen the course of study in the medical school and embody in it such general science studies as are now considered essential to a proper understanding of the pure medical subjects. If we demand more will we get it, when it is not there for us to get? Well informed state officials answer this by saying "No." It leads to fraud and deception, and there is enough of that already. Is it better to limit professional education to the professional school? If that is true, should not the professional school teach all that is necessary to the proper practice of that profession for which it prepares young men and women. If what is offered now by the professional school is insufficient, demand more and then see that you get it, but let us be reasonable in our demands, and see to it that they are met to the letter and not only in spirit. Students should be encouraged to get all the education, broad cultural education, they can. It is wrong to urge them to get no more than is necessary for matriculation in a medical college, but for an actual requirement, we should strike a high enough average below which none must fall.

A well-balanced high school course may not, in the estimation of some, be high enough, but it certainly is preferable to have a specific high school requirement and then a well-balanced course in the medical school extending over a sufficiently long period, than to require a high school diploma of unknown evaluation and two years of college work, which requirement

may, after all, no more than equal the specific high school requirement. It is wrong and indefensible from the educational standpoint as well as from the standpoint of justice. If four years in medicine is not long enough, add another year or even two years. If the reason for raising the entrance requirements is to curtail the output from the medical school, then by all means let us go high enough and demand a degree for admission to the medical course. If it is to lessen the number of medical colleges, then go at once to the two-year college requirement and the combined course. The latter is a most excellent offering, but is it not really a six-year medical course?

Another point to be considered in this connection is that with all the requirements now in force, we are still confronted with the fact that our students learn to practise medicine after graduation—not before. They are grounded in certain theories, are shown how to apply some of them, but really learn to do so in the school of experience, some of which could be given them if conditions were not as they are. We must have more time for teaching medical subjects. All departments are demanding more time. We stand in greater need of better education in the medical school than in general culture education.

The problems with which we are confronted are, then, about as follows: We need more time for teaching because the future doctor must learn more than did his predecessors. Shall we require two years of college work for admission to the medical school and unload into these two years some of the work now done in the medical school, such as anatomy, chemistry, some histology, some embryology, and, perhaps, some bacteriology, or shall we adhere to the present high school requirement and lengthen the medical course and give either time or subject credit for certain work that may have been done in a recognized literary college? To the ambitious student or to him who has time at his disposal, but who would not necessarily be a better doctor, we might hold out the inducement of earning two degrees in six years, the combined course, which, if taken in certain institutions, would prove a most excellent solution of the problem.

One year of college work has been suggested as a feasible requirement, but the objections to such a demand are so obvious that nothing further need be said on that point.

The medical student of to-day is a very discriminating individual. He chooses his school first and then prepares himself for admission to the college of his choice. He is influenced very largely by the standing and reputability of the college, by its facilities and its equipment and not by the entrance requirements, although to a few low entrance requirements are the sole attraction. The attendance at the better colleges is greater than it is at the low-requirement college, so higher requirements in all directions are not a stumbling block to the average medical student.

The crux of the situation is simply this: Are our present public educational facilities such that higher requirements, if adopted, can be enforced? Should a state institution demand more than is furnished by the state to the masses? Even now the high school standards of the various states are not harmonious: no two are alike. Is it right that a student should be forced to get all his education in his own state because there is a lack of unison in education between the states? Is that not an argument in favor of a specific attainable requirement such as we now have? The student with a scientific bent of mind, who has no wish to practise medicine, will take care of himself. What we must look after is the large body of men who will go out among all classes of people to practise medicine.

The honest administration by all medical colleges of the requirements now in force would be a decided step in advance, and in that direction much has been accomplished by this Association. While only about 40 per cent. of the medical colleges of the country are in membership, a careful investigation shows that of the remaining 60 per cent. only a very few schools are eligible to membership. In the past five years the rejections have exceeded the acceptances in number, and the suspensions have exceeded both. The influence of the Association would be even greater if all the better colleges made a determined fight on the inefficient colleges, those that fall below the minimum

requirement in every particular. This, of itself, would be a most powerful argument in favor of higher requirements. If higher requirements are ever to become effective, that is the only way it can be brought about, by determined, concerted action. It is a campaign of education, not only of medical men but of the general public, who if shown the need for better educational facilities will make adequate provision for them by better legislation and a further development of the present educational system. Lack of concerted effort will mean the loss of what has been gained, and the result may better be imagined than described.

It has been said that published requirements and enforced requirements are at variance. That may be true, but is that not a further argument in favor of specific requirements, requirements which every honest college can enforce, and which will allow of no quibbling or hedging. Why publish the fact that a certain requirement is made for entrance and then make the most of what is offered so as to force conformation. If a baccalaureate degree is required, take nothing less than a degree from an accredited institution.

For a number of years I have entertained the belief that the membership might be divided into two classes, one class consisting of those schools that conform to the minimum requirement and the other of colleges having a higher or a maximum requirement. I am not prepared to say whether such a division would be either desirable or advisable, although the president of one of our most prominent universities favored this plan when it was mentioned to him. Such a procedure might stimulate colleges to do more, if that would be permitted by local conditions, and it would be fair to all.

The division might be made as follows: (*a*) Major and (*b*) Minor schools, or (*a*) University schools and (*b*) Colleges, or (*a*) Members and (*b*) Associates, the first division probably being the preferable. The question is open to discussion.

As for the curriculum: With increasing experience it is becoming more evident that with the development of the specialties in medicine and the increasing knowledge in the funda-

mentals, the curriculum of the medical school stands in great need of revision. More demands are being made on the student's time and ability to absorb all that he must know, and there is no immediate promise of anything being done to unload. In fact, it is being suggested that more studies should be added to the curriculum, such for instance, as a course in general psychology, and other suggestions surely will follow before long.

The Association has been engaged for the past two years in rearranging the hours to be devoted to each subject in the first two years of the medical course, and the last two years will be considered in a similar manner during the coming year. It would seem that what is most needed is, first, to relieve the medical course of some subjects, and, second, to correlate the work, thus facilitating study and giving the student more time. It is here that the five-year course would be a most admirable step in advance, and it would permit of adding to the course, without danger of congesting it, courses in physics and biology. This, together with correlation, would solve the problem.

The course as outlined is by no means ideal but merely suggestive and illustrates fairly well what might be accomplished with an additional year. In the first place, applicants who have received credit from recognized literary institutions for work embraced by the medical curriculum might either be given a time credit of one year, or subject credit only, the first being preferable provided the work is done in a prescribed combined course taken in a recognized literary college, or in institutions where the courses are properly correlated. In the second place, one whole semester, the last, could be devoted to clinical work, either in the college or in a hospital under the control of the college. By a different arrangement of the subjects more time might be devoted to clinical work, although it is understood that some clinical work would be done in the fourth year and the first part of the fifth year. The essential feature to be borne in mind is this: that one semester would be given over entirely to clinics.

Finally, might it not be practicable to have a six-year course

of two kinds, practical and scientific, the former consisting of 6 years in the medical school, one year in science subjects, four years in purely medical subjects, and one year in hospital work, this course to lead to the degree of M.D.? By also taking two years' work in the college he might be given his baccalaureate degree. The student choosing the scientific course, or the combined course of to-day, would receive in addition to his baccalaureate degree an M.B. This man would probably become a research worker—the other a practising physician. Thus, too, the degree of M.D. would be made to mean more than it does now. The man coming straight from the high school and taking only four years in medicine could be given an L.M. after he has passed a state licensing examination.

The burthen of this paper is to offer a few suggestions for your consideration and to point out, in a general way, the existing state of affairs, what has been accomplished in the way of arriving at a solution of some of the problems before us, and what still remains to be done, in the hope that all those who are engaged in the work will work together harmoniously, keeping in mind the good of the many and not of the few.

The five-year course might be arranged as follows:

FIRST YEAR.

Semester I.	Semester II.
Anatomy.	Anatomy.
Physics.	Physics.
Chemistry (Organic).	Chemistry (Organic).
Biology.	Botany.

SECOND YEAR.

Anatomy.	Anatomy.
Chemistry (Inorganic).	Chemistry (Physiologic).
Physiology.	Physiology.
Embryology.	Histology.

THIRD YEAR.

Anatomy.	Pharmacology.
Physiology.	Physical Diagnosis
Bacteriology.	Pathology.

FOURTH YEAR.

Semester I.	Semester II.
Pathology.	Autopsies.
Therapeutics.	Therapeutics.
Dietetics.	Medical Jurisprudence.
Medicine.	Medicine.
Surgery.	Surgery.
Hygiene.	Obstetrics.

FIFTH YEAR.

Therapeutics.	Clinics.
Surgery.	
Medicine.	
Gynecology.	
Dermatology.	
Eye, Ear, Nose and Throat	
Mental and Nervous.	
Genito-urinary.	
Pediatrics.	

VI.

THE FIVE-YEAR MEDICAL COURSE.

By JOHN ROGERS, M.D., Cornell University Medical School.

Is there really any need of a five-year course in medicine and, if so, how can it be accomplished most economically for both the students and the schools? The experiences of the Cornell Medical School supply some valuable information in answer to these questions. The institution came into existence only eleven years ago and therefore had no traditions to hamper its policy, and no alumni to send it students, and for the latter reason chiefly had to depend on the excellence of its products as practically the only reason for its patronage. After eleven years of experience it has become apparent that New York City is no longer the great center of medical education that it was thirty, or even twenty years ago. In other words, the clientele of the New York schools is largely local and the conditions are quite accurately comparable to those which might affect medical schools in a considerable center of population.

The Cornell college began in the fall of 1898 with scheduled hours of instruction which averaged five a day for each student. Year by year this was increased by the demands first from one department and then another, until in 1906 the six working days in the week were filled with about seven hours of required work, and still this was not enough. An attempt to dilute this concentration and gain time through increasing the number of months of instruction by offering hours in the usual summer vacation equivalent to those in the succeeding winter session, failed, as the students both would not and could not attend. An analysis of the difficulties showed, when sifted down, great weakness in the third-year students' knowledge of the primary subjects of anatomy, physiology, biology, chemistry and even physics. Yet gross anatomy alone was allotted over 500 hours, and with the other subjects mentioned above filled practically the entire first two years of work. This meant that only the final two years could be given to the subjects which are the princi-

pal objects of the school's existence, and much of this time had to be wasted in drill on fundamental facts. The surgeon spent a great deal of time in teaching anatomy and the physician was thus occupied with physiology and the specialist at the end of the course, felt almost helpless. The teachers of the primary or fundamental subjects complained of the shortness of the time allowed them, and as this time far exceeded its proper relative proportion, the pedagogic error was only too apparent. Though the student worked not only during the seven scheduled hours each day, but at least two hours more in preparation, it was not within human possibility to properly assimilate and retain the vast number of uncorrelated and new facts presented at the outset of the medical course.

The customs and experiences of this country have limited the yearly periods of teaching to an average of thirty-six weeks, which means about 32 actual working weeks for six days each. In the academic colleges from fifteen to twenty hours of schedule work or instruction in recitations, lectures or laboratories, is deemed an average sufficiency, but in the four-year medical course 42 hours a week has at least in one institution been found inadequate, and the conditions became intolerable for both teacher and pupil. These facts are so generally recognized and the remedy so evident that lengthening the course cannot long be delayed.

It does not help matters to state that the American college is the institution primarily at fault, because the secondary schools, through which all professional students must pass, are by the colleges compelled to follow a rigid course of instruction containing little or none of the all-important natural sciences. The folly and extravagance of this both in years and in money is all too apparent, and is so wrong from every point of view that a change is inevitable. But this requires time and meanwhile the medical schools must have relief.

The only alternatives to lengthening their course are: to raise the entrance requirements to the highest possible point—in other words, to demand a college degree for admission; or to raise the requirements to the point of demanding physics, inorganic chem-

istry and biology. This latter proposal may sound satisfactory to the older teachers, but the experiences at Cornell have and are demonstrating that it is not enough. Half a loaf may be better than no bread, but not if it is a hollow sham. The rudiments at least of these subjects can be, and are taught, in a sufficient number of preparatory schools to make such a requirement possible in most of the medical colleges; but even with their exclusion, as will be shown below, the medical curriculum is not materially relieved.

The arguments in favor of a standard of admission as high as the college degree can apply only to a very few medical schools which have exceptional opportunities and need not be discussed here. The number of students who can afford a college course is comparatively small and but a small proportion of these graduates study medicine. At Cornell, for example, in this the first year in which the A.B. degree has been required for admission, there are only one-seventh of the usual number in the entering class. It would seem, therefore, that six-sevenths of the candidates are only able to obtain a high school before their professional education, and this proportion in less wealthy communities is probably too large an estimate.

As regards demanding the requirements intermediary between that represented by a high school diploma and an A.B. degree, or some small amount of natural science, it has been found by the rearrangement in detail of the schedule at Cornell, that such an education cannot help matters except in almost an inappreciable amount. In this institution, for example, even with the preliminary requirement of every subject which it is possible for the academic college to teach, and hence after their exclusion from the medical curriculum, the latter is still so crowded as to threaten an increase rather than a decrease in the number of years in the course. And strangely enough, the subjects which have long been a bone of contention in all medical faculties, namely chemistry and physics, are the subjects which still present the greatest difficulties. But these subjects, fortunately, present an economical solution of the problem and one which is most advantageous to the student and the school.

It must be conceded that organic and physical chemistry are of primary importance in every field of medical activity and every research worker has to depend upon them. The whole future of therapeutics rests ultimately upon these branches of natural science, and instead of eliminating the professor of chemistry from the medical faculty the advances in knowledge are rapidly making him its most important member. This being so, it is not only impossible but an irretrievable error on the part of the medical schools, to attempt to save time and money for so-called practical branches, by dropping this department. Cornell has concluded that it never should be seriously considered even though all the students are required to have had thorough courses in physics, inorganic chemistry and the general principles of organic chemistry and biology. The specialized portions of the subject bearing upon pathologic physiology, the autointoxications, diatheses and immunity alone, have little or no place in a general scientific or academic education, and so must, of necessity, be brought where they belong, that is, in connection with the study of normal and diseased physiology.

As, consequently, the department must be retained to provide for the future, and as it is universally conceded that at least the elements or general principles of this subject should be presented by all candidates for the study of medicine, it is only a matter of small expense to the medical school to delegate one or more members of the department of chemistry, with which physics is usually associated, to teach these subjects in a preliminary fifth year.

Biology and physiology are in certain directions so closely connected, and a knowledge of these subjects is so important preliminary to the medical course, that at least the general principles of biology, must soon, if such is not already the case as at Cornell, be required for admission to the professional school. In the departments of anatomy, physiology or bacteriology there always is, or should be, some instructor, who, at least with a little study and only a small increase in salary, could be delegated to undertake this important teaching, and if comparative anatomy were included, a very valuable, if not indis-

pensable, preliminary fifth year is added to the curriculum. This preliminary fifth year would therefore contain chemistry and medical physics, with physical chemistry, biology and comparative anatomy. The candidate for admission, who has not obtained equivalent instruction elsewhere, must pursue such a course and it can be so arranged as to provide electives for advanced students and opportunities for research for other departments concerned in the instruction of the latter part of the course.

It is not intended that this preliminary year should be elective; indeed that is already the case in many schools and has proved an utter failure But the schools must demand for admission to their first year a thorough knowledge of these subjects of which the standard courses are given in the preliminary year conducted by the medical faculty. This is much more easily provided in colleges which are part of a university, and needs only coöperation between the two faculties of arts and medicine. In other institutions the direct expenditure in money by the medical school would be comparatively small, though its cost in the number of students is the present great deterrent; and being unknown seems more dreadful The influences, however, which attract students vary greatly, but in the majority of instances, fortunately, the excellence of instruction in any given school is the preponderating factor. This one year spent by the participants in laying a solid foundation and in gaining a broad outlook upon the professional studies, in so far as these studies are concerned, is very nearly equivalent to the professional acquirements of the college graduate who has pursued the natural science electives provided in his curriculum. The chief advantage of the latter over the former will then lie in the maturity of judgment obtained by three more years of generally desultory work and experience of life and a knowledge of how to study.

The complaint that a five-year course can become as crowded as one of four years, means that a forty-year course would present the same difficulties. A lifetime does not suffice to learn all that there is in medicine, but in one year the last generation

learned the principles of the construction of the Greek language. Medicine and its nomenclature alone are as foreign to the average boy's present secondary school education and the pedagogic difficulties are somewhat analogous.

The principles on which the science and art of the practice of medicine rests are all that the colleges can expect to teach. They do this now in four years, but can do it better in five. Such a course is not a remote possibility but is an immediate necessity, and if the colleges which now demand the highest preliminary education possible in this country, escape the dilemma long, it will only be because of radical reforms in the academic colleges.

DISCUSSION.

Dr. John W. Scane (McGill University), Montreal:

Although McGill is just entering on the second year in her experience with the five-year course, I believe we have undertaken to do the work in the proper way. The idea when we started to give the five-year course was that it was practically impossible to demand of the elementary colleges in Canada any more than they were then giving. We could not ask them to teach more chemistry, biology, or physics; therefore, the only thing to do was to give it ourselves, to extend the course in the primary sciences so that we could feel certain that students were getting the proper instruction in the proper way. Our course when extended to five years simply meant that we added certain things to the ordinary teaching in these sciences and left as much as possible in the fifth year of the course for purely clinical work. I am sorry to say that the course is not wholly a success, because we find that the harder we try to give the student a little more time to study and reading, the fewer hours are left for such work. We added a little here and a little there, and now we find that our five-year course is quite as crowded as the four-year course was, but I fancy that that will right itself in time. One of the ideas for going to the five-year course was, as I said, to give the student more time for reading and thought, because the ordinary medical student of to-day is rushed from class to class, from class to hospital, and has absolutely no time for reading, thought, exercise or pleasure. As the problem faces us now, we have to guard against putting too much into a five-year curriculum. I am afraid that the tendency is to do that, but I believe that the five-year course is a step in the right direction, and that it will not be long before most of the colleges adopt it. Toronto has started it, and Dalhousie has done the same thing. Only two colleges in Canada are not doing it.

Dr. Egbert LeFevre (University and Bellevue Hospital Medical College), New York:

I was very much interested in the question of the five-year course, but as an optional course it is not a success. Men will not stay five years if they can get out in four. Bellevue, which has had the optional five-year course, finds that it is not a success. Men prefer to take the fifth year in a hospital after they get the degree, but not in the medical school. The fifth year may be taken in the scientific branches or at the end of the course in a hospital. In England the fifth year is at the beginning of the course. If we lengthen the time in the practical branches, the question is, Can we give them sufficient facilities? We have gone rapidly from two to three and then to four years, but even at that every one appreciates the overloading of the curriculum. We are asked on all sides whether we are not trying to do too much in the medical course, giving information rather than training. What is the function of the medical curriculum and of the medical college? Not to turn out a finished product, surely. If we compare the medical student with the worker at the bench, at the end of his four years he is much more efficient in the work than the man who goes to the technical school. We are trying to give too much technical work and not enough grounding of the principles of the work of the profession, so the question is, whether we are to train them only in the technical side, in the art of medicine, or in the basic principles. We have gone too far in the art and have not insisted enough on the principles. If the medical student does not get his science in the medical college, he will never get it. Therefore, we are to prepare men thoroughly in the principles of medical practice, and our clinical work should not be given with the idea that the student shall see so many patients, but in every case he sees he should be shown how to apply the principles of medicine. He can get the art after he goes out. We must consider the five-year course on that basis, not enlarging on the work of the art of medicine, but on the foundation, the principles of medicine. The question also comes up, Are we ready for the five-year course? We must not go beyond the demands of the community in our educational requirements, either in length of time or in subject-matter. That is an economic problem as well as an educational one. The medical course is far the most expensive in time and money. We have done wonders in respect to standards of medical education and preliminary requirements, but before we rush into this matter we must stop to consider what economic problems we have to face. Education is desirable, but it must be economical, if possible to obtain it. This point should never be lost sight of.

Dr. Seneca Egbert (Medico-Chirurgical College), Philadelphia:

Our school has for two years offered an optional five-year course, and, as Dr. LeFevre stated, we find some students willing to enter on it, but in a

little while they see that other men, no better prepared than they, are going to do in four years what they have elected to do in five, putting in the fifth year as hospital internes. They leave the five-year course. It seems to me that we have several things to consider. Our high schools throughout the country might be very much better, but with the thorough high school training that is given in many of the better high schools, the student is given a fair preliminary education, including work in chemistry, biology and physics, and some German or French, so as far as preliminary work is concerned, it is possible for the good high schools to give that. We ought to realize that the pedagogy of medical training has been very much neglected in the past, and that the curriculum is overcrowded. Is there a medical school in America to-day where pedagogy has been considered by an impartial committee? Could not many an hour of the four-thousand hours be saved if there were a logical and reasonable consideration given to the question of pedagogy? As to the five-year course, it does seem to me that it is inevitably coming, but it is not necessary to put the additional year either at the beginning or at the end of the course. Let us widen out the present course, or rather spread it out, and make it cover five years instead of four. There is one thing from which I wish colleges would get away, and that is, the time element. Let us base our credits on work done and get out of the student's mind that he must put in certain time to do certain work. I have had men come to me who at the end of the Senior year were forced to do another year's work, and say that it was the greatest thing that ever happened to them, although they felt at first that they would be disgraced because they had to put in more time than their Fellows. Give credit for work done, no matter how long it takes to do it. That would be a big step in advance.

Dr. James J. Walsh (Fordham University), New York:

The question the whole country is concerned with now is whether we shall educate for information or for power. Woodrow Wilson said: "I have been teaching for twenty years—no, I have been conducting class-room exercises for twenty years. My students have remembered some of my stories and a little of my information when it was of interest to them." He said, too, that the human mind is not a long gut to be stuffed; we are not in the sausage-making business in education. This must be the text of any discussion of educational methods, and particularly with regard to medicine at the present time. Are we making of the minds of our medical students a long gut to be stuffed like a sausage? I am sure that the five-year course will have to come, but there are schools requiring seven and eight years in medicine that are not turning out strong men. It is perfectly possible to spread it out too much, and push facts into people's minds from which they will get no good whatever. Now, we are trying to train people to

know facts, and therefore it is wrong to ask a student to take more class-room work than he has hours for study. He is not doing the work as it ought to be done, and we are not training him in that precious thing of studying afterward; we are not training him in education for power, and to use his own mind. We are simply filling him with facts. You can keep him for so many hours in the class-room, so that he can answer questions, but that does not make him think, and will not make practitioners of medicine, men who think about serious medical problems. This problem is not new. It has come up a dozen times. For instance, the first medical law, dated 1241, enforced in the two Sicilys, required three years of preliminary work and five years in medicine. The first medical school in this country, established in 1541, in the City of Mexico, required three years of preliminary study and four years in medicine, so these things are not new. They have presented themselves before, and even though they may be disposed of now, these questions will probably arise again in the future.

Dr. William M. Polk (Cornell University), New York:

As to the necessity for the improvement in our methods of teaching: The problem as it has presented itself to us in the change we are about to make has been much less from the standpoint of the student than from the standpoint of the teacher. We have reached the conclusion that a very radical supervision of the pedagogic methods our teachers are to pursue is essential before we can get the place we have in view. The more we go into the subject, the more are we convinced that more regard than has heretofore been given be bestowed on the correlation of the various subjects. The tendency of every teacher is to magnify his subject. Probably he would not be as good a man as he is if he did not have that idea in his mind, but in so doing he covers a great deal of ground which will inevitably be encroached on in greater or less degree by those engaged in similar work. The study of the human body and its diseases is one which interlocks at almost every step, and the necessity for supervision is becoming more and more evident. We are about to request that every teacher shall file in the office a syllabus of his course, and if the faculty so decrees these syllabi are to be viséed carefully in consultation with various teachers, with a view to showing them that correlation is necessary and that every teacher shall take great care to remember where his subject comes in contact materially with one that is allied to preserve proper relations. I believe that sooner or later we will be compelled to lengthen the course to five years, so that the student will be given more time for thought. That might perhaps be done under present circumstances if some of the subjects of the final year, namely, the specialties, be made elective and not obligatory. Even with the closest attention to securing correlation, it will be necessary to lengthen the course, but most essential at this time is the securing of such correlation.

Dr. W. B. Hill (Marquette University), Milwaukee:

The two things I want to mention are, first, to carry out the idea of arranging the curriculum not alone so that it will not overlap, or leave bare spaces, but so that the work of the student, especially of the Freshman year, will not be made any harder than it is. He ought to have more time for study. That is very evident when we recall what is expected of him in the way of learning anatomy, histology, physiology, and so forth, all at the same time Another thing: Every Senior is oppressed during the last semester's work because he has a final examination in the college, and another before the state board, before he can go out and do the work he wants to do. He must get down once more to the study of the fundamentals, and these things make his lot in life a hard one. I think we ought to do something looking toward a revision of the licensing examination into two parts, and to make it a broader examination and a fairer examination than it is now. Let us open our schools to the boards, and ask them to take a week or two for each examination, so that it will be a good one as well as a fair one.

MINUTES.

(ASSOCIATION OF AMERICAN MEDICAL COLLEGES.)

Minutes of the nineteenth annual meeting, held in New York City, March 15, 16, 1909.

FIRST DAY—MORNING SESSION.

The Association convened at the New York Academy of Medicine, and was called to order by the President, Dr. Eli H. Long, at 10 A.M.

After the presentation of credentials, a roll-call was taken, and the following colleges were found to be represented:

University of Colorado, Medical Department—William P. Harlow.
Georgetown University School of Medicine—George M. Kober.
George Washington University, Department of Medicine—W. F. R. Phillips.
American Medical Missionary College—R. H. Harris.
University of Illinois, College of Medicine—Fred. C. Zapffe.
Indiana University School of Medicine—E. O. Holland.
University of Iowa, College of Medicine—J. R. Guthrie.
University of Kansas, School of Medicine—M. T. Sudler.
Baltimore Medical College—David Streett.
College of Physicians and Surgeons, Baltimore—Charles F. Bevan.
Johns Hopkins University, Medical Department—P. M. Dawson.
University of Maryland, School of Medicine—R. D. Coale.
Woman's Medical College (Baltimore)—J. H. Abercrombie.
Tufts College Medical School—F. M. Briggs.
St. Louis University, Medical Department—E. P. Lyon.
University of Missouri, Department of Medicine—C. M. Jackson.
Washington University, Medical Department—Wm. H. Warren.
Creighton Medical College—J. S. Foote.
University of Nebraska, College of Medicine—Henry B. Ward.
University and Bellevue Hospital Medical College—Egbert LeFevre.
University of Buffalo, Medical Department—Eli H. Long.
Cornell University Medical College—John Rogers.
Starling, Ohio, Medical College—Wm. J. Means.
Western Reserve University, Medical Department—F. C. Waite.
Meharry Medical College—G. W. Hubbard.
Vanderbilt University, Medical Department—J. A. Witherspoon.
University College of Medicine—A. L. Gray.
Medical College of Virginia—Charles M. Hazen.
Marquette University, Medical Department—W. P. Hill.
University of Wisconsin, Medical Department—Charles R. Bardeen.

There were also present: Charles McIntire, American Academy of Medicine; A W. Alvord, Michigan State Board of Registration in Medicine; W. W Potter, New York Board of Medical Examiners; John W Scane, McGill University, H. C. Tinkham, University of Vermont; Seneca Egbert, Medico-Chirurgical College; J W. Holland, Jefferson Medical College, Chancellor McCracken, New York University, H. L Smith, Yale Medical School; Wm. M. Polk, Cornell University Medical College; James J. Walsh, Fordham University, Joseph C. Bryant, University and Bellevue Hospital Medical College; John A Wyeth, New York Academy of Medicine; W. R Townsend, Medical Society of the State of New York; Abraham Jacobi, New York; Graham Lusk, New York; Wm H Carpenter, Columbia University; N. P. Colwell, Council on Medical Education, A M. A ; A A. Taylor, George Washington University; W. A. Dewey, Council on Medical Education, American Institute of Homeopathy; L C. Morris, Birmingham Medical College; J. H. Raymond, Long Island Hospital Medical College, J. H Kellogg, American Medical Missionary College; Randolph Winslow, University of Maryland; Henry S Pritchett and Abraham Flexner, Carnegie Foundation for the Advancement of Teaching; G. W. Boskowitz, Eclectic Medical College, New York.

The minutes of the previous meeting being called for, the secretary presented the minutes as published in the *Transactions*, and, on motion, they were accepted as printed.

REPORT OF JUDICIAL COUNCIL.

The report of the Judicial Council was made by the chairman, Dr. Means, and on motion of Dr. Phillips, the recommendations of the Council were concurred in by the Association.

The report was as follows:

The chairman of the Judicial Council has been called upon during the year a great many times for opinions on credentials of students seeking admission to colleges of the Association from outside colleges and institutions. In many cases these presented peculiar and interesting features and indicated conditions prevailing among medical colleges not at all creditable to medical education.

Other opinions were given on various matters pertaining to the Association's requirements, laws and rules None of these cases were, however, of sufficient importance to demand submission to the Council as a whole, nor of such interest as would require publication

POSTPONED APPLICATIONS FOR MEMBERSHIP.

The *Toledo Medical College* made application one year ago to be reinstated to membership but for several reasons that seemed sufficient, the Council

advised that action be postponed one year. Secretary Zapffe examined the school a few weeks ago and reported that he found the material equipment fairly good and the clinical facilities ample for the number of students in attendance, which according to register were forty-seven.

He reported also that the income of the college was limited almost entirely to the income from students and that it was not sufficient to pay salaries to teachers in the scientific branches. He reported that only three teachers in the school received pay for their work

The Council also learned that the Regents of New York do not admit to examination for licensure the graduates of this college.

With these facts before the Council the following recommendation is made:

While recognizing the opportunities existing in Toledo for clinical teaching and appreciating the high professional standing of the members of the faculty, we deem it unwise to recommend for membership a college that has not sufficient financial support to pay adequate salaries for the services of well-trained teachers in the scientific branches, and the fact that the college is not recognized by New York Board of Regents, the Council recommends that its membership be postponed another year.

The postponed application of the *Maryland Medical College* from the last meeting was taken up There being no additional information in support of the college, the Council recommends that membership be postponed indefinitely.

The application of the *College of Physicians and Surgeons*, of Los Angeles, that has been under consideration for two years has been carefully considered and membership is recommended. This recommendation is based upon a very favorable report from Dr. D'Ancona, Dean of the Medical Department of the University of California, and Dudley Tait, a former member of the state medical board, who is very familiar with the colleges and their conditions in that state From all data gathered from these gentlemen and other sources, the Council believes the college is meeting fully the requirements of the Association.

New Applications.

Tufts Medical College, located in Boston, Massachusetts, has made application for membership Professor Waite, of Western Reserve, made a careful inspection of the college and gave a detailed report of his findings to the Council. Additional information was received from the state medical board and members of the profession in position to know the standing of the school. With these facts before us, the Council feels that the college meets the standard required by the Association in material equipment, clinical facilities and methods of instruction, and, therefore, recommends the college to full membership.

Cornell University Medical College has made application for admission to membership. The college was examined by Secretary Zapffe His report being favorable, the Council recommended admission to full membership.

The *Medical College of Virginia* has made application for membership. Secretary Zapffe inspected the college and reported favorably upon equipment, clinical facilities and methods of instruction. On his report, the Council recommends the college to full membership.

The *Illinois Medical College* made application for membership. The school was inspected by Professor Ward, of Nebraska University. His report developed the following facts:

First, the college has a fairly good material equipment and good clinical facilities.

Second, the faculty is composed of representative men of the profession.

Third, that the college is in fact holding its first session, although it is a reorganization of the old Illinois Medical College.

Fourth, that it has no endowments or income except from the student body.

Fifth, that the organization is a stock company and for profit.

Sixth, that the Reliance Medical College, a night school, holds its session in the college building.

The Council believes it unwise to admit to membership any college that is holding its first session and hesitates very much to recommend a college that is organized for profit. It is recommended, therefore, that action on membership be postponed for one year.

Secretary Zapffe reported to the Council that he had inspected the *University Medical College* of Virginia and found some of its laboratories short in equipment of that required by the Association, and that he later received a letter from the Dean with the information that the faculty had met and taken action in the matter and the deficiencies were already ordered. The Council reports this action for the purpose of advising the colleges, members of the Association, that inspections will be made during the year and that wherever deficiencies are found they will be reported.

W. J. MEANS, *Chairman,*
R. WINSLOW,
E. LEFEVRE,
W. P. HARLOW,
C. M. JACKSON,
H. WARD.

The report of the secretary-treasurer was then called for, received, and referred to the following Auditing Committee: Drs. D. Streett, W. H. Warren, R. H. Harris.

REPORT OF THE SECRETARY-TREASURER.

Mr. President and Delegates: The appointment of the various committees at the last annual meeting of this Association lightened the labors of your secretary considerably. The division of the work will also tend to increase

the effectiveness of the Association's influence in the field of medical education, and it secures the coöperation of many men who, while they have always been more or less interested in the work, have never been compelled to take an active part in the management of the Association's affairs. Therefore, these committees served more than one useful purpose, for which your secretary is very thankful.

That the influence of the Association is increasing in scope each year is shown by the increase in the bulk of the correspondence, and by the increased diversity of sources from which this correspondence emanated. Considerable information was asked for with regard to the requirements of the Association, and quite a few colleges desired to make application for membership but after sending a copy of the Constitution, nothing further was heard from many of them. Many letters were also received from officials of state examining boards, and in a number of instances the Association was in a position to render assistance.

Little change has been made during the year in the membership of the Association. The Indiana Medical College was absorbed by the Indiana University; as the result of a merger three Kentucky colleges united to form one school, the University of Louisville. One college, the Wisconsin College of Physicians and Surgeons, of Milwaukee, withdrew from membership, thus reducing the actual membership of four. Applications for membership were received from the Cornell University Medical College, of New York; the Medical College of Virginia, of Richmond; and the Tufts College Medical School, of Boston. There are also to be considered this year applications made by the following colleges, on which action was deferred at the last meeting of the Association: College of Physicians and Surgeons, Los Angeles, Cal.; Toledo University Medical Department (Toledo Medical College), Ohio; Maryland Medical College, Baltimore; Bucknell University, Lewisburg, Pennsylvania, and Ohio University, Athens. A report will be made on these colleges by the Judicial Council.

A number of colleges were visited by officers of the Association, and in one instance it was necessary to call the attention of a college to shortcomings in administration and equipment not in consonance with the Association requirements. The matter was immediately taken up by the faculty of the college, and provision was made to remedy the defects. On the whole, fewer complaints have been made against schools in membership during the past year than during any previous year, which may be taken as an evidence that the membership to-day is representative of the best schools in the country.

Pursuant to instructions from the Association, the secretary extended an invitation to make application for membership to about twelve colleges, which it was thought were eligible. Replies were received from half this number, and the results are the applications that have been made. Several

of the colleges preferred to defer making application for obvious reasons. The correspondence from these schools is on file for future reference.

Your secretary will continue his efforts to prove to these colleges the advantages to be obtained from membership, with the hope that applications will be presented during the coming year.

The transactions for 1908 were distributed widely in accordance with the usual custom, and while the recipients in most instances failed to acknowledge receipt, the frequent references made to these Transactions in the literature of the day may be taken as evidence that the work of the Association is commanding attention.

Owing to circumstances over which your secretary had no control, the distribution of the matriculation record blanks was deferred until rather a late date, and for this reason the colleges will be given an extension of time in which to fill out and return these blanks to the secretary's office.

No other publications than the Transactions were issued by the Association during the year, although the advantages of publishing a bulletin, as was done several years ago, cannot be overestimated. By this means the colleges can be kept informed of what is going on in the educational world, and of the work of the Association during the year. The secretary has endeavored to do this by correspondence, and while this method of procedure has proved itself to be fairly effectual, it cannot be compared with the issuance of a regular publication.

In accordance with a resolution presented at the last meeting, the colleges were assessed *pro rata* for the printing of the Transactions and the Constitutions, and in only one instance was the payment of this assessment refused. This step was taken to replenish a somewhat depleted treasury, which it has not failed to do. However, as was stated last year, some step should be taken either to increase the receipts or to lessen the expenditures of the Association.

The treasurer reported that there is now on hand a cash balance of $107.38.

(Signed) FRED. C. ZAPFFE.

REPORT OF THE COMMITTEE ON MEDICAL RESEARCH.

Dr. Egbert LeFevre, chairman of the Committee on Medical Research, reported that while the committee had not accomplished anything as yet, it had kept in touch with legislation looking toward the abolition of animal research work, and was doing all in its power to render assistance to other organizations and committees engaged in similar work.

Dr. F. C. Waite moved that the Committee on Medical Research be enlarged by appointing on it a representative from every

state having a college in membership in the Association. Carried.

The Committee on Medical Education, through its chairman, Dr. Means, gave notice of a proposal to change the present standard of requirements for admission to medical colleges at the next annual meeting (1910) of the Association, and then presented the following report:

REPORT OF COMMITTEE ON MEDICAL EDUCATION.

The present standard is the result of a long, tempestuous fight against obstacles both mercenary and statutory in character. The Association established a four-year high school course as a minimum requirement several years ago, but it has only been in the last three years that it has succeeded in evaluating this standard so that the requirements are definite.

The evaluation placed upon a four-year high school course by the Association has been adopted in a large number of the states of the Union, and made mandatory as a prerequisite literary requirement for admission to examination for licensure to practise medicine, but unfortunately there are a number of states where the public school system still holds to a three-year high school course, and in these states there are local medical colleges that have continued to accept students on evidence of graduation from these three-year high schools.

So far as we know, college members of the Association are faithfully adhering to the four-year high school standard. Those that do not or could not do so have either resigned or were intentionally dropped from membership.

The better class of literary colleges and state universities over the country have been important factors in elevating and unifying the standard of the secondary school system, and are making an effort to standardize the literary colleges.

The question of a still higher standard has been agitated for a number of years by several organizations interested in medical education, but no definite scheme was proposed until the Council on Education of the American Medical Association issued in 1906 an advance by January 1, 1910, that contemplated, in addition to the four-year high school course, a year of college work devoted largely to physics, chemistry, biology and one language, and invited by correspondence with the medical colleges throughout the country their coöperation and willingness to subscribe to it. It seems that, without due consideration of all that it involved both to place and to medical education in general, fifty-four colleges in the United States signified their willingness to adopt as a minimum requirement for admission the proposed one year of college work and published the same in their announcements. Of these twenty-nine were members of the association. Several colleges

had raised the literary entrance requirement considerably higher than the one proposed. Since that time a number of other colleges have added one or two years' college work, so that at the present time 50 per cent. of the members of the Association are either requiring one or more years of college work or have announced their purpose to do so after January 1, 1910.

With these facts before us, the committee felt that the situation required careful thought and a thorough canvas of all the data affecting medical education in this country before presenting its conclusions to the Association.

There are some strong arguments against changing the present standard, and some weighty arguments in its favor. The greatest argument in the way of its adoption at the present time lies perhaps with the medical boards and medical laws of the different states of the Union. If the problem could be settled by a national enactment that would be operative throughout the country on a uniform basis, there could be no good reason urged against a higher literary standard for medical students, but the present status of medical legislation is not likely to be changed as long as the environments surrounding each state differ so widely. This necessarily affects any concerted action on the part of the colleges in general toward adding to the present high school standard.

The medical colleges of this country are numerous, widely distributed and present varying degrees of quality, caused largely by local educational conditions and surroundings. A great number of them have no connection with literary colleges, are not endowed, and, therefore, depend entirely upon the income from the student body to meet running expenses. They conform to the laws of the state in which they are located, and in many instances their product remains very largely within the limits of the state.

It cannot be said that these colleges have no place in medical education. Many of them are doing excellent work in preparing young men to fill positions in the profession as general practitioners. In other words, they are making good doctors and thus meeting the public demand. To those who are familiar with the rural districts, they cannot help being impressed oftentimes with the good work that is being done by the village physicians. They are perhaps not good microscopists, nor very familiar with clinical laboratory work, but, nevertheless, are good diagnosticians, good clinicians and good doctors.

In order to ascertain the sentiment prevailing among the medical boards in the United States, I sent out the following letter to the secretaries of forty-eight and received replies from thirty-six.

"The question of entrance requirements to medical colleges will receive special attention at the next meeting of the Association of American Medical Colleges to be held in New York March 15th and 16th.

"The agitation for a higher standard by the American Academy of Medicine, the Councils on medical education representing the various national

medical associations, the state boards of licensure and the Association of American Medical Colleges, and the profession at large, has placed the subject so prominently before the colleges that they cannot ignore it. Several states have specified in their laws the standard corresponding to that of the curriculum of an accredited four-year high school. A few states hold to a lower standard. In order to present the subject from all view points, we wish to get the sentiment of the state medical boards as nearly as possible. It is a matter of common knowledge that without the coöperation of the examining and licensing boards it will be a most difficult matter to carry into effect a higher standard.

"Will you kindly inform me as to the sentiment in your board for or against raising the standard to one or two years' college work beyond the present high school requirement? For your convenience I enclose herewith a self-addressed envelope.

"Thanking you in advance for a prompt reply, I remain,"

It will be interesting to quote from some of the replies received.

First, is a letter from M. E. Daniels, secretary and treasurer of the Texas State Board.

"Replying to your favor of the 4th instant, beg to advise relative to preliminary education that owing to the age of two or three of our colleges, and it only being since July 12, 1907, that applicants for graduation were required by law to be graduates of a reputable college and especially owing to the fact that our four-year high school standard is just now beginning with the present college year, being put into execution, Texas for the present, at least, will adhere to the said four-year high school standard.

"In a comparative sense we are a young state and are not working under a new law which enables us to exact and enforce requirements equal to the best, but we must be given a little more time in which to get our present requirements into a successful operation.

"Texas possesses every advantage to warrant us in extending our literary prerequisite at any time but for reasons given we think it best not to undertake it just now."

The second one is from M. J. Lewi, secretary of the State Board of Medical Examiners of New York.

"In answer to your communication of the 4th inst., I beg to advise you that in my opinion the members of the New York State Board of Medical Examiners believe that the medical law of the State of New York, as it pertains to preliminary academic requirements, is all-sufficient for the purpose at this time."

Third, Dr. J. A. Egan, Secretary of the Board of Illinois:

"Replying to your circular communication of January 4th, I beg to say that in my opinion—but this is my opinion merely—the sentiment of the Illinois State Board of Health is against raising the standard to one or two years' college work beyond the present high school requirement. I might

say, however, that the state board of health has not yet officially declared itself upon this matter.

"Even if the board were disposed to raise the standard beyond the present high school requirement, this could not be done without an amendment to the present law, a copy of which I enclose you."

Fourth, John W. Bennett, secretary of the New Jersey Board:

"This subject is a difficult one and is rendered more so by the varying standards in the various states, academic as well as medical. There is as much difference between some of the colleges and universities as there is between the Sewanee and Johns Hopkins.

"Our law requires a pre-medical academic education equivalent to four years in an approved high school of our standard preceded by eight years of primary work. The State Superintendent of Public Instruction of New Jersey passes upon the academic matters.

"We have many who come with an A.B. degree and are refused admittance because the work in the colleges attended to acquire the A.B. degree is not equivalent to our four years of high school work. We have a case in point at the present time of a young man who not only passed the entrance examination to a college in Illinois, took one year's work in said college and still could not show work equivalent to our high school work. I am sending you a copy of our synopsis of requirements.

"It is the opinion of myself, and I believe it is shared by the other members of our board, that our academic standard is sufficiently high at the present time or until we can get the majority of the other states up to this standard."

Fifth, Dr. J. V. Stevens, secretary of the Wisconsin Board:

"Replying to your letter of the 4th inst., I will say that, while I think that each one of the members of our board are personally and individually in favor of increasing the requirements as to preliminary education of medical students from the present four-year high school standard to an added one or two years' work in college, I do not think that we will take an action of that kind, nor can we, until our statutes are changed.

"The changing of our law in this respect will be very difficult to accomplish. If these requirements are not as uniform as possible throughout the United States, it will not accomplish the intended result, because students will go to school where the extra requirements are *not* imposed. Three members of our board who have sons in medical colleges now, and wished them to take a classical college course, were unable to persuade them to do so. Two of them have had one year in college and another part of a year. Our young men do not like the idea of going to school until they are nearly thirty years of age, before they can do any practical work, and many of them cannot afford to do so."

Sixth, B. D. Harison, secretary of the Michigan State Board:

"For the present, the Michigan board favors the 60-count requirement,

based upon graduation from a reputable secondary school, or a certificate issued upon examination by the board of preliminary examiners. The present medical act limits the standard to that required for entrance to the Literary Department of the University of Michigan, which is represented in the detail of the suggestive standard brought before the Confederation of Boards at its Cleveland meeting last year, and which I enclose you. Our board is certainly in favor of a higher standard for matriculation, as suggested by the one or two years' college work beyond the present high school requirement, but it believes that its adoption now would not be practical—and again, that it would be unfair to some of the schools who are endeavoring to meet the present standards honestly and efficiently. Speaking for the board, I might also add that there seems to be danger from adverse legislation in case the standards are raised too rapidly."

These letters indicate quite a difference of opinion as to the necessity and feasibility of a higher standard.

Another argument against the adoption of the proposed higher standard is the attitude and quality of the literary colleges. As long as the literary educational requirements are confined to the completion of a four-year high school course, the matter remains in the hands of the general public and is subject to statutory and municipal regulations but when the standard is raised beyond that of the public high school we enter upon an independent field—one that is controlled by individuals, and, therefore, subject to economical conditions and such peculiar educational quirks as the officers and teachers of each institution may choose. The state universities supported by the state and subject to statutory supervision constitute an exception to this rule.

The literary colleges outside of the universities are in the market for students just as much as the independent medical colleges, and, therefore, must be expected to hold out every inducement to young men who matriculate to remain for a full college course. It cannot be expected that the independent literary colleges are going to give eclective courses, or, in other words, a premedical course, such as is proposed in biology, chemistry, physics and a language that contemplates only one year's residence in the college. In other words, the literary colleges cannot be asked to accommodate the medical colleges in this way or make a convenience.

It is a well-known fact that the scientific branches are the most expensive ones taught in a college, whether in a literary course or medical. Therefore, from an economical standpoint, literary colleges cannot afford to give one year in the scientific branches only on the same terms as the other literary branches.

Passing from the money side of the question, which we must appreciate as being a very potent one, there is a scholastic phase that was so ably discussed by Professor Ward in his presidential address at the last session of the association that is a perplexing one.

First, as to quality of the colleges. "It is a well-known fact that many so-called literary colleges are not above the level of city high schools, and, therefore, a year of college work would not really give the prospective medical student any training superior to that which would be indicated by a well enforced requirement of a standard high school." This phase of the question will have to be met by an evaluation of the work to be accomplished in the branches before mentioned.

The most serious difficulty in Dr. Ward's mind was the one that would rise from the colleges against being made a convenience for giving a limited amount of specified training. This has been emphasized by the educators and college presidents throughout the country.

An analysis of the report made by the committee of the Council of the American Medical Association covers the same point. While there are a number of colleges seemingly willing to provide, if possible, a year's eclective work for prospective medical students, there are more that do not encourage it. One of the main objections is that one year is too short a time to cover the amount of work required, and that any effort toward doing it in the limited time mentioned will make a mess of the whole matter.

It would seem, therefore, after a careful canvas of the conditions prevailing among the literary colleges of the country that the proposed addition of one year in college devoted to biology, chemistry, physics and language is a misfit, and from any view-point cannot be carried out consistently, even if desirable. This work will either have to be added to the high school curriculum or made a requirement subject with proper evaluation. In support of this proposition, I wish to quote Professor Mercer, of the Ohio University of Athens, who in a paper read before the Ohio Medical Teachers' Association one year ago on the subject, "What Subjects Can Be Practically Included in a Year's Work in Chemistry, Physics, and Biology, said:

"It will never do for the medical colleges to say, 'We will require one year of college work in chemistry, physics and biology for entrance.' They must state what subjects are required and outline in general what is included in each of the subjects. However, if the medical colleges would require two years of college work for entrance, that would settle the problem in a large measure at least, and the differences between the colleges and the universities would be adjusted."

We have personal knowledge of the product turned out by the Ohio University largely under Professor Mercer's tutorage, and can speak in the highest terms of its quality. We, therefore, give his opinion considerable weight. He gave in his paper a proposed schedule for one year's work on the subjects mentioned, but insisted that it would take an exceptional student to carry out the course to any advantage.

Another obstacle that has been mentioned and is of some force is this: Without uniform legislation in the various states, advanced requirements are going to be doubly hard. The independent colleges, or those depend-

ent upon the income from students for expenses, will find it most difficult to meet higher standard. As long as young men can leave their own state and colleges, gain entrance to colleges in other states of lower standard, and pursue a course in medicine to graduation, and are given the same privileges before examining boards and licensed with the same prerogatives that graduates of the home schools have, the home product under such conditions will be exceedingly scarce.

Medical students are not necessarily self-sacrificing. The majority of them are going to pursue the shortest course that will lead them to the desired goal—that is, the legal right to practise medicine.

This, on first thought, might not be a potent proposition, but when carefully considered it would militate very seriously against medical education throughout the country. It would force the larger student body to the lower grade schools, and thus produce a product of inferior quality. We might mention the experience of colleges in several states when the four-year high school evaluation became a statutory provision. True, it would deter some men from going into the profession but a large percentage would seek the schools where their literary credentials would admit them. Two well-known medical colleges of this country suffered a very large falling off in their Freshman class this session by reason of adhering strictly to the standard of the Association, while a neighboring college increased in about the same proportion.

Arguments in Favor of a Higher Standard.

Four addresses delivered by prominent educators before this association and from various educational and professional sources, we are familiar with the arguments in favor of broader cultural training for medical students and the necessity of greater familiarity with the fundamental science of a medical education before entering the medical course.

W. L. Bryan, president of the Indiana State University at Bloomington, in his address last year forcibly and concisely made a strong plea for additional literary work. He said:

"The high school boy cannot take in the sciences that underlie medicine as the modern physician needs to know them. Those fundamental sciences represent the most difficult as well as the most important achievement of the human intellect within the past century. They determine the development of all reliable medical theory and they establish themselves from day to day by a succession of triumphs in medical practice. The boy who goes from the high school to the medical school and who gives two years to the excessively heavy courses in chemistry, anatomy, physiology, histology, embryology, pathology, bacteriology, etc., cannot assimilate the dose. He cannot retain the essential facts. He cannot grasp the circle of essential ideas. He cannot master the essential methods. He may, by grace of a youth's memory, pass his examinations, but if nothing further is required or

done, then as a practitioner he will have only a vague and ineffective memory of matters which lie at the roots of his daily business."

It is scarcely necessary to take up your time in a discussion of the demands made by modern medical education in the scientific branches. For example, the applications of chemistry, which should be taught, cannot, for the lack of time, be properly given unless the student has a thorough knowledge of the general laws and principles of this science before he enters upon his professional course. Chemistry is now so broad and extensive in its relation to dietetics, therapeutics and physiology that the medical school has not the time to give the fundamentals and their specific application also.

What is true of chemistry holds equally true for biology and physics, the fundamentals of which should be learned before the medical school is reached. To obtain this knowledge requires more preparation than can be given in the ordinary high school, as there, both for the want of time and want of maturity in the students, these subjects can be taught only in an elementary and superficial manner.

It is evident, therefore, that recent advances in medical education make necessary the expenditure of more time in mastering the required elementary and fundamental subjects before entering upon a professional career.

The testimony of almost every teacher in medicine might be quoted in favor of better equipped students in pre-medical subjects. In fact, there seems to be no question of the desirability of higher standards considered from every educational view-point.

While your committee is not ready to advise literary requirements beyond the present standard as a fixed minimum standard at this time for the colleges of the association, yet we are convinced that the present scope of medical education demands a more liberal and technical education than is now given in the high school and should be demanded as soon as feasible. We are particularly impressed with the practicability of the combined course that is now given by many universities that confer the literary and professional degrees in a course of not less than six years.

We have considered the practicability of adding another year to the medical course, thus giving an opportunity to give the student necessary instruction in biology, physics and elementary chemistry. There is not sufficient data, however, at hand upon which to make a recommendation. The committee, therefore, offers the following resolution:

W. J. MEANS,
W. P. HARLOW,
W. F. R. PHILLIPS,
F. C. ZAPFFE,
J. R. GUTHRIE.

Dr. E. P. Lyon moved that the committee be asked to make special recommendations in regard to entrance requirements

and that the consideration of these recommendations be made a special order of business immediately after the opening of the morning session of the second day. Carried.

The Committee on State Medical Boards, through its chairman, Dr. Zapffe, reported as follows:

REPORT OF COMMITTEE ON CONFERENCE WITH STATE EXAMINING AND LICENSING BOARDS.

During the past year your committee has kept in close touch with the various state examining boards in the endeavor to maintain the cordial relationship which has existed between these boards and this Association for many years. It is interesting to note that one state board refused to admit to the licensing examination an applicant coming from a college which was inspected by your secretary and found to be woefully deficient in equipment and facilities. This may be accepted as an apt illustration of what the boards throughout the country are willing to do to support the work of the association when such work is deserving of recognition, and it may not be amiss to say that your officers have always endeavored to deserve such recognition.

Two members of this committee, Drs. Means and Zapffe, attended the last annual meeting of the American Confederation of Reciprocating Examining and Licensing Boards, held in Cleveland, Ohio, April 28, 1908. The president, Dr. William A. Spurgeon, of Indiana, said in his address: "The Association of American Medical Colleges, the councils on medical education of the various schools, and the state boards generally and the profession in particular, are in accord with the work under endeavor by the American Confederation, so far as known, and the Confederation aims to be helpful to these all in return."

The Committee on College Inspection and Classification presented a report in which it was urged that each state board should carefully supervise and investigate every medical college in their state and require them to comply in every particular with the schedule of minimum equipment suggested and recommended by a committee of this Confederation and to faithfully and thoroughly carry out the curriculum advertised in their announcements.

This committee also presented a report on college equipment, which is identical with the equipment standard adopted by this Association at its annual meeting last March. Since then the Michigan board has adopted the standard and its college committee has succeeded in enforcing it, so much so that one school in Michigan was obliged to increase its equipment very considerably in order to meet the requirements.

It will be recalled that in 1907 the Confederation appointed a Committee on Preliminary Education to discuss the question of entrance requirements with this Association. Your secretary had several conferences with this

committee during the year, and the result of these discussions was a report presented to the Confederation by Dr. Harison, of Michigan. While the committee succeeded in coming to an agreement on the subjects to be demanded for admission to medical colleges, the valuation of the work done in these subjects could not be agreed on; therefore, the Confederation adopted only that portion of the report having reference to the subjects of study, and referred back to the committee the question of evaluation.

The point of controversy was whether it is possible to demand 75 counts when nearly all the applicants were unable to present more than sixty counts. The confusion existing in that respect in the courses of study offered by high schools made impossible the settlement of this question. It was maintained by the committee that most applicants were unable to present 10 counts in English, for example, because they could not earn more than eight counts during two years of study, the subject being taught only four times a week instead of five. Therefore, in order to present a 10-count credit the study of English must have been pursued for three years. The same condition of affairs is true as to mathematics and Latin. Therefore, this question of credit is still under discussion, but inasmuch as the Confederation will hold its next annual meeting in April, it is necessary that the Association consider the matter now and instruct its Secretary as to its wishes.

The report was presented as follows:

DETAIL OF ACADEMIC (SECONDARY) WORK AND EXAMINATION.

Total of 75 counts. Required group—Minimum 40 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 35 counts. Elective Studies.

Greek	8	10
French	8	10
Spanish	8	10
German	8	10
Chemistry	4	5

	Credits accepted.	
	Minimum counts.	Maximum counts.
Botany	2	5
Zoology	2	5
*Biology (5)	4	5
Physiology and Hygiene	2	5
*English Literature (3)	4	5
*Trigonometry (3)	2	2
Solid Geometry	2	2
Physical Geography	2	5
Drawing	2	2
Astronomy	4	5
Geology	4	5
Total Elective		35

The question was also raised as to what construction should be placed on the requirement demanding attendance on 80 per cent. of the course in the medical college. After some discussion, the Confederation adopted a resolution to the effect that each student shall be required to be in actual attendance on 800 hours of the scheduled hours of instruction in the curriculum of each year of the school in which the student is registered, and that not more than 100 hours of absence from the course shall be allowable, either at the beginning or end of any college year, students serving as hospital internes during a part of the course to be given credit for the time spent in the pursuance of such work, provided that proper work credits have been secured previously.

The National Confederation of State Medical Examining and Licensing Boards held its annual meeting in Chicago, June 1, 1908, which was attended by Drs. Means and Zapffe. This Confederation discussed matters generally, commended the work done by this Association, and appointed the following committees:

1. Committee on Standing of Medical Colleges—Drs. Henry Beates, Philadelphia; J. A. Duncan, Toledo, Ohio; J. W. Bennett, Long Branch, N. J.; C. A. Tuttle, New Haven, Conn.

2. Committee on Legislation—Drs. E. B. Harvey, Boston; N. R. Coleman, Columbus, Ohio; J. A. Egan, Springfield, Ill.

3. Committee on Examinations—Drs. T. J. Happel, Trenton, Tenn.; A. Ravogli, Cincinnati; J. C. Guernsey, Philadelphia.

Your committee respectfully recommends and urges that the colleges in membership in the Association give to the licensing boards of the states in which they are located every assistance possible in the cause of medical

education, with a view to establishing uniformity and also to maintain coöperation. This will lighten the labors of your committee and further the work more advantageously than can be done in any other way.

Respectfully submitted,

FRED C. ZAPFFE,
W. J. MEANS,
J. R. GUTHRIE.

The Committee on Equipment, through its chairman, Dr. Zapffe, reported, and on motion of Dr. Winslow the report was referred to a committee of three for further consideration before final action would be taken. Carried.

The chair appointed on this committee Drs. Guthrie, Hill and Hazen.

REPORT OF COMMITTEE ON EQUIPMENT.

Mr. President and Delegates: Pursuant to a motion made and adopted at the last meeting, the then president, Dr. Ward, appointed a Committee on Equipment to take up and discuss the equipment standard formulated by your secretary, and adopted as a tentative working basis, the standard which later was adopted by the American Confederation of Reciprocating Examining and Licensing Medical Boards. In order to carry on the work effectively, the subjects were parceled out among the members of the committee, with the request to correct or modify the standard as presented at the 1908 meeting. The subjects were divided as follows: Physiology, chemistry and toxicology, Dr. Wm. L. Dudley, Vanderbilt University; materia medica, pharmacology, therapeutics, hygiene and public health and dietetics, Dr. Wm. H. Warren, Washington University; physical diagnosis, practice of medicine, surgery, obstetrics and gynecology, Dr. David Streett, Baltimore Medical College; pediatrics, eye and ear, nose and throat, mental and nervous diseases and genito-urinary diseases, including dermatology and syphilis, Dr. A. R. Baker, Cleveland College of Physicians and Surgeons; histology, embryology, osteology, anatomy, bacteriology, pathology, medical zoology, post-mortem work and clinical microscopy, Dr. Fred. C. Zapffe, University of Illinois.

Each member of the committee entered on his work with zest, and the result is a series of very carefully prepared and most excellent reports, which are appended hereto. It will be noted that the committee did not confine itself to a consideration of material equipment, but also considered facilities for teaching and buildings, thus enlarging somewhat on the report made last year. This is one of the most important questions of the day, and in order to work it out thoroughly, each dean should submit the report to the heads of the departments in his college, in order that they may pursue it and offer suggestions to the committee tending to make the equipment

standard a standard in fact and not only in name. The tentative standard adopted last year has served a very useful purpose already, and has shown what may be done in this direction. It is not conceivable that five men can go into all the details of this question without receiving assistance from others. This was fully understood by your committee and many men were consulted before the reports were prepared, as was done by your secretary last year, before he formulated the standard now in force.

Anatomy.

The standard of equipment for the Department of Anatomy presented last year apparently is sufficient, inasmuch as none of the anatomists consulted suggested any additions. Most of the teaching in anatomy is now being done in the dissecting room, supplemented by quizzes, either in a classroom or at the dissecting table. The dissecting room should be large, well-lighted, well ventilated, containing dissecting tables of modern design which are kept clean easily. The refuse from the cadavers usually is burned either in the heating plant of the institution or in a special oven provided for that purpose. The bones are kept and prepared for students' use, constituting what is known as a bone library. Not more than eight students should be assigned to one body, preferably ony six.

Microscopic Laboratories.

The subjects of histology and embryology may be taught in the same rooms, which should be large, well lighted, preferably a north light, provided with artificial lighting and running water. Each student should be furnished with a locker in which to keep his kit or working material, and a special room should be provided for the preparation of specimens used for classroom study. The desks used may consist of either individual tables or laboratory desks built especially for the purpose. Facilities should also be provided to permit of the use of the projection lantern or stereopticon, and the charts with which the department should be provided may be hung on the walls so as not to interfere with the use of blackboards. Models and special preparations may be kept in wall cabinets and should be used for demonstration purposes or furnished to the students on requisition.

The general and special equipment was outlined in the report last year.

One laboratory may be used for the subjects of pathology and bacteriology. The arrangement and architecture of this laboratory should be similar to that used for histology and embryology.

Medical zoology may be taught in either of the two laboratories last named. A special room should be provided for clinical microscopy. This room may be isolated in any part of the college, furnishing ample light and space, or it may connect with one of the clinical amphitheatres. Where the college owns and controls its own hospital, it is well to have the clinical laboratory located in the hospital.

Autopsies are held in rooms of which all hospitals are possessed, and therefore no special provision need be laid down for this work.

Minimum Standard Equipment for Teaching Medicine.

The paper on Equipment, presented by our secretary, Dr. Zapffe, at the 1908 meeting, leaves but little for us to suggest in this summary.

The title suggests that we shall propose a minimum standard of equipment for medical colleges; it should be understood that colleges desiring to exceed such equipment are at liberty to do so.

It should also be understood that in formulating such an equipment we should provide for the medical instruction of Sophomores, Juniors and Seniors, since medical instruction is begun in the Sophomore year, by giving elementary work in the, and physical examination of the normal human body.

The standard minimum equipment must necessarily embrace a corps of competent teachers, modern buildings for college, hospital and dispensary, and ample facilities, appliances and equipment for the thorough instruction of students.

College Building.

The college building or buildings should be modern, of ample size for administration, for the class-rooms, laboratories, and smaller rooms for instruction of sections of students.

The class-rooms should not be less than three in number, one of which should be an amphitheatre for general clinical instruction. It should have sufficient elevation or pitch to insure good observation; its arena should be large enough for the proper display of material, and for tables, perambulators, necessary appliances and apparatus; and it should be in direct and easy communication with the wards of the hospital. The other class-rooms should be of ample size, well lighted, heated and ventilated and furnished with comfortable seats, good blackboards and appliances for suspending and displaying charts.

Hospital Facilities.

Every college should own and control a hospital, affording at least two beds for every student of the Senior class, assuming that every bed would change its occupant at least once a month, thus affording at least sixteen patients for each Senior during an eight months' course.

The hospital, in addition to the usual facilities for the proper care and treatment of patients, should have a well-equipped clinical laboratory, with microscopes, chemical reagents and staining fluids for examination of blood, sputum, stomach contents, urine, secretions, excretions and frozen sections of tissues; examination and dressing rooms for section work, appliances, apparatus and instruments of precision, as sphygmomenometers, hemaglobinometers, opthalmoscopes, rhinoscopes, laryngoscopes, stethoscopes,

stomach tubes, flasks and bulbs for vacuum pumps, funnels, catheters, rectal tubes, aspirator, apparatus for administering normal salt solution and other remedies subcutaneously and rectally, portable bath tubs, for instruction and practice in hydrotherapy in fevers; an ambulance service to accustom undergraduates to independent emergency work.

Dispensary Facilities.

Every college should own and control a dispensary for the treatment of the ambulant sick. It should have a large waiting room, an assignment room for the chief of clinic and sufficient rooms of ample capacity for the diagnosis and treatment of diseases of patients and for the instruction of sections of students.

Each room should be suitably furnished and supplied with record books, examination blanks and cards, also blanks for the report of cases assigned them in the outdoor department for home treatment.

The dispensary should be equipped with a clinical laboratory and all apparatus and instruments of precision enumerated in the hospital equipment, it being assumed that the instruction of students and work in the dispensary should be as thorough as that done in the hospital. Students in dispensary work are brought in contact with the diagnosis and treatment of many cases, requiring somewhat different management and treatment from hospital cases.

A dispensary should afford at least fifty patients during the session to every member of the Junior and Senior classes.

General Suggestions.

Ample equipment for medical instruction demands sufficient opportunities, facilities, appliances, apparatus and scientific instruments for thorough instruction of students of the Sophomore, Junior and Senior classes the presumption being that Sophomores are properly instructed in the examination of the normal human body—its topography, including location of the various organs, the divisions of the chest and abdomen, normal cardiac and respiratory sounds, the stomach, its location, inflation and physical examination; that Juniors do the same work amplified on the diseases of the body; that the Seniors are required to report and extend the work in the examinations and investigation necessary in hospital and dispensary practice.

This practical work should be, as far as possible, concurrent and correlative with lectures, recitations, clinics, clinical conferences, demonstrations and quizzes.

The college should afford ample hospital and dispensary patients for instruction of the three classes in medicine; they should, during the three years, be brought into professional contact with such patients and become accustomed to their examination and treatment, so that at the end of their Senior

year they shall have become reasonably familiar with diseases and all of the usual methods of diagnosis and treatment.

Minimum Standard Equipment for Teaching Surgery.

In addition to the outlines already presented, of the general equipment required for medical teaching in the present-day medical colleges, the matter of necessary equipment for surgical teaching demands apparently only a word.

Training in anatomy, both histologic and general, is of course of invaluable advantage to the student in surgery and work over the cadaver and skeleton along lines of applied anatomy should be persisted in by the student until his graduation. Pathologic specimens carefully arranged and made available for purpose of demonstration constitute a considerable addition to surgical teaching, while adequate instruction in bacteriology and in pathologic histology, especially of tumors, is of great importance. The actual performance of operations on the cadaver by the student under instruction is a necessary requirement and should be supplemented in the Senior class by selected operations on the living animal, performed under anesthetics in suitable rooms under proper supervision and with every regard for the welfare of the animal. But it is in the hospital that the student for the most part learns and should learn his surgery and the essential requirements beyond good teaching are only two: first, that there should be an abundance of clinical material, and second, that the material should be systematically and intelligently made use of by the student.

To this end the division of the Senior class into working sections is of prime importance. By this means every student may be made to serve his turn as actual surgical assistant, in the wards, in the operating rooms and in the dispensary. He acquires first-hand knowledge in wound dressing, in bandaging and in the application of splints and other apparatus, and above all, in the examinations of patients and the making of diagnosis.

A teaching hospital equipment presupposes suitable amphitheatre and operating rooms adequately fitted and furnished with necessary instruments and appliances and especially with established routine and methods insuring precision and the proper handling of patients and wounds.

Surgery remains essentially a practical part and to learn it is required not so much equipment as opportunity.

Minimum Standard Equipment in Obstetrics.

In addition to the laboratory rooms and clinical amphitheatre necessary for the didactic and clinical lectures delivered to the whole class, there should be at least two demonstration rooms for sections of classes with two manikins and baby manikins for teaching the mechanism of labor, use of forceps, version, etc.; a good supply of anatomic, embryologic, histologic and pathologic charts, and laboratory apparatus for the instruc-

tion in embryology, histology and pathology. There should be enough microscopes to supply one to each student in the class; a good collection of specimens in the museum, which should at least include normal and abnormal pelves, embryos of all ages, placentas (normal, abnormal, multiple) with membranes, some of the common monstrosities, extra-uterine pregnancy, etc.

The most important equipment is a lying-in hospital containing at least one bed for each five students in the graduating class. If proper care is taken in the selection of cases, this will enable each student to see at least seven cases of labor and to assist in at least two cases. The delivery room should be large enough to allow a small section of students (5 to 10) to see the delivery without being in the way of the doctors, nurses and students assisting in the labor.

There should be a well-organized out-door department in charge of the professor or his assistants. Proper blanks should be furnished so that a correct report of each case may be made to the instructor. There should also be a sufficient supply of obstetric bags and instruments to supply all groups of students attending the out-door cases.

The Teaching of Gynecology and the Equipment Required.

In the teaching of gynecology, as in all other clinical branches of medicine, much less depends on equipment than on the capacity of the instructor to teach, on the thoroughness with which he uses the materials at hand and especially on his ability to infuse enthusiasm into his students. The tendency at the present time is, I think, to place too much importance on equipment and too small a value on the teacher's capacity to really teach.

The details of the lecture course should be laid out in advance, each student being furnished with a synopsis of the year's work, showing the exact order in which the different subjects will be covered and so eliminating any excuse on the part of the student for not keeping up his text-book reading. The teaching should not be by didactic lectures solely but by a free use of the quiz or recitation method, every subject being demonstrated on the living subject, when practicable, or by charts and models. These latter are useful and should be generously supplied, but of much greater value are free-hand drawings on the blackboard, models moulded in clay and simple pieces of apparatus which can be readily made by any one having a fair amount of mechanical ingenuity; preserved dissections of the female pelvis showing the organs in position and in different stages of development; the same organs removed from the pelvis and as complete a collection of well-selected pathologic specimens, carefully prepared and mounted, as it is possible to obtain. History taking, blood and bacterial examinations, methods of making physical examinations and of applying local and general preliminary and post-operative treatment should be dealt with in the lecture course,

but they are all better taught to small ward classes at the bedside and to very small sections in the dispensary.

Operative procedures are best taught during the operative gynecologic clinic, no more operations being done than can be thoroughly demonstrated, obscure points being made plain by means of the blackboard drawings and clay or other models previously mentioned.

Whether the class be comprised of ten or one hundred men, the equipment required would be practically the same—prepared charts and models in inverse proportion to the teacher's drawing and modeling ability; the preserved pelvic dissections and pathologic speciments spoken of, together with lantern and microscopic slides and a projecting lantern and projecting microscope for class demonstrations; one or more high-power microscopes for blood and bacteriological examinations in section and dispensary work; a dispensary service furnishing from six to ten patients daily with a well-trained man in charge of the box; a hospital service of at least fifteen gynecologic beds, together with a generous supply of instruments, sterilizers, etc., so that the best methods of technique can be demonstrated.

Equipment for Medical Diagnosis.

The necessary equipment for teaching medical diagnosis in a modern, up-to-date medical college, may be arranged under two divisions: First, the necessary equipment for instruction in the broad, general principles of diagnosis; second, that which comes under the head of special departments and laboratories.

1. Sub-divided into didactic and clinical teaching.

Didactic teaching may be regarded as part of general college construction and demands a lecture hall with good acoustic properties.

The clinical teaching, which ought to be carried out in sections with a limited number of students, calls for a well-lighted, comfortably heated, moderately large room, or the arena of a well-lighted amphitheatre. The necessary equipment of a suitable room depends considerably upon the teacher. A minimum supply is about as follows: One or two examining tables or stretchers, and the necessary coverings for the patients, several towels, a couple of auscultating towels, stethoscopes, plesser and pleximeter, tongue depressor, two basins, two pitchers, stomach tubes and funnels, rubber sheet, aspirator and needles, calipers, sphygmomanometer, microscope, fully equipped with slides and cover slips.

2. This takes into consideration the equipments of the different special departments, such as the eye and ear, nose and throat, rectal, gynecologic, etc., which should be sufficiently well equipped to demonstrate the normal in each department to second-year students, the general pathologic conditions and a certain familiarity with the instruments necessary to those of the third-year and plenty of practical work individually performed to students of the fourth year.

Physiology.

Groups of students should not consist of more than six, one group at each table.

1 Dissecting set.
1 Frog board (myograph).
1 Kymograph.
1 Contact key.
1 Simple rheocord.
4 Non-polarizable electrodes.
3 Battery cells.
3 Receiving tambours.
3 Iron supports, 6 clamps.
1 Ergograph.
1 Time marker for kymograph.
1 Dissecting board for frogs.
1 Frog heart lever.
1 Inductorium.
1 Dubois-Reymond key.
1 Commutator.
2 Shielded electrodes.
3 Recording tambours.
2 Animal holders.
1 Mercury manometer.
1 Plethysmograph (finger).
Glass and rubber tubing, clamps for tubing, watch glasses, beakers, pipettes, test tubes, microscopes.

The demonstrator's table should have: Galvanometer, rheostat, capillary electrometer, sphygmomanometer, sphygmograph, chest pantograph, apparatus for demonstrating vision, and tuning forks.

Hygiene and Public Health.

Notwithstanding the importance of hygiene and public health, it is inadvisable to be too specific regarding equipment for its teaching. That must largely depend upon the funds of each school. Certain European universities consider the subject important enough to occupy a separate building equipped with every convenience for teaching and investigation. Not one man, but several, are engaged in the work and it is wisely provided that they shall be quite independent of the laboratories of other departments. Naturally, in the laboratories of allied subjects, matters of importance in hygiene are brought up but each department usually emphasizes its own individual point of view and lays less stress upon hygienic aspects. Therefore, it would seem as if the *Hygienic Institute* should be the ideal for which every university should strive. Such an institute should comprise:

1. *Separate laboratories* (*i. e.*, chemic, bacteriologic, etc.) equipped in the usual way, for teaching and investigation.

2. *Director of the Institute* and a trained staff of teachers and investigators.

3. *Museum*, containing all materials and appliances required for teaching and investigation.

4. *Library*, containing complete files of journals, pamphlets, reports, etc., catalogued and accessible to teachers, investigators and students.

At the present time only a few schools can offer such advantages and most will have to be content with much less.

1. As equipment for lectures there might be provided models, charts, tables, statistics, photographs, museum specimens.

2. For practical demonstrations the equipment might contain plumbing appliances (good and defective), ventilation appliances (good and defective), heating appliances (good and defective), filtration appliances, disinfection appliances, apparatus of precision used in testing the above appliances, apparatus for testing air, water, milk, food, soil, etc.

3. Library, catalogued and accessible: Public Health reports, Public Health Laws, Reports of U. S. Govt. and of other countries, Reports on Milk, Water, Food, etc., Reports on School Hygiene, Statistic Reports.

Pharmacology.

The full significance of this subject would seem in all cases not to be clearly understood. For example, it is hardly proper to accept a course in materia medica and pharmacy as constituting a department of pharmacology. Yet at the present time some schools appear to be giving nothing more.

Under the most favorable conditions the department should be provided with two separate laboratories, one adapted for physiologic and the other for chemic experimentation. A provision as generous as this will be possible only in a few schools.

While it is possible to use one laboratory both for physiology and the physiologic side of pharmacology, it would seem advisable to insist that each department should have separate apparatus, unless physiology and pharmacology are under one head, an arrangement which prevails in few instances. There would seem to be no need of making many changes in the equipment for physiology given on page 110 of the Proceedings of Association for 1908, for essentially the same things are used in pharmacology. Possibly some things might be omitted and other things added, but such matters would better be left to the judgment of each individual teacher.

An important feature of equipment not mentioned—and it would seem to be equally important in physiology and pharmacology—is a suitable building, or room, where normal and experimental animals may be kept under the very best conditions. A sufficient supply of animals (cold-blooded and mammalian) should always be on hand.

Experimental pharmacology also requires a complete stock of drugs, including crude vegetable drugs, organic acids, alkaloids, glucosides, natural principles, synthetic, set of U. S. P. and N. F. preparations.

Passing to that part of experimental pharmacology which is chemic in character, we recognize the possibility of doing such work in the laboratory of physiologic chemistry, though a separate laboratory would be better. If the laboratory of physiologic chemistry were used, few changes would need to be made in the apparatus advised for such work on pages 110 and 111 of the Proceedings of the Association for 1908. Also in using one laboratory

for the two subjects, there is no reason why a student should not use one set of apparatus.

Materia Medica.

This subject, as stated elsewhere, should be treated as an integral part of pharmacology. The most essential part of the equipment will consist of a museum collection of Official U. S. P. and N. F. preparations, synthetics, crude drugs, an herbarium. Specimens should frequently be replaced and kept up to date. Such a museum should always be accessible for study and the specimens should be properly labeled and in receptacles of convenient size to facilitate handling. The collection used in experimental pharmacology would quite naturally form a part of this museum.

Further class-room demonstrations might be made by means of photographs and colored illustrations of plants and their parts.

Therapeutics.

The clinic-room and the hospital-ward are laboratories, where we study the action of drugs on the human in a pathologic condition.

Based on these considerations, the equipment indicated for therapeutics would include among other things: A good hospital with abundant material under the control of the school for bedside instruction with students present as clinic clerks and surgical dressers; clinics and dispensaries; hydrotherapeutic and thermotherapeutic apparatus; apparatus for massage; *X*-ray exposures; Swedish gymnastics; instruments of precision to study pulse, heart's action, blood pressure and respiratory changes.

Dietetics.

Among the things to be considered in the way of equipment are:

1. Properly equipped diet-kitchen of hospital for the practical study of "invalid cookery" and dietaries applicable to special diseases. 2. Government charts of food materials, food values, etc. 3. Hospital material and laboratory facilities for studying the value of different food-stuffs. 4. Milk laboratory for modification and alteration of milk in connection with diseases of children and infant feeding. 5. Calorimeters. 6. Microscopes and slides showing various facts of importance. Models, casts, charts, lantern slides, etc.

Pediatrics; Eye, Ear, Nose, and Throat; Mental and Nervous Diseases; and Genito-Urinary Diseases.

The equipment for these departments is essentially that of the dispensary. In most medical schools the dispensary is well supplied, and there is an abundance of clinical material, and a sufficient number of teachers. If any criticism is to be offered it is mostly applicable to the curriculum, which does not provide enough time for these subjects. In many schools the attendance is not compulsory, as it should be.

In order that the classes may be divided into small sections of not more than five, or at most ten each, it is necessary that enough rooms be devoted to the dispensary to accommodate all these sections, preferably at the same time. This would necessitate a large reception room with a clerk in attendance to keep records of all patients, and assign them to the various departments. Another room stocked with drugs, in charge of a registered pharmacist. One moderate sized room will answer for pediatrics. Another for nervous and mental diseases, and one for genito-urinary diseases. The ear, nose and throat department will require a larger room, and the eye department two rooms, one of which can be darkened. Students should also have access to, and be assigned regularly in sections, to work either in special hospitals or wards devoted to these special branches in general hospitals. There should be a pathologic department, either connected with the dispensary, or closely associated with it, so that bacteriologic, chemic and pathologic specimens could be examined and reported upon quickly. X-ray apparatus, giant magnet and other expensive equipment should be provided either in the dispensary or associated hospitals.

Pediatrics.

Same as medicine, and each student should provide himself with a stethoscope and clinic thermometer.

Mental and Nervous Diseases.

Same as medicine, simple electric apparatus for testing reactions, charts, and atlases.

Genito-urinary Diseases.

Same as surgery, catheters, sounds, etc., manikins and models.

Ear, Nose and Throat Diseases.

Five or more lights (one for each student in the section), with condensers, ear speculums, laryngoscope, probes, etc. Each student must be provided with a head mirror (preferably bought by himself), atomizers, various solutions—cocain, adrenalin, nitrate of silver, fluid vaseline, etc., manikins, charts and atlases.

Eye Diseases.

Dark room with one light for each member of the section, one ophthalmoscope for each student (to be bought by himself), several retinoscopic mirrors, case of lenses for retinoscopy, ophthalmometer.

Refraction room:—perimeter, complete trial case and test type, small case of operating instruments, and solutions of cocain, atropin, eserin,

nitrate of silver, protargol, fluorescein, suprenalin, boric acid and calomel. Atlases of ophthalmoscopy, a few specimens prepared in gelatin or glycerine.

F. C. ZAPFFE,
D. STREETT,
W. L. DUDLEY,
W. H. WARREN,
A. R. BAKER.

On motion the report was accepted.

REPORT OF REFERENCE COMMITTEE.

Your Reference Committee appointed to consider the report of the Committee on Equipment desire to make the following recommendations:

Anatomy.—Insert after the word "large," "or there should be separate rooms large enough for two tables." After the tenth line, insert "or in such manner as the State law requires."

"Reading tables should be provided. Sufficient light should always be provided for."

Hospital.—In the first line for the word "and" substitute "or;" after hospital, insert "when possible." Omit to the end of the paragraph.

Dispensaries.—Omit at end of second paragraph reference to ambulance service. First line, for the word "and" insert "or." After the words "fifty patients" insert "during the session."

Obstetrics.—For the last paragraph, substitute, "The Outdoor Department should be under the immediate supervision of the professor or his assistants, who shall be supplied with proper report blanks and instruments."

Gynecology.—Omit down to "charts and models," omit "these latter," and continue to end of subject.

Medical Diagnosis.—Omit to "necessary equipment."

Hygiene.—Substitute for the report the following: "A properly equipped laboratory of physiologic chemistry can be made sufficient for this work, supplemented by charts, tables, models,

statistics, photographs, museum specimens, referring to sanitation and public health.

Materia Medica and Pharmacology.—Substitute for the report the following: "A well-equipped laboratory of experimental physiology will be sufficient for the work in Pharmacodynamics; in addition to this for the teaching of materia medica there should be a collection of sample drugs, pharmacists' scales, glassware, etc., as may be needed for compounding prescriptions."

Therapeutics.—Substitute for the report the following: "The equipment of the hospital connected with the medical school should include apparatus for instruction in electro-diagnosis and therapeutics, hydrotherapeutics, thermo-therapeutics, massage and Swedish movements, X-ray diagnosis and treatment; besides instruments of precision to study pulse, heart's action, blood pressure, etc."

CHAS. M. HAZEN, M.D.,
W. B. HILL,
J. R. GUTHRIE.

The chair at this juncture appointed as a Nominating Committee, Drs. Winslow, Bardeen and Ward.

A communication from the Council on Medical Education of the American Medical Association, requesting the Association to appoint a representative to the fifth annual conference, was read and referred to the Nominating Committee for disposition.

Dr. F. C. Waite, chairman of the Committee on Curriculum, then presented the following report:

REPORT OF THE COMMITTEE ON CURRICULUM.

Division of time for first and second years.

	Total hours.		Lectures, recitations, demonstrations. Hours.	Laboratory work. A minimum of hours.	Change from present curriculum.	
Division of Anatomy.....		750				
Gross Anatomy.....	540		120	420	increase	90(*a*)
Histology and Microscopical Anatomy.....	135		30	105	increase	47
Embryology.....	75		30	45	decrease	15(*b*)
Division of Chemistry....		420				
Inorganic Chemistry (*c*) (*h*).....	180		60	120	increase	120
Organic Chemistry.....	105		60	45		
Physiological Chemistry (*d*).....	135		60	75		
Division of Physiology....		240				
Physiology.....	240		165	75	decrease	60(*d*)
Division of Pathology, etc.		405				
Bacteriology.....	135		30	105	increase	5
Hygiene (*e*).....	30		30	...	same	
Pathology (*f*).....	240		45	195	same	
Division of Pharmacology		185				
Pharmacology.....	105		40	65(*g*)	increase	45
Materia Medica and Pharmacy (*h*).....	80(*i*)		?	?	increase	20
	2000	2000		Total increase		240(*j*)
Division of Clinical Subjects (*k*).....		(105)				
Division of Preparatory Subjects.....		(1)				
Zoology.....						
Physics.....						

The committee presents the foregoing apportionment of time for the curriculum of the first and second years on the basis of a total curriculum of 4000 hours to be given in four years of 1000 hours each and a minimum of 30 weeks of teaching per year.

This division of time is presented as a preliminary report representing

the present opinion of the committee on this part of the curriculum, but the committee reserves the privilege of modifying these figures, if new information is received, and to incorporate this modified curriculum in a report on the curriculum of the entire four years which it expects to present at the meeting in Baltimore in March, 1910.

The present feeling of the committee is that the entire 4000 hours should be required work and that there is not room for making any of this elective.

This report does not attempt to show the distribution of the time in any given subject between the first and second year, but it is hoped that in the final report such a distribution may be made.

It is the feeling of the committee that the total number of hours for any one division of the subjects above should not be diminished in putting the curriculum into effect, but it is recognized that the number of hours here stated for one subject in a division may be somewhat diminished if a corresponding increase be made upon another subject of the division, as noted under certain of the comments below.

The time is apportioned in multiples of 15 hours, assuming that the year has 30 weeks of teaching and is divided into semesters of 15 weeks each. The growing demands of the curriculum make it advisable to increase the number of weeks of teaching to 32, but in the absence of any action on this point, the curriculum is based upon 30 weeks.

Comments.

(*a*) The increase in the total number of hours given to Gross Anatomy (which includes osteology, dissections, descriptive anatomy and the anatomy of the brain) seems justified by the average of the amount of work in this subject which is given in the better medical colleges in the country and also because of the fact that laboratories are becoming better equipped in this subject.

(*b*) The decrease in embryology is in conformity with the report on this subject presented last year and printed in the Transactions, in which it was held that the old curriculum giving an equal amount of time to histology and embryology is illogical. This decrease is offset by the 45 hours' increase in histology, which is in conformity with the greater amount of time required in this subject due to increased demand in the teaching of microscopical anatomy of the central nervous system.

(*c*) The amount of time given to Inorganic Chemistry is based on the assumption that students may enter colleges carrying this curriculum without previous training in chemistry. Then the time comes that all of the colleges of the Association can demand inorganic chemistry (including qualitative analysis) for entrance; the 180 hours here given may be distributed either to other laboratory subjects or a part of it used in the last half of the second year for beginning work on clinical subjects (see *k*).

(*d*) The time given to Physiologic Chemistry does not appear as a separate apportionment in the schedule now in force. There it is included largely under physiology and hence 60 hours have been taken from physiology and to this 60 have been added 75 hours which seems justified in view of the increasing importance of physiologic chemistry. It is obvious that the division of time between organic and physiologic chemistry is incapable of being sharply made since some teachers give a certain part of the work under one title and some under the other, but it is believed that the two together should occupy 240 hours. Of course, if organic can be demanded for entrance this total may be decreased, but such demand cannot be made except where college work is required for entrance.

(*e*) No time is apportioned to laboratory work in Hygiene, it being assumed that the laboratory work in bacteriology will have a trend toward hygiene and hence the subject of hygiene and bacteriology may mutually vary in amount of time.

(*f*) The time apportioned to Pathology assumes that there is likely to be some additional time given to gross pathology demonstrations in the third year.

(*g*) The 65 hours of laboratory work in Pharmacology aims to include a certain number of demonstrations of the action of drugs, but at least one-half of this 65 hours should be given to actual work by the students individually or in groups.

(*h*) The subject of Toxicology does not appear as a separate division and it is assumed that the toxicology of inorganic chemistry will be given with the chemistry while the other division will be given under materia medica and pharmacy.

(*i*) It has seemed impossible to divide the 80 hours given to Materia Medica and Pharmacy into didactic and laboratory work. The information obtainable as to the usage in various medical colleges shows that the line of demarcation between these two subjects is extremely indefinite.

(*j*) This report shows a total increase of 240 hours for the laboratory subjects and, conversely, there will be corresponding decrease in the amount of time for the clinical subjects. This increase for laboratory subjects is in line with the growing increase of laboratory equipment in the medical schools of the country.

(*k*) If Inorganic Chemistry can be demanded for entrance, there may be time to give in the second year some work in physical diagnosis (of the normal signs only), bandaging and possibly some beginning work on medicine, but the committee does not feel that there should be more than 105 hours of this work before the third year, *i. e.*, it believes that the first two years should be marked off rather sharply from the last two years and devoted to laboratory subjects.

(*l*) In those schools where it is impossible to demand any biology or physics for entrance, it may be necessary to give these subjects under the

direction of the medical faculty, but the time devoted to them should be *in addition* to the time outlined above. Work in Zoology should emphasize primarily the structure of vertebrates. The committee feels that with the limited time it would be best to devote all the time to zoology rather than to divide between zoology and botany.

F. C. WAITE,
C. M. JACKSON,
P. M. DAWSON,
H. ALBERT,
E. LE FEVRE,
W. S. WARTHIN,
D. COALE.

The Association then adjourned until 2 P.M.

AFTERNOON SESSION.

The Association reconvened at 2 P.M., with the president, Dr. Long, in the chair.

The report of the Committee on Curriculum was made by Dr. Waite, and on motion of Dr. Ward, discussion was postponed until the following day.

Professor William H. Carpenter, of Columbia University, then read a paper on "The Combined Course," which was discussed by Drs. LeFevre, Hill, Foote, Winslow, Phillips, Waite, Egbert, Guthrie, Hazen, and in closing by Dr. Carpenter.

Dr. Fred. C. Zapffe read a paper entitled "The Present Status of Medical Education," and Dr. John Rogers discussed "The Five-year Course."

These two papers were discussed by Drs. Scane, LeFevre, Egbert, Walsh, Polk, and Hill.

The Society then adjourned until 8.30 P.M.

EVENING SESSION.

The Association reconvened in Hoosack Hall, and was called to order by Dr. W. F. R. Phillips, who introduced Dr. John A. Wyeth, president of the New York Academy of Medicine, and chairman for the evening.

Dr. Wyeth briefly welcomed the Association, and delivered a very interesting address on the "Reminiscences of a Medical Student of 1867."

Dr. Eli H. Long then delivered his presidential address, entitled "The Function of the Medical School," and Dr. Henry S. Pritchett, president of the Carnegie Foundation for the Advancement of Teaching, spoke on the "Question of Higher Standards in Medical Education."

The Association then adjourned, to partake of a repast provided by the Local Committee on Arrangements.

SECOND DAY—MORNING SESSION.

The Association convened at 9;30 and was called to order by the chairman, Dr. Long.

Dr. Streett, chairman of the Auditing Committee, reported that the Committee had examined the accounts of the treasurer and found them to be correct. On motion the report was accepted and the committee discharged.

The special committee appointed to consider the report of the Committee on Equipment, reported through its secretary, Dr. Hazen (see appendix to original report), and on motion of Dr. Phillips, it was decided to publish the original report with the corrections offered by the special committee, and refer the entire report back to the Committee on Equipment for further consideration.

The Committee on Medical Education presented its supplemental report on entrance requirements, and on motion the report was accepted.

SUPPLEMENTAL REPORT OF THE COMMITTEE ON EDUCATION.

The Committee on Medical Education, after a thorough study of the situation and consideration of the problems involved in the question of preliminary educational requirements for entrance to the colleges of this association, beg leave to report as follows:

First.—The committee recommends that the Association reaffirms the resolution adopted at the session of 1908, which reads as follows:

"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 now 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."

Second.—The committee 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 upon 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.

Third.—The committee further recommends that the Association recognizes the importance of standardizing the secondary educational system of the country, and places itself upon 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.

Fourth.—The committee recommends that the Association, in accordance with its position favoring additional preliminary education 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.

W. J. MEANS,
W. P. HARLOW,
G. H. HOXIE,
W. F. R. PHILLIPS,
F. C. ZAPFFE.

Dr. Randolph Winslow moved that this report be given the widest possible publicity, sending it to examining boards and the superintendents of public instruction in the various states. Dr. Phillips offered as a substitute that the Committee on Medical Education be given full power to act in this regard, securing the desired publicity. The substitute was carried.

Dr. Waite moved that the secretary be authorized to call for an additional assessment of not more than five dollars per college in membership, to help defray the necessary expenses incurred by the Committee on Medical Education in furthering this work. The motion prevailed.

The report of the Committee on Curriculum was then dis-

cussed, and in this connection Dr. A. W. Alvord, of Michigan, emphasized the necessity of teaching more about anesthetics and anesthesia, and urged the committee to consider this matter in connection with its other work. Dr. Alvord's remarks were very favorably received, and on motion of Dr. LeFevre, the matter was referred to the Curriculum Committee.

Dr. Ward moved that the committee be asked to include in its report the item with reference to the teaching of physics and zoology in the medical course. The motion prevailed.

Dr. Bardeen moved that the committee be instructed to take up the question of study hours necessary for the student to properly prepare the work offered by the curriculum presented by the committee. This motion also prevailed.

Dr. Waite announced that the committee would be prepared to present a preliminary report at the next annual meeting on the subjects embraced in the third and fourth years of the curriculum.

REPORT OF COMMITTEE ON MEDICAL TEACHING.

The Committee on Medical Teaching, through its chairman, Dr. Ward, reported as follows:

Most of the questions heretofore considered by this Association have dealt with medical teaching from the standpoint of the student. They have discussed one aspect or another of the limitations which should be placed upon the entrance of students, upon their work during the professional course and upon their graduation. They have sought to provide that only students of proper training and maturity should be admitted to the medical school, that during the course they should be required to devote their energies primarily and effectively to professional studies, and that, after having filled out the proper study periods, they should be subjected to suitable tests for graduation and subsequently for licensure in order that the state might with confidence grant them the right to minister to the physical ills of its population.

There is, however, distinctly another side to the question. A student might conform to all of the limitations set forth by this Association, by state board regulations and even by the most advanced standards advocated in our sessions without having profited effectively from the time spent. It is fair to ask whether within the college itself pedagogic conditions are such that the students secure the best results in the given time. It is right that we should attempt to safeguard the interests of the aspirant for medical

honors as well as the interests of the general public. According to the terms of its appointment (see *Proc. 18th Ann. Mtg.*, p. 113) the work of this committee is limited to the field of activity thus outlined. It deals with the pedagogic aspect of medical education, not as concerning courses of study and the intimate relations of subjects to each other but with the teaching ability of the faculty and the methods employed to secure educational results. It has nothing to do with the details of content or time that concern the individual subjects. It is called upon to accept any given subject under the precise limits of time and content which have been laid down by the Committee on Curriculum. It has nothing to do with examinations as indicating the amount of work covered in specific subjects or particular years, but it does take into consideration those examinations and all the other factors which may tend to show whether the teachers have presented the material properly to their students, whether their methods in educational work are correct and effective and whether the best interests of the student are subserved by existing conditions. It deals with subject material in finished form and discusses the type of teacher and methods employed in instruction Under this general heading must be considered, first, the competency of the medical teacher and, second, methods of instruction. The first depends upon (*a*) adequate training in the special line taught; (*b*) primary attention to the subject taught; and (*c*) regard for the responsibilities involved.

The competency of medical teachers rests on no peculiar basis. One may judge it by the same standards which apply to teachers in any technical line. It would be too much to suppose that without any adequate training a teacher could present the subject of Latin to his classes. It is equally beyond acceptance that the student who has just made his medical degree should be able to present effectively technical subjects to a class of medical students. He might be an adequate assistant to some well-established teacher but no college could expect to command thorough approval which gave him the exclusive charge of a department. Not only a certain age but equally a certain experience is essential to the teacher. All will probably agree that the satisfactory teachers in any professional branch cannot be found among those who have had no technical training in any specific line beyond the experience gained in the professional course. Evidently, also, a student is not a proper teacher to place in charge of any phase of educational work. No position in control of a class or course should be given to any one who has not had a minimum of two years' experience in the subject he is called upon to teach. This is true not only of those teachers who handle the scientific branches in the earlier part of the curriculum but also equally of those who occupy themselves with the clinical subjects of later years. In all cases some adequate technical training should be required before the candidate may assume the functions of an instructor.

It should be equally clear that the medical instructor should devote

his attention outside of class hours, as well as during them, primarily to the subject which he is expecting to handle in teaching. Under the modern development of science a general practice is not good training for the teaching of physiology, of bacteriology or of chemistry. The demands of these fields are so exacting that a proper knowledge of the subject matter cannot be obtained unless the individual devotes his energy primarily to study and research. In general the laboratory man should not be engaged in the general practice of medicine, although there is some difference in that respect in the case of some of the subjects embraced in the medical curriculum. A surgeon may be a very good quiz master in applied anatomy, but a medical practitioner is certainly unfit for the position of a teaching chemist. The committee is of the opinion that the scientific branches should be taught by specially trained men who are devoting their attention primarily, if not exclusively, to the development of these fields through instruction and investigation.

The same is true, however, of such special subjects as fall within the limits of the clinical years. Here also the teacher should be working in the line in which he is giving instruction. Evidently an internist is not adapted to the teaching of ophthalmology, and the surgeon would not be an appropriate person to teach therapeutics. Furthermore, it is too much to expect that the general practitioner should be able to handle any special topic when the major part of his time and energy is devoted to work along general lines. It is scant justice to the student to entrust his training in a highly developed specialty to one whose main energies are employed along entirely different lines. While such relations appeal to the thinking man at once as unreasonable, one can readily find among the medical schools of the United States these strange misfits between topic and teacher. It is eminently proper that this Association should call attention definitely to these conditions that are pedagogically wrong and demand their prompt readjustment or the disqualification of the school in which they are found.

In dealing with (*c*) regard for the responsibility involved one may say that there are included certain items of a purely pedagogical type, such as regularity, promptness, discipline, drill, etc., which are not considered at all in any medical schools. Emphasis should be laid also upon one element, the presentation and control of the subject, and yet how often are such factors considered in any degree in the selection or retention of medical faculties. Again, the medical teacher should keep in mind self-effacement rather than self-exploitation. If he is to rank as a teacher he should present those simple things which the student will be called on to use rather than those things which the student will never be in a position to employ Finally, one should mention development of character and sense of duty If there is any profession in which that is important, it is the medical profession, and the final emphasis of the Association should be laid on that point among the qualifications of the medical teacher.

With reference to the question of methods of instruction, your committee feels that this Association stands in a very important relation to the character of state board examinations. In our opinion, the present type of state board examinations tends to encourage quiz compend methods and the memorizing of facts, rather than the development of knowledge and judgment. The committee views with favor the introduction of practical tests into such examinations to determine whether the student has actually come in contact with the subjects taught him and whether he is familiar with scientific methods by hand and eye, rather than by the presentation of a mere list of facts.

There are four items which seem to need emphasis in considering methods of instruction. In the first place, mass instruction is undesirable. The lecture method, the medical oration, and the spectacular clinic, or, as called by some, "the arena circus," are clearly as unpedagogical as they are antiquated. Patient instruction and individual work with students are essential to obtaining good results. There is a general call for laboratory work rather than for mere exhibition or demonstration. In the clinical years there is need for more sectional work rather than for presentation of cases to large bodies of students by which superficial consideration is encouraged and careful study of detail is prohibited.

Another item of criticism is one that has been mentioned by other committees, namely, the marked tendency to overcrowd the student. The schedules of a considerable number of medical colleges show that the time of the day is consumed very thoroughly. No opportunity is given the student for reading and reflection. This practice is unpedagogic and prevents the student from obtaining effective control of the subjects under discussion.

Finally, the committee would urge the necessity of enforcing coördination between the various branches of the curriculum. In no other way can we avoid that duplication in instruction which wastes so large a part of the energy of our faculty and students.

Your committee presents this brief synopsis merely as a basis for later discussion. It desires to call attention to a few of the more patent factors in the pedagogic evaluation of present-day medical teaching, not primarily or even prominently for the purpose of criticizing evident errors or exposing unfortunate weaknesses in existing conditions, but first and foremost that the line of progress may be pointed out, that the discussion may lead to advance all along the line and that medical teaching may be placed as firmly on a professional basis as instruction in any normal institute or teachers' college in the land. To this end your committee recommends:

1. That this general subject, or some appropriate portion of it, be made the topic for a symposium and series of papers in the program of the next annual meeting.

2. That this Association encourage the holding of outside discussions and the formation of local or regional societies dealing with the problems

of medical education in a pedagogic manner. Thus far only one state, Ohio, has formed an association of medical teachers; with the multiplication of such organizations and their discussions will come promptly and generally that improvement in the character of medical teachers and methods of teaching which will enable us to realize in a fuller sense the true possibilities in medical training.

Finally, in view of the fact that Dr. H. O. Walker finds himself unable to assume the duties incumbent upon membership in this committee, the other members request that he be excused from further service and Dr. W. S. Thayer, of Johns Hopkins, be appointed in his stead.

HENRY B. WARD,
E. P. LYON,
CHAS. R. BARDEEN,
J. A. WITHERSPOON.

At the request of the committee, Dr. W. S. Thayer, of Johns Hopkins University Medical Department, was made a member of the committee.

On motion of Dr. Jackson, the report of this committee was accepted and ordered published.

At this juncture the Nominating Committee presented the following report, and on motion of Dr. Phillips, the secretary was instructed to cast the unanimous ballot of the delegates present for the election to office of the nominees, which was done:

President, George H. Hoxie, University of Kansas.

Vice-presidents, David Streett, Baltimore Medical College, and J. A. Witherspoon, Vanderbilt University.

Secretary-Treasurer, Fred. C. Zapffe, University of Illinois.

Judicial Council, Egbert LeFevre, University and Bellevue Hospital Medical College, and Wm. P. Harlow, University of Colorado (term of office of LeFevre and Harlow to expire in 1912).

Delegate to Council on Medical Education, A. M. A., and to American Academy of Medicine, Fred. C. Zapffe.

At the invitation of Dr. Winslow, it was decided to hold the next annual meeting in Baltimore, Maryland, March 21 and 22, 1910.

The vacancy created in the Committee on Medical Education

by Dr. Hoxie's election to the presidency was filled by the appointment of Dr. J. R. Guthrie, University of Iowa.

Dr. W. B. Hill presented the following resolutions:

Resolved, That it is the opinion of the Association of American Medical Colleges that state board examinations for licensure should be divided into two parts, the examinations in the laboratory sciences being offered at the end of the second year of the medical course, and in the practical work after graduation. That, state examining and licensing boards be urged to effect such an arrangement wherever legally possible.

Resolved, That the Association of American Medical Colleges favors practical examinations and laboratory tests as substitutes for a part of the written examination now almost universally employed, and that state boards be requested to adopt these measures wherever possible.

On motion, these resolutions were unanimously accepted.

On motion of Dr. Ward, Dr. Henry S. Pritchett, president of the Carnegie Foundation, was elected to honorary membership in the Association.

On motion of Dr. Gray, the Association extended a vote of thanks to Dr. LeFevre for the very successful arrangements made for the meeting, and to the New York Academy of Medicine for many courtesies extended during the meeting.

Dr. Ward moved that the secretary be instructed to prepare the Transactions in suitable form for effective distribution and that the cost of such printing and distributing be divided *pro rata* among the colleges in membership, and added as a second item to the regular account for dues.

The motion was carried.

On motion of Dr. Ward, a vote of thanks was extended to the retiring president, Dr. Eli H. Long.

Dr. LeFevre moved that the secretary be instructed to extend to Dr. A. S. Downing, of the New York State Education Department, an expression of sympathy from the Association because of the illness in his family, and best wishes for a speedy recovery of the invalid. Carried.

There being no further business to come before the Association, it adjourned.

ELI H. LONG, *President,*
FRED C. ZAPFFE, *Secretary.*

ASSOCIATION OF AMERICAN MEDICAL COLLEGES ROSTER—1909–1910.

OFFICERS.

President, George H. Hoxie, University of Kansas.
Vice-presidents, David Streett, Baltimore Medical College; J. A. Witherspoon, Vanderbilt University.
Secretary-Treasurer, Fred C. Zapffe, University of Illinois.

JUDICIAL COUNCIL.

William J. Means, Chairman, Starling-Ohio Medical College.
Randolph Winslow, University of Maryland.
Henry B. Ward, University of Nebraska.
C. M. Jackson, University of Missouri.
A. A. D'Ancona, University of California.
Egbert LeFevre, University and Bellevue Hospital Med. College.
William P. Harlow, University of Colorado.

COMMITTEE ON MEDICAL EDUCATION.

William J. Means, Chairman, Starling-Ohio Med. College.
W. F. R. Phillips, George Washington University.
George H. Hoxie, University of Kansas.
W. P. Harlow, University of Colorado.
Fred C. Zapffe, University of Illinois.

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.

F. C. Waite, Chairman, Western Reserve University.
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.
C. L. Dana, Cornell University Medical College.
C. G. Coakey, University and Bellevue Hospital Med. Coll.
J. F. Barnhill, University of Indiana.
Edward Jackson, University of Colorado.

COMMITTEE ON MEDICAL RESEARCH.

Egbert LeFevre, Chairman, University and Bellevue Hospital Med. Coll.
C. W. Greene, University of Missouri.
A. S. Warthin, University of Michigan.

COMMITTEE ON MEDICAL TEACHING.

Henry B. Ward, Chairman, University of Nebraska.
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.

College of Physicians and Surgeons, Los Angeles.
Cooper Medical College, San Francisco.
University of California, Medical Department, Berkeley, San Francisco and Los Angeles.

Colorado.

University of Colorado, Medical Department (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.
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.

Maryland.

Baltimore Medical College, Baltimore.
College of Physicians and Surgeons, Baltimore.
Johns Hopkins University, Medical Department, Baltimore.
University of Maryland, School of Medicine, Baltimore.
Woman's Medical College, Baltimore.

Massachusetts.

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, Medical Department, St. Louis.
University Medical College, Kansas City.
University of Missouri, Department 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 Department, 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, Medical Department, University.

Ohio.

Cleveland College of Physicians and Surgeons, Medical Department.
Ohio Wesleyan University, Cleveland.
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.

Medical Department, Marquette University (Milwaukee Medical College), Wilwaukee.
University of Wisconsin, Medical Department, Madison.

HONORARY MEMBERS.

Dr. George M. Sternberg, Washington, D. C.
Dr. Henry Y. Bowditch, Boston, Mass.
Dr. Egbert LeFevre, New York, N. Y.
Dr. Henry S. Pritchett, New York, N. Y.