ASSOCIATION OF AMERICAN MEDICAL COLLEGES

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ADDRESS OF PRESIDENT

HIGHER MEDICAL EDUCATION, THE TRUE INTEREST OF THE PUBLIC AND OF THE PROFESSION

WILLIAM PEPPER, M.D.
PHILADELPHIA

I have adopted this title for my paper in order to call attention to the fact that my father delivered a very notable address under the same title in 1877 on the then position of medical teaching in America. He called attention to existing deficiencies and to certain much-needed reforms and improvements. He recorded with regret that in the United States there was at that time one medical school for, at the most, every 500,000 inhabitants, and at least one medical man to every 750 inhabitants. Much water has passed under the bridge during the forty-four years that have elapsed. Today we would be accused of pessimism if we were to say as he did:

> I suppose that few persons who are at all familiar with the subject would be willing to express even the smallest satisfaction with the present state of the medical profession in this country. It is true that for the past four years all branches of industry have been depressed, but the troubles that affect the medical profession have been steadily advancing and increasing for at least fifty years. Its ranks are overstocked to an unparalleled extent; there is, I believe, no other business in which so small a proportion of those engaged earn a living; it finds successful rivals among the practioners of such exclusive schools as homeopathy, eclecticism, and the like; and, worst of all, it has failed to elevate its standing and repute with the public, or to exert that powerful influence upon sanitary legislation, upon public and private hygiene, upon education, and upon similar subjects which is at once its duty and its highest prerogative.

At our meeting last year we listened to a very valuable series of reports presented by various subcommittees. These reports were on the teaching of gross human anatomy, neuro-anatomy, physiology, biochemistry, public health and preventive medicine, pharmacology, pathology and bacteriology, and parasitology. The reports, together with the discussion they evoked, have been published and sufficient copies forwarded to all the colleges in membership in the Association for distribution among the various interested members of the faculties.

Today we are to hear reports of other committees on the teaching of medicine and medical specialties, surgery and surgical specialties, and obstetrics and gynecology. Yesterday we heard a very interesting symposium on graduate training in the various

medical specialties. Let me touch briefly on a question that has been discussed frequently in the past, but which has been somewhat neglected of late, the premedical course.

THE PREMEDICAL COURSE

I am not satisfied with the so-called "two-year premedical course" now required by practically all medical colleges. I believe the time has come to consider seriously whether this premedical course is producing, for the medical schools, students properly prepared to study medicine. Already five medical schools have decided that they believe that two years of college work is insufficient. Johns Hopkins, California, Leland Stanford Jr., Western Reserve and Cornell now require three or more years of college work before admitting a student to their medical school. The number is apparently increasing. Quite a few medical teachers feel that enough chemistry cannot be taught during the two years of college work and that a third year of chemistry is needed, so that the student entering a medical school will have a real course in qualitative analysis in addition to the general inorganic and organic chemistry, which is all most students have studied at present. Other teachers call attention to the fact that the two-year premedical course contains only specified amounts of physics, biology, chemistry, English and French or German, and in consequence practically no time remains for any other college subjects. Complaint is often made by medical teachers that students when asked to do some collateral reading in French or German disclaim the ability to do so, despite the fact that when they sought admission to the medical school they presented college credits which meet the present entrance requirements.

The University of Pennsylvania requires only two years of premedical work, but our college faculty is recommending to our medical faculty that we increase our entrance requirements. Let me quote from a communication received recently from our college faculty:

> When the medical schools of high rank established the requirement of two years of college work, they did so, as we understand it, with the intention of securing thereby students who had taken at least two years of liberal education. The mental training and the increased breadth of interest which should come with two years of college work were, we are sure, the qualities that the leaders in medical education wished to secure for the future leaders of the science of medicine. The two-year course preparatory to medicine does not furnish the students who take it with this highly desirable quality. Owing to the increased requirements in science, a large number of the studies which are usually associated with liberal education have been crowded out of the student's course. Among the thirty units of work which would normally be taken by a student in two years, the following are now specifically required (by units are meant year units); Chemistry, 6 units; physics, 5 units; biology, 4 units; modern languages, 3 units; English, 6 units; a total of 24 units. And since the courses in the

college in the sciences are nearly all based on a three-unit arrangement, each student must practically take two courses of three units each in either botany or zoology, thus reducing his elective units to four.

If he has, in addition, to take mathematics as a prerequisite for physics, he has practically no election. Such a course is lacking in many important elements of a college education, such as history, philosophy, politics, economics, ancient languages, modern languages and the higher courses in English.

The best plan in our judgment would be to require a combination of seven years, with the understanding, of course, that the college should grant its undergraduate degree at the completion of the first year in the school of medicine.

Some colleges of arts and science, unaffiliated with medical schools, in recent years have arranged two-year premedical courses so planned that they meet the entrance requirements of all or most of the medical schools on a two-year basis, but there are other colleges which disapprove of the two-year premedical course and have not disarranged their curriculum to meet the needs of the few premedical students enrolled in their classes. At some of these colleges it is almost impossible for a student to get the required amount of the necessary subjects in less than three years.

LIMITATION OF SIZE OF CLASSES

Reference was made last year to the fact that sixteen medical schools had set a definite limit on the size of their classes and that certain other schools which had not as yet actually set a limit, nevertheless realized that there was a figure beyond which they could not go and teach effectively. Dr. Colwell estimated, however, that the sixty-eight schools in Class A could have easily handled 2,000 more students last year than were enrolled. This year, however, there are nearly 600 more students enrolled in the entering classes than there were last year, and I believe that for a time we may expect to see larger classes each year. There does not seem to be any danger in the immediate future that a properly prepared student will not be able to enter some Class A medical school, but it does seem quite certain that many a student will have to be content to go where he can, rather than to the school of his first choice or the one nearest his home.

A more equitable distribution of medical students than we have had in the past will mean better education in the long run. There is, in my opinion, a limit beyond which it is unwise for a school to go, no matter how large its faculty or how well equipped its laboratories or how rich its clinical faculties may be. We must not lose that invaluable personal contact of the teacher with the individual student. I am confident that there will for years to come be medical schools which will limit the size of their classes, and such schools will, in consequence, endeavor to select the best students, and will in their selection tend to take men with more than the

minimum entrance requirements. Students are beginning to realize this, and in order to increase their chances of getting into the medical school of their choice they are taking more than the required two years of premedical study. As a result, in certain schools now unable, on account of the limit placed on their enrolment, to admit all applicants, three or more years of college work is becoming a *de facto* although not as yet a *de jure* requirement.

SEVEN-YEAR COMBINED COURSE

In my opinion, the seven-year combined course is the ideal course, but unfortunately, although easy enough to arrange where college and medical school are combining in a university, it is, at present, difficult to find separate colleges willing to send their students at the end of their junior year to accredited medical schools and to grant these students the degree of bachelor of arts on the successful completion of the first year in medicine. The result is that university medical schools which require for admission the promise of a prospective degree on the completion of the first year of medicine are apt to admit students from their own college with only three years of work, while those students that come from other colleges have been forced usually to have taken four years.

This inequality can only be justified by supposing that four years in some small college is the equal to three years in the college department of a large university. Although this may be true in certain instances, it cannot be defended as a generalization. It is my hope that more colleges of arts and science will see the propriety of entering into such a scheme of mutual cooperation and that they will agree to send their students at the end of the junior year to such medical schools as they approve of, and then will confer the degree of bachelor of arts on learning from the medical school that the student has satisfactorily completed his first year of medicine. I believe if the colleges would do this that many students would stay in college for three years that now stay but two and the medical schools would get in consequence a greater number of better prepared students.

I hope the members of this Association will urge the colleges from which they now draw students to enter into such a plan of cooperation. I believe that until the colleges of arts and science quite generally adopt such a scheme of cooperation with the medical schools, the number of medical schools raising their entrance requirements above two years will remain rather limited, but nevertheless, I feel convinced that the number of students who will present for admission to medical schools more than two years of college work will steadily increase, and that eventually the requirement will become much more common than it is today.

This will come about despite the feeling so prevalent at present that the graduates in medicine are beginning the practice of their profession too late in life. The only relief from this situation seems to be the hope that boys and girls can enter college at an earlier age. We hear much talk of this desired improvement, but little happens, and in the meantime we keep on adding years of medical training. The intern year is really, on an average, a year and a half because many men have to wait a few months before their service begins, and the service at many hospitals is from a year and a half to two years' duration. We have been told that in order to fit oneself to be a specialist, about two years of graduate study are necessary, so that from the time a boy enters college until he emerges as a full-fledged specialist, from ten to eleven years have elapsed, and he is nearly 30 years of age.

I have tabulated the records made by over 300 students whom we have admitted to the medical school during the past ten years from our own college department, and I find that there is a distinct relationship between the amount of college work these students have had and the record they make in the medical school. A larger proportion of the men who enter with a degree make good records than do those who enter with three-year credits, while the three-year students make a better showing than do the two-year students.

Before closing this discussion, let me again read a short abstract from my father's address of 1877. He says:

> If we consider the present state of medical science, and not the vast advances which have been made during the past century in all of its departments; if we reflect upon the enormous extent of accurate information, of minute technical knowledge and of special practical training which is now required to fit a man to practice medicine scientifically, and to render to those sufferers who seek his help the full measure of the benefits which the healing art is now capable of bestowing, shall we be surprised at the careful and prolonged course of study that we find is imposed in all countries but our own upon the applicant for the degree in medicine? Surely, no one can fail to appreciate the enormous importance of having a sufficient supply of thoroughly trained and skilful physicians. When overtaken by serious accident or illness, all other means of relief fail, and the most wealthy, the most powerful, the most illustrious must, like the poor and unknown, cast their dependence upon the skill which, under God's guidance, the physician shall display in battling with the dread angel of death, whose wings hover near at hand. No other study presents difficulties and complexities so great as those which beset the study of medicine; in no other occupation in life are such varied culture of the mind and training of the senses demanded.

Let me, finally, read a statement made in 1765 by Dr. John Morgan, the first professor in the first medical school in the American colonies:

It is now more than fifteen years since I began the study of medicine in this city, which I have prosecuted ever since without interruption. During the first six years I served an apprenticeship with Dr. John Redman, who then did, and still continues to enjoy a most justly acquired reputation in this city for superior knowledge and extensive practice in physic. At the same time I had an opportunity of being acquainted with the practice of other eminent physicians in this place, particularly of all the physicians to the hospital, whose prescriptions I put up there above the space of one year. The term of my apprenticeship being expired, I devoted myself for four years to a military life, principally with a view to become more skilful in my profession; being engaged, the whole of that time, in a very extensive practice in the Army, among diseases of every kind. The last five years I have spent in Europe, under the most celebrated masters in every branch of medicine, and spared no labor or expense to store my mind with an extensive acquaintance in every science, that related any way to the duty of a physician; having in that time expended, in this pursuit, a sum of money, of which the very interest would prove no contemptible income. With what success this has been done others are to judge and not myself. Thus I have arrived at the middle age of life, in endeavoring to lay up treasures of useful knowledge, before I commence a setttled practice.

We see from this that even 156 years ago there were leaders in the profession who realized that higher medical education was to the true interest of the public and of the profession.

UNDERGRADUATE TEACHING OF MEDICINE AND THE MEDICAL SPECIALTIES

General Medicine

DRS. CHARLES P. EMERSON, CHAIRMAN, INDIANAPOLIS; GEORGE BLUMER, NEW HAVEN, CONN.; GEORGE DOCK, ST. LOUIS, AND WM. S. THAYER, BALTIMORE

INTRODUCTION

As introduction to the discussion which follows of the best use to make of the 640 hours alloted in the medical school curriculum to the department of general medicine, we desire to state the premises on which our recommendations are built. The percentages cited later, when discussing the practices in medical colleges, were obtained from a study of the latest catalogs of fifty-six of the sixty-two medical schools which offer a four-year course and which are listed as accredited in the October (1920) *Bulletin of the Federation of State Medical Boards* of the United States. We have, for purposes of comparison, studied also the catalogs of six Canadian medical schools, since these schools have not been under the influence of the same national bodies as have ours.

OBJECTS OF COURSE

1. The objects of the course in general medicine are: First, to train the many students who will practice general medicine; and, second, to lay for the few who plan to specialize in internal medicine a satisfactory foundation for their advanced work. These problems are not one and the same. Failure to emphasize this has made internal medicine, in the opinion of medical students, merely the starting point beyond which and into some operating specialty he must "advance" if he is to "get on" in his professional career, unmindful of the fact that internal medicine is the hardest specialty of all to master, using, as it does, as tools so many of the sciences, requiring, as it does, for its foundation so long and varied an experience. The training of the internist is the problem of the committee on post graduate instruction. It is, however, our duty so to plan the undergraduate curriculum that it will no longer stifle that which is the highest and best development of general medicine.

MEDICINE: ART OR SCIENCE

2. Medicine is certainly an art; some think that it is also a science. It is the art which seeks the restoration and preservation of health by nonoperative measures. According to definition, it is or is not a science, but in either case it does and must enlist

in its service all of the sciences. A good internist will be a better internist if he is well trained in the medical sciences, but the sum total of all the medical sciences does not make internal medicine, nor is a splendid scientific education of necessity a good preparation for a clinical career. Undoubtedly, it would have helped Phidias had he known the chemical composition of the stones, ivory and metals which he wrought; doubtless, Beethoven could have made good use of modern physics, etc., but one does not qualify in sculpture or in music by careers in chemistry and physics. The greatest clinician after Hippocrates was Sydenham, whose very name is synonomous with medicine at its best. Surely, his reputation is secure. And yet, the historian records that of the medical sciences of his day he was "indifferent or scornful." Indifferent or scornful of the work of Vesalius, Descartes, van Helmont, Sylvius, Willis, deGraff, Stenson, Boyle, Hooke, Harvey, Malpighi and Mayow! How could he have been! Of all periods of medical history his, to a man of clear vision, should have been the most interesting and exciting. It was then, following ages of mental darkness, that for the first time the sciences began to illume the medical world; and yet Sydenham viewed it all with "indifference or scorn." Today, a Sydenham library and the very numerous Sydenham societies are witness to the esteem in which his name is held. But do not misunderstand us. We do not for one moment defend Sydenham; we are even presumptious enough to criticize him. We believe that if he had taken some interest in the science of his day it would have made him an even better internist. Please, also, do not jump to any conclusion nor misunderstand our position concerning the preclinical subjects. It is they, the teachers of these sciences, who pulled American medical education from the quagmire of the latter half of the nineteenth century. They are martyrs who have given their all for but little honor and less recompense. To them we clinical professors of today owe much of the dignity which enshrines our professional chairs. And yet we do urge that clinical medicine is a sphere apart from theirs, and while we praise them for insisting that the clinical branches come up to their standard of quality, we urge them not to dictate too definitely just what it is that shall have that quality. The medical sciences are not the "foundation" or "underlying" sciences of clinical medicine, as they are so often called, but, on the contrary, historically and logically, medicine is the foster mother of them all. And yet, the clinican owes it to himself and to his patients that he be well trained in them. He should be able to use as tool any scientific method which may prove useful. But his excellence as a clinician will not depend on this, for he must, first of all, have that which Sydenham had, only minus his indifference and his scorn.

The clinician is the one whose talent is internal medicine, i.e., the art of clinical inspection and observation employed in the light of experience. The sciences give him some of his very best tools, but they are only his tools and not his art.

DUTY OF DEPARTMENT OF GENERAL MEDICINE

3. The duty of the department of general medicine so far as teaching is concerned is to impart to the students the knowledge of today; to train them so that they will always be critically receptive to new truth; and, what is very important, to train them so that they can and will add to the fund of medical knowledge. But each department of a medical school has still another duty, and in this the medical school differs from the other branches of a university; the medical faculty must, in some degree at least, also be responsible for the student's technic. In this particular the training of a medical student is somewhat similar to that of a musical student. The music teacher must be sure that the pupil has the "gift." This granted, he will instruct him much about music, but still more, he will train him to perform successfully. We all know the man next door who "knows how" to play the cornet, just as we know the medical graduate who knows all about medicine, but whose actual performance is no better.

A medical student may know how to make a physical diagnosis; he may be able to describe and recite the significance of the various physical signs; but can he so see, feel, percuss and listen that he can elicit these same physical signs? In others words, medical knowledge is not the best part of medical education; we must first be sure a student has the gift and then aid him to develop it.

THE TIME ALLOTED

4. Six hundred and forty hours is entirely too brief a time in which successfully to teach general medicine. We, therefore, must seek relief both below in the grade schools, high schools and colleges, and above in the postgraduate schools. We should as a national body interest ourselves in the common school, the high school and the college, and it is to us who use their products that these teachers must listen. It makes little difference how long a student continues his medical course, for all this time he is developing, is "growing into" his profession, and up to a certain point, the longer he continues his training the higher is the level at which he later can practice. But it does make a great difference how young he is when he begins. Especially is this true of general medicine which requires a working knowledge of more different sciences than does any other one department of the medical school. We should urge our confréres of the first two years that they unite with the college men in encouraging the development of high

schools for whose work in the elementary sciences some credit can be given; or, if it be insisted that the high school student is not quite old enough for these subjects, that in the high schools they give more intensive training in the languages and literature for which he is old enough, and so allow more time in his premedical years for the intensive study of the elementary sciences. And we would beg the teachers of the postgraduate schools that during that fifth medical year they assume the entire responsibility for some of the specialties which now overload the undergraduate years.

RESEARCH

5. The spirit of research should permeate the entire medical department. A clinical teacher will in large measure fail if he is not engaged in some medical research; and the senior students also should be encouraged to undertake limited problems. We certainly approve of the requirement of a thesis for graduation. The reason for this is that all medical practice, and this is more true of general practice than of the specialties, is, in fact, research. Each patient is likely to present one or more new individual problems. As a rule, these are disregarded and a deadly routine is followed. Those students only who have the spirit and training of research workers can follow in the footsteps of Hippocrates and Sydenham, that is, can helpfully treat their individual patients.

THE STANDARDIZED COURSE

6. Our committee agrees that the standardized medical course, so many calendar years, so many months a year, so many days a week, so many hours a day and so many hours for each subject, has worked admirably in reforming medical education in America. But we also agree in praying for the day when this shall pass away and schools be given more liberty to develop their personality as schools as well as the personality of their better medical students. The dawn of this day must already be here, for it is quite as impossible to figure hours of instruction from the catalogs of some of our medical schools as it is from those of some of our Canadian neighbors, and the University of Toronto is developing a medical course which is fascinating because of its individuality. Some of our committee would follow the continental plan and leave the student fairly free in his choice of subjects and quite free as to the date of his individual commencement. That is, they would allow him to cover a more liberally outlined ground at his own pace, and, when he has covered it, to present himself for graduation. Partial applications of this plan are already in force in several of our schools. Some, e.g., Johns Hopkins, Rush et al., offer throughout the clinical years a fairly liberal list of electives; others, including the University of California, Harvard, Wash-

ington University et al., leave the whole of the last trimester, semester, or even the whole senior year open for elective work. According to a plan followed in several schools, the better students are encouraged to take five, six or more years to cover the four-year course in order that they may devote to research work and to teaching the time thus made free. These students should, however, be required to carry a total load (that of regular class work plus the special work) which is at least equal to that of their classmates, for if this plan be applied generally, it would probably work out as it did in Germany and enable students who cannot hold up under the minimum load prescribed in the American schools finally to get their degree by carrying a few subjects at a time. So far as we know, no American school allows individual commencements, although many graduate students on two days each year, and the University of Minnesota on four.

WEEDING OUT THE UNFIT

7. Some clinical teachers believe that the weeding out of unfit students should come during the premedical and preclinical years. The practical result of this custom is that those who survive these winnowings are practically guaranteed their diplomas. We would protest. If a splendid record in the college and preclinical years guarantees a man passing grades in the clinical subjects, then the clinical teachers are traitors to their calling. Students may lead their classes in the premedical sciences and be "unfits" in the clinical branches. While this unfitness may be intellectual in but few cases, and yet there are these few, those who are emotionally and morally unfit are more numerous than the records of faculty action would indicate. Teachers of medicine should consider qualities in students which need not be so stressed in the scientific departments. A splendid student of science may not have the gift of internal medicine and should not attempt this career. Again, the moral responsibility of the practitioner for the welfare of his patients and for the community in which he practices should not be entrusted to some who, although they lead their classes, are too selfish or immoral. How many professors of medicine refuse such students their grades?

PRECLINICAL TEACHING

8. The clinical teacher of today should be allowed the time to review with his students each medical science from the angle of his own subject. Not only will the best of students each year forget a certain (not small) amount of each science unless it is reviewed, but it is also true that a real anatomist and a real chemist will not teach anatomy, chemistry, etc., in a manner quite satisfactory to the internist or the surgeon; and the more excellent

these courses are, as judged by university standards, the more eminent specialists these teachers are, the more unsatisfactory at first to clinical teachers will the results be. The difference is not in the anatomic, chemical, etc., facts, but in the angle from which one views them, in the interest they arouse and in the emphasis they demand when applied in the various clinical subjects. To the student this makes a great difference, just as a stretch of country viewed from two different hills will look quite different. The immediate results of the preclinical teaching of years ago were much more satisfactory to the clinical men of that day for practicing physicians taught these sciences and just as much of them as seemed "practical" and useful. Even today, in the catalogs of some Canadian schools (e. g., McGill), the elementary pure sciences are still listed as "medical chemistry," "medical physics," etc. But now we plan for the future, realizing that the "useful" anatomy of today may not be sufficient for tomorrow, and that the student's training must be directed by an idealism which, scorning simple utilitarianism, teaches him the truth and creates in him the desire for more regardless of whether he sees any use for it or not. As a result, he will more gladly and efficiently meet the problems of the future toward which his training has not consciously been directed. Let the professors of anatomy, physiology and biochemistry, etc., first agree with us what the general content of their courses should be and then may they teach their subjects, each from his own angle, as final, as unrelated to medicine. The better they do this, the better trained will the students be whom we teach, even though they may seem less well prepared for our courses. The professor of orthopedic surgery may rage when a student who made a good record in anatomy, but who now views the question from the angle of a child with a club foot, stumbles in naming the tarsal bones. But that same professor confronted with an unusual case will probably pull down his anatomy and "refresh his mind." I only wonder that the students made as good an appearance as they do. That the clinical departments are now assuming more of the responsibility for the applications of the preclinical subjects may be evidenced by the distance which they have "eaten back" into the second year, in some schools consuming a third and even more of this year which formerly was entirely in the possession of, and overcrowded by, the preclinical subjects. The criticism was made last year that the preclinical sciences "did not correlate well with the clinical branches." How much should they "correlate," "articulate," etc., and who should determine the "articulation?" In the interests of good pedagogy, give the teachers of the medical sciences the independence of their subjects. It is we who should make the application, not they. It must be understood, however, that the time allowed these preclinical

courses must be reduced by the amount spent in making "correlations," and I should judge, from the study of the curriculum of the first two years, that this already has been done.

Courses Suggested

SECOND YEAR

INTRODUCTION

One of the interesting studies in medical pedagogy is the content of the second year of the course. At first, this was merely a repetition of the first and was the final year; then it became the middle of three and was largely or wholly clinical; then it was the second of four and largely clinical; then in some schools it became wholly scientific and the students of that year were even warned that it would not meet with favor if they were even seen visiting the clinical departments. At present sixteen, or 24 per cent., of the schools still offer such a year. Now again, in most schools it is about one-third clinical. At present forty of the fifty-six (71 per cent.) medical schools studied offer some physical diagnosis during this year. Of these forty, five state that the physical signs of normal subjects only are demonstrated; one school (University of Nebraska) presents such a course under the department of physiology, while at least three combine this course with one of regional or applied anatomy. Clinical laboratory methods are studied during the second year in eight (14 per cent.) of these fifty-six schools; elementary medicine (didactic, or the recitation of assigned lessons) in eighteen (32 per cent.), while in eight (14 per cent.) the second-year students attend clinical demonstration in amphitheater, dispensary or ward. A few schools (e.g., Harvard) offer the second-year students a course in therapeutics and prescription writing. Some of the schools which now offer during this year the most clinical work of all are the schools which a few years ago offered little or even none (e.g., Johns Hopkins). Other schools which now give these courses in the second year probably always have, that is, they never passed through the "all-science second-year" stage.

We cannot but feel that some clinical work should be taught during this year, if for nothing else than to train the "clinical instincts" and mental habits of the student. But a better reason is, to give more meaning to the sciences he is studying. We even suggest the prophesy that at no far distant date it will be the "style" to teach clinical medicine in all four years and to continue some of the present first and second-year courses through to the end (as in Toronto).

1. *Physical Diagnosis.*—The course in physical diagnosis during the second semester of the second medical year might well

consist of one, or better two, demonstrations each week to the class as a whole, and one practice period of two hours each week for each student, who also shall be required to practice outside of class hours. The teacher may use the demonstration periods to describe and to illustrate to the whole class the methods of physical examination and the various instruments used. Special attention should be paid at first to the normal subjects. When pathologic cases are presented, the clinical history and symptoms of the patients should also be considered, thus introducing the students to clinical medicine. Each symptom, each physical sign, should be discussed in terms of the patient. It is time that we clinical teachers talked, not less about "diseases," "tests" and "plates," but much more about sick persons; for the tragedy of the medical course of today is that preclinical men are trying to teach medicine and teachers of medicine are practicing preclinical subjects. Neither is developing his own subject to the best of his ability. Let us teach medicine in terms of humanity and not of personified pathology, chemistry and biology.

For the practice periods the class is divided into groups of not more than six students, each under a demonstrator. The primary object of this course is to develop the skill of the student rather than to impart information. The head of this department will need to train his demonstrators carefully, since the temptation is strong for young men to turn such practice periods into clinics and also for each to teach little individual methods of diagnosis different from those of the other demonstrators.

2. *Surface anatomy of the living and regional anatomy* in so far as it is important in medical diagnosis, may be taught separately or combined with the course in physical diagnosis. It would better not be combined with the similar course taught in the surgical curriculum since the compromises made necessary by such a combination would, as a rule, be against the medical interests. It is desirable to make this a serious course for the second and third years. It should start with osteology and be a real review of anatomy from the medical angle. It should be taught by a medical man and illustrated by patients. If the individual student studies this only as suggested by his hard work, then the various groups of students will fare very unequally.

3. *Recitations in clinical medicine* from a textbook might well begin in the second year after the course in general pathology is at least half completed and should be continued during the first half of the third year. The purpose of these recitations is to allow the consideration of diseases rarely seen in the wards and to emphasize the cardinal features of each common disease. We would note the advantage of conducting these recitations with small groups, e. g., of thirty (Rush) and not with entire classes at once, since each student must then take a more active interest

in each exercise. We have considerable sympathy with the opinion of Prof. Friederich von Mueller, who recommended to his students medical textbooks small enough to be carried in the coat pocket, since they would actually learn more by mastering the contents of this small book than from the partial reading of a larger one. Our teachers too often emphasize rare conditions and the new, interesting and often doubtful aspects of common diseases, forgetting that to the student all is new, and that from a discussion involving facts and interesting theories, the student is more apt to remember the latter. Proper projection apparatus can be very useful in this course.

4. *Clinical Lectures.*—There are some good arguments in favor of a few clinical lectures during the second year in order that the student may get the clinical viewpoint early; but in a crowded curriculum, this is hardly worth the time it would consume, especially since the same object may be attained more profitably by developing the clinical side of the demonstrations in physical diagnosis and surface anatomy.

THIRD YEAR

5. *Clinical Diagnosis.*—The course in clinical diagnosis given during the third year might well occupy thirty-six weeks, two periods of laboratory medical diagnosis, of at least two hours each, and one hour for recitation each week. Not more than one third of each laboratory period would be spent in the formal demonstration. During this course, the student should examine as many different specimens as possible of sputum, blood, urine, gastric contents, stools, spinal fluids and various exudates. The examination of each specimen should be preceded by a brief statement of the case concerned, and in some cases by the demonstration of the patient himself.

An important element in the success of this course is that none of the chemical, biologic, serologic or bacteriologic methods should be new to the student. He should already have become familiar with these in the premedical and preclinical courses in chemistry, physics, biochemistry, physiology, bacteriology and serology. This is not a course in, nor a review of, these subjects. His attention now should be focused on the application of each test to the problem which the patients themselves present, and on his ability to use it accurately enough to get trustworthy results. For the most of the exercises in clinical microscopy and chemistry the entire class can work with individual specimens, smears, etc., all from the same patient and taken at the same time. To determine the accuracy of their blood work we have required each student to examine one blood, usually his own or that of his partner, on consecutive days at the same hour of the day until two consecutive red cell counts differ by not more than 4 per cent., that of the

leukocytes by no more than 10 per cent., and hemoglobin estimations by not more than 5 per cent. Each student should be required to standardize his instruments against those accepted as standard, and should also be required to use several different types of instruments in order that he may gain some judgment as to the relative value of each. Each student should practice sputum and blood staining until his results are pronounced satisfactory. For the gastric contents, blood colorimetric work, complement fixation tests and spinal fluid examinations (colloidal gold, etc.), the students can work in groups of not more than six under each demonstrator. The whole class, working in pairs, should simultaneously examine quantitatively the same specimens of urine, artificial gastric contents, etc., and make simultaneous differential blood counts. The tabulation of all their results with a single specimen is one of the most instructive of lessons.

All laboratory examinations should, so far as possible, be discussed in connection with the history and physical examination of the patients. The present sharp separation of laboratory and ward should be condemned strongly. It may be explained by the fact that the busy clinicians of a generation ago were untrained in laboratory work and, therefore, depended on young assistants, but these assistants later, when clinicians, evidently inherited the idea that laboratory examination is work for an assistant and that their dignity requires them to consider only a written report. We should teach otherwise. No matter how successful a man may be, he has no moral right to entrust his laboratory diagnosis entirely to others. He need do very little of it himself; he must have laboratory assistants to do the mechanical work, and he needs the cooperation of specialist in the medical sciences, but the conscientious man must regard the laboratory examinations as part of the general personal examination and must hold himself personally responsible for it all, even though he himself does but little of it. The one who takes the history of the patient and makes the physical examination is the only one who can interpret a laboratory finding correctly. Exactly identical reports may have quite different meanings in different cases. He alone who knows the patient can interpret and evaluate a specimen under the microscope or in a test tube, and he will often see there that for the record of which no dotted line is provided on a laboratory blank, but which may suggest further questions for the history and further physical examinations. The rather widespread and blind confidence which the past generation has placed in impersonal laboratory reports has brought internal medicine into a certain degree of disrepute. The diagnosis of pulmonary tuberculosis now is too often made by roentgenologists or by laboratory workers who examine the sputum only, while the diagnosis of syphilis is too often made in a laboratory from a blood test.

6. *Medical recitations,* one hour a week throughout the third year, are a continuation of Course 3.

CLINICAL TEACHING

In order that our discussion may be clearer, we first would define arbitrarily certain terms often used in catalogs. In the following section by *"clinical teaching in ward and dispensary"* or ward "rounds," we refer to that form of teaching at the bedside or in the dispensary examining room which requires the student to whom the case has been assigned to demonstrate the patient to the clinical teacher; that is, the clinical group go to the patient and there the student presents the actual work which has been done.

By *clinical conference* we mean a class exercise in a lecture room or amphitheater, attended by a considerable body of the students, presided over by the teacher during which the student demonstrates the patient and the work already completed. The most of clinical teaching should be of the character described under these two headings.

By *clinical lecture* is meant a demonstration and discussion of the patient by the teacher in lecture hall or amphitheater to a group of students, none of whom has had an active part in the study or care of the patient. Sometimes a student is called forward to help in the examinations, but one who has not seen the patient before. Such lectures enable a teacher to present private cases or unusual cases invited to the clinic. We would recommend, however, that an assistant aid in the demonstration rather than a student who has not seen the case before, since the so-called "socratic method," i. e., developing a subject with a "green" student, observes merely the form of good teaching and certainly wastes time.

By "ward visit," as the term often is used, we understand a visit to the patients in the wards by a teacher and student group none of whom has had an active part in the study of the cases. Some use this term as synonymous of "ward rounds." This was historically an important intermediate stage in teaching, a great advance over the former lecture system. Teachers won a great victory in some hospitals when at last they actually "could take the students into the wards," but the victory was over the hospital administration. Such teaching may, under certain conditions, even now have some value, but it certainly is not to be recommended if the group numbers more than six, since there can be little real demonstration of a patient to all of the group, and the time would be spent more profitably demonstrating him to the entire class in a clinical lecture. The value of real ward teaching lies in the fact that the entire group of students attending the "rounds" actually

work in that ward; that all of them know more or less about the individual patients and are at liberty to discuss and examine them at their leisure.

It would appear from the study of the catalogs at our disposal that, disregarding for the moment the practice groups in physical diagnosis, disregarding also the one or two schools in which the second-year students make a few ward visits but not as clinical clerks, and disregarding those two or three schools in which ward and dispensary work both begin during the senior year, that the custom in our schools is that clinical clerk work in medicine begins in the medical dispensary and ends in the hospital wards. This may in the past have been necessary, and it certainly will be difficult to change it as long as staff promotion is toward the wards, yet from the point of view of pedagogy we believe it an error, and hold that all students in clinical medicine should receive their clinical instruction in the wards first and later in the medical dispensary. The reason for this is that in the ward the student has much better opportunity to take complete histories and to follow complete examinations, while the teachers are in a much more favorable position to check up the completeness and accuracy of the student's work. He may, therefore, acquire at the very first good clinical habits.

In the dispensary, on the other hand, the diseases are more often less advanced and the diagnosis, therefore, more difficult, and there is far less opportunity for the student to follow the case, or the teacher the student, and the result is likely to be superficial work, the junior student limiting his attention, as does the average dispensary teacher, to the conspicuous features which, as a rule, are treated symptomatically. That the work in the dispensary may be comparable to that of the medical ward would require in the former a fine organization of the best trained men of that school, men who can work very rapidly and who need not take all the steps in the processes of making a diagnosis. Of course, these conditions may sometimes be possible, and then there would be good arguments in favor of a dispensary service before that in the ward. This was Dr. Osler's view, and one now followed by Dr. George Dock, who previously preferred the ward service first. Dr. Henry A. Christian, on the other hand, much prefers the dispensary last, on several grounds, one of which is that it gives the senior student a little training in medical work which resembles in many ways general practice. But dispensaries, as they are, have, we are confident, spoiled many a good student. Those of us who have had to teach the same students in the wards of two different hospitals know how hard it is to "bring up into line" those who began their medical work in the one with the poorer organization. Much the same is true if the student begins in the average dispensary.

7. *Ward Work.*—The student as clinical clerk should be assigned to one medical service, be the assistant of but one intern at a time and responsible to him for definite ward duties. He is there to work; he is there to be used, not amused. He should have his own desk space, his own locker and his individual apparatus. The daily ward "rounds" should not last over ninety minutes, and in addition to this he should have free at least two hours a day in which to do his ward work. The patients, when they are admitted, are at once assigned to the students in rotation. Each student is responsible for his patients from the day of admission until they leave (granting this is within his term of service in that ward). He takes the history, records the physical and all other examinations made, and makes notes as to daily progress. He makes his own physical examinations of which he keeps a separate record, which is the record under discussion at ward "rounds." He assists at all special examinations, takes notes of these and should insist that the specialists demonstrate to him their findings. He accompanies his patient to the roentgen-ray room, to the electrocardiographic department, etc. He makes, under supervision, the routine blood, urine, etc., examinations, and is responsible that these are recorded properly. He follows his patient's bloods, spinal fluid, etc., to the chemical, bacteriologic, serologic, etc., laboratories, and whenever possible presents at a future ward "rounds," not a written report of these examinations but the specimens themselves, e. g., the rack of tubes of the Wassermann or colloidal gold "set up," the smears, the cultures, etc. At ward "rounds" it is he who demonstrates the patient to the visiting physician, and as many as possible of the actual laboratory specimens (even the tube with the albumin or sugar test, the blood smear, etc.). The clinical teacher listens, suggests, corrects, encourages, explains, questions, expresses doubts and demands that he be convinced; but he does not lecture, and he demonstrates that only which the student cannot demonstrate. When the clinical group reaches this same patient on subsequent "rounds," the student should report his progress to date and also present some classic and recent literature bearing on the case. The student should have at his disposal all the necessary apparatus (home-made as far as possible, in order that its principle and accuracy may be understood by those using it), and a small but handy library of reference books. On the ward itself should be a display box for the study of the roentgenograms of the patient then being examined.

8. *Clinical Conference.*—We are firmly convinced of the value of at least one clinical medical conference a week attended by the entire class, a conference at which the teacher is in large degree the presiding officer and critic. Here the students will demon-

strate their most instructive cases. In this way the clinical observations of the class will not be as fragmentary as is their ward experience.

9. *Dispensary service* will come in the third or fourth years, preferably the fourth; each student attends four days a week. In the general medical dispensary (including the departments for tuberculosis, gastro-intestinal and cardiovascular diseases, etc.), the student will, so far as is possible, follow the methods of the wards. Some of the histories he takes must of necessity be briefer and the examination less complete, but he will do the best he can under the circumstances. It is to the dispensary that the best teachers should be assigned, and promotion should be from the wards to the dispensary, not the reverse. The interesting dispensary cases should be presented to the entire class in a weekly conference.

Schools with large faculties and which control abundant teaching material are able to offer the senior and even the junior student his choice of numerous special clinical courses in various branches of general medicine (Rush). In a much larger number of schools these special departments are recognized in the dispensaries if not in the wards. Were our dispensaries organized for more serious work this would be possible in practically all schools. There is great value in presenting these groups of patients as clinical units, the internist integrating for the student the history of that special subject, the clinical laboratory methods, the apparatus for physical examinations and all the various therapies of value for some one group of cases.

10. *Special Topics.*—Some schools offer many short courses in special medical topics; life insurance, industrial medicine, military medicine, etc. (Stanford, e. g., publishes thirty-eight different courses under Genera Medicine).

11. We would call attention to some very important and interesting courses offered (e. g., at Stanford) in the *specialties as related to general medicine* (e. g., "cutaneous medicine"), for in certain examinations the internist must be better trained even than the specialist, since some of the physical signs found in the skin, eyes, nose and pelvis may have far more significance for him than for the specialist himself to whom they are not evidence of local diseases, but merely shadows thrown here, as it were, by distant diseased organs.

12. Several schools offer elective courses in *experimental medicine* open only to the best students of the class.

13. *Environment Medicine.*—We should recommend that a special social service worker be appointed a regular member of the medical staff and make rounds as medical assistant with the clinical group. Not many years ago our clinics accepted the diagnosis of

the patients and treated them accordingly. Now we all make our own diagnosis. Today we are apt to accept the patient's statements of his past personal and environmental history. Now, while we do not doubt his honesty, we desire more accurate information than he can give. This worker can assist in the diagnosis by gathering, in person or through the local and state workers, data concerning the family, and information of a local, family, social, industrial, etc., nature, and can assist in therapy by organizing for the later care, work, etc., of the patient when he returns home. The chief value to the students of the presence of such a worker is the emphasis her work will place on the importance of environment (including work, home, etc.), in the etiology and therapy of disease.

14. *Literature.*—The students should be required to report on the important literature of their interesting ward cases. It is very important also that during the third or fourth years the students be trained in the use of current literature. To recommend that they read is not enough. Medicine may well be called a living subject which breathes in laboratories, wards and current journals, and which later dies and is embalmed in a textbook. We must teach our students to live with their subject. The stream of medical thought flows in a rapid current in which the student will either swim or drown. We must teach him to swim. We would recommend that the professor meet with the medical group one hour a week in a Journal Seminar and that the drill there be rigorous.

15. *Clinical-Pathologic Conference.*—Of the value of a formal clinical-pathologic conference at which the clinician first describes the course of the disease in a certain case and gives the reason for his diagnosis, and then the pathologist demonstrates the necropsy findings, many have no doubt. These, however, are not without danger, since the success of such a conference depends, in large part, on the implied ignorance of both clinician and pathologist of that which the other is going to say. Every necropsy should be attended, if possible, by the clinician who had the case and the clinical group who saw the patient in the ward. It is at the necropsy table that the organs are best demonstrated. If the above-mentioned conferences tend to diminish the interest of the clinician and his clinical group in the necropsy itself, then they are not to be recommended. On the other hand, all the organs of recent necropsies should be demonstrated by the clinical teacher to the entire third or fourth-year class at the weekly clinical conference; this is particularly important in the case of patients who previously had been presented to the group.

16. *History of Medicine.*—We would urge that there be given during the third or fourth year a well-planned course in the history of medicine of at least one hour a week for thirty-six weeks. Such courses have often been recommended on the ground that they

are "broadening," "cultural," etc., but they can have a far greater value than that. This course might well be labeled "a course in the history of our medical prejudices," since our emotions are millstones which we unconsciously hang around the neck of all our medical pupils. We little realize how many of our beliefs are ours by inheritance rather than the results of accurate observation and research on the part of ourselves or of any of our predecessors. Indeed, some of our most honored and conventional practices may date back to a quarrel of centuries ago between persons whose very names have been lost. Such a course should be long enough to allow a discussion not only of men and periods, but of the progress of our knowledge of certain diseases. In the catalogs of fifty-six schools we found a course in history mentioned in four only, and in two of these the time was too brief (eleven or sixteen hours) to allow any valuable instruction in this truly fundamental subject.

17. *Therapy.*—One of the strongest arguments in favor of the study of the history of medicine is our present disregard of the various forms of physical therapy and the resulting strength of the many popular schools of irregular practitioners, the excellence of whose therapy partly offsets the handicap of their ignorance. The conventional therapy we teach today is the result of the influence of the Arabians, to whom we owe much of our knowledge of chemistry, combined with the social standards of the Middle Ages which made it impossible for a gentleman to use his hands in anything resembling physical work.

Our students should be taught to respect the sacredness of the implied contract which each physician enters into with his patient. The latter desires relief and employs a physician to give him that relief. What he needs he does not know, but he believes that the doctor does know and fully believes that the doctor will use all that will help him. Our physicians, because of prejudices arising from social conditions of the Middle Ages and which have been quite nonexistent for over 100 years, have withheld from him that which often would have helped him much or even most and have administered a line of treatment the arguments for which at the beginning of the nineteenth century ceased to be cogent. We have added roentgen ray and radium to our therapy, but I fully believe that had these been discovered fifty years earlier, they would have shared the intense prejudice which then obtained against other physical measures, massage, hydrotherapy, etc., and would now be the stock-in-hand of a hostile irregular school.

One of the strongest arguments in favor of a department of environmental medicine in our schools is the emphasis it places on the many and varied elements necessary in the plan to get a man well. It has been the custom of the medical department to pre-

scribe drugs, to insist that they be taken as directed and then in an off-hand way, but without special emphasis, to mention other measures. If we are to hold the respect of the public at large we should teach our students to prescribe whatever therapy is needed and then insist that the patient gets it. If medicine is needed, then medicine it should be; if operation, then an operation; if radiotherapy, then that; if passive movements, massage, etc., than these. If to meet the conditions he presents the patient needs prayer, then the medical student should be trained to be just as efficient in obtaining for him a man who can pray well as he is to choose a surgeon who can operate well. To keep his part of this implied contract our student must be ready and willing to do whatever the patient needs. For this reason our teaching hospitals should be well equipped with all necessary apparatus for physical therapy and have an active department of environmental medicine so that the therapeutic problem can be taught in its entirety.

18. *Hygiene and Preventive Medicine.*—While hygiene is so closely related to bacteriology that it may, in part, at least, be taught as a second-year subject, preventive medicine, on the other hand, presupposes a fairly complete course of medicine and logically should be taught toward the end of the senior year. We fail to know any reason which justifies the presence of this subject earlier in the curriculum. Also, we fail to know any honest argument which can justify the few hours assigned these courses which alone of the entire curriculum might train the physician to be directly useful to the community at large in which he practices. We would urge a course of at least ninety hours during the senior year, during which the principles of hygiene, sanitation, ventilation, school inspection, water supply, food inspection, etc., can be taught. If we do not do this, then the sanitary engineer will continue to rob the doctor of the prestige he formerly enjoyed as the one who best could advise in matters pertaining to public health.

19. *Life Insurance.*—The lectures on life insurance, if enlarged, could be made one of the most valuable courses in medicine. Until now our only opportunity to check up our diagnoses and prognoses was the necropsy table. The actuaries of life insurance companies, however, are steadily collecting valuable statistics which can define accurately to us the significance of clinical signs and symptoms and which in time should place prognosis on a surer foundation.

UNDERGRADUATE TEACHING OF DERMATOLOGY AND SYPHILOLOGY

J. A. FORDYCE, CHAIRMAN, NEW YORK; G. W. WENDE, BUFFALO; M. F. ENGMAN, ST. LOUIS; C. J. WHITE, BOSTON; U. J. WILE, ANN ARBOR, MICH.

A. 1. *Dermatology and syphilology should be taught in one department because*:

(*a*) The early signs and symptoms of syphilis—the time when the disease may be aborted by proper treatment—are strictly cutaneous.

(*b*) The protean manifestations of syphilis closely mimic benign and less harmful skin diseases and require for recognition the technical training possessed only by a skilled dermatologist.

(*c*) To teach properly the early diagnosis of syphilis, the instructor must be skilled in the recognition of cutaneous diseases.

2. The department of dermatology and syphilology should be correlated closely with other departments in the institution. This relationship is extremely important because of the occurrence of cutaneous manifestations, and especially those of syphilis, in the fields covered by other teaching departments.

3. Dermatology and syphilology should have an important place in the curriculum. The social and economic value of the prompt recognition by the general practitioner, and, particularly, by the public health physician, of infectious skin conditions, especially of early syphilis, is evident. The majority of communicable diseases have cutaneous signs among their early manifestations.

4. The personnel of the teaching staff should comprise a full professor sitting in the faculty as chief of the department of dermatology and syphilology. He should be a skilled dermatologist and well trained in internal medicine and neurology. The first assistant also should be a dermatologist, while all the instructors should be men well equipped in dermatology. The average student should be so trained that he can grasp the important relations of cutaneous diseases and syphilis to other diseases.

5. Dermatology and syphilology should be presented didactically, clinically and in the laboratory. The didactic work should be given to the whole class; the clinical work to small groups in the dispensary and at the bedside; the laboratory work should include the microscopic study of the flora and fauna of skin diseases and the practical use of the dark field for the examination for *Treponema pallidum*. Chemical, serologic and cultural methods should be taught in the departments of bacteriology and pathology.

6. The course in dermatology and syphilology requires a minimum of from eighty-five to 100 hours. This claim is based on the assumption that (*a*) the cooperation of other departments in properly presenting the clinical side of dermatology and syphilology is secured, and (*b*) that the departments of bacteriology, pathology, chemistry, etc., teach the laboratory methods of use in diagnosing skin diseases and syphilis, including the serology of syphilis.

7. Adequate equipment should be provided to teach the special treatment of skin diseases and syphilis. This includes roentgen ray and other light apparatus and radium; the equipment for the administration of arsphenamin, mercury, lumbar punctures and intraspinal therapy.

8. In conjunction with a department of preventive medicine, the department of dermatology and syphilology should give the medical student careful training in the social service methods of following up those afflicted with the great group of communicable skin diseases and most particularly with syphilis.

B. *The course might be divided as follows*:

A preliminary course of fifteen lectures in the third year:

1. To review the physiology and histology of the skin and to study the method of vesicle formation, edema, acute and chronic inflammatory processes as they occur in the skin and the mode of formation of papules and elementary skin lesions.

2. To study the pathology of the more important dermatoses and of syphilis.

3. To study cutaneous reactions, sensitization to light and its various reactions to chemicals of all kinds, including pollens, dyes, professional dermatoses, etc.

4. To cover the historical outline and parasitology of and the immunologic processes in syphilis.

In the fourth year:

1. Thirty or thirty-five clinical lectures on dermatology.

2. Twenty or twenty-five clinical lectures on syphilology.

3. Twenty or twenty-five hours of section teaching.

The purpose of each course is as follows:

1. To instruct the students in the proper method of examining patients with skin diseases, and to give them a conception of the symptomatology and treatment of such diseases, special emphasis being placed on the commoner dermatoses. The relation to general infections, focal infections, and the early invasive significance of lesions that might manifest themselves on the skin in eruptive fevers should also be emphasized.

2. To give students the proper conception of syphilis as a constitutional infectious disease, its general symptomatology and treatment, special emphasis being placed on its cutaneous manifestations and on the fact that the disease may affect all organs of the body.

3. To illustrate in detail the features brought out in the clinical lectures.

The method of instruction should be designed to train the student in observation and to teach him to describe accurately what he sees; in other words, to teach him to think dermatologically and not to confuse him with dermatologic terms. All practical points should be illustrated by means of clinical material, and where this is not feasible, they should be demonstrated by lantern slides, moulages, charts, photographs and colored drawings.

C. *In sections the students should be given the opportunity* to observe the minutiae of dermatology and syphilology, by the demonstration by means of clinical material of elementary lesions, eruption characteristics and disease entities. Dark field examinations and the method of preparing hairs and scales for microscopic examination for ringworm of the scalp and body should likewise be taught. The administration to patients of mercury and arsphenamin should be taught, as well as the technic of lumbar puncture and intraspinal therapy, and instruction given in roentgen-ray therapy and intraspinal therapy. Instruction in roentgen-ray therapy and the various mechanical methods of treatment of cutaneous diseases should also be demonstrated.

The department of dermatology and syphilis should have at its disposal a certain number of hospital beds so that the student may become familiar with types of dermatoses and syphilitic lesions not seen in an ambulatory clinic.

Where practicable he should also be made familiar with social service methods.

The following plan, giving a more detailed schedule, is applicable to clinics in large cities where material can be selected. In smaller cities some modification may be necessary.

D. DERMATOLOGY

1. Classification; elementary lesions; eruption characteristics.

2. Diseases due to pyogenic and septic organisms, including boils, carbuncles, erysipelas, impetigo, etc.

3. Diseases due to vegetable fungi and animal parasites.

4. The erythema group, including the urticarias and skin sensitization to foreign proteins. These lectures should show the relationship between diseases of the skin and internal medicine in

its broadest sense, discussing causes of the erythema group and its relationship to various constitutional and infectious diseases.

5. Drug eruptions.

6. Papulosquamous and papulovesicular diseases, including eczema, psoriasis, the lichen group, etc.

7. Vesicular and bullous diseases, including pemphigus, dermatitis herpetiformis and allied conditions.

8. The tuberculosis group, including the tuberculosis lesions and lupus erythematosus.

9. Leprosy.

10. Mycosis fungoides, together with the skin conditions occurring in leukemia, in Hodgkin's disease and related affections.

11. Pre-epitheliomatous conditions of the skin.

12. Epithelioma of the skin and adjacent mucous membranes.

13. The sarcoma group of skin diseases.

14. Benign new growths and miscellaneous conditions.

E. SYPHILOLOGY

1. The more recent discoveries relating to the modern knowledge of the disease should be discussed. They include the successful inoculation of animals by Metchnikoff and others; discovery of *Treponema pallidum* by Schaudinn and Hoffman; the Wassermann reaction, and the discovery of arsphenamin by Ehrlich and Hata.

2. *Primary Syphilis*: Cases should be demonstrated which show as far as possible the clinical manifestations of the primary lesion on genital and extragenital parts. The value of the employment of the dark field microscope in examining secretion from suspicious sores should be emphasized and stress laid on the importance of early diagnosis. The date at which the Wassermann reaction becomes positive after the appearance of the initial lesion should also be discussed, and the students should be warned against the dangers of relying entirely on laboratory tests and cautioned to correlate the laboratory results with clinical observations. When patients are not available, lantern slides could be shown illustrating the clinical features of these lesions on the genital organs of both sexes and on extragenital parts.

3. *Secondary Syphilis*: Patients should be demonstrated who show the various eruptions characteristic of this period of the disease on the skin and mucous membranes. The differential diagnosis of syphilitic from nonsyphilitic eruptions should also be taught at this time by means of patients and lantern slides. The students should be taught that it is by the dissemination of the

virus during the secondary period that foci are established in the central nervous system, the cardiovascular system and in the viscera, which may later lead to degenerative processes in the various organs mentioned. The importance of careful neurologic and ophthalmologic examinations during this stage should be emphasized.

4. So-called *latent syphilis* with absence of external manifestations: It must be impressed on the student that during the so-called latent period, if the Wassermann reaction continues positive, the patient is still menaced with the infection in some organ. At this stage of the disease cooperation with the departments of medicine and neurology is frequently necessary to determine the site of the lesions which may be producing the positive Wassermann reaction.

5. *Tertiary Syphilis*: Late lesions of the skin, bones and mucous membranes should be demonstrated by means of patients and lantern slides and their differential diagnosis discussed.

6. *Congenital Syphilis*: The relation of syphilis to marriage should be discussed and the rules given as to when a patient previously infected may marry. As far as possible the lesions of congenital syphilis should be demonstrated. These include the various evident skin, bone and eye manifestations. The student should be taught that congenital syphilis involves practically all of the organs in the new-born child.

7 and 8. *Pathology.—Treponema pallidum* from the initial lesion, from the secondary lesions and from the visceral lesions of congenital syphilis, should be demonstrated under the dark field. The histologic changes in the tissues of the primary sore, of the secondary and tertiary lesions should be shown under the microscope and projected on the screen by lantern slides made from photomicrographs. The student should be taught the pathologic process in syphilis in all stages of the disease, from the primary sore to the vessel changes in paresis. The pathologic changes in the cardiovascular system and the viscera should be demonstrated by means of lantern slides made from sections of the various organs. An endeavor should be made to interpret the significance of the Wassermann reaction in the various stages of syphilis and the students instructed not to be misled by repeated negative reactions of the blood in the presence of symptoms pointing to involvement of the central nervous system. Methods employed in determining the pathologic phases in the spinal fluid, their interpretation and prognostic value should be shown and discussed.

9. *Treatment*: An endeavor should be made to standardize as far as possible the treatment of the various stages of syphilis. The merits of mercury should be discussed and the method of

using this drug internally, by inunction and by intramuscular injection, together with the indications and contraindications for its use; also a short account of the discovery of arsphenamin and the method of its preparation for intravenous administration, its dosage and the intervals between doses. The treatment of pregnant women, infants, and neurosyphilitics requires special attention. An attempt should be made to give the student, as far as possible, very definite directions regarding the treatment of the infection and the criteria of cure which must be complied with before a patient may be discharged from observation.

Section Teaching: The demonstrations before the sections must depend on the clinical material available. In addition, every student should see mercury and arsphenamin administered; the *Treponema pallidum* under the dark field; ringworm fungi under the microscope, and the application of various mechanical treatments. Time should also be devoted to the treatment of skin diseases in a general way, demonstrating the use of lotions, salves, pastes, etc., their properties, the general indications for their use, etc.

UNDERGRADUATE TEACHING OF PEDIATRICS

J. P. SEDGWICK, CHAIRMAN, MINNEAPOLIS; F. B. TALBOT, BOSTON; L. R. DEBUYS, NEW ORLEANS; WM. P. LUCAS, SAN FRANCISCO; CHESTER A. STEWART, MINNEAPOLIS

PROPOSED PEDIATRIC CURRICULUM

Fourth Year.—Physical diagnosis of children, 10 hours.

Fifth Year.—100 hours. Pediatric lectures, 55 hours, including topics concerning care of newborns and prematures, breast feeding, artificial feeding, special therapy, diseases peculiar to and distinctive of childhood, child welfare organizations, social hygiene, physical diagnosis, contagious diseases, pediatric recitation, quizzes, didactic lectures and clinical lectures.

Contagious diseases, 10 hours; clinical lectures in wards of contagious diseases hospital.

Outpatient and practical ward work, 20 hours; observation and study of patients under supervision of teaching staff.

Sixth Year.—85 hours. Clinical and didactic lectures, 15 hours; clinical clerkship; clinical conferences.

Outpatient work, hospital ward study, 57 hours.

Diet laboratory, 3 hours.

Contagious diseases, including intubation, 10 hours.

The committee feels decidedly that these recommendations are a compromise. This is especially true just now when the American Pediatric Society, and others, are urging, especially, the increase of preventive child welfare work. It would seem needless to reiterate the fact that time spent in the prevention of diseases in childhood and in learning how to prevent and treat diseases of infancy and childhood, brings out more far-reaching results than time spent in learning the treatment of such diseases in other specialties.

It is thought that a distribution that gives the maximum number of hours in ward and outpatient work is far more satisfactory than a larger number of hours devoted to didactic and clinical demonstration to a whole class.

One member of the committee feels very decidedly that more time should be allotted to quizzes in small sections than is given here.

The case teaching of records to small sections is recommended. The lectures should especially include those things that are not easily understood or which cannot be easily obtained in the textbooks.

UNDERGRADUATE TEACHING OF NEUROLOGY AND PSYCHIATRY

C. MACFIE CAMPBELL, CHAIRMAN, BOSTON; FOSTER KENNEDY, NEW YORK; ALBERT P. BARRETT, ANN ARBOR, MICH.

The teaching of neuropathology should precede that of clinical neurology; four or more lectures on clinical anatomy and physiology should be given by the clinical neurologist as an introduction to clinical neurology. As an introduction to psychiatry, there should be lectures on medical psychology, to supplement the study of physiology by a study of the reactions of the individual as a whole. The distribution of the subjects in the different years will depend on the requirements of the general curriculum in the different schools.

Neuropathology may well be taught at the same time as pathology. Clinical neurology can begin along with clinical medicine; clinical psychiatry should be taught in the third year, for to postpone clinical contact with cases of mental disorder till the fourth year makes it difficult for the student to grasp the principles of psychiatry in their proper medical perspective. No uniform distribution of hours between clinical demonstrations and didactic lectures is recommended.

As to the distribution of hours on the basis of a total allotment of 160 hours to nervous and mental disorders, the following is recommended:

Neuropathology: 40 hours; given preferably in the second year.

Neurology: 60 hours, the time to be distributed between clinical demonstrations, didactic lectures, and outpatient work, according to the local conditions. Clinical neurology would begin either toward the end of the second year, or at the beginning of the third year.

Psychiatry: 60 hours; of which six would be given to lectures on medical psychology in the second year.

Clinical psychiatry would come in the second half of the third year, and the distribution between clinical demonstrations, didactic lectures, ward work, and outpatient work, would depend on local conditions.

DISCUSSION

DR. FRANK BILLINGS, Chicago: The details brought out by Dr. Emerson for general medicine may be discussed with expressed differences of opinion. We all agree with him that in the curriculum for medicine there must be a closer relationship with, and coordination and cooperation on the part of the departments of clinical medicine in the formation of the curriculum. After all, what Dr. Emerson said may be secured,

that is, a study of man rather than of disease, if we adopt this method. To understand man we must know anatomy, chemistry and physiology. The tendency with teachers of the fundamentals has been to decry any attempt to teach these subjects as applied sciences. We sympathize with them in their belief that they should be taught as pure sciences, and so they should be taught if the teachers in the fundamentals will understand and sympathize with and cooperate with the teachers in the clinical branches. This will occur, too, if we are personally associated day after day. The time has come when the medical school, as a whole, must be part of the university, and all departments must be united on the same campus so that the faculty may intermingle day after day in their work. The clinical curriculum should provide for the study of man and his reactions to the pathologic processes going on in his body; that is the problem before the student. We may differ as to how we may do this, but we all agree on the fact, I think, that the time has passed for didactic clinical instruction, and we all recognize the need of actual contact of the student with the patient in order to study his reactions. The student must have this direct contact, and it makes no difference whether it is in the outpatient department or in the wards of a hospital, or in both. Therefore, a good medical school must have the material, in the form of patients, coming to its diagnostic clinic, the outpatient department, and in the wards of the hospital. The main function of a medical school is to train practitioners of medicine; therefore, all the teachers of the clinical departments who are specialists in the department should form a group to teach the students. In other words, the student should not approach a man or woman with the preconceived idea of what the treatment may be, as I have seen it done in institutions I have visited. That is one of the biggest errors that has crept into clinical medicine. It is the fault of the internist, the surgeon and the specialist that this error has crept in. How many times does a student go into the wards with his teacher, and the patient is approached as a diabetic, or how often does a surgeon go into the wards and say to the student in approaching the bed, "This is a case of surgical abdomen"? If we will study a man or a woman's reactions to pathologic processes as a group of teachers, regardless of the treatment he or she is going to have in the end, we would accomplish much in principle. This does not mean that we are going back to the days of Skoda and Rotitanski by being concerned only to make a diagnosis of the pathologic process manifested in the patient and be satisfied if at the necropsy we are able to have our diagnosis verified. I do not think that at all. I am not a nihilist in therapeutics. We should adopt the principle that the primary object is to teach diagnosis. I sympathize with and approve of what Dr. Emerson said about therapy. The principles of pharmacology should be taught as one of the preclinical studies, but the pharmacologist should also be with the clinician. He should have an opportunity to teach his students in pharmacology some of the human reactions to drugs, and not have all experiments made on animals. The student should have an opportunity to observe the effects of poisons on human beings in the wards rather than on animals. We should be able to teach students that there is a drug therapy that is dependable. That these dependable drugs are limited in number is true, but we may teach the student the rational use of them, and we may teach him the axiom laid down by Sydenham that it is as necessary to know when not to give a drug as when to give it. We should be able to teach

him in the clinical departments the practical side of pathology and the principles of immunology, so that he may understand serology, the therapeutic application of serums, and have an understanding of the effect of antigens given either subcutaneously or intravenously. In other words, after a study of the human being and a knowledge of the pathologic process that is causing mental and physical reactions in the individual's body, it will be easy to teach the principles of rational therapy.

The work done by the medical department of the army during the war showed the importance and value of the application of physical therapy. Proper rest, of a proper environment, a proper diet, of physical treatment in the form of hydrotherapy, of occupational therapy and of active and passive exercise, are very important factors, and it is not difficult to teach a patient to carry out much of it himself. It is not difficult to teach these things to a student if there is, as there should be, a department of physical therapy in every well-equipped hospital.

DR. JAMES EWING, New York City: The work of the internist is becoming so extensive that we must look about for some means of limiting its scope so that we can safely bring it before the undergraduate student. I would like to suggest a principle which I think is of some importance. We must distinguish between the primary and secondary phenomena of disease. The primary phenomena of disease, as a rule, are rather few, rather striking, very tangible and very important; the secondary phenomena of disease are very numerous, practically illimitable in number, of not very great importance, but of very considerable interest, especially when we have unlimited time at our disposal and are engaged in teaching disease as a whole. In teaching medicine to undergraduate students, a sharp distinction ought to be made between the primary and secondary phenomena of disease, and we ought to confine our attention largely to the primary phenomena and make it clear to the student that when we examine the blood and urine and the functions of various organs, we are digressing from the essential principles of the practice of medicine. Unless we do that, there is going to be somewhere in the training of the student a very serious deficiency. As a pathologist I find our men are deficient in their knowledge of the primary phenomena of disease, and the result is that at the necropsy table we very often have extensive descriptions and very careful studies of cases, but the diagnoses, unfortunately, are incorrect. For instance, in the diagnosis of cancer of various organs. The great majority of medical students are turned out from the best schools unable to recognize the beginning of cancer in the various organs, and it is a lethal disease. They do not know cancer of the cervix; they have never seen it; they do not understand the methods of differentiating between benign and malignant processes in this organ. Very few students from our modern universities have any conception of the method of approach for the diagnosis of mammary cancer. Very few of them understand the differential diagnosis of rectal cancer; almost none of them know the beginnings of malignant tumors of bone. The effective teaching of medicine will be very much improved if those in charge of it would make a careful analysis of the whole scope of their work and say: we will teach a certain amount of this detail study of the secondary phenomena of disease, but limit ourselves specifically to the primary phenomena of the disease, in order to make sure that when our men enter on the practice of medicine they will be capable of recognizing and dealing with the primary phenomena of the lethal diseases.

DR. G. CANBY ROBINSON, Nashville, Tenn.: Dr. Emerson states that clinical medicine is an art and not a science. Although it is largely a matter of terms, or, perhaps, point of view, I wish to maintain, as I did at this conference last year, that there is such a thing as the science of clinical medicine, which deals especially with the problems of disease in living human beings. It is a field for research, and deserves a place as a department in a true university. The practice of medicine may be considered an art, or at least an applied science. The relation of art and science in the practice of medicine has provoked considerable discussion. This relation has been admirably expressed, it seems to me, by Dewey, in his recent book, "Reconstruction in Philosophy," in which he says:

"Just in the degree in which a physician is an artist in his work, he uses his science, no matter how extensive and accurate, to furnish him with tools of inquiry into the individual case, and with methods of forecasting a method of dealing with it. Just in the degree in which, no matter how great his learning, he subordinates the individual case to some classification of diseases and some generic rule of treatment, he sinks to the level of a routine mechanic. His intelligence and his action become rigid, dogmatic, instead of free and flexible."

Whenever the problem of the individual is lost sight of, the so-called "laboratory man" is in evidence, and the clinician, in the true sense, disappears. But so long as the problem of the individual or group of individuals is the predominating factor which is guiding the activities of the worker, the work may be claimed as belonging to the realm of clinical medicine.

I wish to emphasize one other point in regard to the teaching of clinical medicine, namely, the correlation of subjects, particularly those of the laboratories with those of the clinics. It is a subject which, like the weather, has been much discussed, but little has been done about it. The lack of correlation is well illustrated by the methods usually employed in the study of a disease like pneumonia. The student learns the characteristics of the pneumococcus in his first year of study. In his second year he learns the gross and microscopic changes that this organism produces in the lungs. In his third year, he is taught the physical signs by which pneumonia is recognized; and in his fourth year, he may encounter the disease pneumonia as a whole for the first time, and may, perhaps, have an opportunity to study the disease with some thoroughness in one or more cases. More should be done in an attempt to bring together the various phases of disease, and it is particularly desirable that the study of special pathology and clinical medicine should be carried on simultaneously and in a coordinated manner. A scheme for such a correlation recently has been published by the Edinburgh Pathologic Club. A paper by Dean in this report entitled "An Inquiry into the Medical Curriculum," is especially suggestive. The departments of pathology and medicine should make the beginning, and every opportunity for further correlation of teaching should be sought.

DR. J. J. R. MACLEOD, Toronto, Ontario, Canada: During recent years we have been face to face in Canada with a problem which you solved some years ago, namely, the proper expenditure of time for a combined six years' course in arts and medicine. The course which we have evolved conforms with standards you have laid down, but at the same time, makes an attempt to correlate more adequately the clinical with the

laboratory subjects. I do not propose to take your time in discussing details of this course here, but I would like to point out one or two of the principles which have guided us in formulating it. It is no doubt true that medicine is, in large part, an art. I, for one, however, would not feel inclined to subscribe to the statement made by the committee that it is primarily an art and only secondarily a science. What would be the status of medical knowledge at the present time had it been so regarded? The advancement of medicine has not been accomplished by men who have regarded it mainly as an art and only secondarily as a science.

The methods, I believe, by which the subject can be correlated depend on this principle. Throughout the whole of the course, from its beginning to the end—from the beginning of the first year to the end of the sixth year—the student must be made to realize that the science of medicine and surgery depends on the application of the fundamental sciences, physics, chemistry and biology in the study of the human animal in health and disease. At present we give these subjects early in the course, and after requiring the student to pass an examination we suppose that he has a practical knowledge of his subject. We take him through the courses in physiology, biochemistry and anatomy, and then, after an interval of several months into the clinic where he is brought face to face directly with the application of the principles of these sciences in the practice of medicine and surgery. This procedure is, I think, the chief thing we have to correct by a better overlapping of the subjects. We must, of course, give instruction in the premedical sciences, as the first step, and I think it is generally conceded that the laboratories should be manned by men intensively trained in these sciences. We must, as the second step, give physiology, biochemistry and anatomy by men similarly trained, but instruction in these subjects should not stop there. We must make provision to give instructions in their application during the clinical years, as was brought out in the report. The student must constantly be shown how the fundamental knowledge may be used in the study and treatment of disease. The question arises, how can we do this? In my opinion it is practically impossible to expect a physiologist or an anatomist or a biochemist to show this application, nor does the student know the clinical diseases; he does not know the names of the diseases, much less their characteristics. He knows nothing of symptoms, so that it is impossible for the physiologist and biochemist to make more than a general allusion to the principles of these sciences in the treatment of disease. It must be done in the later years, and the question is: How is it to be done? My belief is that it can only be done by proper correlation between the clinical and laboratory teacher, and this is not so difficult a thing to do as it may appear to be at present.

In the United States many of the premedical and fundamental medical sciences are given in schools in buildings that are situated at a distance from the clinic, and there may be practical difficulties in working out the correlation; but I imagine that in the future laboratories in the fundamental medical sciences will be brought into closer touch geographically with the clinical wards, and that the scheme of which I am to speak will become possible. The scheme is that the teachers in the clinical branches should be given opportunity of meeting, not necessarily very frequently—once in two weeks probably is sufficient—to talk over, in informal meetings, the application of physiologic and biochemic methods in the study of the symptoms and treatment of disease. We are making an attempt

to do this in Toronto at the present time. In the department of medicine, for example, the teachers meet regularly once a week to discuss policies of teaching. The attendance during the few years in which it has been going on has been very satisfactory, indeed. I forget the precise figures, but somewhere over 75 per cent. of all men in the department of medicine have attended these meetings, and they have discussed, how shall we classify nephritis? Shall we take the classification of the clinician? They have debated that subject until they have arrived at a common basis of classification. They have also discussed how to fit in the various individual cases met in the clinic with that classification. They have taken up many other similar subjects, and now we propose that these meetings shall be broadened so that the teachers in the departments of physiology and biochemistry will meet with the clinical instructors for similar purposes to discuss, for example, what should be the teaching with regard to the physics of intrathoracic conditions, the physics of hemodynamics, the proper method of taking blood pressure, the interpretation and value of electrocardiograms, etc. These conferences do not take much time because the men are more or less familiar with the subjects. It is merely a matter of sufficient conferences to enable them to correlate their ideas, to remove or reconcile differences of interpretation, and to decide on some common policy of teaching. If this can be done, we will remove by far the greatest part of the difficulty that presents itself or that exists at present in the correlation of laboratory with clinical instruction.

In the clinic the student is confused. He has been taught several doctrines by the physiologist; he goes to the clinician, and the clinician gives an entirely different interpretation. Therefore, the student is apt to become utterly confused, and he says: "I cannot be bothered with those theoretic considerations; I will limit myself to practical work, to learning a prescription or two; that is all I want; I can then go into general practice and make a livelihood." He sees a conflict of ideas between the physiologist and the clinician, and no one takes the trouble to try to remove the fearful confusion that results in his mind.

I do not believe that it would be a satisfactory expedient to have a clinical instructor alone responsible for giving the physiologic interpretation during the clinical years, unless he is a man who has been intensively trained in the subject, and is paying little attention to private practice. It would not be safe to have him teach as physiologic doctrines facts which were not thoroughly supported by experimental proof or clinical observation. That would be disastrous. The general practitioner has not time to make himself familiar with the most recent advancement of this subject or correlated subjects. To remove that difficulty, we as physiologists and biochemists should assist the clinician in bringing him up-to-date and he can then decide by his own clinical experience whether the new facts have application in disease. In many cases a correlated knowledge need not necessarily mean teaching a thing he does not believe, but, at least, it secures having him teach the subject in its relation to the primary sciences.

We have introduced a course in psychology because medicine is an art which depends on an understanding of the normal psychology of the human individual.

Dr. George M. Kober, Washington, D. C.: I endorse what Dr. Billings said, that the primary function of a medical school is to turn out competent practitioners. The old time preceptor subserved an important function, and in his absence it is essential that the student receives proper individual instruction in matters relating to physical diagnosis and treatment. It may be necessary to make graduation conditional on the completion of a satisfactory hospital internship. At all events we should see to it that our men are sufficiently trained to become competent diagnosticians and practitioners, and when they are, they can render adequate service to at least 95 per cent. of their patients, and they will know when to enlist the aid of specialists. There is a great scarcity of general practitioners, especially in rural regions. I receive almost weekly urgent appeals for young practitioners who may be induced to take up the burden and responsibilities of a rural practice. Personally, I shall always be proud of my service as a general practitioner in the army and in the rural districts of frontier posts.

Specialists are, of course, important, but from what I have seen at the Mayo Clinic and elsewhere, we need not worry about their training, for they will find ample opportunities to develop the skill and experience necessary to do expert work and to contribute to the further progress in medicine and surgery, and also to qualify as competent teachers. The greatest need, as I see it, is to turn out competent men, good general practitioners and not group practitioners whose charges are beyond the means of the average patient. If we do not, the cults that are now multiplying with startling rapidity will occupy a large field, much to the detriment of the human family.

Dr. W. F. R. Phillips, Charleston, South Carolina: Dr. Emerson emphasized many things that are of paramount importance. He referred to the preclinical teachers as the makers of the tools. I wish he would tell us preclinical teachers what kind of tools he wants to use.

We preclinical teachers are asked to furnish the scientific basis on which the art of medicine is founded, but we are not told exactly what we are to furnish. Dr. Emerson said that the teachers of anatomy, physiology, etc., should tell the clinician what they, the anatomists and physiologists, etc., are going to teach, and the teachers of physiology and anatomy should then teach these sciences as sciences and unrelated in their practical application. I would put it the other way. The clinicians should tell the teachers of physiology, pathology, etc., what tools they find defective in order that they may make an effort to remedy the defects. The greatest difficulty I have had is to know what to teach; there is so much to teach. I cannot impart a thorough anatomic knowledge and make an anatomist in the time at my disposal. There is a great deal that is useful, that is going to be useful to the student and there is a great deal for which I can see no earthly application. Shall I deliberately decline to teach or impart that which I know is useful and shall I teach that which I see no application for because it may be useful next year or some centuries later? Personally, I have tried to teach that which I know would be useful, but I am doubtful sometimes whether that which I am teaching is useful. I am very doubtful sometimes whether the anatomy I am teaching is being applied by the clinician to patients. Sometimes my students come back to me with questions which

incline me to think that possibly the clinician is not using quite enough anatomy in his practical work—a little more anatomic thinking might be advantageous all around.

DR. ROBERT WILSON, Charleston, S. C.: I should like to emphasize the need of readjusting the relation which is now observed between ward teaching and dispensary teaching. All of us have had occasion to note the defect to which Dr. Ewing has called our attention, and it seems to me that this is partly due to the stress laid on the study of cancer, tuberculosis, Bright's disease, and so on, in their advanced and fully developed forms in the wards, and leaving to the junior students, who are entirely unfamiliar with the methods of investigation or with the clinical aspects of disease, the problem of attempting to unravel these diseases when they present themselves in their incipient forms in dispensary service. I cannot help feeling that we ought to put our senior students in the dispensary and the junior students in the wards, or make an arrangement by which seniors and juniors can work in the wards and dispensary.

I would like to comment favorably on his suggestion that the students write theses. I can give my own personal experience and endorsement of that practice. For several years our students have been required to present a theses before graduation, a theses based on some original investigation in the wards; such, for instance, as an analysis of all the cases of malaria which have occurred during the previous year, and so on. This has proved an admirable exercise for them, and at the same time it has been rather profitable to the professor of medicine to read these theses.

I agree with Dr. Emerson that we should teach medical history more than we do.

When Dr. Emerson says that many of our notions and practices date back to the middle ages, I think I can truthfully go him one better and say that many of our practices and many of our notions in common vogue date back to a time as far removed from Hippocrates as Hippocrates is removed from us; that is, we find them prevailing in the old kingdom on the banks of the Nile which started four thousand years before the Christian era.

DR. LOUIS B. WILSON, Rochester, Minn.: Certain personal characteristics should be developed in a medical student, even at the sacrifice of a little bit of knowledge. As the first of these I would suggest thoroughness. I cannot help feeling, considering the enormous number of subjects now taught in our medical schools, that they are very materially reducing thoroughness, the sense of thoroughness necessary in the graduate. The average student does not seem to know what it means to go absolutely and completely to the bottom of a subject, to know in detail, and not be satisfied until he has worked out what is the matter with the patient, and what may be done for him. I believe that it would be better if we taught only half of the subjects but taught the student to be thorough in these things. The next qualification or characteristic I would mention is modesty. It seems remarkable how much more humble the medical graduate is in making a diagnosis of a skin disease, when the evidence is open to the world, than in making a diagnosis of a disease of the stomach when the evidence is hidden by a few inches of abdominal fat. We need to inculcate modesty and honesty in medical students; I

mean real honesty to one's self. We can not inculcate honesty thoroughly in our medical graduates until we raise the percentage of postmortem examinations in our schools, until we follow out for a longer time the results of our treatment of patients. There is no reason why there should not be 80 per cent. postmortems made in every hospital in America. So long as we are not honest enough to insist on postmortem examinations to get at the truth, we cannot expect to inculcate honesty in our graduates. As long as we are not honest ourselves in following patients, we cannot inculcate honesty in our students. I have reference to scientific honesty, scientific conscience, that is not satisfied with any other than the truth and of knowing whether we have been wrong or not.

UNDERGRADUATE TEACHING OF SURGERY AND SURGICAL SPECIALTIES *

HUGH CABOT
ANN ARBOR, MICH.

We shall not attempt in this report either to describe accurately what is now being done in the teaching of this part of medicine in the medical schools of the country, nor shall we attempt to advise in detail what we believe might be done to advantage. Rather, we shall attempt to estimate the tendencies of the present time in the teaching of surgery, and point out how these tendencies may be assisted, where we believe them to be sound, and counteracted where they seem to us to tend in undesirable directions. We recognize that a hard and fast plan of teaching would not only be impossible of adoption by all schools, but also that it would be undesirable. It is clearly important to encourage individuality in schools as well as in people, and any attempt to bring pressure to bear tending to a high degree of similarity of teaching would, we believe, be undesirable.

General Surgery

RELATION OF THE TEACHING OF SURGERY TO THE TEACHING OF PRECLINICAL BRANCHES

The very strong tendency of the recent years to what may be called "block teaching" in the preclinical subjects has had definite advantages in enabling these subjects to be driven home and thereby create a solider foundation. On the other hand, it has also had a distinct tendency to create the impression that the branches so taught are done and finished. This produces an undesirable isolation and accentuates the tendency to a sharp break between the first two years of the curriculum, which are largely preclinical and the last two years which are largely clinical.

It is noticeable that the attitude of mind of the students in the first two years is quite different from that in the later years, and that they tend to make less use of their foundation as the real basis of their knowledge than should be the case. It must be the effort of the teachers of the clinical subjects to keep students constantly in touch with the preclinical work, and to use every effort in their power to make the course more continuous. Surgical

* This report was prepared by a committee and was read by the chairman, Dr. Hugh Cabot. He had the advice and assistance of the following: GENERAL SURGERY: Dean Lewis, Chicago; R. B. Greenough, Boston. ORTHOPEDIC SURGERY: R. B. Osgood, Boston. GENITO-URINARY SURGERY: H. W. Plaggemeyer, Detroit. OTOLARYNGOLOGY: R. B. Canfield, Ann Arbor, Mich. OPHTHALMOLOGY: W. R. Parker, Detroit.

diagnosis cannot be taught, except with the most intimate association with pathology and bacteriology. Surgical treatment cannot be taught without the most intimate association with anatomy. It seems fairly clear, that it is not feasible to begin the teaching of surgery earlier than is at present the case. Many schools begin to teach the principles of medicine and the principles of surgery during the second semester of the second year, and there is no room in the curriculum to begin these subjects at an earlier date. It follows, therefore, that the teaching in pathology and bacteriology must be carried along throughout the third and fourth years, and this must either be done by a closer association of these departments with the teaching of surgery or the department of surgery must equip itself with clinical pathologists and clinical bacteriologists. Though often the teaching hospitals provide men who can work closely with the surgeons, this is not always the case, and it seems eminently desirable that a closer cooperation with these departments should be brought about. To some extent the separation has been due to physical circumstances, and this is likely to diminish with the building up of university hospitals in close physical relation with the buildings which house the preclinical departments. We doubt, however, whether it is wise to allow this question to wait on such physical development, and believe it to be of real importance that closer cooperation should be planned for and actually carried out.

Very desirable exercises tending to draw together surgery, pathology and bacteriology are the careful review of all patients coming to necropsy, such discussions to be conducted by the surgeon, the pathologist and the bacteriologist jointly. In this way the parts of the picture which are likely to become isolated are drawn together, and not only do the students get a far juster appreciation of the real relation, but the teaching staff is likely to acquire a balance which can be obtained in no other way.

With regard to the more continuous teaching of anatomy, the case is somewhat similar. It is relatively impossible for the anatomist to come to the surgeon, and it is, therefore, desirable that more stress should be laid by the department of surgery on the teaching of applied and regional anatomy. In teaching the principles of surgery, more stress might be laid on applied anatomy, and in the teaching of operative surgery, the anatomic relations involved might easily receive more attention than is at present the case. It is further important that the teachers, particularly of junior students, in the department of surgery should have more familiarity with embryology in its relation to the production of deformities, and as a satisfying explanation of anatomic relations as they bear on surgical problems.

To summarize our suggestions on this point we might say: that in the field of pathology and bacteriology greater effort must be made to interest the teachers in these departments in the clinical problems and lead to their closer association with the surgeon, while in the field of anatomy effort must be made to increase the working knowledge of the surgical teachers in embryology and anatomy as they come up in daily relation to surgical diagnosis and operative surgery.

RELATION OF THE TEACHING OF SURGERY TO THE TEACHING OF MEDICINE

Unless we are prepared to regard all diagnosis as essentially medical and to admit that surgery is only a department of applied therapeutics, we must believe that the teaching of medicine and the teaching of surgery should go hand in hand. But there is grave danger, with the present marked tendency to separation in the teaching of these subjects, of the development of a medical view versus a surgical view of the same condition. We all of us remember the struggles between the physician and the surgeon in the early days of operations for acute appendicitis. How often we saw the surgeon advising, even urging, operation, while the physician took the view that nature and, perhaps, a little medicine would do equally well. Such a contrast of opinion could only have existed among people whose approach to the problems of medicine were diametrically opposite, and all must recognize that, with due allowance for human fallibility, in every obscure condition there must be one treatment which is sound while all others are relatively less sound. Since it is the business of the medical school to turn out neither physicians nor surgeons but young men trained in a sound comprehensive view of the field of medicine and prepared to develop along more special lines as their qualifications and aptitudes may determine, it is clearly important that they should have the broadest view of the diagnosis and treatment of disease and be relieved from the dangers incident to specialization. If it be inquired how we propose to counteract this tendency, we would suggest that it means more joint exercises in which the departments of medicine and surgery are widely involved, and that it is probably best that this teaching should be given toward the end of the course rather than at an earlier period.

With the present general distribution of hours between the department of medicine and the department of surgery we are in accord. They seem to suit reasonably well the present requirements, and we agree, in view of the ground now covered by medicine, that it should continue to have as it has had for some time, the larger assignment. We would suggest, that in the fourth

year a considerable series of clinical exercises, conducted jointly by the departments of medicine and surgery, should be introduced more widely. We incline to the view that two hours a week throughout the entire year would be exceedingly desirable, and to these exercises should be brought that great group of conditions in which the study is now commonly carried out in the medical wards and in which the treatment may or may not be surgical according to the indications. This will also enable these two departments to call to their assistance all the subdepartments or specialties of medicine and surgery, and it will tend to produce in the mind of the student better orientation than is always obtained under present arrangements.

METHODS OF TEACHING IN SURGERY

The developments in recent years have shown a strong tendency to abandon didactic and ex-cathedra teaching and rely more on those methods which bring the student and the patient into closer contact. This tendency has, of course, been carried further in some schools than in others, but is very marked everywhere and, with possible limits, has been entirely desirable. We desire at this time to point out what appear to be the advantages and limitations of various methods without undertaking to be dogmatic as to their application.

Didactic Lectures.—Lectures may be divided into the didactic and the clinical. Some of the most advanced teachers in surgery hold the view that the didactic lecture has no place in the modern curriculum, but an examination of the printed schedules of many schools appears to show that the didactic lecture is still considerably used, and we desire therefore to discuss its place in the curriculum. Didactic lectures are certainly not a desirable method of teaching surgery as a whole. If used on too large a scale, they tend simply to relieve the student of the requirement to read, which is in fact for him a most important method of learning. On the other hand, it is quite possible in didactic lectures to give a skeleton view of certain parts of the field of surgery which can only with difficulty be obtained from textbooks, and if such skeleton didactic lectures are promptly followed by clinical demonstration and section teaching, they are likely to obviate much confusion in the mind of the student as to the relative importance of various signs and symptoms. But if the didactic lecture is to be used in this way to advantage, it is important that the clinical demonstration follow promptly and closely. For instance, a course of didactic lectures followed months afterward by clinical demonstration or given in one year when the clinical material is only produced in the next, is not, we believe, an advantageous method. The didactic lecture

is, perhaps, at its best in laying down the principles of surgical diagnosis and the fundamentals of surgical practice. If a systematic course is planned, particularly in the third year, one or more didactic lectures as an introduction to each of the subsections of such teaching is, we believe, desirable.

Clinical Lectures.—The substitution of the clinical for the didactic lecture has been a very common and, we believe, a very wise practice. It is not a substitute for section teaching or bedside instruction but rather a substitute for the cold and rather skinny didactic lecture which must be illustrated, if at all, only by drawings and diagrams. Most of us have a visual rather than an auditory memory, and we, therefore, learn best from that which we can see; but the limitations of the clinical lecture are very real. It can only do, though somewhat better, that which the didactic lecture does, namely accentuate principles, give perspective and help to produce in the student's mind an orderly arrangement in the subject.

Quizzes.—The older practice of conducting quizzes based on textbook reading has largely been superceded by quizzes based on clinical lectures, bedside and section teaching. Used in this way it is a most valuable method of summarizing knowledge and is, perhaps, most important in that it enables the instructor to find out at relatively frequent intervals how successful has been his presentation of the food for study. We believe that a regular system of quizzes, given as far as possible at such time as to crystalize a definite subject in the student's mind, is highly desirable. It is important that they should be conducted in an orderly way, and the student should know beforehand what ground they will cover, and that the instructor should bear in mind the danger of only quizzing on certain portions of the subject which happens to interest him with the result that no real summary of the subject is achieved.

Section Teaching.—It is unnecessary to point out that section teaching is essential when dealing with the relatively large classes which today are the rule. It is the modern answer to the grave damage which resulted to the teaching of surgery when medical schools became thoroughly organized and the old days of "walking the hospital" disappeared. Within reason, sections should be made as small as possible, but with large classes this will require a number of instructors which is likely to prove a severe strain on the budget. We doubt whether sections of more than twenty men can be dealt with to the best advantage, and we believe that fifteen more nearly approaches the optimum number. The method should be introduced into the teaching of surgery as early as possible in the curriculum, and except where the class meets for

didactic or clinical lectures or for quizzes, this should be the method of election in all teaching. Where physical arrangements make it possible, it is probably better to bring the patient to the student rather than take the student to the patient, as in the method of making so-called "ward rounds." It is not easy, when taking students into open wards, for the instructor to discuss the peculiarities of a particular condition without either advertising the patient's disabilities to his neighbors or failing to say what he really means. Where it is possible to bring patients one after another to a separate room for teaching purposes, they may then be examined, discussed as far as it can be tactfully done and then dismussed so that the portions of the discussion which are undesirable for the patient to hear need not be neglected. This, of course, requires the provision in teaching hospitals of special rooms in connection with each department, and the present construction of many hospitals which were not originally planned as teaching hospitals makes this difficult or impossible. At the same time, the principle may be borne in mind and applied as widely as possible.

Clinical Clerkships.—The practice of introducing students directly into the hospital as part of its machinery has come widely into use in recent years. It is a most desirable method as it fosters in the student the practice of getting close to his patient and accentuates the necessity of some understanding of a patient's psychology as a prerequisite to obtaining a decent history or to making a satisfactory physical examination. It is almost the only way in which students can be trained in the art, as distinguished from the science, of medicine, but it, of course, follows that if students are to get the most out of such close contact with their patients they must be supervised carefully or they get into highly objectionable habits which may largely negative the value of the method. We think there is a definite danger in placing unsupervised students in contact with patients, and this danger lies partly in their coming to regard these unfortunate people as cases or examples of disease and partly in allowing them to abuse the privilege which is thus given them by discourtesy and roughness. In order to get the best results from this method, it is necessary to have an instructor definitely assigned to their supervision, and this instructor must be impressed with the rights of the patients as well as with the desirability of this method of teaching. Here, perhaps, better than at any other point, can be taught the psychology of medical practice, and here certainly should be taught the importance of having due regard for the opinions which may have been expressed by the physicians from whom the patients came and their undoubted right to have these opinions respected. It cannot be doubted that the careless and loose talk of students

and interns has done much to bring about the hard feeling which occasionally results in the minds of referring physicians in regard to the treatment of their patients. There is here, we believe, on the teaching staff a very clear requirement which has not been realized sufficiently, and we are satisfied that attention to these matters will be of benefit not only to the student but to the position of the teaching hospital in the medical world.

Clinical Library.—One of the most important things in the teaching of medicine is that the student should learn how and where to obtain information on any given subject. Throughout the remainder of his life he will at frequent intervals have to look into the recent and current contributions on various subjects, and this should be taught as part of his medical course. If, as is the case in some universities, the library is conveniently situated, no other provision need be made, but where teaching hospitals are situated at considerable distress from medical libraries, these hospitals must be provided with clinical libraries in which the student can work freely. Standard reference books and abundant files of current literature, together with a reasonable access to medical records, are necessary to develop a knowledge of how to investigate the literature of a subject. Particularly in the fourth year, definite set subjects which a student must investigate and report on are probably the best way of forcing him into contact with the literature. It is clearly a method of teaching on which insufficient stress has been laid, and we would ask careful consideration for this suggestion.

RELATION OF GENERAL SURGERY TO THE SURGICAL SPECIALTIES

If the course in surgery is to be well balanced, it is important that there should be "central planning" to the end that balance is not lost sight of in the eagerness to impart a knowledge of details. Specialties, whether in surgery or in medicine, tend to exalt their fields. Such exaltation is highly desirable for the development and widening of the field of knowledge, but it is not desirable to the end that a well balanced knowledge of surgery be obtained by the student. Every special department is bound to take the view that it is neglected, and that a far larger amount of time should be devoted to it. Only by "central planning" can permanent lack of balance be avoided. But it is to be remembered in attempting to plan the relative time requirements of various specialties that many, at least, of the subdepartments of surgery are not fixed entities. Thus, of the five specialties assigned to this report—ophthalmology, otolaryngology, orthopedics, genito-urinary surgery and roentgenology—two are relatively fixed and three are

utterly changeable. It is but a short time since genito-urinary surgery dealt chiefly with venereal disease, while orthopedic surgery dealt largely with deformities and tubercular disease of bone. Today, genito-urinary surgery may properly claim a much wider field, and the scope of orthopedic surgery is so rapidly changing that probably no two schools in the country would agree as to its exact scope. The answer to the question of how much time should be assigned to these departments seems to us to depend entirely on local conditions. In the rapidly changing specialties teaching must, we think, be built around the men who actually have the work to do, and this can be done without any alteration of the total hours devoted to surgery. It matters not whether certain portions of orthopedic or genito-urinary surgery are taught by a specialist or by a general surgeon, provided always that sight is not lost of the fact that whoever does the teaching must know his business. For instance, if the surgery of the kidney is taught by a genito-urinary surgeon, this will be satisfactory if it is well taught and will relieve the division of general surgery of just so many hours. As another example, if the care and management of fractures are to be taught by the orthopedic surgeon, just to such extent will the pressure on general surgery be relieved. In one important particular, however, the teaching of the specialist in these departments has generally been better than that of the general surgeon, namely, in laying stress on the importance of functional end results. For example, many a general surgeon is quite capable of teaching the operative treatment of stricture of the urethra, but at this point his enthusiasm wanes and he forgets to point out that unless the after-treatment be continued for years, the result will be a failure and another operation. In the management of bone and joint lesions, the general surgeon has too often neglected the specialized after-care as regards function with resulting sacrifice of what would otherwise have been a good result. Therefore, if and when the general surgeon undertakes to teach special subjects, he must do so in fact and not in name.

RELATION OF SURGICAL SPECIALTIES TO THE CURRICULUM

The teaching of these specialties should fit into the general scheme of the teaching of surgery as part and parcel of the regional teaching. Just as it is now the accepted principle to begin the teaching of surgery with the third or end of the second year and carry it through the course, beginning first with the teaching of principles and working on to the details, so the surgical specialties are better taught over at least a two-year period rather than crowded into one. There are undoubtedly physical difficulties and objections to such an arrangement, but it seems wiser to teach the principles of the surgical specialties in the third year and the

practice in the fourth year in accord with the view that the teaching should be progressive from the second to the fourth year in order that a student may have a ground-work before he begins to deal with special conditions.

ASSIGNMENT OF TEACHERS

It is an axiom of pedagogy, that the more elementary the teaching the more skilled and experienced should be the teacher, and this principle we believe holds good in the teaching of surgery. It is highly desirable that the basic or didactic lectures should be given by senior men, and that the principles as first laid down for the student should be taught by the same group. The broad bearings are likely to be best appreciated by men of broad experience, while the applications of these principles are often as well or better taught by junior men. We believe it sound and practicable that the didactic lectures, the clinical lectures and the introductory presentations should be given by the chiefs of the departments, whereas the quizzes, the section teaching and the supervision of clinical clerks can be carried out by junior instructors. Particularly should the joint exercises with the pathologist, the bacteriologist and with the department of medicine be conducted by experienced senior teachers. Here must be laid down principles, relations and broad judgments which can only come with experience, and it is here that the character of the surgical teaching should be established. In the interests of a broad and homogenous course, junior teachers should, as far as possible, attend these exercises, for while it is desirable that students should acquire a variety of opinions, these opinions should differ on details and not on principles. There is grave danger, particularly with junior students, of involving them in a complexity of differences of opinion which to them appear to involve principles and yet do in fact involve only details. Much time is often wasted in trying to unlearn that which has never in fact been taught but which has been implied or inferred from lack of cooperation.

ARRANGEMENT OF THE CURRICULUM

As already pointed out, the plan for the whole teaching of surgery must be made by the chief of general surgery in the interests of balance. Inasmuch as there are fundamental principles which underly all surgery and surgical specialties, these must be laid down at the beginning. Where possible, this may well be done in the second semester of the second year, though in many schools such an arrangement is not possible. In any case, the student must be introduced to surgery at the beginning and not in the middle. The exact amount of subdividing which can be done depends on the hospital organizations on which the medical school

may count. For instance, neurologic surgery, though not as yet classified as a surgical specialty, has developed to such an extent that in many schools it may be taught by a surgeon who devotes much of his time to this work. In other schools it will be dealt with as part of the general curriculum. A plan which deals with the teaching of surgery regionally is sound but often difficult of application, inasmuch as the clinical material necessary to illustrate such a regional plan may not be always available. In this regard those schools with superabundant material are at a distinct advantage. On the other hand, we have not always made the fullest use of the students themselves as models in the teaching of regional surgery. For instance, in the application of splints, dressings and bandages, the student is better than any model. When one has experienced the delights of too tight a splint, of an improperly applied or removed "plaster" bandage, or the exquisite torture of removing adhesive plaster from the unshaven skin, he becomes not only more sympathetic but more efficient.

After the fundamental principles have been laid down, the teaching of general surgery and the specialties may go on a parallel course. Thus, there is no objection to the teaching of the principles of ophthalmology relatively early in the third year if only the student has the necessary background of fundamentals behind it. If it is found convenient in arranging the curriculum to carry on the teaching of the fundamentals in general surgery and all the specialties parallel through the third and fourth year, there appears no pedagogic objection.

We have already discussed the relation of lectures, clinical and section work to the general principles of teaching and need not therefore repeat them here. They are equally applicable to general and to special surgery. On one point, however, we would here lay stress. In the past much time has been spent by students in watching surgical operations under the guise of learning the technic of surgery. This we believe to be an exceedingly wasteful method. In the first place, much of the time consumed in doing an operation cannot be devoted to teaching without needless repetition, and in the great majority of operations nobody but the operator and his first assistant really see what is going on. A far sounder method of teaching what should be taught in regard to the technic of surgery is that now adopted by some schools of having a special course, in sections, devoted to certain typical operations on the cadaver and particularly to operations on animals.

It is not desirable to attempt to teach undergraduate students to be operating surgeons. With the complexity of modern surgery this is obviously impossible and has long since been pushed out of the medical curriculum into the part of medical education given to hospital interns. All that can wisely be taught to under-

graduates is the principles of surgery, the practice of aseptic technic and the importance of nice and delicate handling of tissue. The technic of operative surgery belongs in the post-graduate course, and no medical school can undertake to turn out surgeons but only graduates who have learned the underlying principles and are properly impressed with axioms of operative surgery in regard to the control of bleeding, the delicacy of manipulation, the avoidance of shock and the proper application of ligatures and sutures. We believe that the practice of doing surgical operations before even small groups should be confined to a minimum, and that the natural curiosity of the student to witness scenes of bloodshed should discreetly be curbed, and that he should be allowed to satisfy this natural appetite outside of required hours. A limited number of typical operations may be done to advantage but most of these should be those done outside of the abdomen, and, perhaps, among the best are those which deal with surface or extremity surgery. Care must be taken to see that the proper requirement of the hospital to get its patients operated on does not have the result that operating before the class is allowed to take up hours which should be devoted to clinical teaching.

Orthopedic Surgery

As already pointed out, it would be quite impossible to say with any exactness what field is now embraced in the term "orthopedic surgery" as part of the teaching of general surgery. On the other hand, there is a very noticeable tendency to widen its scope and undoubtedly the war gave an impetus to this tendency though it did not create it. Those portions of the field of surgery which dealt with fractures and infections and disease of bone had not proved as interesting to the average teacher of surgery as some of the other departments, notably abdominal surgery, and it was probably true that the management of these conditions was within comparatively recent times less well handled than some other departments. In the meantime the orthopedic surgeon has shown great capacity in the application of mechanical principles to these conditions and was making his influence felt in this field. The hesitation on the part of the general surgeon to turn over to the orthopedic specialist this considerable department of surgery was in some measure due to the fact that many of the men doing orthopedic surgery were not thoroughly grounded surgeons but had come to their field with a somewhat insufficient training. It is probably still true that there are not in the country a sufficiently large number of thoroughly well trained orthopedic surgeons with a broad view of surgery to warrant any sweeping changes in the teaching of this subject. On the other hand, where such men exist and are available, they are rapidly showing the capacity to

deal with this subject better than it has been handled by the department of general surgery and are to some extent taking it over. Clearly, what is actually wise to do under given circumstances must depend on the local conditions. On the other hand, if the surgery of bones and joints, in general, is to be added to orthopedic surgery, as it has ordinarily been understood, far more hours must be given to this subdepartment of surgery, but as these simply are subtracted from the total hours of surgery, no increase in the total is required.

Early in the teaching of the principles of surgery must be laid down the underlying principles of the management of fractures and dislocations. The mechanics of splints and bandages goes nicely with the principles of surgical dressings and should properly be taught early in the course. As these principles are those underlying much of orthopedic surgery, they may often, we think, be taught to advantage by the orthopedic department. The same view applies to the diseases of bones, including osteomyelitis and tumors.

They are fundamental subjects, could be taught early and fit well with the teaching of fractures. Such a preparation leads smoothly to the more advanced discussion of orthopedic conditions, including deformities and their correction.

Finally, perhaps during the latter part of the course and in the fourth year should be discussed those borderland conditions in which many departments are involved. This part of the teaching might well be included in the joint clinics where would properly come up the management of arthritis, of the paralytic deformities and the syphilitic lesions of bones and joints, combining, as they do, the joint wisdom of medicine, surgery, neurology and syphilology. In this, as in other of the subdepartments of surgery, though the relative place in the curriculum must be decided by the head of the department, the plan for the teaching of this subdepartment should be made by the teacher actually in charge. It is not possible for the general surgeon to estimate with the same soundness the relative amount of time which should be devoted to the various groups of conditions which must here be discussed. He must take advantage of the more detailed knowledge of his colleague to the end that the relatively rapid progress made in surgical specialties may be equally rapidly transferred to the student.

Genito-Urinary Surgery (Urology)

Much that has been said in the section on orthopedic surgery is applicable here and need not be repeated. It is, however, true that the field of genito-urinary surgery is changing somewhat less rapidly than that of orthopedic surgery, and that more schools

will find themselves equipped with a well developed genito-urinary surgeon capable of handling the broader aspect of the subject in a satisfactory way.

The teaching of this branch has in the past suffered from a failure to lay down at an early period in the course the fundamental underlying conditions. While it is undoubtedly true that the pathology and physiology of the urinary and genital apparatus have been taught in the preclinical years, it is nevertheless true that much has been forgotten, and that the clinical bearings of these facts could not be accentuated sufficiently. It, therefore, follows that as a preliminary to the teaching of the diagnosis and treatment in this field, the physiology and pathology of renal function should be reviewed and the test for renal function demonstrated and actually carried out by the students. The physiology of urination should be stressed, and the anatomy and physiology of the genital tract in the male reviewed carefully. Then, thorough instruction in urethral and genital infections should be given as these conditions are constantly facing every practitioner in every field. It is desirable, where possible, that the teaching of venereal infections and syphilis be conducted more or less jointly, and it will, we think, save some time if this plan can be adopted.

Next should be laid down the principles of urethral, bladder and ureter examinations and the place of cystoscopy in the diagnosis of urinary lesions. It is not possible and we believe not wise to undertake to teach the practice of cystoscopy to undergraduate students. This method of examination is not, and, perhaps, never will be, fool-proof, and while the student must clearly appreciate the essential importance of these examinations in the diagnosis of all lesions above the neck of the bladder, it will do him nothing but harm if he be led to believe that a few observations through a cystoscope entitle him to subject his patients to such examinations. Late in the course, perhaps in the fourth year, diseases of the kidney and bladder and their relation to general medicine and general surgery will form a large and important field. Some joint teaching with the department of medicine is highly desirable from the point of view of both departments, particularly when dealing with lesions of the kidney and with the obstructive lesions of the bladder where a sound estimate of the condition of the rest of the patient is essential. There is considerable danger that the student may acquire a sound working knowledge of the nature and mechanism of the obstructing prostate while overlooking the fact that these lesions can only be dealt with after a searching examination and sound knowledge of the condition of the cardiovascular, pulmonary and renal machinery of these patients.

Otolaryngology

During the past ten or fifteen years progress in the development of the specialties has been considerable. This is especially true of otolaryngology, which through the study of focal infections, cerebral localization by means of the so-called Bárány tests and of the diseases of the nasal accessory sinuses has come to occupy an important place among the clinical departments. In the time which can be alloted to the study of this work, but little more can be done than to teach the pathology and clinical manifestations of the common diseases of the ear, nose and throat, and to impress on the student the necessity for postgraduate work along this line. The method by which this can best be done has been rather carefully worked out in many schools. The differences now in the different schools seem to be chiefly in the thoroughness with which this method is carried out. It is based on a thorough study of the anatomy, physiology and pathology of the region, made in the preclinical years and must include:

1. A certain intensive section work on the patient, and a certain number of didactic lectures to supplement the section work in respect to that class of cases that cannot be studied in section. The diagnosis of the diseases of the ear, nose and throat depends on methods of examination, so technical in character and so difficult to acquire that it seems necessary to begin this work by a short intensive course in the technic of examination. This is best given in the junior year and forms one of the so-called demonstration courses given to a small section of the class. This section, preferably a small one of from ten to twelve students, may be as large as the clinical facilities and material will permit. Here, under the intimate personal supervision of the instructor, the student learns how to handle the tongue depressor, the ear and nose speculums and the laryngeal mirror. He learns to see and recognize the tympanic membrane, the vocal cords and the structures of the deeper parts of the nose. This he learns fairly well in twelve periods of two hours each, or twenty-four hours in all, during which he examines carefully about 100 patients. During this period short quizzes on the physiology, and surgical anatomy of the region refresh the student's memory and prepare him for the study of the functional tests of hearing, taste and smell. Toward the end of the course patients suffering from the common diseases of the ear, nose and throat are utilized, and the student is prepared to study them more intelligently during a later period, usually in the senior year.

2. Having completed the above work, the student is prepared to begin his senior section work. This work given to sections, preferably of from ten to twelve, continues the work of the demonstration course and occupies the same number of hours. Patients

showing the common diseases of the ear, nose and throat are utilized throughout the course. A careful and precise technic of examination is insisted on. The student must learn to decide for himself such questions as:

1. Is the tympanic membrane present?
2. Is the ear discharging?
3. Has it ever discharged?
4. Has the patient an obstructive or perceptive deafness?
5. Is some complication from the ear, nose or throat to be suspected?
6. Is nasal obstruction present?
7. Can a focal infection be demonstrated?
8. Should some pathologic condition which I cannot diagnose be suspected?

During the course, the suppurative diseases of the ear, the functional tests of hearing and of the labyrinth and transillumination of the nasal accessory sinuses are demonstrated, the diagnosis of syphilis, tuberculosis, and malignancy of the ear, nose and throat are emphasized, and the manifestations in the ear, nose and throat of diseases in other parts of the body are considered. In addition, a certain amount of operating is done before the section and the after-treatment discussed.

3. The work is completed by a course of didactic and clinical lectures to the entire class. This includes thirty-four lectures and is meant to cover a general discussion with demonstrations of cases of the common ear, nose and throat diseases, with special reference to their etiology, pathology, diagnosis and treatment. In this course are taken up chiefly:

1. Nasal obstruction and its relationship to bodily and mental development.
2. Nose and throat infections and their relationship to diseases of childhood and to the diseases of later life.
3. Those less common diseases of the ear, nose and throat that have not been taken up in the section work.

Throughout the course in otolaryngology, the effort is made to impress the student with the fact that he has not been created a specialist in this line, but that he has been given merely an outline of the work necessary for every general practitioner and that, to acquire even a working knowledge of the subject, postgraduate work is necessary.

Ophthalmology

It is recommended that the undergraduate teaching in ophthalmology be given in the third and fourth year of the prescribed medical course. No differentiation or electives to be permitted.

The instruction for the juniors should include embryology, anatomy, physiology of the eye, anomalies of refraction and demonstration of the use of diagnostic apparatus and instruments. The subject matter is to be presented by lectures, textbook work and quizzes.

The didactic and clinical demonstration course for the seniors should include lectures, demonstration and textbook work, supplemented by quizzes. Emphasis is to be given to the significance of ocular manifestations to the general pathologic process present.

The cases presented should be worked up thoroughly. Operations before the whole class are to be discouraged, this part of the instruction being reserved for section work.

The section work for the seniors should include the taking of histories, the examination of the patients, special bacteriologic examination, together with demonstration of external diseases of the eye and operative technic. Each student should receive instruction in the use of the ophthalmoscope, and be made familiar with the clinical manifestation of refractive errors and ocular muscle imbalance.

While it is impossible to give sufficient instruction in the regular medical course to qualify one as a specialist, in any sense of the word, the student should know the possible ocular manifestations of general diseased processes and be familiar with the more ordinary diseased conditions of the eye, especially with those in which the sight of the patient is in jeopardy.

The details of the method of instruction are to be left to the individual teacher.

Roentgenology

As this is the youngest of the clearly defined special departments, its position in the teaching of surgery is less accurately defined and less uniform. There can be no question of the importance of this aid to diagnosis, but its value is, perhaps, hardly greater in the general field of surgery than in that of medicine. Therefore, when it comes to the allocation of hours from the already full curriculum, it is only proper that about an equal amount of time should be taken from that already assigned to medicine and surgery. As with the other specialties, no attempt should be made to make roentgenologists out of undergraduate students. They must, however, know the theory and principles of roentgenology and above all, they must understand the place of this diagnostic method in the field of surgery. We believe that it is sound practice to begin the teaching in the third year and carry it through to the end of the course, and that this teaching should roughly follow the lines already laid down for the other specialties. Much use should be made of the roentgenologist in the joint medical and surgical clinics, as in no other way can the varying position of the method be kept constantly before the

student. The views put forward by the American Roentgen Ray Society seem to us entirely sound, and to avoid to a notable extent the danger of overemphasizing a special subject though fully recognizing its fundamental importance. The gross time devoted to the subject should probably be not far from that at present allowed to the subdepartments in medicine and surgery.

DISCUSSION

DR. M. G. SEELIG, St. Louis: Dr. Robinson opened his discussion with a quotation from a philosophical writer, Dr. Dewey, showing the relation of his ideas to medicine. I am reminded of a book by a political writer, Walter Lipman, on "Drift and Mastery," and I cannot help feeling that the drift that is so clearly evident in our confusion of thought concerning so many of the seemingly fundamental principles involved in the proper teaching of clinical surgery is eventually going to convert itself into mastery. Personally, I am in a confusional state of mind as the result of much of the discussion that we have heard and much of the deliberation aimed at rational surgical teaching. I do not know just where we are going to come out, but I think we will eventually head in the right direction if we maintain some of the fundamental principles laid down here today.

What Dr. Macleod said about art and science is particularly applicable to surgery. By intensifying the art side of surgery we have developed what the English surgeon Treves has said is the greatest possible menace, that is, the simon pure brilliant technician. That idea of surgery comes naturally from undue emphasis laid on the art side. The only man who is a real, qualified, rounded surgeon, is he who has approached surgery from his student days under the guidance and instruction of properly inspired instructors, with the idea that the fundamental regulating factor in surgery is the scientific basis on which it rests.

I was particularly interested to hear Dr. Cabot give approval to the so-called quiz. The quiz, I think, came into a state of undeserved disrepute; but if used properly it is one of the most advantageous forms not of extracting information from the student but rather of teaching him to think.

Of all the problems that confuse me as a teacher of surgery, I find the most difficult one is to get the student not so much to marshal his information as to know what his information rests on, to get him to think clinically along purely clinical lines, along lines to know what he is doing, to feel that he is being taught by the clinical men to correlate clinical phenomena with the fundamentals (which ordinarily he is allowed to assume that he may forget after his examination in the second year). He should be taught logically to see what the correlated relationships are between the preclinical branches and how they fit in with the clinical branches in the last two years.

This meeting ought not to end surgically without a word regarding what seems to be the incipiency of a deadly doctrine. There is creeping into surgical literature now the idea that the surgeon is a so-called incidental therapeutist. Largely on that basis, I think, we are seeing the development of the so-called group system in medicine. I have nothing to say about the group system, it has its advantages and disadvantages,

but one of the weaknesses in the group system is that the surgeon is likely to be relegated to the pace of incidental therapeutist—technician—medical carpenter, who performs his mechanical function, and who then gracefully and graciously retires. If this doctrine prevails, we may as well recognize that all the efforts of surgery to command her field are lost. Since the days of Ambrose Paré, surgery has struggled for her academic and scientific autonomy. And now, in this enlightened age, due to some queer eddies in the current of thought, somebody begins to spread the doctrine of the surgeon as incidental therapeutist. It is worth while considering whether this be heresy or not.

Dr. George E. Armstrong, Montreal, Canada: I am strong for teaching students methods, but there is a great difference between the teacher and the communicator of knowledge. A teacher will inspire his class with his methods after a time. His methods should begin with a certain rotation. The student never gets far until you get him to adopt a certain method. For example, in a case of fracture of a long bone, I want the student to record his observations, what he sees, what his impression is, and you will be surprised how far he can go without touching the patient. He can get the clinical history, the history of the injury, the date of the accident, and so forth.

With regard to the operative clinic: It is important for a student to see an abdomen opened, and what it looks like. You can teach the student so much more about appendicitis after he has seen a case and is shown the appendix. We may teach him a great deal about intestinal obstruction if we show him a gangrenous bowel. The instruction you give him after that is very much more valuable. He appreciates it more, and it becomes a part of his knowledge.

There are two conditions which I want the student to see once or twice, because he will have to deal with them in the country, without help. One of these is empyema. I want the student to know that a case of empyema can be operated on under local anesthesia without hurting the patient, and he can see the pus escaping from the involved area. He can see the tube put in for drainage and the dressing applied. The second condition is a fracture and a dislocation. Fractures and dislocations, so far as possible, should be dealt with before the class. They can see the splints selected, prepared and padding applied, and the way traction is applied, and all of that sort of thing, better than they can read it in the books. Fractures and empyema cases should be a part of the operative surgery course.

Another condition which is becoming more and more common, and which the student should see, is duodenal and gastric ulcer. The student should be familiar with the history of duodenal and gastric ulcer, its location, the complications possible, and if he can see one or two cases, then I think the teaching in medicine on that subject and of surgery in regard to duodenal ulcer, gastric ulcer and its complications, is much more effective.

The only other thing that I would like to mention is what I practice a great deal. I get the students always to look up a few cases and report them. If a man comes in with a Colles fracture, I want the student to know who Colles was. I want him to know who Putt was. I insist on the students reading epoch-making articles, not ordinary

articles but those that are valuable, that are advancing our profession. One important thing we should inculcate in our students is the habit of gathering information from reading.

DR. B. D. MYERS, Bloomington, Ind.: I am in entire sympathy with what Dr. Cabot said in regard to the surgeon taking advantage of the opportunity and, indeed, of the necessity of reviewing anatomy as the occasion develops. The best way I have ever seen that done was in the clinic of Professor Trendelenburg, about twenty years ago. He would say, "Learn anatomy before you come here," and would press a button by the side of the wall, the room would darken, and then on the screen he would throw charts and slides of the anatomic regions which the men had not known sufficiently well.

There is a strong sentiment here in regard to the surgeon teaching anatomy. Sentiment may lead one to a hard place, but it accomplishes nothing. Conviction becomes dynamic and something is done. Clinicians can do something that is really practical. The anatomist cannot do it all. The anatomist, in addition to teaching anatomy, is confronted with the necessity of teaching the language of medicine, and the nomenclature is not small.

The other point to which I would like to call attention is that of the quiz. There is danger, I think, always in connection with the quiz of the knowledge of the student being brought out in a fragmentary way. I believe if the student is called on in the so-called quiz to give a discussion of the subject, it is much better.

UNDERGRADUATE TEACHING OF OBSTETRICS AND GYNECOLOGY

JENNINGS C. LITZENBERG, MINNEAPOLIS; FRANKLIN S. NEWELL, BOSTON; J. WHITRIDGE WILLIAMS, CHAIRMAN, BALTIMORE

That the current methods of teaching obstetrics in this country are in need of revision was impressively demonstrated by a recent paper on the "Risk of Childbirth" by Dr. William T. Howard, Jr., lecturer on vital statistics in the School of Hygiene and Public Health of the Johns Hopkins University.

Howard directed attention to the fact that such risks cannot be determined accurately by the methods of tabulation usually employed by the health departments, and can be arrived at only by ascertaining the number of maternal deaths which occur in a given number of labors—say 10,000, in which are included all live and stillbirths occurring from the fifth month of pregnancy onward. Calculating by this method, he found that the risk of chlidbirth in the registration area of this country for 1918 was greater in urban than in rural communities. Specifically, he found that 88.84 women died out of every ten thousand delivered, and that the urban and rural rates were 92.69 and 84.22, respectively. This represents a risk of approximately 1 per cent., and means that in this country about one out of every thirty women who bear children will eventually die from causes connected with childbirth, if the estimate is accepted that 3.5 live births per marriage are necessary to keep the birth and death rates on the same level.

Howard then presented statistics from England and Wales, as well as from Scandinavia, and showed that in those two countries the risk was 40.31 and 33, respectively. In other words, in this country the risk of childbirth is more than twice as great as in England, and nearly three times as great as in Scandinavia. Such figures, of course, represent averages, and, consequently, in certain localities they may be higher or lower. Thus, for the five years, 1915 to 1919 inclusive, the risk of childbirth in the cities of New York and Baltimore was 46.11 and 64.89, respectively, as compared with 94.45 for the states of Maryland, Virginia and North Carolina.

These deplorable results can be explained only in one of two ways: either by admitting that the obstetric training of the medical profession in this country is inferior to that obtaining in the rest of the civilized world, or by attributing it to the activity of midwives, who are admittedly incompetent. At first glance, it might be assumed that the latter is the correct explanation, more particu-

larly when it is recalled that the risk of childbearing is least in countries possessing the best trained midwives. On the other hand, two considerations argue against such a conclusion: first, Howard's figures show that in this country, the risk of childbirth is greater in urban than in rural communities, and secondly, the fact that midwives are less extensively employed here than in Europe. Furthermore, the fact that in most cities physicians deliver many more women than midwives apparently indicates that the former, rather than the latter, are responsible for the excessive mortality. Should, however, the deduction be incorrect, we must then face the conclusion that radical improvement can be effected only by developing an extensive system for the training of midwives, and, worse still, by admitting that obstetrics can be practiced more safely by partially trained women with an inferior preliminary education, than by graduates of medicine who have had an extensive and expensive technical training.

Your committee regards the latter conclusion as a reductio ad absurdum, and it prefers to face the situation and to blame the conditions in this country on poor obstetric training in our medical schools, and to hold that the risk of childbirth to American women will not be reduced materially until a radical reform has been effected. We are confident that if the deans will frankly face the status of the obstetric departments in their respective schools, that the great majority will be compelled to admit that it is highly unsatisfactory, and is far inferior to that prevailing in the departments of medicine and surgery. Consequently, the committee will not undertake to lay down a detailed obstetric curriculum, but will devote the time at its disposal to the consideration of certain broad phases of obstetric education and will discuss the following problems:

1. The relation between obstetrics and gynecology.
2. The physical equipment of a woman's clinic.
3. The type of teachers required.
4. The character of teaching.
5. The minimal amount of time which should be devoted to it.

1. *The Relation Between Obstetrics and Gynecology.*—The committee is unanimous in advocating that in all university medical schools obstetrics and gynecology should be merged into a single department for teaching purposes, irrespective of what the individual members of the staff may prefer to do in their private practice

The reason for this recommendation is twofold: first, that the two subdivisions embrace the entire field of the physiology and pathology of the female reproductive organs, and thus constitute a subject sufficiently important to occupy fully the attention of well trained and intelligent men, and, secondly, they overlap to

such an extent that when taught separately, considerable reduplication of teaching effort must occur, which leads to an unnecessary waste of time which is so precious in our overcrowded curriculum.

As detailed consideration of this aspect of the subject would occupy the entire time at our disposal, we shall dwell only on a few salient points. Before entering on their discussion, it is well to decide what type of obstetrician we hope to develop for the future. During the present generation, obstetrics has become transformed from a medical into a surgical branch. Our fathers regarded it as part of family practice, and conducted it exclusively in the homes of their patients, without knowledge of asepsis, and with no other aid than a monthly nurse or some well-intentioned friend of the family. Their armamentarium consisted of the obstetric forceps and the instruments necessary for destructive operations on the child, so that patients who could not be relieved by such means were left in the "hands of God." The modern obstetrician, on the other hand, in the simplest delivery employs the same aseptic technic as he does in surgery, and demands that all complicated cases be cared for in hospitals, where the resources of a well equipped operating room, with all that the term implies, are available. The extent of the change may be appreciated by recalling that prior to 1883 not a single successful cesarean section had been performed in the hospitals of New York or Paris, while at present its results have so improved that its too frequent performance is becoming a menace to our women, as well as to correct obstetric thinking.

In other words, our fathers were man-midwives, while we aim to be obstetricians in the broadest sense of the word. If we desire to continue to train the former, the present facilities are sufficient to enable us to continue to graduate each year men and women who will be likely to maintain the risk of childbirth at its present appalling level. If, however, we desire to develop broadly trained obstetricians, we must offer the oncoming men an opportunity for surgical training. Unfortunately, this cannot be done in purely obstetric services of even considerable size, for, if they are conducted conscientiously, major operations are performed too infrequently to afford the assistants the necessary surgical training, with the result that after completing a long service they are not equipped to do the best by their patients. In that event, they must, if conscientious, refer patients requiring cesarean section or operation for ruptured uterus, extra-uterine pregnancy or other serious complications, to surgically trained men, and must eventually revert to the status of man-midwives, who will differ from their predecessors only by a knowledge of aseptic technic and of certain features of prenatal care. If these are the prospects, is there any wonder that American obstetrics has remained relatively sterile, and that men of first rate ability hesitate to take it up?

Your committee feels that the essential surgical training can be obtained only in gynecology, and conversely, that correct gynecologic thinking requires extensive obstetric training. For that reason it advocates the fusion of the two branches. That this is advisable for gynecology, as well as for obstetrics, becomes apparent on a little consideration. In this country most gynecologists have no obstetric training, with the result that, although quite one half of their work originates from injuries or infections occurring at the time of labor or abortion, they take no interest in their mode of origin or in preventing their occurrence. Moreover, they frequently attempt to relieve such conditions by operative procedures which fail to take into account the ultimate object of the reproductive apparatus, with the result that trivial abnormalities are sometimes repaired in such a manner as to render future childbearing impossible or unduly dangerous. What, for example, could be more serious for a woman, who had previously gone through a normal labor or so, than to be left in such condition, after the treatment of a cervical tear or a simple leukorrhea, that pregnancy would afterward occur with frightful regularity and each time end in the expulsion of an immature fetus? Yet this is happening constantly, and it has required thirty years for the most intelligent gynecologists to realize that, except under very unusual conditions, high amputation of the cervix is contraindicated during the childbearing period.

Your committee will leave this aspect of the subject with the statement that one may be a good gynecologic operator without having any knowledge of obstetrics, but that one cannot be a good obstetrician without being at the same time a competent gynecologist; and it is its conviction that each subject is essential to complete knowledge of the other, and that it is in great part due to lack of interest in obstetrics and in the fundamental problems underlying the reproductive process, that the gynecologist has striven to extend his field into abdominal surgery, with the result that the specialty is disappearing, and is being taken over by general surgery, on the one hand, and by obstetrics on the other.

After having considered this phase of the problem at some length, it is unnecessary to go into details concerning the overlapping of the two subjects from a teaching point of view, and it will suffice to state that the only portions of gynecology which could not be approached equally well, or better, from the obstetric side, are those connected with gonorrheal infection and certain tumor formations, and even these frequently have an obstetric bearing.

2. *The Physical Equipment of a Woman's Clinic.*—Your committee feels that the chief cause for the prevalence of poor

obstetric training in this country lies in the tardy appreciation by the authorities of our medical schools of the physical needs of the department of obstetrics. Until very recently it was generally believed that, while the teaching of medicine, surgery, gynecology and certain other surgical specialties required an abundance of adequately housed clinical material, obstetrics could be taught suitably by lectures supplemented by an outpatient service in the homes of the poor, and that the head of the department should consider himself fortunate if a few beds in a corner of the hospital were available for certain operative cases.

It can be stated without fear of successful contradiction that the predominance of German obstetrics and gynecology during the past generation was attributable to the fact that every university possessed its woman's clinic, which offered reasonable facilities for the care and study of obstetric and gynecologic patients, as well as for scientific investigation, and was conducted by men who realized that their advancement was in great part dependent on their contributions to medical knowledge. Furthermore, in many German cities, not the seat of a university, similar clinics were maintained at the expense of the community, and offered superior facilities for the training of students and young assistants.

In this country, on the other hand, Columbia is the only university medical school which possesses a woman's clinic physically adequate to its needs, although several other schools maintain rudimentary clinics, which are much inferior to those of even the smallest German university. Indeed, it may be said that in this respect the facilities available in this country are not comparable to those obtaining in Germany at the end of the Franco-Prussian war. Fortunately, the need has at last been recognized and is slowly being met, as funds are now available at Harvard, Johns Hopkins, Iowa and possibly at several other universities for the erection and maintenance of adequate women's clinics. It will, however, be many years before such institutions become general, and until they are, obstetric instruction must languish, and with a few exceptions the best type of graduate must be expected to enter other and better organized fields of medicine.

It is the general feeling of the committee that an adequate supply of indoor clinical material is essential to the proper teaching of obstetrics, and that its lack cannot be supplied by work in the homes of the poor, no matter how extensive. Of course, it is realized that such a service may be extremely valuable, not only as a feeder of abnormal material into the clinic, but also as a means of affording additional experience to advanced students. Generally speaking, however, the committee believes that one adequately conducted hospital delivery equals at least three outpatient cases in teaching value, and that the latter should eventually be elim-

inated from undergraduate teaching, as their employment is as illogical as to attempt to teach medicine and surgery under similar conditions.

How serious a financial and economic problem is the maintenance of a woman's clinic adequate for the instruction of a class of 100 students will be realized from the following figures: Admitting for the sake of argument, that each student should participate in the conduct of at least ten indoor deliveries during his third year, and conduct as many more in the outdoor service during his fourth year, and admitting that it is unsafe for more than two students and an instructor to examine each patient vaginally, it becomes evident that 500 labors at term will be required each year to afford the necessary teaching material. Moreover, when it is recalled that a considerable number of patients are admitted in the act of aborting, that many are in such condition that they are not available for examination by students, that others are delivered precipitately before examinations can be made, and that the service must be maintained during vacations, as well as throughout the academic year, we calculate that the clinic must admit at least 900 patients per year in order to have 500 deliveries available for teaching purposes.

What does this mean in bed capacity? If it be calculated that each patient will have an average stay of three weeks in the clinic, each bed will accommodate seventeen patients during the year, which means that from fifty to sixty beds must be available for obstetric patients and about one half that number for gynecologic patients. In other words,, a woman's clinic adequate for the training of a class of 100 students, must have from ninety to 100 ward beds constantly available. In addition, it must also maintain an efficient outpatient department to serve as a feeder, as well as to afford the necessary facilities for prenatal and postpartum care and for follow-up work.

Furthermore, when it is remembered that the full value of such a clinic will not be realized unless it is prepared to study scientifically certain of the problems incident to the handling of such numbers of patients, it must be provided with well-equipped laboratories for histology, chemistry, bacteriology and physiology; and, more particularly, it must have command of funds with which to pay a certain number of young teachers and investigators who cannot spare the time to support themselves by outside practice.

Merely to sketch such ideals must cause chills to creep up the spines of university presidents and medical deans, as they wonder how the necessary funds can be provided, and yet your committee is confident that ideal conditions will not prevail until every university medical school possesses a woman's clinic adequate for the training of its students in obstetrics and gynecology.

3. *The Type of Teachers Required.*—Fortunately, this side of the problem can be disposed of rapidly. It must be apparent that men of the type necessary to head woman's clinics such as we have outlined will be chosen not for their success in private practice nor for political considerations, but rather because they have demonstrated by their ability as teachers and by their contributions to the knowledge of their special field that they will be prepared to spend the rest of their days in demonstrating to younger men the joy of a life devoted to the pursuit of knowledge and to the welfare of the patients and students committed to their care.

The director of such a clinic must inevitably be a "full-time" man, and devote his entire energy to its interests. We believe, however, that time will prove that it will be a matter of indifference whether he be paid a comparatively large salary and be obliged to restrict his services to nonpaying patients, or whether he be paid a smaller salary and be provided with a small service for private patients (not exceeding eight or ten beds) from whom he can collect fees. The essential feature is that all his work must be done in the clinic, and be so arranged that a certain amount of time will be available for productive research.

Given such clinics and such directors, no serious difficulty will be experienced in filling the subsidiary posts, and within a few years so enthusiastic a body of young workers will have developed that we shall no longer be ashamed of American obstetrics and gynecology, and shall not have to debate whether obstetrics can be practiced more safely by medical men or by midwives, nor to inquire where obstetrics ends and gynecology begins, or vice versa.

Such ideals, of course, belong in great part to the future, and for the present those responsible for the departments of obstetrics and gynecology must realize that they will fulfill their teaching obligations imperfectly until suitable conditions obtain. Consequently, they must be prepared to sacrifice both time and money in order to prepare for their successors post of the type of which they can only dream. It is, however, the conviction of your committee that teachers who face the situation in such a spirit can be relied on to utilize to the fullest extent whatever opportunities for teaching are at their disposal.

4. *The Character of the Teaching.*—Your committee holds that with the comparatively short time available for instruction in obstetrics and gynecology in the medical curriculum, it is as irrational to expect that recent graduates should be competent obstetricians as that they should be accomplished operative surgeons, and that they cannot be regarded as safe practitioners until

they have served a year's internship, nor as experts until they have served an apprenticeship of from three to five years in a well-organized woman's clinic.

So far as undergraduate students are concerned, only two things can be expected from such a clinic: (1) that it furnish an adequate supply of material for clinical instruction; and (2) that the existence of a body of assistants in various stages of training, and particularly contact with those in pursuit of research along both clinical and scientific lines, will serve to impress the student with the fact that he is obtaining merely an introduction to a subject, which he can hope to master only after years of patient work, instead of feeling, as he now so often does, that he has a satisfactory knowledge of obstetrics and needs but an opportunity to become a competent and money-making gynecologist.

What should be done for the student in the way of direct instruction? In the first place, we should teach him obstetrics as a continuation of his course in general biology, and impress on him the significance of reproduction as one of the fundamental life processes. He should be taught that all he can expect to obtain during his medical course is a superficial but intelligent view of the subject and sufficiently practical training to be able to conduct normal deliveries. Especially should he be impressed with the relation which obstetrics bears to preventive medicine, and he should learn that a great part of the ills peculiar to women are the result of defective care at childbirth, and that the most efficient method of lowering the death rate in any community is by diminishing the number of children which are born dead or which die during the first month of life. He should also learn that the venereal diseases, broadly considered, come next after tuberculosis as the chief cause of death, and that fatal puerperal infection is almot entirely preventable, and that its frequent occurrence is as great a stigma on the intelligence of a community as epidemics of typhoid fever. Finally, he should learn that abnormal obstetrics, and gynecology in general, are as much beyond his ability as is major surgery, and that he can prepare to deal with them satisfactorily only by intensive postgraduate work.

The undergraduate teaching should be of two types—a minimal course required as a prerequisite for graduation, and after its completion as many short elective courses as possible for smaller groups of students who desire additional training.

The obligatory work must consist of class exercises and of practical work. The former may be in the form of didactic lectures, although most teachers are coming to prefer recitations, in which all possible pedagogic aids are employed, such as free-hand blackboard drawings, charts, illustrations, lantern demon-

strations, the exhibition of specimens and the demonstration of patients. The practical work must be conducted in small groups in which the student comes in direct contact with the patient in the dispensary, in the wards and in the delivery and operating rooms. For this purpose, the dispensary and hospital services should be conducted as an interlocking whole, and provided with an abundance of graduate, trained, social service workers so that the student will promptly realize the importance of prenatal and follow-up work, especially in its bearing on the public health.

In a well-organized service, every student as soon as he has learned obstetrical anatomy and the physiology of normal labor, should serve for at least two weeks in the dispensary—spending the first week in learning the essentials of obstetric examination, palpation and pelvimetry, and the second week in becoming acquainted with the details of prenatal care, particularly as it concerns the recognition and treatment of syphilis, the prophylaxis of eclampsia, and the recognition of the existence of abnormal presentations and of disproportion between the size of the child and the pelvis. Later, he should be afforded additional facilities for perfecting himself in the technic of pelvimetry and palpation on patients awaiting delivery in the wards, and then be given the opportunity to take part in at least ten normal deliveries in the ward, being required to follow each patient from time of admission to the delivery room until she is discharged from the hospital. Merely witnessing deliveries is not enough, but each patient should be palpated and examined rectally and vaginally, and toward the end of his experience each student should be allowed to deliver several patients under the supervision of a competent instructor.

In the postpartum clinic the student should be taught that his responsibility does not end with the delivery of the patient, but continues until she can be discharged in such physical condition as to be able to attend to her household duties without effort and to suckle her child. For this purpose he should attend the postpartum clinic and learn from personal experience to recognize abnormalities in the involution of the uterus, and particularly to appreciate the part played by labor in the production of uterine displacements and injuries to the birth canal, as well as learn which cases may be treated palliatively and which require prompt operative treatment. In the same clinic he will likewise have opportunities for learning the relationship existing between puerperal and gonorrheal infection and pelvic inflammatory disease, as well as certain types of sterility. As far as possible, unusual conditions complicating pregnancy or the puerperium should be demonstrated to larger groups, which should afterward have an opportunity to follow their outcome by means of ward visits.

So far as obligatory gynecology is concerned, major attention should be directed toward such subjects as sterility, dysmenorrhea, uterine displacements and the significance of uterine hemorrhage. The greatest importance should be attached to the individual examination of patients in the dispensary, as well as under anesthesia after admittance to the ward. On the other hand too much stress should not be laid on attendance on major operations. Operative clinics before the entire class have proved to be almost valueless as a means of instruction, consequently they should be done away with and be replaced by operations before small groups of students, which have been carefully selected for their teaching value.

The fundamental obligatory courses should be conducted by the professor and by the senior members of the department, who should likewise take part in the various phases of the practical work, although, of course, it cannot be expected that each student can hope to receive personal demonstrations from the head of the department on every point. Your committee lays the greatest stress on the importance of the professor personally conducting such courses as demonstrate the interlocking relations between gynecology and obstetrics, and also on his taking a personal, although necessarily small, part in the various phases of dispensary activity, as experience shows that without it, the work will inevitably "slump," and will fail to develop its greatest possibilities for patient and students.

If possible, a laboratory course in obstetric and gynecologic histology and pathology should form part of the obligatory instruction, but where it is not feasible, all students should be encouraged to take it as an elective. In addition, as many short elective courses as possible should be offered to students who have completed their obligatory work. Such courses may be given in part by the professor and the senior members of the staff, but they offer a predominant opportunity for the younger members of the staff to teach subjects in which they are particularly interested, and make it possible for many subjects to be taught to small groups, which are either too advanced or too technical to be presented to the entire class. The following list of courses by no means exhausts the possibility of this type of instruction:

1. History of obstetrics and gynecology.
2. Contracted pelvis.
3. The metabolism of pregnancy.
4. The care and diseases of young infants.
5. Rudiments of teratology.
6. Comparative placentation.
7. Sterility and allied problems.

8. Relation of the ductless glands to the reproductive system.
9. Clinical conferences.
10. Intensive work in various dispensary activities.
11. Additional outpatient work.
12. Student internships, etc.

5. *Minimal Time Required.*—Your committee feels that the required work in obstetrics and gynecology should be given in the third year, or possibly during the second term of the second year as well, and that a minimum of approximately 200 to 250 hours should be required of each student somewhat as follows:

OBSTETRICS	Hours
Recitations or lectures, including exercises on the manikin, three times a week	99
Ward rounds, or examination of patients	16
Dispensary, technic or examination	12
Dispensary, prenatal care	12
Dispensary, postpartum clinic	12

Conduct of 10 deliveries, no fixed hours.
(Students to live in hospital, while on delivery duty.

GYNECOLOGY	
Recitations or lectures, once weekly	33
Ward rounds or operations	16
Dispensary, diagnostic examinations	12

COMBINED	
Ward service as clinical clerks	from 2 to 4 weeks

If desirable, fourth-year students may be required to conduct, under proper supervision, in the outdoor service, from five to ten additional deliveries, according to the size of the service and the number of students in each class. Furthermore, a limited number may be selected to serve as student interns in the clinic for periods of from four to six weeks. Otherwise, all fourth-year work should be elective, and consist of certain of the short courses already outlined, as well as of additional opportunities to witness abnormal deliveries and more complicated operations than during the third year.

The point on which the committee desires to lay the greatest emphasis is that the value of obligatory instruction in any subject lies not so much in the time occupied as in the manner in which it is given. If the student is brought into direct personal contact with the personnel of an enthusiastically conducted clinic, he will receive an impression concerning its aims, which he will fail to get from freer access to a service of much larger size conducted in a

perfunctory manner. Consequently, the secret of sound obstetric and gynecologic teaching consists in providing the department with an adequate but not excessive supply of well-housed clinical material, but particularly with teachers who are more interested in the scientific and humanitarian aspects of their work than in its financial reward. From the teaching point of view, if these two prerequisites are available, all other things will eventually be added to them.

DISCUSSION

DR JOSEPH B. DE LEE, Chicago: I agree with Dr. Williams as to the necessity of having the gynecologic and the obstetric teaching under the headship of one professor, and the advisability of having that one professor a full time man. The difficulties in getting a full time man, however, are very great, and in most cities they are insurmountable at present, principally for financial reasons. The advantages of the full time man are patent. The advantages of having the two subjects under the one headship are not so evident that there is a general agreement on them. For domestic reasons, for reasons of management, there is difficulty in combining operative gynecology and obstetrics. These difficulties would not be insurmountable in a well organized clinic, and especially if a man were devoting all of his time to the subject. The difficulty has been to get men interested enough to take up obstetrics, and even if they have taken up obstetrics, a few years of practice has shown them the futility of trying to make a good living and provide for the future, so they gradually slip off into the easier and more lucrative practice of gynecology. That has been the experience in Chicago of all the men who have come here and taken up the two departments. As soon as they become expert gynecologists, they become inexpert obstetricians. They forget what obstetrics they knew, or what they knew has become old and unusable in the advance of time.

There are a few points in Dr. Williams' report which deserve emphasis, the first one of which was the statement that in the United States the mortality of childbirth was higher than in European countries. I would like to disagree with that statement. The statistics that have been published in the United States are very uncertain, and I have made it a rule not to base generalizations on them that I would try to defend.

In the first place, our birth registration is very inadequate. All over the United States birth registration is insufficient. I can say it is particularly inefficient in Chicago because I know it is. In the second place, there is a large part of the country that is not registered as to deaths. Reports of deaths are not recorded.

DR. WILLIAMS: This is the registration area that I talked about.

DR. DE LEE: In the registration area, if the births of individuals are not recorded, you would not get the relation of births to the number of deaths.

Another point which makes comparative statistics not so available, is that in some European countries they still have difficulty in getting stillbirths and births properly registered. My observation of European obstetrics, and I have seen it in England, in France, in Germany, and in Austria, is that the doctors over there do just as poor work, if not

poorer, than we do over here, and midwives are no better. The president of the Midwife Association told me the condition of the practice of the midwife was absolutely miserable. He did not see that there was any hope for it. He hoped that they would have something better to show in the lines of outpatient clinics, such as we are trying to establish.

In Chicago the number of deaths per year in maternity cases varies from 110 to 210. It is not as large as would be indicated by the generalization of one in thirty, but the maternal mortality is less than 3 per cent. Some years ago, I think it was Brothers, of New York, who tried to get the statistics for New York City, and he found that one in a hundred died during childbirth. About twenty years ago in the United States there was a guess made by some one of 1 in 72. For our own protection, I believe that the 1 in 30 report should be most thoroughly investigated before being accepted.

DR. L. E. BURCH, Nashville, Tenn.: In the past the trouble between gynecology and obstetrics has been that a wall was built between the two subjects, and they have always remained separated. This should not be the case. In a university hospital the man in charge of obstetrics should also be in charge of gynecology. He should have had a broad obstetric and a broad gynecologic training. I do not mean that the head of the department should practice either gynecology or obstetrics alone. I do not think that it is possible for a man to attend a large obstetrical service and at the same time carry on a large gynecologic service, for the reason that if he is up all night attending obstetric cases, it is impossible for him to be in charge of the department to do himself or his patients full justice if he has lost all of that sleep. I do believe that it is absolutely essential that the two departments should be drawn together and placed under one head.

In regard to teaching, I think we have all made the mistake in not giving the students personal supervision, and if we can teach our students obstetrics in a hospital it is more valuable under proper supervision than sending them from one end of the town to the other without any supervision whatever.

In laying down the course, one teacher teaches one way, and another teaches another way. One man gets results by a certain method, while another gets his results by a different method. I have obtained the best results by assigning a lesson in a standard textbook, and then bringing out the important points before the students and trying to impress on them the things that they should remember in this lesson, at the same time elucidating the subject with models, charts, lantern slides and pathologic specimens. I believe in this way you can get closer to the student; you can make him appreciate the important points, and at the same time not burden his mind with the points that amount to very little.

DR. JAMES M. H. ROWLAND, Baltimore: In the matter of the combination of gynecology and obstetrics into one chair, there can be no doubt of the advisability of that in university teaching, where the course is established on a university basis, and where the teacher is a full time man. There is not the slightest doubt that the best teaching will be done in any branch when a man gives his whole time to it. It could result in nothing but the best sort of teaching. Whether that would be advisable in all schools or in all subjects, I do not know, but it certainly would tend to give the best teaching.

As to the character of the teaching that should be given students, there is no doubt that a well demonstrated case of labor in a hospital is worth more than any case can possibly be on the outside, but students cannot see a sufficient number of cases or a satisfactory variety of clinics in hospitals, unless each school has a very large lying-in hospital.

The thing that has impressed me most in going about the country and looking over the clinics in the various teaching centers has been that while we are constantly teaching students that obstetrics should be done with as careful technic as a surgical operation, all over the country one is seeing students sent to do outdoor obstetric work with the most meager equipment, and with instruction that certainly does not advise them to be particularly careful in their aseptic technic. That has been the most amazing thing to me in the various outdoor clinics I have visited. It strikes me that it is the height of absurdity to teach careful technic in a hospital and send students out improperly prepared to practice it on the outside. I am a great believer in the worth of an outdoor clinic, but I do not think cases should be conducted on the outside by undergraduates without careful supervision. That is a most serious mistake. Constant, careful supervision is necessary, and I think the daily recording of the condition of the patient after delivery, checked up by a visiting graduate instructor, has been one of the most helpful things in the instruction of our students. I think most of us probably are teaching obstetrics fairly well in hospitals; probably many of us are teaching obstetrics fairly well from a didactic and clinical standpoint. The difficulties I have found among men engaged in the practice of obstetrics, judging from the cases that come into the hospital are these: in the first place, not sufficient emphasis is laid on the fact, and the student never seems to learn, that the vast majority of women will be delivered normally if they are let alone; that is, provided they have proper prenatal care and are watched during their delivery. The second point is, if it is apparent during the labor that the woman is not going to be delivered normally there is no use in meddling with the case until nobody can deliver it properly. Those are two of the great lessons students do not seem to be able to learn. Men seem to forget so quickly the lessons they are taught, but certainly among the things that are most important in making men more careful and efficient, which have been introduced in the last eight or ten years in obstetric teaching, the conduct of labor without too much interference is the greatest, and while some of them have gotten it, many have not. From the experience I have had with men on the outside, I should say obstetric teaching falls down as much in that point as any other, that the men are taught too much what to do and not quite enough as to what they should not do.

Dr. Jennings C. Litzenberg, Minneapolis: We should keep clearly in mind that we are medical teachers and not practitioners of medicine here today. The most important parts of our report are these: First, from a pedagogic standpoint, obstetrics and gynecology are logically inseparable. You cannot make a good obstetrician without training him gynecologically, and if you will permit me to say so, I affirm that you cannot make a good gynecologist without extensive obstetric training.

The next point that is important is that obstetrics and gynecology have not been given due consideration in our medical schools. As we have said in our report, and those of you who are teachers and deans

particularly, have been put off into some corner of the hospital, and told to be content with leavings. In Minnesota we have only one-half of the beds to which we are entitled, according to the recommendation of the Council on Medical Education of the American Medical Association. We have said in our report that we believe that one case, taught properly and handled in the clinic indoors, is worth three—and personally I believe it is worth ten—on the outside.

The other important thing is that the teacher should be a full time man, either on a sufficient salary, so that he can devote his time entirely to the nonpay patients, or he may be allowed a small number of pay patients, so that men of ability may be attracted to this specialty which is worthy of the best minds in America or in the world.

I have said at home that I am only a kind of John the Baptist trying to prepare the way for a full time man, and I hope still further that I shall be the last man who is compelled to give three-quarters of his time to the university and then spend his nights trying to make a decent living.

DR. GEORGE M. KOBER, Washington, D. C.: My own estimate of the importance of obstetrics and gynecology is best evinced by the fact that these services occupy about one-third of the entire bed capacity of the university hospital, which has 250 beds. We have also a prenatal clinic which is a life saving institution, and a good infant welfare station. Dr. Williams has adduced statistics showing a frightful mortality in what is ordinarily considered a perfectly normal process. When I was a student, I was taught that meddlesome obstetrics is a very dangerous thing for mother and child, and we all must deplore the tendency at the present time of hasty recourse to instrumental deliveries. I believe there is a distinct need in awakening the conscience in regard to the sanctity of life and our duties and responsibilities. Our senior students receive a few lectures on general ethics, followed by a special reference to unnecessary, meddlesome and unjustifiable procedures, in which the wrongs of craniotomy are especially emphasized.

DR. ALICE W. TALLANT, Philadelphia: I should like to make a plea for outdoor obstetrical service. After students have had indoor work demonstrated to them in their third year, as obstetrics is now, it is valuable for them to learn as much as they can about these patients in their homes. Unfortunately, medical students are not able to have three cases in a hospital, but in the homes they will have them under all sorts of conditions and descriptions.

JOINT ANNUAL CONFERENCE ON MEDICAL EDUCATION AND LICENSURE OF THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION, THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES, THE COUNCIL ON HEALTH AND PUBLIC INSTRUCTION, THE FEDERATION OF STATE MEDICAL BOARDS OF THE UNITED STATES, AND THE AMERICAN CONFERENCE ON HOSPITAL SERVICE

This conference was held in Chicago, March 7-10, 1921. The program was a joint one and continued for four days. On the first day the chairman of the Council on Medical Education and Hospitals presided; on the second day the president of this Association presided.

The contributions to the program made by this Association consisted of the reports on teaching of medicine and medical specialties; surgery and surgical specialties; obstetrics and gynecology.

These committees were:

MEDICINE

Charles P. Emerson, chairman; George Blumer, George Dock, Wm. S. Thayer.

DERMATOLOGY

J. A. Fordyce, chairman; W. G. Wende; M. F. Engman; C. J. White; Udo J. Wile.

PEDIATRICS

J. P. Sedgwick, chairman; F. B. Talbot; L. R. DeBuys; Wm. P. Lucas; C. A. Stewart.

NEUROLOGY AND PSYCHIATRY

C. Macfie Campbell, chairman; Foster Kennedy; Albert P. Barrett.

SURGERY

Hugh Cabot, chairman; R. B. Greenough; Dean Lewis.

ORTHOPEDIC SURGERY

R. B. Osgood.

GENITO-URINARY SURGERY

H. W. Plaggemeyer,

OTOLARYNGOLOGY

R. B. Canfield.

OPHTHALMOLOGY

W. R. Parker.

OBSTETRICS AND GYNECOLOGY

J. Whittridge Williams, chairman; J. C. Litzenberg; Frank S. Newell.

At this meeting the president, Dr. Pepper, read his president's address, entitled, "Higher Medical Education, The True Interest of the Public and of the Profession."

MINUTES OF THE THIRTY-FIRST ANNUAL MEETING HELD AT CHICAGO, MARCH 8, 1921

The representatives to the meeting convened in the Florentine Room of the Congress Hotel, and the meeting was called to order by the president of the Association, Dr. William Pepper, at 2 p. m.

ROLL CALL

The roll call showed that fifty-four of the colleges in membership were represented by delegates, as follows:

Leland Stanford Junior University School of Medicine.—Ray Lyman Wilbur, W. Ophüls.

University of Colorado School of Medicine.—Charles N. Meader.

Army Medical School.—M. W. Ireland.

Navy Medical School.—W. C. Braisted.

George Washington University School of Medicine.—William C. Borden.

Georgetown University Medical School.—George M. Kober.

Howard University School of Medicine.—Paul Bartsch.

University of Georgia Medical Department.—Hugh N. Page.

Northwestern University Medical School.—C. W. Patterson.

Rush Medical College.—J. M. Dodson.

University of Illinois College of Medicine.—A. C. Eycleshymer.

Indiana University School of Medicine.—C. P. Emerson.

University of Iowa College of Medicine.—L. W. Dean, J. F. McClintock.

Tulane University of Louisiana School of Medicine.—J. T. Halsey.

Johns Hopkins University Medical Department.—J. Whittridge Williams.

University of Maryland School of Medicine, College of Physicians and Surgeons.—J. H. M. Rowland.

Medical School of Harvard University.—Alexander S. Begg.

Tufts College Medical School.—W. E. Sullivan.

Detroit College of Medicine and Surgery.—W. H. MacCraken.

University of Michigan Medical School.—C. W. Edmunds.

University of Minnesota Medical School.—E. P. Lyon.

University of Mississippi School of Medicine—J. O. Crider.

St. Louis University School of Medicine.—H. W. Loeb.

University of Missouri School of Medicine—Guy L. Noyes.

Washington University School of Medicine.—N. Allison.

John A. Creighton Medical College.—H. von W. Schulte.

University of Nebraska College of Medicine.—Irving S. Cutter.

Columbia University College of Physicians and Surgeons—William Darrach.

Cornell University Medical College.—Walter L. Niles.

Long Island College Hospital.—A. M. Miller.

Syracuse University College of Medicine.—John L. Heffron.

University and Bellevue Hospital Medical College.—John H. Wyckoff.

University of Buffalo Medical Department.—C. Sumner Jones.

University of North Dakota College of Medicine.—H. E. French.

Ohio State University College of Medicine.—E. F. McCampbell.
University of Cincinnati College of Medicine.—K. V. Blackfan.
Western Reserve University School of Medicine.—C. A. Hamann.
Hahnemann Medical College and Hospital.—W. A. Pearson.
Jefferson Medical College.—Ross V. Patterson.
University of Pennsylvania School of Medicine.—William Pepper.
University of Pittsburgh School of Medicine.—W. S. McEllroy.
Woman's Medical College of Pennsylvania.—Martha Tracy.
Medical College State of South Carolina.—W. F. R. Phillips.
University of South Dakota College of Medicine.—C. P. Lommen.
Vanderbilt University Medical Department.—Lucius E. Burch, G. C. Robinson.
University of Tennessee College of Medicine.—McIvor Woody.
Baylor University School of Medicine.—W. H. Moursund.
University of Texas Department of Medicine.—W. S. Carter.
University of Vermont College of Medicine.—Henry C. Tinkham.
Medical College of Virginia.—E. C. L. Miller.
University of Virginia Department of Medicine.—Theodore Hough.
Marquette University School of Medicine.—Louis F. Jermain.
University of Wisconsin Medical School.—C. R. Bardeen.

MINUTES OF THE PREVIOUS MEETING

The secretary submitted the minutes of the previous meeting as published in the volume of Transactions for 1920, pages 177-199, and, on motion, they were adopted as printed.

REPORT OF THE SECRETARY-TREASURER

The secretary presented the following report:

The short time allotted for the business meeting this year is the reason for the brevity of this report. You have the program for the meeting before you. It is the result of many conferences between the secretaries of the organizations represented therein. Unfortunately, participation in the Congress by so many organizations, has lengthened the program to four days, but effort will be made next year to shorten the program so that it will come within the desired three days' limit.

The transactions for the 1920 meeting have been sent out in sufficient number so that each faculty is well supplied. Those colleges that made a definite requisition for a certain number, have received the number asked for; colleges not asking for any copies, have been sent the number which it was believed would be required to supply the departments concerned in the discussion last year. The same procedure will be adopted this year for the distribution of the transactions for this meeting.

Arrangements have already been perfected for presenting at the next annual meeting a detailed report on teaching facilities—material and equipment—by the Committee on equipment, of which Dr. John T. McClintock of the State University of Iowa, is chairman.

The business referred to the chairman of the Executive Council during the year will be reported on by the Council later.

The membership has not undergone any change. A number of colleges in membership have been inspected during the year: University of Texas; Baylor University and Tulane University by the secretary; University of Louisville; Indiana University; University of Cincinnati; Ohio University; Western Reserve University, by the chairman of the Executive Council. One college applied for membership—the School of Medicine of Loyola University, Chicago. The college was inspected by the chairman of the Executive Council, accompanied by the secretary. The report was made to the Executive Council and will be discussed later.

At the request of the International Health Board, through Dr. Victor G. Heiser, the president appointed a committee which consulted with Dr. Heiser with reference to the desirability of changing the teaching courses in hygiene and public health in the medical schools. This committee consisted of Drs. M. J. Rosenau, chairman; William H. Park and Alexander C. Abbott.

The treasurer reports a cash balance on hand of $2,100.20.

(Signed) FRED C. ZAPFFE.

On motion, duly seconded and carried, the report was ordered published in the transactions and the financial statement was referred to the auditing committee.

The report of the Executive Council was called for and read by the chairman of the Council, Dr. Irving S. Cutter.

REPORT OF THE EXECUTIVE COUNCIL

The Executive Council has held a number of meetings at which were discussed problems which have arisen in the course of the past year, and such business as comes within the province and jurisdiction of the Council.

The Executive Council is of the opinion that the membership of this Association does not demand that a report be made of transactions conducted during the year, unless action by the Association is required. Therefore in this report only such matters will be referred to as must properly come before the Association for definite action.

1. Boston University School of Medicine.—Application for membership was made, but on request of the institution action will be deferred until further notice. An inspection was made by Dr. Pepper and his report is in the hands of the Executive Council. The college wishes to make suggested changes, when another inspection will be asked for.

2. Loyola University School of Medicine.—Application for membership was made and the college was inspected by the chairman of the Executive Council and the Secretary. The Executive Council recommends acceptance of the application.

3. West Virginia University School of Medicine.—Correspondence from the president of the University, Dr. Trotter, indicates that changes have been made to overcome the objections raised by the inspection committee at the time of the 1919 inspection, and a reinspection is asked for. In order that the standing and collegiate status of the students of that institution will not be affected unfavorably by the action taken at the last annual meeting, putting the school in a state of suspension for the time being, the Executive Council recommends that if a reinspection shows that the school is now conforming with all the requirements of this Association, it be automatically reinstated in membership, and that

other medical colleges to which the students of the West Virginia University School of Medicine may apply for completion of their medical work be authorized to grant them admission to full standing without prejudice.

4. Baylor University College of Medicine.—Notice having been received from this institution that many changes had been made to overcome the objections raised at the last inspection, and the Executive Council having satisfied itself that statements made are in accordance with the facts, it is recommended that the membership of this institution be continued for one year, pending the findings of a reinspection.

5. The Executive Council received reports on the inspection of colleges in membership in the states of Texas, Indiana, Ohio, Louisiana, ,Kentucky, but as no action needs be taken in any case, no special report will be made to the Association. It is expected that before 1922 all the colleges in membership will have been inspected.

6. The Executive Council recommends that membership in the National Council on Education be discontinued. The emergency which arose during the war and which demanded that concerted action be taken by the various educational organizations for the purpose of furthering efficiency in various directions, no longer exists, and inasmuch as the work done by the National Council on Education at this time does not have any bearing on medical education and further inasmuch as the emergency created by the war no longer exists, the Executive Council is of opinion that membership is no longer desirable.

Respectfully submitted,

(Signed) IRVING S. CUTTER,
WILLIAM PEPPER,
JAMES EWING,
FRED. C. ZAPFFE,
W. S. CARTER.

On motion, duly seconded, the various recommendations of the Executive Council, respectively numbered 1, 2, 3, 4 and 6, in its report be concurred in and adopted as binding on this Association.

REPORT OF COMMITTEE ON MEDICAL EDUCATION AND PEDAGOGICS

The report of this committee consisted of the reports made on the teaching of medicine and medical specialties; surgery and surgical specialties; obstetrics and gynecology (see pp. 11, 44 and 63).

On motion, duly seconded, the report was received and ordered published.

REPORT OF COMMITTEE ON POSTGRADUATE DEGREES

The Committee on Postgraduate Degrees, Dr. A. C. Eycleshymer, chairman, reported as follows:

Before considering the advanced degrees in medicine, it is well to have in mind the academic degrees which are intimately related to the medical curriculum. These are the A.B. and S.B. The fulfillment of the conditions imposed by the colleges and universities, as far as the medical schools are concerned, results in the student taking about three years in the liberal arts course plus one year in medical subjects for the A.B. degree.

The requirements for the B.S. degree permit the student to take about two years of work in the liberal arts course and two years in medical subjects. It is thus fair to assume that practically all medical students in universities have completed the requirements for an academic degree at the end of the first or second year in the medical school. At this time the student is prepared to begin investigative work. He should be afforded an opportunity and encouraged to undertake such work whether he contemplates the practice or teaching of medicine as a vocation; the practice of medicine demands the investigative attitude of mind and the teaching of medicine demands productive scholarship. It is all important that we give immediate and serious consideration to the fact that graduate work in medical schools is rapidly decreasing. Without graduate students it is of little consequence to continue the discussion of graduate work and its certification.

At the last meeting of the Association of American Universities, its Committee on Academic and Professional Higher Degrees considered the reports of the Committees on Graduate Work from both the Association of American Medical Colleges and the Council on Medical Education, and concluded that these reports were essentially in harmony with the principles adopted by the Association of American Universities.

The opinions of all three committees may be briefly summarized in the following recommendation. The M.A. and M.S. should be the only Masters' degrees given for work in the medical sciences including public health. The PH.D. should be the only degree given in the medical sciences, including public health, certifying the power of independent thought and the ability to do investigative work of a high grade. The work leading to these degrees should be under the auspices of, and approved by, a graduate school of equal standing with those of the Association of American Universities. The Sc.D. should be construed as an honorary degree. For work in review or extension courses, commonly designated as practitioner's or postgraduate courses, certificates should be given by the medical school.

The committee suggests that the Masters' degrees (M.A. and M.S.) imply at least a year's advanced study in something besides new clinical or laboratory technic or besides latest information. They should be concerned rather with new theory and investigation and they should also conform to the requirements put on Masters' degrees in other subjects, that the major study be supported by a minor, that is, by cognate subjects, by subjects insuring to the purely professional courses the advantages of fundamental science and of general outlook. So conceived, the Masters' degree, like the Doctorate, should be administered as a graduate degree, by a university graduate school. In other words, it should partake of the university spirit in distinction from the always narrower spirit of a profession.

(Signed) A. C. EYCLESHYMER, Chairman.
A. ROSS HILL.
E. P. LYON.

On motion, duly seconded, this report was received and ordered spread on the minutes. The committee was continued.

REPORT OF DELEGATE TO NATIONAL COUNCIL ON EDUCATION

Dr. Burton D. Myers read his report, which was as follows:

The American Council on Education is now fully organized ,with Samuel P. Capen, formerly of the U. S. Bureau of Education as director.

The Council has an annual budget of over $20,000 per annum for a period of five years.

It is organizing slowly but with care and the splendid committee appointed promises well for the success of the Council.

It is true that the Council has not been active in the field of medical education. Such activity was not needed as this Association and the Council on Medical Education is caring for this field in a splendid way.

It has never been the purpose of the Council to supplant organizations functioning well.

It has been the purpose of those interested in the Council, that it should serve as a common agency through which all other educational associations might secure hearings, and possibly action on matters of national or international educational importance; an agency through which they might work together for ends unattainable as separate organizations.

The annual membership fee, $100, is very small, the purpose is worthy. The American Council on Education should have a fair chance to show what it can do.

I recommend that the Association of American Medical Colleges retain membership in the American Council on Education, that the annual fee of $100 be paid and a committee of three be appointed to represent this Association on the Council.

(Signed) BURTON D. MYERS.

REPORT OF SPECIAL COMMITTEE ON TEACHING HYGIENE

The Committee on Teaching of Hygiene of the Association of American Medical Colleges—M. J. Rosenau, chairman; Wm. Halleck Park and A. C. Abbott—met with Dr. Victor Heiser of the Rockefeller Foundation to discuss the teaching of hygiene in American medical schools.

The discussion resulted in the following recommendations:

1. That an approved course of instruction in Hygiene and Public Health be required of all candidates for the degree of Doctor of Medicine.

2. That a minimum of 90 hours be given to the subject and that the teaching include both didactic instruction and appropriate laboratory exercises.

3. That arrangements be made for demonstrative excursions to places of sanitary interest and to industries involving processes that may be detrimental to the health of the workers.

4. That in addition a sanitary survey of a town, village, or part of a city be required of each student and the results be embodied in the form of a written report. Such surveys to be done in extra time, not included in the 90 hours provided in Paragraph 1.

5. That the major part of the teaching in Hygiene and Public Health be given not earlier than the third year of the course leading to a degree in medicine.

6. That the instruction be given by and under the direction of a full time teacher who shall devote the major part of his time and interests to investigation and teaching in the field of Hygiene and Public Health.

The committee discussed the field to be covered by such instructor and as a result offers the following suggestion:

LECTURES.—Eugenics, Heredity and Immunity; Maternal Care (prenatal supervision); Infant Welfare; Hygiene of Childhood and Adolescence; Industrial Hygiene and Housing; Vital Statistics; Food and Nutrition; Control of Communicable Diseases, including Epidemiology; School Medical Inspection; Mental Hygiene; Personal Hygiene; Sanitation, Water, Air, Soil, Waste; Public Health Administration; Sanitation of Camps, Summer camps, Contractors' camps, Military camps.

LABORATORY EXERCISES.—Analytic methods used in sanitary investigations including water, air, soil, sewage, milk, disinfectants, etc., with correct interpretation of results.

Food—tests for the detection of impurities—methods of preservation, etc.

The causes of infection—their behavior within and without the body. Methods used for their detection and destruction.

Study of the origin, nature and preparation of the various biologic products used in the prophylaxis and treatment of specific diseases.

Practical application of such statistical methods as are employed in public health work.

It is desirable that the laboratory exercises in Hygiene and Public Health be so correlated with the work of the bacteriological, pathological, physiological and other cognate laboratories as to avoid duplication of work wherever possible.

SANITARY SURVEYS.—To comprehend: Social Conditions; Existing Sanitary Conditions; Recommendations for Improvement.

(Signed) M. J. ROSENAU, Chairman.
WM. H. PARK,
A. C. ABBOTT, Secretary.

On motion, the report was received and referred to the Committee on Education and Pedagogics for further action.

DISCUSSION

DR. WICKLIFFE ROSE, New York City: I shall undertake to emphasize only three or four points in connection with this report. In the first place as representing an agency that is devoting its entire time to the subject of hygiene and public health, I wish to express my very keen interest in the report. It is significant that the American Medical Association should have appointed a committee to consider the question of improving the teaching of hygiene in the medical schools; that the committee should have submitted a report recommending giving to this subject a really important place in the medical curriculum; and that your committee on pedagogy should have given the report its unanimous endorsement.

The interest which this report manifests on the part of the medical profession in America is not an isolated incident; it is only symptomatic of a world-wide movement indicating a rapidly growing interest in the whole subject of hygiene and public health. The object of medicine

is not the treatment of disease, it is the conservation of life, and health and working efficiency. This is what the lay public is interested in. If this be the true object of medicine, then the mere treatment of diseases should be regarded as incidental. When it comes to be recognized by the medical profession and the public that the prevention of disease is more important than its cure, then hygiene will be given due consideration in the training of the physician.

The medical profession has in the past occupied a position of leadership in the development of public health in this country and in other countries. The record is one in which the profession may feel a just pride. I am convinced, however, that this leadership is not so pronounced at present as it was fifteen years ago. Unless something definite be done and done in the right direction this leadership is going to pass from the hands of the medical profession into other hands. That would be unfortunate. We see indications of it. Large business corporations which a few years ago were accustomed to employ physicians to treat the sick are now employing men who can give them sound advice as to how to protect the health and to promote the working efficiency of their employees. If this is sound business for corporations it is sound business for the entire community; and the intelligent layman is coming to understand it. But one need not dwell on details.

Just a word on the subject of hygiene from the point of view of the medical student. As I interpret the tendency of medicine, it is in the direction of what one may call the genetic interpretation of disease. The student seeks to understand a pathologic condition by ascertaining how the condition came to be. It is an effort to trace diseases back to their earliest beginning. Following this line of effort the student soon finds himself interested in his patients' personal habits, his home conditions, his community surroundings; that is, he finds himself in his effort to understand disease drawn into a study of personal, domestic and public hygiene. The point I wish to emphasize is that the medical school in order to teach its students to know disease must give to the subject of hygiene, personal and public, much more attention than has been given in the past—much more than is being provided for at present.

I should like to say a word about the practical aspects of this recommendation. I am quite well aware of the fact that your medical curriculum is overcrowded. Nothing has interested me more in this meeting, however, than the frank recognition of this fact and the apparent determination on your part to loosen up the curriculum by moving some of the specialties on to the graduate years. That will leave room for doing some of the fundamental things of which nothing is more fundamental than hygiene.

It has been stated by Dr. Wilbur, and I should like to emphasize the point, that if this report should be adopted, it could not be put into effect over night. In the first place medical schools could not finance it at once. If they could finance it you could not find the men to man these departments—they are not here, they have not been trained and the agencies for their training have not existed. You will have to develop men gradually and that is slow business. If you had both money and men you would not be prepared to outline the course at a single stroke and to fit it into the regular medical curriculum. This course in hygiene must be developed experimentally; it must be a growth and its development will be slow.

If the report should be adopted by this body, this in itself would be an important step in the right direction; it would put the medical profession squarely behind the movement and give it the backing without which little or no progress can be made. With the medical profession behind it giving it moral sanction the next step will not be difficult. It ought not to be difficult to find three or four medical schools that would offer favorable conditions for trying out the experiment. With two or three schools offering favorable conditions it ought not to be difficult to get funds with which to finance the undertaking as an experiment. The expenditure of funds for such purpose would be a good investment. While the course is being developed men should be placed in training; it should be possible to provide fellowships for this purpose. With one or two successful demonstrations the course will be extended to other institutions as its usefulness comes to be appreciated and as men competent to head such departments become available.

RESOLUTION ON CHANGING TIME AND PLACE OF MEETING

Dr. E. P. Lyon, University of Minnesota, presented the following resolution:

"Resolved, that the Executive Council be requested to consider the advisability of holding the annual meetings of this Association at some other time and place from the meeting of the Council on Medical Education, at least in alternate years."

On motion, the resolution was adopted unanimously and referred to the Executive Council.

RESOLUTION ON PREMEDICAL COLLEGE WORK REQUIREMENT

Dr. E. P. Lyon, University of Minnesota, presented the following resolution:

Resolved, that the admission requirement of two years of premedical college work is to be interpreted as 60 semester credits earned by study in an approved college and including the required subjects, but without regard to the period of time within which the college work was pursued. It is understood that the evaluation and acceptance of such credits is to be done by the registrar or other proper official of the university of which the medical school is a part.

On motion, the resolution was adopted.

REPORT OF NOMINATING COMMITTEE

The Nominating Committee appointed by the chairman, consisting of Drs. John T. McClintock, Burton D. Myers and W. S. Carter, reported as follows:

President: THEODORE HOUGH, Charlottesville, Va.

Vice President: CHAS. P. EMERSON, Indianapolis.

Secretary-Treasurer: FRED. C. ZAPFFE, Chicago.

Executive Council: For two years, C. R. BARDEEN, Madison, Wis., and JAS. EWING, New York. For one year to fill the vacancy caused by Dr. DYER'S death, G. CANBY ROBINSON, Nashville,

On motion, the report of the committee was accepted and the secretary instructed to cast one ballot for the Association for the election of the nominees. The secretary did so, and the chairman declared the nominees duly elected to the offices mentioned in the report.

REPORT OF AUDITING COMMITTEE

The Auditing Committee, consisting of Drs. Phillips, Robinson and Rowland reported that the accounts of the treasurer had been audited and found to be correct.

On motion, the report of the committee was accepted.

There being no further business to come before the Association at this time, a motion to adjourn *sine die* prevailed.

Adjourned.

WILLIAM PEPPER, President.
FRED C. ZAPFFE, Secretary.

MINUTES OF THE ORGANIZATION MEETING OF THE EXECUTIVE COUNCIL

At the meeting of the Executive Council held in the Congress Hotel, Chicago, March 9, 1921, the following business was transacted.

The meeting was called to order by the secretary.

On motion, duly seconded and carried, Dr. Irving S. Cutter was elected chairman of the Council for the ensuing year.

On motion, duly seconded and carried, Dr. Cutter was appointed the delegate for the Association to the Council on Medical Education of the American Medical Association.

On motion, duly seconded and carried, an honorarium of $750 was voted to the secretary-treasurer for the ensuing year, and an honorarium of $200 to the chairman of the Council.

On motion, duly seconded and carried, the following membership of the three standing committees of the Association was appointed:

Committee on Education and Pedagogics: Dr. Hugh Cabot, University of Michigan; Dr. Ray Lyman Wilbur, Leland Stanford Jr. University; Dr. Alexander C. Abbott, University of Pennsylvania; Alexander S. Begg, Harvard Medical School; Burton D. Myers, University of Indiana.

Committee on Equipment: Drs. John F. McClintock, University of Iowa, chairman; A. E. Gunther, University of Nebraska, and Clarence C. Jackson, University of Minnesota.

Committee on Medical Research: Dr. Frederic S. Lee, Columbia University, chairman; Dr. R. M. Pearce; University of Pennsylvania; Dr. W. B. Cannon, Harvard University.

The Council then adjourned.

IRVING S. CUTTER, Chairman.
FRED C. ZAPFFE, Secretary.

OFFICERS AND COMMITTEES FOR 1921-1922

President: DR. THEODORE HOUGH, Charlottesville, Va.

Vice President: DR. CHAS. P. EMERSON, Indianapolis.

Secretary-Treasurer: DR. FRED C. ZAPFFE, 3431 Lexington Street, Chicago.

EXECUTIVE COUNCIL

IRVING S. CUTTER, Chairman, Omaha.
WM. PEPPER, Philadelphia.
CHARLES R. BARDEEN, Madison.
J. EWING, New York.
G. CANBY ROBINSON, Nashville.
THEODORE HOUGH, Charlottesville, Va.
FRED C. ZAPFFE, Chicago.

COMMITTEES

Committee on Education and Pedagogics

HUGH CABOT, Chairman, University of Michigan.
RAY LYMAN WILBUR, Leland Stanford Jr. University.
ALEXANDER C. ABBOTT, University of Pennsylvania.
ALEXANDER S. BEGG, Harvard Medical School.
BURTON D. MYERS, University of Indiana.

Committee on Equipment

JOHN F. MCCLINTOCK, Chairman, University of Iowa.
A. E. GUNTHER, University of Nebraska.
CLARENCE C. JACKSON, University of Minnesota.

Committee on Medical Research

FREDERIC S. LEE, Chairman, Columbia University, New York.
R. M. PEARCE, University of Pennsylvania, Philadelphia.
W. B. CANNON, Harvard University, Boston.

Special Committee on Teaching Hygiene

M. H. ROSENAU, Chairman.
W. H. PARK.
ALEXANDER C. ABBOTT.

MEMBERS

ALABAMA

University of Alabama School of Medicine, Tuskaloosa.

CALIFORNIA

Leland Stanford Junior University School of Medicine, San Francisco.
University of California Medical School, San Francisco.

COLORADO

University of Colorado School of Medicine, Boulder and Denver.

CONNECTICUT

Yale University School of Medicine, New Haven.

DISTRICT OF COLUMBIA

Georgetown University School of Medicine, Washington.
George Washington University Medical School, Washington.
Howard University School of Medicine Washington.
Army Medical School, Washington.
Navy Medical School, Washington.

GEORGIA

Emory University School of Medicine, Atlanta.
University of Georgia Medical Department, Augusta.

ILLINOIS

Loyola University School of Medicine, Chicago.
Northwestern University Medical School, Chicago.

Rush Medical College (University of Chicago) Chicago.
University of Illinois College of Medicine, Chicago.

INDIANA

Indiana University School of Medicine, Bloomington and Indianapolis.

IOWA

State University of Iowa College of Medicine, Iowa City.

KANSAS

University of Kansas School of Medicine, Lawrence and Rosedale.

KENTUCKY

University of Louisville Medical Department, Louisville.

LOUISIANA

Tulane University of Louisiana School of Medicine, New Orleans.

MARYLAND

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

MASSACHUSETTS

Medical School of Harvard University, Boston.
Tufts College Medical School, Boston.

MICHIGAN

Detroit College of Medicine and Surgery, Detroit.
University of Michigan Medical School, Ann Arbor.

MINNESOTA

University of Minnesota Medical School, Minneapolis.

MISSISSIPPI

University of Mississippi School of Medicine, University.

MISSOURI

St. Louis University School of Medicine, St. Louis.
University of Missouri School of Medicine, Columbia.
Washington University Medical School, St. Louis.

NEBRASKA

John A. Creighton Medical College, Omaha.
University of Nebraska College of Medicine, Lincoln and Omaha.

NEW YORK

Columbia University College of Physicians and Surgeons, New York.
Cornell University Medical College, Ithaca and New York.
Long Island College Hospital, Brooklyn.

Syracuse University College of Medicine, Syracuse.
University and Bellevue Hospital Medical College, New York.
University of Buffalo Department of Medicine, Buffalo.

NORTH CAROLINA

University of North Carolina School of Medicine, Chapel Hills.
Wake Forest College School of Medicine, Wake Forest.

NORTH DAKOTA

University of North Dakota School of Medicine, University.

OHIO

Ohio State University College of Medicine, Columbus.
University of Cincinnati College of Medicine, Cincinnati.
Western Reserve University School of Medicine, Cleveland.

OKLAHOMA

University of Oklahoma School of Medicine, Norman and Oklahoma City.

PENNSYLVANIA

Hahnemann Medical College and Hospital, Philadelphia.
Jefferson Medical College of Philadelphia.
University of Pennsylvania School of Medicine, Philadelphia.
University of Pittsburgh School of Medicine, Pittsburgh.
Woman's Medical College of Pennsylvania, Philadelphia.

PHILIPPINE ISLANDS

University of the Philippines College of Medicine and Surgery, Manila.

SOUTH CAROLINA

Medical College of the State of South Carolina, Charleston.

SOUTH DAKOTA

University of South Dakota College of Medicine, Vermilion.

TENNESSEE

University of Tennessee College of Medicine, Memphis.
Vanderbilt University Medical Department, Nashville.

TEXAS

Baylor University College of Medicine, Dallas.
University of Texas Department of Medicine, Galveston.

VERMONT

University of Vermont College of Medicine, Burlington.

VIRGINIA

Medical College of Virginia, Richmond.
University of Virginia Department of Medicine, Charlottesville.

WEST VIRGINIA

West Virginia University School of Medicine, Morgantown.

WISCONSIN

Marquette University School of Medicine, Milwaukee.
University of Wisconsin Medical School, Madison.

AFFILIATED MEMBER

Meharry Medical College, Nashville, Tenn.

ASSOCIATE MEMBERS

Dr. James R. Guthrie, Dubuque, Iowa.
Dr. William P. Harlow, Boulder, Colo.
Dr. George H. Hoxie, Kansas City, Mo.
Dr. William J. Means, Columbus, Ohio.
Dr. W. F. R. Phillips, Charleston, S. C.
Dr. Henry B. Ward, Urbana, Ill.
Dr. Fred C. Zapffe, Chicago.

HONORARY MEMBERS

Dr. Henry S. Pritchett, New York.
Dr. Kendric C. Babcock, Urbana, Ill.