

ASSOCIATION OF AMERICAN MEDICAL COLLEGES



PROCEEDINGS OF THE TWENTY-
SIXTH ANNUAL MEETING, HELD
AT CHICAGO, FEBRUARY 8, 1916

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AIMS, METHODS, AND RESULTS IN MEDICAL EDUCATION *

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Medical education represents an organized attempt to train men to apply scientific methods to the prevention, cure or alleviation of disease and to the advance of medical knowledge. To this end the public, the teachers and the students all contribute. The public through endowment or state support now pays the more liberally supported schools at least \$300 per year per student, or \$1,200 for the four-year course; the teachers by rendering skilled service for less than what they might earn in practice probably contribute at least as much, while the time of the student in addition to his tuition fees and other expenses makes his contribution worth not less than \$1,000 per year or \$4,000 for the course, in addition to which he usually devotes several thousand dollars' worth of time to postgraduate study.

The public gets the largest returns from the investment both from the advances in medical knowledge which come from the better supported schools and from the increased efficiency of medical service which benefits not only those individuals who pay for services received, but also the community at large. The students, who furnish by far the largest part of the investment, may ultimately get some fair financial return from this investment, but must look to joy of service for the chief return. The teachers find their main reward in the companionship with youth in devotion to ideals.

The results of the joint product of educational plants, teachers and students are to be determined, on the one hand by the scientific output of the institution and on the other hand by the ability of the graduates to perform the services for which they are trained. This ability does not become fully manifest until the youths of today become the mature men of tomorrow. We do not manufacture a product ready to work perfectly the minute it is turned out and for which there is an eager market to stimulate us to devise methods of turning out an ever greater quantity at less cost. On the contrary we have to devise methods which will train men to fill in a worthy way the medical needs of the nation a generation in the future, men for whom when first turned out the public does not seem particularly eager.

* Presidential address at the annual meeting of the Association of American Medical Colleges, Chicago, Feb. 8, 1916.

Our methods should be designed to furnish the requisite training as directly, simply and inexpensively as possible, compatible with adequate results. In studying and trying out methods we should, however, focus our attention on the end results desired, not on artificial standards such as have at times been introduced by efficiency engineers and other professional students of other peoples' business who have been active of late in the field of education and who are apt, because of the difficulty of determining the nature of the products of an educational institution, to adopt some such standard as the unit hour of instruction as the product or to base estimates of efficiency on the elaboration of machinery. On the whole, however, I believe that we have been fortunate in the breadth of view shown by outside investigators of our own field of education and that we ourselves are to be blamed for too much emphasis on time requirements, too great a readiness to standardize without sufficient study of the ultimate result produced. This attitude has led to a condition where the requirement of two years of premedical college work has made much more rapid progress in the requirements of licensure to practice in various states than have practical examinations in medicine.

Under the cheaper methods of medical instruction which prevailed in this country until recent years the results on the whole were not satisfactory. It has been stated that as many as 40 per cent. of medical graduates quit the practice of medicine within a few years after leaving the medical school. Of the rest some by natural ability and hard study subsequent to graduation became of great value to society and others, allowing themselves to drift, became venders of prescriptions but not men able to apply modern science to relieve disease.

The recent developments in medical education have added greatly to the expense of maintaining medical schools and to the cost in time and money to those seeking a medical education. Are the results satisfactory? Can they be improved? Can the expense be reduced without injuring the product? These questions cannot be answered satisfactorily at the present time, first, because of the relatively short period that the newer methods of medical education have been in force and, second, because of the absence of satisfactory records of the subsequent careers of our graduates. They are, however, questions which every institution should carefully study and from time to time various institutions should report the results of such studies because of the help to other institutions thus furnished. Only one institution, at present, the Johns Hopkins Medical School, I believe, furnishes an account of the subsequent careers of each of its graduates. Since this institution was the first to assume what have since become, with a

few modifications, the modern standards of medical education in this country,¹ a statistical study of the careers of the graduates of the first ten years, 1897-1906 inclusive, may be of value in throwing light on the results produced by recent trends in medical education. To me the study has been of special interest because I was a member of the first class and assisted in teaching the other classes.

Four hundred and fifty-six students were graduated in the ten classes under consideration, 166 in the first five classes, 290 in the second five classes. Fifty-five were women.

Table 1 shows the general careers of these graduates. Twenty-six, 5.7 per cent., have died, fifteen, 3.3 per cent., have retired from practice. Of the latter, nine are women who retired because of marriage. Only five men, 1.3 per cent. of the total number,

TABLE 1.—CAREERS OF GRADUATES
(J. H. U., 1897-1906)

	Total Number	Women	First 5 Classes	Second 5 Classes
	456	55	166	290
Died.....	5.7%	7.3%	8.4%	4.1%
Withdrawn.....	3.3	18.2	6	1.8
Practice.....	80	70.9	71.1	85.2
Science.....	8.8	1.8	13.3	6.2
Administration.....	2.2	1.8	1.2	2.8

have withdrawn from medical work. These figures are certainly in marked contrast to the 40 per cent. of graduates supposed to have dropped out of practice under the old system of medical education.

Of the total number of graduates 80 per cent. are now in practice, 8.8 per cent. are engaged in teaching or scientific work and 2.2 per cent. in medical administrative work.

1. The requirement of premedical college work covering physics, chemistry, biology and a modern language, adopted to the extent of one year by the Association of American Medical Colleges and to the extent of two or more years by a large proportion of the schools in the association, is a modification of the requirement adopted by the Johns Hopkins Medical School beginning with the first class which entered in 1893. For matriculation a student was required to have a college degree and to have had college training in physics, chemistry and biology, a reading knowledge of French and German and as much Latin as may be studied in two years in a high school. With the exception of the last, the only high-school subject specifically required, and some of the modern language which could be studied in the high school, the specific requirements of the Johns Hopkins could be covered by two years of college work. The standards now adopted by most of the better schools are quite similar except that but one modern language is required instead of two. Furthermore, the Johns Hopkins curriculum devoted the first two years to work in the basal medical sciences, the last two to clinical work, an arrangement in the main now generally adopted. The standard of full-time teachers and investigators in the basal sciences then established has likewise been widely accepted.

Tables 2 and 3 illustrate the specialization within the fields of practice and scientific work that has taken place. The percentage of graduates within each of these fields is shown. The data tabulated are based on the records published in the Johns Hopkins Circular and in the American Medical Directory. It is probable that the specialization is carried even further than here shown.

Specialization carries with it in most cases, and should in all cases, special training beyond that offered in the medical school. Table 4 shows the number of graduates in each of the main subgroups and the percentage of graduates in each of these groups whose records show special training subsequent to graduation. These records, as published in the Johns Hopkins Circular, are necessarily incomplete and undoubtedly represent far less than the total amount of postgraduate work and study. In the third column the percentage is shown of the graduates of each group

TABLE 2.—FIELDS OF PRACTICE
(J. H. U. Graduates, 1897-1906)

	Total in Practice	Women in Practice	First 5 Classes	Second 5 Classes
	365	39	118	247
General practice without special- ization.....	22.2%	35.8%	16.9%	24.7%
General practice with specializa- tion.....	20.5	46.1	18.7	21.5
Internists.....	9.6	....	18.7	5.3
Medical specialties.....	11.2	7.7	5.1	14.2
General surgery.....	15.9	....	17.8	15
Surgical specialties.....	9.9	....	10.2	9.7
Eye, ear, nose and throat.....	5.2	....	6.8	4.1
Obstetrics.....	5.5	10.2	5.9	5.3

who took a hospital internship of one or more years, in the fourth column the percentage of those taking an internship of two or more years, in the fifth column the percentage of those who took laboratory work but not a clinical internship, in the sixth column the percentage of those whose postgraduate work was confined to graduate study, in the seventh column the percentage of those whose records indicate no formal work subsequent to graduation, and in the eighth column the percentage of those who took an internship at the Johns Hopkins Hospital. Since these last internships are open to students in the order of their class standings, the percentage of those in a group accepting them indicates the general scholarship of the group, although some of the best students in each class take work elsewhere.

From this table it may be seen that the eighty-one graduates now in general practice whose records shows no specialization belonged to the group with a relatively low grade of scholarship as undergraduates and with the least training after graduation, 32.1 per cent. giving no record of such training.

TABLE 3.—SUBDIVISIONS OF ACTIVITIES (J. H. U. GRADUATES, 1897-1906)

GENERAL PRACTICE	
Number of Individuals, 156	
	Per Cent.
No specialty indicated.....	51.9
General practice combined with	
Public health work.....	9
Laboratory work	7.8
Pediatrics	5.8
Obstetrics	1.9
Surgery	10.9
U. S. army surgeons.....	3.8
Institutional work	3.8
Medical missionaries	5.1

Teachers, 7.7 per cent.

MEDICINE	
Number of Individuals, 76	
	Per Cent.
Internists	46
Pediatricists	14.5
Neurologists	10.5
Dermatologists	8
Laboratory diagnosis	21

Teachers, 63.2 per cent.

SURGERY	
Number of Individuals, 133	
	Per Cent.
General surgery	43.6
Gynecology	10.5
Orthopedics	7.5
Genito-urinary surgery	9
Eye, ear, nose and throat.....	14.3
Obstetrics	15

Teachers, 42.1 per cent.

SCIENCE	
Number of Individuals, 40	
	Per Cent.
Anatomy	15
Bacteriology	2.5
Physiology	15
Hygiene	5
Roentgenology	2.5
Pharmacology	7.5
Medicine	12.5
Pathology	40

Teachers, 90 per cent.

ADMINISTRATION	
Number of Individuals, 10	
	Per Cent.
Hospital	50
Public health	40
Medical association	10

Teachers, 0

The seventy-five graduates in general practice who are specializing to a greater or less extent, on the other hand, show but 12 per cent. without internship or some other form of postgraduate training.

The seventy-six graduates in the group of specialists in internal medicine show but 3.9 per cent. without special postgraduate training, although in this group laboratory work, chiefly in pathology, has been to a considerable extent substituted for clinical

TABLE 4.—SPECIAL TRAINING AFTER GRADUATION
(J. H. U. Graduates, 1897-1906)

1	2	3	4	5	6	7	8
Group	Number in Group	Hospital Internship at Least One Year	Further Resi- dence Train- ing	Labor- atory Work Only	Gradu- ate Work Only	Special Train- ing not Speci- fied	J. H. H. Interns
		Per Cent. of Group	Per Cent. of Group	Per Cent. of Group	Per Cent. of Group	Per Cent. of Group	Per Cent. of Group
General practice with- out specialization....	81	63	34.6	3.7	1.2	32.1	16.
General practice with specialization.....	75	80	56	6.7	1.3	12	17.4
Total general prac.	156	71.2	44.9	5.1	1.3	22.4	16.9
Internists.....	35	77.1	62.9	14.5	2.9	5.8	42.9
Pediatricists.....	11	72.7	63.6	18.2	9.1	....	18.2
Neurologists.....	8	75	75	12.5	....	12.5	0 (37.5% Disp.)
Dermatologists.....	6	33.3	16.7	....	66.7	....	0 (66.7% Disp.)
Laboratory diagnosis	16	25	6.3	75	....	....	0
Total medicine.....	76	61.9	48.77	25	9.2	3.9	22.4
General surgery.....	58	87.9	74.1	7	1.7	3.4	46.6
Gynecology.....	14	85.7	57.1	7.1	....	7.1	71.4
Orthopedics.....	10	100	60	....	....	....	50
Genito-urinary.....	12	75	58.3	....	8.3	16.6	33.3
Eye, ear, nose, etc.	19	58	21	5.3	26.3	10.5	10.5
Obstetrics.....	20	90	80	....	....	10	55
Total surgery.....	133	83.5	63.2	4.5	5.3	6.8	44.4
Science teachers.....	40	50	15	50	....	....	42.5
Hospital superintend.	5	100	100	....	....	....	0
Public health officers..	4	75	25	25	....	....	0
Others.....	1	....	....	100	....	....	0
Total.....	415	71.6	48.9	13	4	11.3	29

internships. The two men of the group who now hold the chairs of medicine at Harvard and Columbia, respectively, had a post-graduate training largely in pathology. The internists show a high percentage of Johns Hopkins Hospital internships, while the neurologists and dermatologists have depended more on dispensary training, a third of the first group and two thirds of the second having had work at the Johns Hopkins Hospital Dispensary.

The 133 graduates who have specialized in general surgery and its various branches show a high record of undergraduate scholarship as evinced by the high percentage of Johns Hopkins Hospital internships and few, only 6.8 per cent., without records of special postgraduate work, chiefly internships. The length of time spent by many of these surgeons as interns and residents in hospitals is considerable. Thus the total resident hospital service spent by the twenty-two general surgeons who received one or more years of their hospital training at the Johns Hopkins was ninety-eight years, an average of four and one-half years. That of 8 gynecologists with similar training was thirty-seven years, likewise an average of about four and one-half years, while that of eleven obstetricians was thirty-nine years, an average of about three and one-half years. The length of service of different individuals varied in surgery from two to eight years, in gynecology from three to seven years and in obstetrics from two to five years.

With this long hospital service of graduates preparing for surgery may be compared the services of a similar group of thirteen men preparing for internal medicine. These men served a total of fifty years, an average of nearly four years, with variations in length of service from two to ten years.

Of the graduates in the surgical group those whose records show the smallest percentage of specialized graduate training belong to the genito-urinary surgeons and the eye, ear, nose and throat specialists. These men undoubtedly have for the most part had a large amount of dispensary training not indicated in the records.

The forty graduates included in the science group all had, as assistants and young instructors, a large amount of special laboratory training subsequent to graduation. Yet 50 per cent. of them first spent a year or more as clinical interns.

The ten men now engaged in administrative work all had some special postgraduate training in most cases including a hospital internship.

The long course of preparation, four years in college, four years in the medical school and several years of subsequent training for a specialty which marks the career of so large a percentage of those under consideration would lead us to expect to find most of them settled in large centers of population where specialists have the best opportunity to exercise their calling and get return from the heavy investment in time and money. This is the case. The graduates of the first ten classes are widely scattered over the country from Maine to California and from Minnesota to Louisiana but for the most part they are settled in large cities, Baltimore naturally claiming the lion's share, but with a relatively large number in New York, Boston, St. Louis and San Francisco.

Table 5 shows the distribution of the graduates engaged in private practice in this country and its dependencies, marked "foreign" in the table, according to the size of the communities in which they are located. From this it may be seen that over two thirds are located in cities of 100,000 inhabitants or over, and relatively few are located in towns of 10,000 inhabitants or less.

The great majority, therefore, are in active competition with first-class men in large centers. How many have made a striking success? This is a difficult matter about which to form a fair judgment. Excellent service may lead to a merely local reputation while the ability of a mediocre man to get articles into popular weeklies or into the newspaper may lead to inclusion in

TABLE 5.—LOCATION ACCORDING TO SIZE OF TOWNS
(J. H. U. Graduates, 1897-1906, Practitioners Only)

Population of Residence	Total Number	Women	First 5 Classes	Second 5 Classes
	329	33	108	221
1,000,000+.....	9.4%	15.2%	10.2%	0.9%
400,000+.....	30.7	15.2	29.6	31.2
200,000+.....	16.7	18.2	19.4	15.4
100,000+.....	11.5	9.1	16.7	9.1
50,000+.....	10.9	9.1	7.4	12.7
20,000+.....	6.4	15.2	6.5	6.3
10,000+.....	....	6.1	2.8	4.5
5,000+.....	6.7	0.3	2.8	2.77
5,000-.....	6.4	6.1	1.9	8.6
Foreign.....	0.1	0.3	2.8	0.5

"Who's Who." In order, however, to get some measure of success I have tabulated (Table 6) the percentage of those belonging to various special groups who have been made members of special scientific medical societies, of those who have been included in "Who's Who," and in "American Men of Science," with a special column for those starred as among the first 1,000 men of science. Since the last edition of "American Men of Science" was published in 1910 the scientific standing of the members of the later classes to graduate is not up to date. For the sake of comparison I have also shown the percentage of each group who are fellows of the American Medical Association and I have included a special column to show the fellows of the American College of Surgeons.

The graduates who have taken up a career in science show the greatest percentage of those included in "Who's Who" (52.5 per cent.) as well as in "American Men of Science" (75 per cent.) and in the starred list (30 per cent.). The internists come next (28.6 per cent. in "Who's Who") while relatively few of the sur-

geons are thus distinguished (6 per cent.). The surgeons represent, on the whole, the strong students with a practical rather than a scientific attitude of mind, while the internists represent a group of strong men with both "practical" and scientific leaning.

TABLE 6.—SOCIETIES AND DISTINCTIONS
(J. H. U. Graduates, 1897-1906)

Group	Number in Group	Fellows A. M. A., %	Mem- bers Spec. Soc., %	Fellows A. C. S., %	Who's Who, %	Ameri- can Men of Science, %	Starred Indi- viduals, %
General practice with- out specialization....	81	54.3	6.2	0	2.5	2.5	...
General practice with specialization.....	75	72	5.3	0	1.3	4	...
Internists.....	35	91.5	48.6	0	28.6	22.9	2.9
Medical specialties.....	41	80.5	43.9	0	2.4	14.6	...
Total medical.....	76	85.5	46	0	14.5	18.4	1.3
General surgery.....	58	88	27.6	60.4	5.2	5.2	1.7
Surgical specialties.....	36	83.4	47.3	50	8.3	2.8	...
Eye, ear, nose, throat..	19	89.5	31.6	42.1	5.3	10.5	...
Obstetrics.....	20	80	15	35	5	....	...
Total surgical.....	133	85.7	31.6	51.9	6	4.5	0.8
Science.....	40	57.5	82.5	....	52.5	75	30
Administration.....	10	50	....	....	....	....	...
Total.....	415	73.5	28.8	16.6	10.4	13.3	3.4

TABLE 7

Adult Males	Estimated Number	Per Cent. in Who's Who	Per Cent. in American Men of Science	Starred List
30-39 years of age.....	7,700,000	0.029	0.015	0.008
40-49 years of age.....	5,600,000	0.77	0.04	0.008
Male college graduates:				
30-39 years of age.....	91,000	1.18	1.1	0.24
40-49 years of age.....	65,800	3.2	2.8	0.6
Physicians, Men:				
30-39 years of age.....	44,000	0.41	0.8	0.15
40-49 years of age.....	32,000	1.1	0.8	0.15
Second five classes: living men.....	254	3.9	9.1	1.2
First five classes: living men.....	125	25.6	25.6	8.8
Both classes.....	379	11.1	14.5	3.7

Taking the whole group of 415 individuals now engaged in medicine we find 10.4 per cent. included in "Who's Who," 13.3 per cent. among "American Men of Science" and 3.4 per cent. among the starred individuals.

For the sake of comparison the following rough estimate² may be of interest:

Since relatively few women are included in "Who's Who" and in "American Men of Science" and only one of the fifty-one living women graduates in our list, we can get the best idea of the relative distinction indicated by inclusion in these two lists by comparing the percentage of men graduates included in these lists with the percentage of other men of similar age thus included. The average age of the men of the first five classes may be taken for "Who's Who" to be from about 40 to 45 years of age and of those included in "American Men of Science" from about 35 to 40 years of age. The average age of those of the second five classes may be taken to be about five years less. Without going here into detail we may say the percentage of graduates of the

2. These estimates, necessarily rough, are based on the following data: The population of the country is taken as 100,000,000. The number of males of a given age is based on the ratios given in the last United States census reports. The number of college graduates is based on the ratio between academic and medical students during the last quarter of the nineteenth century and on the assumption that the ratio between the number of living individuals with the M.D. and of those with the bachelor's degree corresponds with this ratio but with somewhat fewer students finishing the academic than the medical course. This gives as a rough estimate 500,000 college graduates, a number probably too high if graduates of regular college courses of the old type are alone counted, too low if the graduates of all sorts of technical courses leading to the bachelor's degree are counted. It is arbitrarily assumed that of the 500,000 graduates, 350,000 are men and the ratios used in estimating the general male population of a given age are used in determining the number of college graduates of a given age, the age of 22 being taken as the minimum age of those graduates. The number of physicians is estimated from the numbers given in the last edition of the American Medical Directory, an arbitrary allowance of 2.5 per cent. being made for women physicians. The number of physicians of a given age is estimated like that of college students, but twenty-five is taken for the minimum age. The estimates of the Johns Hopkins graduates are based on actual figures. The numbers of those given in "Who's Who" are taken from the last edition, but the age ratio and sex ratios are taken from data given in the 1903-1905 edition. The estimates of those included in "American Men of Science" are based on the figures 5,536 for all individuals and 1,201 for starred individuals (269 names being added to the list of 1,000 in the first edition and sixty-eight removed). The age ratios for the thousand leading men given by Cattell in the last edition are used for estimating the number of individuals of a given age in both lists. Since the age of the leading men tends to be higher than that of those not attaining distinction, this method of estimating probably gives figures smaller than the actual figures for those merely included in the total list and possibly also for those who make up the 200 starred individuals in excess of the 1,000 on which Cattell bases his estimates. Since, however, no allowance has been made for the 2 or 3 per cent. of women in the lists and for Canadians in the first list, it is probable that the estimates used give sufficiently accurate results for our present purposes. Cattell in his statistical tables shows at what institutions 515 of the first thousand men of science received their bachelor's degree, but he does not give figures showing the number not receiving a bachelor's degree. Pearce in his analysis of the medical group (*Science*, xlii, p. 277, 1915) shows that about 22 per cent. of those contributing to the medical sciences took no bachelor's degree, although many of these did some college work. Since this group compared with other groups contains a high percentage of investigators who took no bachelor's degree we may take 15 per cent. as an arbitrary proportion in estimating the number of such men, and this has been done in estimating the percentage of college graduates included in "American Men of Science" and among the starred individuals. Test counts supported those estimates. The age ratios are estimated as given above. Scott Nearing has recently made a study of 2,000 men in "Who's Who" of about the age of those here studied.—*Scientific Monthly*, January, 1916.

second five classes included in these lists is about ten times as great as would be expected from them as physicians and from nearly four to eight times as great as would be expected from them as college graduates. The percentage of those of the first five classes included in the lists is from twenty-three to nearly sixty times as great as would be expected from them as physicians and from eight to fifteen times as great as would be expected from them as college graduates. I have no data with which to compare them with other college men who have taken the medical course elsewhere. It is obvious, however, that an unusual percentage of the men under consideration have attained the kind of distinction which gives one a place in "Who's Who" and in "American Men of Science" and may be looked upon as among the leaders in their chosen fields. Of the graduates of the first two classes about one in three is included in "Who's Who," four out of the fifteen in the first graduating class are in the starred list in "American Men of Science."

The relation of ultimate success to premedical college training is of some interest. While I have not time to go into this subject at present in any detail, I may point out in Table 8 that students coming from the colleges of the Middle West have been particularly strong in science, while those from the colleges of the North Atlantic States have been strong in practical surgery but have not gone much into research or other fields leading to a more or less national distinction. It is only by putting the graduates of the collegiate department of the Johns Hopkins in the North Atlantic division that this division is enabled to make a fair showing outside of surgery as compared with the other divisions. Based on its clientele this department might perhaps more justly be placed in the Southern division. Some points brought out by the table are difficult to explain. Why, for instance, should the graduates of the University of California make an unusually good showing from the point of view under discussion and those of Leland Stanford an unusually poor one? Why should the smaller colleges of the South do so much better on the whole than those of the small colleges of the rest of the country?

From the records of the graduates of these first ten classes of the Johns Hopkins Medical School it is clear that their success along orthodox lines has been unusually high. Into this success numerous factors have entered which we need not discuss here, but not all of which can we hope to have generally repeated with the elevation of entrance standards and reorganization of methods in the medical schools throughout the country. It is evident, however, that this general reorganization is accompanied by greater scientific productivity in medicine and a greater tendency to specialization than we have hitherto had in this country, accompanied by an increased tendency to settle in large cities. What

lessons can we learn from this group of graduates who represent in a way the first product of our present methods of medical education and what deductions can we make as to the directions in which we should guide medical education so as to provide adequately for a generation ahead.

TABLE 8.—RELATION OF PRELIMINARY TRAINING TO CAREERS
(J. H. U. Graduates, 1897-1906)

	Total No.	Special Groups			Honors			
		Medicine, Per Cent.	Surgery, Per Cent.	Science, Per Cent.	W. W., Per Cent.	Science, Per Cent.	Science Starred, Per Cent.	A. O. S., Per Cent.
New England colleges for men:								
Yale.....	50	22	36	10	14	18	2	26
Bowdoin.....	11	9	27.3	9	0	0	0	0
Harvard.....	11	18.2	18.2	27.3	27.3	27.3	9	9
Amherst.....	9	11.1	66.6	0	11.1	11.1	0	44.4
Williams.....	7	14.3	47.2	0	14.3	0	0	42.9
Five others.....	11	9	54.5	0	0	0	0	9
Total.....	99	17.1	39.4	9.1	12.1	13.1	2	21.2
Eastern colleges for women:								
Smith.....	8	0	25	12.5	12.5	12.5	12.5	0
Wellesley.....	8	12.5	0	0	0	0	0	0
Four others.....	8	37.5	0	0	0	0	0	0
Total.....	24	16.5	12.4	4.1	4.1	4.1	4.1	0
North Atlantic:								
John Hopkins.....	67	27	29.9	13.4	14.9	19.4	3	17.9
Princeton.....	17	5.9	59	0	0	5.9	0	47
Cornell.....	8	12.5	62.5	0	0	0	0	0
Twenty others.....	39	10.3	30.8	2.6	0	2.6	0	20.5
Total.....	131	18.3	35.9	7.6	7.6	11.5	1.5	21.4
Middle West:								
Wisconsin.....	22	36.4	22.8	13.6	9.1	18.2	4.6	9.1
Knox.....	6	16.7	33.3	0	16.7	33.3	0	16.7
Michigan.....	5	0	20	80	60	60	40	0
Chicago.....	5	20	20	20	40	60	20	20
Adelbert.....	3	0	33.3	33.3	33.3	33.3	33.3	33.3
Twenty-six others	30	9.9	33.3	9.9	0	6.7	0	16
Total.....	71	18.3	28.2	16.9	12.7	21.2	7.1	14.1
Far West:								
Stanford.....	17	5.9	35.4	0	0	5.9	0	0
California.....	11	18.2	27.3	18.2	18.2	27.3	9	18.2
Total.....	28	10.7	32.1	7.1	7.1	14.3	3.6	7.1
South:								
Randolph Macon.....	10	10	40	10	30	10	10	20
North Carolina.....	8	25	0	12.5	0	12.5	0	0
Georgia.....	5	40	40	0	20	0	0	0
Kentucky.....	5	40	20	20	40	20	20	0
Hamp. Sidney.....	4	25	25	0	25	0	0	25
Nineteen others.....	28	25	25	7.7	3.6	10.7	0	14.3
Total.....	60	25	25	8.3	13.3	10	3.3	11.7
Canada.....	2	0	0	50	50	50	50	0
Totals.....	415	16.3	32	9.6	10.4	13.3	3.4	16.6

The aim in requiring premedical college training in physics, chemistry and biology and in greatly strengthening the laboratory work in the basal medical sciences has been to qualify men to bring the whole force of modern science to bear on the solution of medical problems. As a matter of fact, the main point of view presented to and accepted by the majority of the group of students under consideration when they came to clinical problems was what we may designate as a "looking backward" point of view. The basis on which to found conceptions of a given disease was that of its ultimate ravages in a body incompetent to resist. The course of the disease was to a considerable extent reasoned out from the findings in the autopsy room. Most of the cases seen in the hospital wards were patients in whom disease was far advanced so that the autopsy picture of similar cases was an aid in formulating a picture of the probable appearance of the organs. Even in the dispensaries a large proportion of the patients were advanced cases. Little or no opportunity was given to study the beginnings of disease and the conditions in the individual or the community which produce these beginnings, although, of course, opportunity was given to study specific micro-organisms and lectures were given on etiology. Few of the group of graduates under consideration have gone effectively into the fields of hygiene and preventive medicine, although two have achieved distinction along these lines and one has a world-wide reputation for his work in the Far East and the Near East.

The medicine of the future is certainly to become more and more concerned with the prevention of disease or with the prevention of the spread of disease not only in the community but in the individual and relatively less concerned with its ultimate ravages. Means must be devised for bringing the student in contact with disease in its incipency both in the community and in the individual and to give a "looking forward" rather than a "looking backward" point of view, opportunity to think of disease in terms of its earliest beginnings and gradual spread, rather than merely to deduce its course from its ravages. The detection of the earliest symptoms requires far more highly trained powers of clinical observation and far more highly skilled laboratory work than does the detection of disease in its later stages. We now expect tuberculosis to be detected before large cavities have appeared or even before the specific bacilli are found in the sputum but how many physicians can do so? The field that lies between chemistry, bacteriology and clinical medicine has been greatly developed since the men we have been considering above received their undergraduate clinical training and offers great help. Modern roentgenology is also of help in early diagnosis. But the undergraduates of today will not get opportunity to have practical experience in cultivating these fields if abundant oppor-

tunity is not given them for coming into contact with patients in the earliest stages of disease. For this consultation and diagnostic centers, such as have been urged by insurance companies, will have to be extensively established and placed at the disposal of our clinical teachers. To encourage this the public will need some education but there is a greater demand for such centers, I think, than is understood by the medical profession. The need of preventive dentistry has long been understood by the more intelligent classes in this country. Recent developments have shown that in the endeavor to save teeth some dentists have succeeded to the detriment of the general health of the patient and have served to emphasize the fact that specialists must cooperate for the ultimate best results to the patient.

Diagnostic centers used for medical teaching will probably have to be supported by public taxation or by endowments. Similar centers should be open to those who can afford to pay a moderate fee for the services of a group of specialists. Few can afford, or feel they can afford, to go to a series of specialists and pay the fees necessary to keep up a series of special establishments unless disease is so far advanced that the necessity seems imperative. With the development of opportunities to study disease in its incipency optimistic therapy will more and more take the place of the therapeutic nihilism that haunts the autopsy room.

The development in Europe of social insurance and its beginnings in this country will make the importance of preventive medicine increasingly clear both to the organizers of industry and to industrial workers. Somewhere in the training of our students we must make them acquainted with modern industrial problems so that as physicians they may take a wise leadership in at least the medical aspects of the industrial reorganization which is taking place.

One mistake frequently made should, I think, be pointed out. No sharp line can be drawn between preventive medicine, on the one hand, and curative medicine, on the other hand. Public health officers can not do thoroughly effective work if they can not apply remedies to diseased individuals as well as to other sources of danger to the public health. By far the most effective public health service in this country today is the United States Public Health Service and here treatment of individuals and treatment of environment are carried on hand in hand. The practicing physician cannot do effective work for his patients if he does not take an active part in promoting public health measures.

From the social standpoint two things in the practice of medicine especially need changing. First, we need more organization and cooperation of men in different lines of work in place of the extreme individualism which prevails today and is economically so wasteful. Hospitals should be looked to more and more as

natural centers where the specialized activities of groups of physicians may be brought into harmonious cooperation and where diagnostic centers for those who can afford to pay, as well as for the poor, may be established and economically run. Hospitals of this kind established in rural districts would do much to make the conditions of rural practice more attractive and to overcome the lack of physicians which in some communities is already serious and will become more so with the decrease in the number of physicians brought about by raising of standards of medical education. A greatly reduced number of physicians in this country can serve the needs of the people effectively only through cooperation. With cooperation it will be possible to serve the community far more effectively than before. It has been estimated for instance that at present in Wisconsin physicians attend woman in labor in only 40 per cent. of cases, midwives, usually poorly trained, in 40 per cent. of cases, and no trained persons in 20 per cent. of cases. With the establishment of more hospitals and the use of automobiles practically all women might be given opportunity to bear children amid good surroundings and under skilled care, with untold good to the public. Rural nurses in connection with the rural hospitals and visiting nurses in connection with the city hospitals add greatly to their effectiveness.

Besides the need of more effective organization and cooperation there is a need of a reorganization in medical economics. The public should pay for the public services which physicians perform. The evil of extracting a large amount of service for little or nothing is especially marked in the large cities where young physicians are encouraged to do a large amount of dispensary work for "experience." The Robin Hood method of subsequently making the rich pay fees sufficient to cover the services rendered the poor is economically wrong. Public service should be paid for by the public to the medical as well as to the legal profession.

The expenses connected with the early years after graduation as well as the cost in time and money of the long training now demanded of medical students makes it imperative that we should seek to lessen the cost to the student in every way compatible with efficient training. Otherwise we shall limit the profession too much to a restricted class of the well to do. By making the relative proportion of the cost of the investment represented by a medical education unduly high to the student we shall encourage him subsequently to become commercialized, to forget that the public and teachers are stockholders in the investment and to make his chief aim in practice the greatest possible financial return to himself. With the profession confined to a few high-priced practitioners there will be danger of increased quackery for the mass of the people.

If we try to reduce expense by educating large numbers in relatively few medical centers, as seems to be advocated by those in charge of the investigations of medical education for the Carnegie Institutions, I believe that effective results will not be obtained because intimate association between teacher and pupil is necessary for effective training in a complex field like medicine and this becomes difficult or impossible when students are thought of in large masses rather than as individuals. Our schools with the largest endowments and best facilities are thus coming to limit the number of students received in each class. The tendency to encourage students to get the premedical work in academic colleges and the growing number of institutions giving the first half of the medical course show us ways of keeping the number of students taking the preliminary scientific training for clinical medicine restricted to relatively small groups the members of which can receive considerable individual attention. There are two chief difficulties at present connected with this part of the work. First, work in the preliminary sciences at the larger colleges and universities is given to such large classes and sections that individual instruction is hampered unless special sections with special instructors are provided for the premedical students. Second, the premedical work in the sciences is practically always given and the work in the fundamental medical sciences is to a greater or less extent given by men who have not had a medical education and are not intimately acquainted with medical problems. While the fundamental sciences should be taught from a broad point of view and not be restricted to a special aspect taught by the teacher to be all that is necessary for medicine, the training in the basal sciences should be such as to fit the student as simply and directly as possible to view medical problems from the point of view of physics, chemistry and biology and the more specialized sciences. That medicine can be thus viewed from these various points of view will be best appreciated by the student if he is thrown with teachers capable of doing so. Those who administer preclinical courses should keep this fact in mind. If it is kept in mind there is no reason why there should not be gradually established in the country a considerable number of effective preclinical courses where the student can get an effective training for clinical work. Compared with ordinary college courses such courses will be expensive, but viewed from the standpoint of their value to society they should be of great value.

The clinical part of medical training presents a more difficult problem. At present the tendency is to devote about one third of the second year and all of the third and fourth years of the four-year medical course, and an intern year to clinical training. The premedical and preclinical medical work takes up the major part of our ordinary four-year academic college course. In addi-

tion, we require three further years of clinical study, as much time as is required of a college graduate for a Ph.D. degree. The graduate student has opportunities for teaching fellowships sufficient to cover at least the cost of living. The medical student is required to pay large tuition fees in addition to his living expenses except during the intern year when he is relieved of the tuition fee and gets room and board for his services to the hospital. Students are encouraged to believe that they can get adequate clinical training only in large cities and that the most valuable internships are in the larger hospitals in these cities. Clinical teaching thus becomes to a large extent mass instruction. Intimate relations between individual students and individual teachers become difficult even during the intern year.

The old apprenticeship system in medical education had some marked advantages which present system of mass instruction lacks. Is it not possible to restore some of the advantages of the old apprenticeship system without loss of modern scientific training? Can we not utilize a large number of clinical centers for clinical teaching and a large number of progressive men as teachers instead of restricting clinical teaching to a few men connected with large hospitals adjacent to medical schools in large cities?

I believe this can be brought about by encouraging a greater number of practicing physicians to qualify for the term doctor in its original sense of teacher. Why should not our medical students after two years of premedical college work and two or three years in the medical school be qualified to reside in hospitals, for the most part small hospitals, where they could earn board and room by helpful work about the place and at the same time study under the immediate supervision of members of the hospital staff. Such hospitals should provide diagnostic centers along the lines outlined above. If a few students thus acted as clinical clerks in a series of hospitals during the course of two or three years following the present second or third year in the medical school they could get a broad experience in direct contact with medicine as it is best practiced at the present time. Variations in the types of hospitals would secure training in the varied lines of medicine. Each student would come in intimate contact with a considerable number of active progressive men whom he would stimulate and some of whom would in turn inspire. Only hospitals of a certain grade would be recognized for this service and this in turn would serve to stimulate hospital development. The immediate clinical facilities of the medical school could be utilized for supplementing and strengthening the extramural hospital service and the clinical staff would have supervision of the clinical teaching in the hospitals and give the final examinations. The expenses of the medical course would be reduced and the public would profit from a more direct training of its practitioners. Furthermore, this

system would help to overcome one of the greatest dangers of our present system of education, the destruction of originality through too many years of subordination of personality to mass domination by teachers. It would tend to produce independence in the students.

Such a plan may not, of course, be best for all schools but it may for some. As an association let us maintain the scientific ideal in medicine but let us not carry standardization too far. Let us encourage different methods of reaching the results at which we all should aim, the establishment in our students of habits of independent accurate observation, of judgment based on knowledge of fundamentals and of skilled execution based on practical experience, and then let us study the results as scientifically as possible and base our changes in methods so far as we can on observed facts.

MEDICAL EDUCATION WITH REFERENCE TO RURAL MARYLAND

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Medical education and premedical education have for some time been matters of interest and study to physicians and educators, and lately have been brought to the attention of our legislatures through the appeals of medical colleges for funds necessary now to conduct modern schools, the time being long past when the fees of the students were sufficient to pay the necessary expenses. To many of us it appears that the time is rapidly drawing nigh when these questions will become of vital interest to the rural citizen through the failure of the schools to supply the necessary number of doctors to satisfy the wants of rural communities.

Though under 40 years of age, I have seen during my adult life practically the whole history of the advancement of medical standards in this country. Twenty years ago when I was a student at the University of Virginia (which is a Class A school) there were no entrance examinations, nor were preliminary educational requirements demanded of those who desired to enter on the study of medicine, and after two years' residency in the medical school, and the doing of satisfactory work a man was given the degree of M.D.

No sane physician denies that there was the greatest need of regulating the right to practice medicine, and to raise the standard of educational qualifications of those who desired this right. The only criticism that has been heard to come from those who had a right to express their opinion is that, perhaps, there has been too great rapidity in raising the standard, and that the time has come when the raising of the standard shall be done less abruptly and with more thought for all that may be concerned.

There is no question that today the American people are receiving vastly better medical attention than they did ten years ago, but already the cry for a doctor is coming from rural communities, and they are asking for a good doctor if possible, but in any case "a doctor."

The report of the Carnegie Foundation on medical education in the United States and Canada is certainly praiseworthy, and did an immense amount of good in weeding out "diploma-mills" and purely commercial medical schools. Unfortunately, in such

an exhaustive study of medical conditions there appears too frequently the spirit of the advocate rather than that of the judge, and this is noteworthy in comparing the conditions underlying the practice of medicine in this country and in Europe. In such a comparison there are certain important factors which have been entirely overlooked. While the ratio of physicians to population has been considered, little or nothing was said as to the relative morbidity in Europe and in the United States, and that there is a great difference is at once noted by the statistician when the mortality rates of Germany, France, Austria and England are compared with those of the registration area of the United States. For example, the typhoid rate in the United States is over 2 per 10,000 living, while in England it is only 0.5 per 10,000 living. After studying medicine in Baltimore hospitals for five years, where I saw the wards filled with typhoid patients, I can well remember my surprise in not seeing a single typhoid patient in the Strasburg hospital during what we, in this country, commonly call the "typhoid season." Another very important point which has a bearing on the ratio of physicians to population is the per capita wealth of a community, which is so much greater in the United States than in Europe. These two factors mentioned above are important ones, and must be considered with many others, such as sickness insurance, etc., when one estimates the number of physicians required by a given number of people.

My personal opinion with reference to medical education has been that there is need in this country of two classes of medical schools, the one modeled after the Johns Hopkins, and in which the requirements can hardly be set too high, the other and larger class for the training of the practitioners of medicine. The first type of school should have an absolutely self-limited number of students, and they should be thoroughly trained not only in clinical and laboratory medicine, but trained also in the methods of research. Naturally, the men who graduated from such a school would become teachers, research workers, specialists and practitioners and consultants in the larger towns and cities. I have always felt that after a man has spent four years at college and four years additional at a good medical school he would be unwilling to settle at the "cross roads," but would rather starve in a larger community where his mental appetite, if not his physical, would at least be satisfied. To require the above of all men who desire to practice medicine would undoubtedly raise the standard of the profession, but I fear that in the "long run" it would prove no more satisfactory than to require that all locomotive engineers should be graduates in mechanical engineering from an approved college.

The second type of school, in my opinion, should demand for admission that the applicant be really grounded in the essentials of a good education, namely, the requirements demanded for

admission to most colleges in English and its branches, history, mathematics, and, in addition, the fundamental scientific branches underlying medicine, such as chemistry, physics and biology. Personally, I cannot even see the absolute need of an ancient or a modern language, as even we who have "qualified" once on a time in a modern language have so forgotten it that we rarely make use of it as a help in our professional work. Every doctor who looks at this question from an absolutely commonsense standpoint realizes that the knowledge of a modern language is a help but never an essential.

This second type of school should give a full four-year course, and the work should have little of the elective in it. The clinical and laboratory courses in such a school should be of the very best, but the time devoted to research by the student should be limited to a minimum. Any one who has to take part in the arranging of the schedules of work to be done by medical students knows what a problem it is, and knows that the problem consists, not in finding subjects to teach, but in finding the time in four years to give the student even a satisfactory foundation.

At the present time the Johns Hopkins and certain other schools are examples of the class first mentioned, and these of course, are, and will be, uninfluenced by the requirements of any governing body, but the second group would be the ones affected by rules regulating premedical education.

On page 45 of the Carnegie report it is noted as a fact that graduates of the Johns Hopkins have settled in small communities. I have made a study of the physicians practicing medicine in rural Maryland, defining "rural" according to the United States census as those communities having less than 10,000 inhabitants. The basis of my figures is the directory (1914) of the American Medical Association. The results of the study are enumerated in the appended tables. I have arranged in Table 1 the number of physicians practicing in each county in Maryland (the four cities of Baltimore, Frederick, Cumberland and Hagerstown omitted), and have subdivided them according to whether they graduated from the Hopkins or from one of the other three class A schools, the University of Maryland, College of Physicians and Surgeons, and Baltimore Medical College. You will note that in spite of the fact that the Johns Hopkins Medical School is situated in Maryland there are only four of its graduates practicing in rural Maryland, while there are 350 graduates of the University of Maryland, eighty-eight graduates of the College of Physicians and Surgeons and fifty-nine graduates of the Baltimore Medical College who are practicing medicine in the Maryland counties.

Table 2 is perhaps more illuminating, as it shows those graduating from these four schools since 1897, the year in which the

Johns Hopkins graduated its first class. As you will note, in the sixteen years from 1897 to 1913, inclusive, the Johns Hopkins Medical School graduated 965 men, of whom four only are practicing medicine in rural Maryland. During exactly the same period the University of Maryland graduated 1,225, 140 of whom are practicing medicine in Maryland outside of the cities.

I believe that the above figures justify my belief that the graduates of a school like the Hopkins will only exceptionally

TABLE 1.—PHYSICIANS PRACTICING IN RURAL MARYLAND (1914)
(Cities of Baltimore, Cumberland, Hagerstown and Frederick omitted)

Counties of Maryland	Graduates of				
	University of Maryland	College of Physicians and Surgeons	Baltimore Medical College	Johns Hopkins Medical School	All Other Medical Colleges
Allegany.....	10	5	1	0	13
Anne Arundel.....	23	4	2	1	13
Baltimore.....	63	13	10	0	18
Calvert.....	4	5	1	0	1
Caroline.....	12	5	1	0	4
Cecil.....	11	3	3	0	14
Carroll.....	32	4	3	1	12
Charles.....	8	2	2	0	1
Dorchester.....	12	4	5	0	7
Frederick.....	32	2	6	0	13
Garrett.....	9	0	0	0	6
Harford.....	23	3	0	0	9
Howard.....	10	4	1	0	4
Kent.....	5	3	4	0	11
Montgomery.....	15	4	2	0	16
Prince George's.....	13	9	2	0	21
Queen Anne's.....	7	3	2	0	6
St. Mary's.....	11	2	1	0	6
Somerset.....	11	1	2	1	9
Talbot.....	15	2	2	1	4
Washington.....	8	3	6	0	17
Wicomico.....	8	3	2	0	9
Worcester.....	8	4	1	0	12
Total.....	350	88	59	4	226

Physicians of rural Maryland, 727.

Ratio to population (709,000), 1:975.

Graduates of what is now "The University of Maryland and College of Physicians and Surgeons" in rural Maryland, 497.

Number of doctors graduated from Hopkins from 1897 to 1913, inclusive, is 965, of whom 4 have settled in rural Maryland.

Graduates of all other medical schools in rural Maryland, 226.

(Compiled from last edition (1914) of the Medical Directory of the American Medical Association.)

settle in the country, and that if we want physicians who will practice in the country, we must make the premedical requirements less exacting *in time*, although perhaps they may be raised somewhat along certain lines above today's standard, and any increases in the requirements must be made slowly and gradually and only after most careful study of all possible consequences.

You will note in the Carnegie report that in 1909 there were seven medical schools in Baltimore, one Class A plus school, the

Johns Hopkins Medical School; three Class A schools, the University of Maryland, the College of Physicians and Surgeons and the Baltimore Medical College. The other three schools were not Class A, and ceased to exist some years ago. Today there are only two medical schools in Baltimore, the Johns Hopkins Medical School, and the other three Class A schools merged into one under the name of "The University of Maryland Department of Medicine and College of Physicians and Surgeons." The decrease

TABLE 2.—PHYSICIANS IN RURAL MARYLAND (1914) GRADUATED
SINCE 1896
(Baltimore, Cumberland, Hagerstown and Frederick omitted)

Counties of Maryland	Graduates of				
	University of Maryland	College of Physicians and Surgeons	Baltimore Medical College	Johns Hopkins Medical School	All Other Medical Colleges in U. S.
Allegany.....	3	0	0	0	4
Anne Arundel.....	12	2	1	1	6
Baltimore.....	23	4	7	0	11
Calvert.....	2	1	1	0	1
Caroline.....	7	1	0	0	1
Cecil.....	7	1	1	0	3
Carroll.....	11	0	1	1	5
Charles.....	4	0	1	0	1
Dorchester.....	13	2	1	0	4
Frederick.....	13	0	5	0	5
Garrett.....	5	0	0	0	5
Harford.....	9	1	0	0	4
Howard.....	4	2	1	0	0
Kent.....	0	2	2	0	3
Montgomery.....	4	1	0	0	8
Prince George's.....	5	1	0	0	9
Queen Anne's.....	4	1	2	0	0
St. Mary's.....	1	0	1	0	3
Somerset.....	5	0	1	1	4
Talbot.....	5	1	1	1	2
Washington.....	0	1	3	0	4
Wicomico.....	4	0	2	0	8
Worcester.....	4	3	0	0	6
Total.....	140	24	31	4	97

Hopkins graduates (1897-1913).....	965	in rural Maryland.....	4
U. of M. graduates (1897-1913).....	1,225	in rural Maryland.....	140
P. & S. graduates (1897-1913).....	1,029	in rural Maryland.....	24
B. M. C. graduates (1897-1913).....	1,330	in rural Maryland.....	31

Graduates: U. of M., P. & S., B. M. O. (combined).....	1905	1915
Freshmen: U. of M., P. & S., B. M. O. (combined).....	249	128
	263	44

in medical graduates in this State is well shown by the fact that the merged schools mentioned above graduated 249 in 1905, while in 1915 they graduated 128. A more accurate prophecy can be made by comparing the freshman classes of these combined schools, there having been 263 freshmen in 1905 and only forty-four in 1915.

A growing country cannot be supplied by a diminishing output of medical practitioners. We are facing a real and dangerous shortage. This will become manifest when the present small

classes are graduated, and the need will be emphasized by the large number of physicians required for an enlarged Army and Navy, and the putting into force of the whole-time county health officer advocated today by many authorities on public health.

I do not present this paper as an argument for lowering standards, but simply as a study of local conditions with the hope that the progress in regulating medical training will be done thoughtfully, and as President Pritchett of the Carnegie Foundation says: "Furthermore, let us not forget in our zeal for research that the principal function of the medical school is the training of medical practitioners."

SYMPOSIUM ON CLINICAL TEACHING

THE TEACHING OF APPLIED THERAPEUTICS

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THE NEED

The teaching of therapeutics is one of the weakest points in the training of the medical student. Instruction in therapeutics is given in part by the clinical departments, in part by the department of pharmacology. The actual details of treatment are taught incidentally to the other instruction in clinical medicine; and as the basis for such instruction the student is given a course in pharmacology dealing with the properties and action of drugs. The weakness lies in the fact that no systematic instruction is usually given in the general principles of therapeutics. The clinician criticizes the pharmacologist—says the course in pharmacology is not practical enough; the pharmacologist criticizes the clinician—says the clinical instruction in therapeutics is not scientific. Both criticisms are wrong. So far as it goes, the instruction in therapeutics in both of these courses is usually good; but it is incomplete.

In the course in clinical medicine the attention of the student is directed chiefly to symptomatology and diagnosis, and treatment is relegated to a subordinate position. In such a course, moreover, so far as treatment is taught, emphasis is laid especially on the details. This emphasis on the details is correct enough in such a course. The forms which any one disease may take show so many different clinical pictures in different patients—depending on the severity of the disease, and on the fact that different patients react so differently to disease with differences in age, sex, constitutional characteristics, and other factors—and change so much from day to day in any one patient, that the treatment of every new patient is a new problem, and the actual details of treating sick patients can, therefore, be learned properly only by the inductive experimental method of long-continued bedside observation of many patients under treatment—the method now used in teaching the subject.

We treat individuals rather than diseases. This is especially true in chronic diseases, where the exact details of treatment depend on the extent to which function is disturbed, on the condition of the patient as a whole, factors concerning which, since

exact measurements play as yet but a small part, good judgment is gained only by long clinical experience with cases of all grades of severity. There are, nevertheless, back of the many details, certain points of view relating to the purpose of treatment and certain general principles of treatment which cannot well be taught incidentally to the other instruction in clinical medicine and which deserve and need consideration as a separate subject.

Pharmacology, though generally considered the science at the basis of treatment, is not so, for it deals with only a part of the fundamentals of therapeutics. Pharmacology deals with the action of chemical compounds in the body, with the physiologic action of substances quite independent of their therapeutic effect; it deals with the action, not only of those substances which are useful in therapeutics, but also those, like muscarin, curarin and saponin, which are not useful, and whose action is chiefly harmful; furthermore, in the case of useful drugs, pharmacology deals not only with those activities which are of therapeutic significance, but also those which are not.

Although until very recently all this was not strictly true, and pharmacology could not be said to exist as a science independent of practical therapeutics, it has now developed to such an extent that it is pursued as an independent science without reference to the practical needs of medicine, in the same way, and with the same justification, that anatomy, physiology and chemistry—once a part of practical medicine—are now pursued as independent sciences; and, just as in the case of anatomy, physiology and chemistry, so also in pharmacology, instruction is given, research is carried on and books are written by men who are not physicians.

In actual practice, drug treatment is nearly always combined with other forms of treatment; agents such as heat, cold, rest, exercise, posture, diet, massage, electricity, Roentgen rays, high altitude and sunlight are very extensively used in therapeutics. An intelligent application of these other agents depends on a knowledge of physiology, physics, chemistry, psychology, and on other factors—even such a one as the personality of the physician—as well as pharmacology; in certain instances the other factors are of more importance than the strictly pharmacologic knowledge.

A knowledge of pathology and clinical medicine especially, though not necessary for the pharmacologist, is an absolutely necessary prerequisite for the study of therapeutics; the therapeutically important questions relating to the effect of pathologic conditions in altering the effect of drug action (we now have abundant evidence showing that drugs may have a different effect in pathological conditions from what they have in health) and when and how to use drugs in disease are outside the province of pharmacology; furthermore, questions relating to diagnosis and

prognosis which have to be taken into consideration in therapeutics, and the good judgment necessary for estimating the effect of treatment on the clinical condition require a knowledge of clinical medicine. A knowledge of pharmacology alone is not a sufficient basis for the treatment of diseased patients.

THE REMEDY

There is, then, a deficiency in the usual medical curriculum, a deficiency which it is highly desirable should be filled by the addition to the curriculum of a course dealing with the general principles of therapeutics and filling in the gap between physiology, chemistry, pharmacology and the other fundamental sciences on which treatment is based on the one hand, and the actual details of treatment as carried out at the bedside from day to day on the other. Such a course should deal with the purposes and general principles of treatment, and with the larger facts of physiology, chemistry, pharmacology, and the other fundamental sciences which underlie the methods of treating diseased patients; it should aim to give the student a point of view regarding these purposes and principles of treatment that will serve as the basis for an allocation in correct perspective of the many and often confusing details of treatment learned in the subsequent clinics, so that these details may be contemplated, not as a vast number of crude empirical and unrelated elements, but as mutually dependent parts of a whole; it should continue the emphasis on scientific habits of thought, which is one of the objects of instruction in physiology and the other fundamental branches of medical science, and bring out the fact that *therapeutics is an applied science, not an empirical art*. Since students take up the study of medicine for the purpose of learning to treat sick patients; since the practical purpose of courses in pathology, physiology, diagnosis and the other fundamental branches is to help in understanding the treatment of patients; and since the details of therapeutics as demonstrated in the subsequent clinical courses are merely illustrations of the practical application of the principles of therapeutics; *such a course in therapeutics as that which I have outlined should be the most important course in the curriculum*, the one around which all the other courses should be grouped.

THE CONTENT OF A PROPER COURSE

The first question to be considered in outlining such a course—a question often lost sight of in actual practice—should be that of the purpose of treatment; this question—not such a simple one as it may seem at first—is very fundamental, since the whole character of the course in applied therapeutics depends on the point of view adopted toward it. When the physician removes a dis-

eased appendix, or gives antitoxin to a patient with diphtheria, he aims at ridding the patient of all evidence of disease; when he uses digitalis, diuretics or other agents in cases of heart disease, his purpose is neither to remove a diseased valve, nor to make it whole, but to improve cardiac function. The ultimate purpose in both cases, however, is to improve the functional efficiency of the patient. Though superficially, the principles of treatment of acute disease and those of chronic disease show certain differences, *improvement in functional efficiency is the ultimate purpose of all therapeutics.*

In acute disease the treatment aims at complete removal of disease, or diseased material, or the cause of disease—the anti-toxin treatment of diphtheria and the removal of a diseased appendix are examples. Even in the case of acute diseases like scarlet fever and measles in which such direct radical treatment is not yet available, and in which the disease must be left to run its course to be combated by the natural defenses of the body itself, the result aimed at, in promoting conditions under which the natural defenses of the body will act to best advantage, is also the complete removal of all evidence of disease.

In chronic disease the aim of treatment appears to be very different. We do, indeed, make use of the therapeutic methods of acute medicine; we treat contributory causes directly, and we promote conditions under which the natural defenses of the body will act to best advantage. But after we have done all this the most important and difficult part of the treatment has not, as a rule, been given. The most important part of the treatment is of an entirely different nature, and relates, not to anatomic structure, but to physiologic function. When the heart, for example, is so far diseased that the amount of work which it can do is less than the amount of work required of it, when compensation fails, the leaky valve or other anatomic change responsible for the condition cannot be removed or made whole. This is not necessary. The patient with heart disease often knows nothing of the anatomic changes responsible for his condition; he wants the symptoms alleviated so that he will be more comfortable and better able to do his work; in other words, it is not *anatomic integrity* about which he may know nothing, that interests the patient, *but functional efficiency.*

On account of the very great reserve powers—the high factor of safety—of all our organs, an organ may be the seat of disease and yet functionally efficient; it has been calculated that the normal heart, for example, can do six times the work ordinarily required of it; and we know that the factor of safety of certain double organs like the lungs and kidneys—since one of the pair can be entirely removed without danger to the patient—must be at least 100 per cent. But with severe disease there comes a time

when the affected organ cannot perform the amount of work ordinarily required of it and the physician is called, not to make the organ anatomically perfect, but to restore equilibrium between the work required of the organ and the work which it can do. Two general groups of methods are utilized to restore equilibrium: (1) methods which decrease the work required of the organ; (2) methods which stimulate the organ to do better work. We have long recognized that drugs cannot qualitatively change function, but can only increase or decrease function; the same thing is true of other forms of treatment; under their influence, function may be increased or decreased but not qualitatively changed. A knowledge of therapeutics, especially the therapeutics of chronic disease, consists largely of a knowledge of (1) methods of stimulating organs or functions; (2) methods of resting organs or functions; (3) knowledge of when and how to apply such methods. Though the diseased organ may never become anatomically normal as the result of treatment, it may, nevertheless, be made functionally efficient, that is, competent to its tasks.

These differences in principle between treatment in acute disease and treatment in chronic disease are not fundamental differences, but differences in emphasis in different parts of the treatment. All the methods of treatment may be grouped under three headings:

1. Preventive treatment.
2. Direct treatment of the disease or its cause.
3. Indirect treatment of the anatomical basis of the disease or the cause of the disease; treatment directed at the functions of (a) the heart, (b) the lungs, (c) the kidneys, (d), (e), (f), etc., the gastro-intestinal tract and other organs . . . and (z) the general metabolism.

In the case of smallpox, most emphasis is usually given to methods of preventing the spread of the disease; in the case of diphtheria, to direct treatment with antitoxin. In the case of most of the specific infectious diseases—pneumonia, scarlet fever, influenza, etc.—reliance must still be placed chiefly on indirect treatment. In the case of chronic disease the emphasis is usually laid chiefly on one of the subdivisions of 3—3a, for example, in the case of heart disease, 3z in the case of diabetes.

In all kinds of disease, then, all three groups of methods are borne in mind; the differences in the treatment of different diseases are merely differences in the emphasis on one or the other of these three groups. It is not strictly true, therefore, that the general principles of treatment of acute disease are different from those of chronic disease; the same general principles lie back of the treatment in all diseases. The fact that in chronic disease emphasis is laid chiefly on methods of influencing the functional

activity of some one organ, and that in acute disease the methods of influencing any one organ may form only a subordinate part of the whole treatment makes it, nevertheless, simpler and more convenient for the purposes of instruction to consider the principles of treatment of the two classes of disease separately. The purposes and principles of preventive treatment (hygiene), and of direct treatment (antitoxin, surgery, etc.), are usually easily understood; the practical details come in large part under the supervision of special teachers. The greater part of *therapeutics* deals chiefly with the treatment of function and is a *branch of applied physiology*; it is a very difficult subject and requires long training.

It is obvious that the long duration of chronic disease, and the fact that treatment, though not always directed at one organ or function alone, is, nevertheless—in contrast with the general supportive treatment in acute disease—usually centered on improvement in the functional efficiency of some special organ or function, makes the study of chronic disease the best discipline for instruction in therapeutics. The emphasis placed on chronic disease is justified, too, on other grounds. Only a small portion of the population suffers from acute disease at any one time, and the illness lasts but a short time; in the course of a few weeks the patient is either well or dead. With chronic disease the case is quite different; a large proportion of persons who have reached middle life suffer from some weakness of function, some handicap based on a physical defect—in its broadest sense, some form of chronic disease; this is not over in a few weeks; the patients live a long time and must adjust themselves to their handicapped condition. In such cases it is the province of the physician to help them adjust themselves; the length of time they live, their general efficiency and comfort, almost everything, in fact, depends on the physician.

The details of treatment depend very much on the severity of the disease, on the degree to which functional efficiency is impaired. Since we have made scarcely a beginning in our methods for the exact measurement of functional efficiency, estimates of the severity of the impairment of function and of the degree of change, either for better or worse, in the severity of the disease depend on the judgment of the physician. Judgment concerning the degree of disturbance of a function like circulation, for example, depends on estimates of the severity of the dyspnea, cyanosis, weakness on exertion and other more subtle changes, none of them capable of very exact measurement, and a comparison of the changes with those seen in many other cases. To this kind of judgment must be added, as the basis of treatment of each new case, long experience in observing the effect of treatment in influencing the severity of such disease. Compared with some of

the more definite technical examinations used in the study of specific infectious diseases, such knowledge and judgment require much longer and more careful training for its cultivation and, in addition, a certain amount of natural ability and aptitude. In the treatment of chronic disease, furthermore, a broader view of all the circumstances of the case must be taken than in the treatment of acute disease; facts concerning the nature of the patient's occupation, and the state of his family and financial affairs must be taken into consideration. In acute disease these factors have very little influence; for the few days during which they are sick, no matter what may be their family or financial responsibilities, all patients with such diseases as pneumonia or typhoid fever usually succeed in having the same excellent treatment carried out.

The therapeutics of chronic disease, in short, is the best discipline—a far better discipline in this respect than the therapeutics of the accidental and ephemeral acute infections—for bringing out the fact that therapeutics is a branch of applied physiology (and applied sociology).

In addition to pointing out *how* to treat sick patients, it is very important to impress students strongly early in their medical career with an optimistic and hopeful attitude toward the *results* of treatment. Since it is only through feeling confident of obtaining good results that the physician—in the face, often, of great difficulties—can carry out his treatment with enthusiasm, great attention should be paid to demonstrating that under proper treatment, disease—especially chronic disease—has a hopeful outlook. Our optimism at the hospital where my own course is given is due not alone to the adoption of the physiologic point of view regarding the purposes and principles of treatment, but also, in part to the fact that, as we observe patients at the hospital, we see results of treatment *with the treatment properly carried out*. The less optimistic attitude of many physicians turns out on inquiry to be due, not to the poor results of treatment, but to discouragement *at the difficulties*, in private practice, *of having treatment intelligently carried out*. This distinction is brought home to the student. That chronic disease is amenable to treatment and has a hopeful outlook is capable of demonstration; and in a course on therapeutics the aim should be not alone to show how to treat sick patients, but to demonstrate how much treatment can do.

Stated broadly, then, therapeutics should be taught as a branch of applied physiology, using physiology here to include all the fundamental, scientific branches dealing with function. Since this point of view brings out the physiologic aspect of disease as contrasted with the anatomic aspect so much emphasized in the diagnostic side of clinical medicine, the question arises, Is this point of view correct? Certain objections to such a course may, further-

more, be raised. It may be objected that the subject of the purposes and principles of therapeutics is one of great controversy, that different physicians have different points of view; and that, not only does the apportionment of values in the emphasis laid on different phases of the principles differ with different physicians, but, with increasing experience, every physician is led to a continuous readjustment of values. The objection may, too, be raised that in presenting principles of treatment to students—fourth-year students who have had about a year of clinical medicine—before they know much about the details of treatment, I am committing the very grave error of placing abstract ideas before concrete examples, an error which the present generation of educators has been doing so much to correct. These questions bring up such very big subjects that, in the present brief discussion, I must take refuge almost in a *paralepsis*, with the explanation that I hope to discuss them more fully in a separate publication.

As to the correctness of this point of view: It cannot be denied that the facts on which the anatomic view of disease are based are as correct as the physiologic facts; but facts by themselves do not make the truth; they are, indeed, the elements of which the truth is made up; but the truth has many aspects, and the important thing in determining the best aspect of a truth lies not alone in the correctness of the facts but in the pragmatic value, in the Kantian sense, that the point of view which results from the selection and arrangement of the facts and the distribution of emphasis among the facts has as a useful productive agent. With this criterion of usefulness as a guide, let us contrast, from the standpoint of therapeutics, the hopeful physiologic aspect of disease with the anatomic aspect. The pathologic-anatomic investigations that have led to such brilliant results in the therapeutics of acute infectious disease during the last half century have done but little to advance the treatment of chronic disease. Though the death rate has decreased by one half in the last half century, and the expectation of life has increased by a dozen years, this increase in the expectation of life ends at the fortieth year. While the death rate in the registration area of the United States has decreased steadily during the last generation—chiefly as a result of decreased mortality from acute infectious disease—from 19.8 in 1880 to 19.6 in 1890, to 17.8 in 1900, to 15 in 1910, and to 13.6 in 1914, the mean death rate for persons over 40 years of age—those chiefly affected by chronic disease—actually increased by 3 per cent. between the years 1880 and 1890, and by 21.2 per cent. between the years 1880 and 1910.

The anatomic point of view tends, indeed, to decrease rather than to increase optimism; even eminent practitioners, because of the difficulty of believing that treatment can influence the structural changes which the anatomic view brings into prominence,

often show a tendency to skepticism in their estimate of the value of treatment, a tendency to consider the so-called chronic and incurable diseases as hopeless conditions having an inherent downward tendency; and because of this view many physicians show a tendency to regard as the most important task of the physician that of determining the exact nature and distribution of the anatomic lesions present. But this pessimism, the result of looking at disease from the anatomic standpoint, is all wrong. Most chronic diseases do not have an inherent downward tendency; they result in a weakness of function, and if the functional activity of the patient is adapted to his functional capacity the *status quo* may not only be maintained but, often, improved. It is a mistake—a mistake for which the anatomic view of disease is directly responsible—to associate together the words “chronic” and “incurable.” The dictionaries (Century, Webster) define “incurable” as “beyond the power and skill of medicine,” and give “hopeless” as a synonym; the term implies that the physician is powerless in the face of the condition. The term “incurable” may, then, properly be applied to those acute infectious diseases not susceptible of specific treatment whose course it is “beyond the power and skill of medicine” to influence directly; it should not be used with reference to such conditions as heart disease, nephritis, diabetes and many other chronic diseases; we may, indeed, be unable to influence the anatomic changes found in these diseases—these pathologic changes may be incurable; but, looked at from the standpoint of physiology, the disease is not “incurable”; the course of the disease, the functional efficiency of the patient, is most decidedly amenable to, often, indeed, largely determined by treatment.

We may lay down the very important apodictic assertion that the whole point of view responsible for these mistakes is a wrong one, and one which can be and should be, counteracted by laying great emphasis on the fact that in chronic disease the purpose of treatment is to influence not so much structure as function. A patient whose leg had been amputated would not be sent away with the statement that, since it is impossible for him to grow a new leg, nothing can be done for him; by the use of an artificial leg and by refraining from certain occupations for which normal legs are desirable, such a patient can be made nearly as efficient as a normal man. The same attitude should be taken toward patients with incurable lesions of internal organs; these patients, too, can often be made functionally efficient.

In examining patients, attention should be directed chiefly to the nature and degree of the disturbance of function; in heart disease, for example, we do not treat damaged valves or the murmurs to which they give rise; in some of the worst cases of cardiac decompensation murmurs are absent; and it is, therefore, a mistake to pay more attention to the murmurs than to the degree of

circulatory decompensation as evidenced by the history and symptoms of the patient. All this bears directly on the question of the correctness of the physiologic point of view, for surely this optimistic physiologic view is a *more useful* guide, has a *greater pragmatic value* in therapeutics than the hopeless outlook forced on us by pathologic anatomy; and if usefulness, pragmatic value, are measures of the correctness of a scientific truth it is, then, the correct point of view.

As to the controversies: Controversies there are, but there are, too, certain fundamentals concerning which there is little controversy; and it is on these fundamentals that the emphasis should be placed. The course in therapeutics should aim to enlighten the understanding and stimulate the use of the intelligence in the application of treatment; the principles as laid down should not be taught as rigidly crystallized doctrine; the purpose should not be to inculcate dogma but to give training in scientific habits of thinking. And so, therefore, just as some of the details of treatment as laid down may be of doubtful value, details that research is constantly modifying; so, too, elements of even greater moment, some tenets of the principles of treatment as stated, may exhibit faults, and inconsistencies, or a distorted perspective in relation to the degree of emphasis laid on different parts of the treatment; or, even if sound today, may be shown to be ephemeral and to have, therefore, but provisional significance. This is not important, for it cannot be helped. The details and facts must be used as the material out of which the ideas are formed; but the modelling of the idea should not be taken for the idea itself.

The physiologic point of view regarding the purpose and principles of treatment may be compared with a wave; though the actual physical particles of which the wave is composed change from instant to instant, the wave maintains its form and character; such a point of view may still better be compared with life itself, with a unicellular ameba, for example; the ameba is continuously changing its form, and the particles of which it is composed are constantly changing, but the living essence, the cell itself, remains. Scientific education should consist, not so much in the accumulation of facts, as in the development of correct habits of thought and points of view; in the establishment of a state of mind in which the facts can take their proper place. Under the influence of a correct point of view facts arrange themselves in order, just as the particles in a pile of iron filings do under the influence of a magnet.

It is, of course, impossible to so adjust the perspective that it will be free from criticism; the truth has many sides and every physician will have his own point of view and scale of values. But the physiologic point of view serves to bring system out of what often appears to be chaos; a statement of the facts of thera-

peutics, subordinated to certain guiding ideas, is to the disordered array of apparently unrelated "remedies" and prescriptions which the student commonly accumulates, what a disciplined army is to a mob of individuals. This point of view, moreover, while simple, definite and clear, is, nevertheless, elastic enough to respond to the necessity of incorporating newly discovered elements of treatment. The tests of *usefulness* (discussed in a preceding paragraph) and *elasticity*, should be the chief guides in determining what to lay down as the truth; the test of usefulness to restrain any tendency toward idle abstraction; and that of elasticity to avoid the other extreme of fixed and rigid canon. As old details and methods of treatment become obsolete they can be dropped out of the scheme and be replaced by better ones, but even though large parts of the scheme of treatment have to be altered to conform to the results of scientific progress, the idea itself will still remain, and the scheme still serve as a paradigm, just as the living ameba or wave, already mentioned in comparison, remains though the component particles constantly change.

The other objection—that generalizations should not be presented before the facts on which they are based are known—is an academic one; it cannot be applied to the content of a course, only to the method of instruction. It is, of course, true that empirical experience should precede scientific conception, that educational advance should proceed from the concrete to the abstract; in such a complex subject as therapeutics this is especially true. But this very complexity itself makes it advisable that the student should have some elementary instruction that will serve as a guide through the maze of details. Such elementary instruction is all that such a course can hope to give; it can serve as an introduction, only, to the general principles of treatment. As pointed out later, in the actual carrying out of the teaching—to contrast this with the content of the course—instruction should be based on and proceed from concrete cases.

THE DETAILS OF INSTRUCTION

Before taking up the details of teaching applied therapeutics as I carry it out in my own course, I should like to point out that the organization of these details is a subordinate matter. So much emphasis is being laid on organization, equipment and material facilities for medical instruction in recent years that it may not be out of place to point out here that in the teaching of medicine or any other subject, though certain facilities, equipment and organization may be necessary, these are but ancillary to the chief requisite, namely, that of a teacher, a man with ideas. In the case of therapeutics, if the teacher recognizes the needs I have already pointed out, and knows how to fill them, the actual instruction can

then be carried out in a great variety of ways. The details which follow are simply those which I happen to be using in my course at Tufts Medical School at the present moment.

My own facilities for teaching therapeutics are excellent. The course is given in a large modern hospital of about 150 beds, well equipped for diagnosis, treatment, pathologic studies and scientific laboratory investigation, and with abundant and varied clinical material. While the hospital is intended for patients with chronic disease, nevertheless, as a result of intercurrent infection, acute exacerbation, or other reason, many patients with acute conditions come under observation; so that all the common acute diseases—pneumonia, typhoid fever, the acute stages of rheumatism, appendicitis, gallstones, gastric ulcer and tonsillitis—are seen during the course of the year. Among chronic diseases, the variety is very great; cases of all the common, and many of the uncommon diseases of the heart, kidneys, vessels, blood, lungs, joints, bones, nervous system, skin, gastro-intestinal tract and general metabolism are seen. Not only medical methods, but also, by cooperation of members of the staff, surgical, orthopedic and other special forms of treatment are demonstrated. Much attention is devoted to the so-called imponderable remedies, massage, exercise, hydrotherapy, posture, and diet; and the students have an opportunity of observing these methods carried out under the direction of experts.

In the discussion of treatment the plan is to take up, first, the treatment of diseases of the heart, then, in succession, diseases of the kidneys, and vessels, the respiration, the blood, the gastro-intestinal tract, and last, diseases of metabolism. This seems a rational order of discussion: the heart has but one function, that of maintaining the circulation, and, in the treatment of heart disease, there is but one function to be influenced; though the details of treatment may be modified by the nature of the lesion, the general principles of treatment are practically the same, whether the endocardium or the myocardium is the seat of disease, whether the lesion is one of the mitral or of the aortic valve; that is to say, the exact nature of the anatomic lesion is of far less significance, so far as treatment is concerned, than the severity of functional disturbance as evidenced by the amount of venous congestion, edema, dyspnea, or other symptoms of impaired circulation.

In the treatment of diseases of the gastro-intestinal tract a new complication is introduced; the gastro-intestinal tract is made up of a number of distinct organs, and each of these organs has several distinct functions; the same general principles—stimulation of function, and rest of function—are used, and the degree of disturbance of function is of the utmost importance, but we ought first to recognize which particular function—motor, diges-

tive, or absorptive—is disturbed before applying the treatment. Diseases of the kidney occupy a position intermediate between diseases of the heart and diseases of the intestine. At the present time the treatment can be discussed with the same degree of simplicity as that of heart disease; the details of treatment depend chiefly on the severity of the disease, on the extent to which waste products are accumulating in the body. There is, however, some difference in function between the glomeruli and the tubules, and a case is occasionally found in which it is chiefly the tubules or chiefly the glomeruli which are imperfectly functioning; in other words, a case in which the exact distribution of the lesion is significant for treatment.

In diseases of the general metabolism the disturbance of function often cannot be related to any particular organ, sometimes, perhaps, simply because we do not know which organ is diseased; in other cases, perhaps, because the cells of the body as a whole are involved. In discussing diseases of the different organs, (1) the functions of the organs are very briefly reviewed, and then are taken up, in turn; (2) the nature of disturbances of function which pathological changes in the organ can lead to; (3) methods of influencing these disturbances of function; and, finally, (4) the clinical forms of disease of the organ. The facts are illustrated by demonstrations of patients under treatment.

Instruction is given to small sections of fourth year students; it is given at the bedside, and actual cases and actual treatment charts are used. The scheme of procedure outlined in the preceding paragraph—from disturbances of simple function to those of gradually increasing complexity, and in the case of each disease from the physiology to clinical forms of disease—is borne in mind as a paradigm; but in the actual instruction it is not always adhered to in detail; while recognizing the excellence of this general scheme as a model, certain points may best be brought out, and the final object of the course better reached by varying the actual details. Acute infectious diseases, for example, logically come last; but in actual practice, cases of these diseases are shown as opportunity arises and the importance of the physiologic point of view regarding the purpose and principles of treatment emphasized by contrasting, in certain respects, the treatment of specific infectious disease with that of chronic disease.

As far as time permits, didactic instruction is avoided and the "quizz" method of instruction used; with the aid of hints and suggestions the student is led to reason out rational treatment from what he knows. To show what treatment can do, the actual effect of drugs and other forms of treatment are illustrated as far as possible. New forms of disease are successively taken up and new patients shown, but the patients already seen are followed from day to day to show the results of treatment and the neces-

sity for changes in treatment. Emphasis is laid throughout on the *general principles* of treatment; and it is pointed out that whereas the details of treatment—the particular drug used, the size of the dose, and often even more important features—may differ, yet the general principles of treatment are essentially the same with different physicians; and one physician can, as I do, use the treatment charts of other physicians as good examples of methods of treatment. Many of the patients are seen by the student under colleagues giving other courses at the school so that the student is able to complete his picture of the case by other points of view.

THE TEACHING OF CLINICAL MEDICINE

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THE SCIENCE OF CLINICAL MEDICINE

Clinical medicine is one of the most complex of the natural sciences, for successfully to study it one needs to be more or less familiar with the content and the methods of investigation of a whole series of ancillary natural sciences (physics, chemistry, biology, anatomy, physiology, psychology, physiologic chemistry, pharmacology, pathologic anatomy, pathologic physiology, bacteriology and parasitology, immunology, etc.). Like other natural sciences, clinical medicine consists of a growing accumulation of truths that make up a more or less distinct body of knowledge. In order that this body may be conveniently organized, the facts of the science have to be collected, compared with one another, arranged in logical sequence, and, as far as possible, summarized in the form of generalizations known as laws or principles. The many ways of accumulating and organizing the facts pertaining to the sick constitute the scientific method of internal medicine.

Studies of patients have shown us that the transformations of matter and energy in the bodies of the sick, though conforming to natural law, deviate to a certain extent either qualitatively or quantitatively from the transformations in health. Workers in clinical medicine are gradually finding out how to detect these deviations from the normal by systematic inquisition of the minds and bodies of their patients. They began their studies by using the method of simple observation, but they have learned how to make observation more accurate by experiment so that internal medicine has now become an elaborate experimental science. The study of a single patient by modern methods includes the making of a very large number of experiments, that is, of test procedures adopted on the chance of their yielding to observation under especially controlled conditions definite information that is not obtainable by simple nonexperimental observation. There is no other science in which the technic of accumulating facts is as extensive as in clinical medicine, for its methods of examination are based on and include the technical methods of the preliminary natural sciences and of all the intermediate, simpler preclinical sciences.

The end, or goal, of clinical medicine is to understand the abnormal conditions that may occur in the human organism in order that physicians may act in a rational way to cure them or

to prevent them, instead of being content to act in the blind and haphazard way of the ignorant. The collection of data, the arrangement of them according to their similarities and sequences, the epitomizing of them in the form of brief symbols or generalization such as syndromes or disease complexes, though important in themselves for the construction of the science, are in reality only means to the larger end of permitting suitable action for the welfare of human beings that entrust themselves to the care and supervision of the medical profession.

The great science of *clinical medicine* is, therefore, subdivisible into two large parts: (1) that dealing with the understanding of exactly what is going on in the body and mind of the patient and how it has come to pass—the *science of diagnosis*; and (2) that dealing with the fitting action to be taken to prevent the origin or extension of abnormal processes, and, when possible, to restore bodies and minds deviating from normal function to a healthy state—the science of *prophylaxis and therapy*. We endeavor to *know* in order to be able to *predict* and to gain the power to *control*.

The imperative need of the clinician to know in order rationally to act has accounted for the origin of the whole group of the natural sciences. For as every one knows, physics, chemistry and biology had their birth in the curiosity of physicians; these sciences, and each member of the whole group of the pre-clinical medical sciences, began as daughters of the clinic. In their infancy they were under the fostering care of medicine; but they have grown up into lusty adults, and now, many of them, besides contributing handsomely to maternal support, are rendering notable service to human efficiency and culture in domains far removed from clinical medicine. I mention the primary relationship, for some understanding of it is of importance for the planning of clinical teaching.

THE NATURE OF CLINICAL TEACHING

If the definition of clinical medicine that I have given be accepted, the nature of the teaching will be readily understood. It will consist (1) in *instructing* the students regarding the organized body of knowledge that has been accumulated in diagnosis and therapy (as already broadly defined); and (2) in *educating* them in the methods used in accumulating facts, in arranging them, in comparing them, in epitomizing them, and in acting in a rational way afterward—preventing, curing and mitigating.

On these general principles as a foundation, the teachers of clinical medicine have to construct a suitable concrete curriculum for the clinical years, in planning which every effort should be made to parcel out the precious time, and to fill the periods in

such a way as to give the best opportunities possible under the teachers and with the equipment available. It is desirable that the students shall gain a comprehensive knowledge of the principles of clinical medicine and a systematic schooling in its practical-technical methods, both of which are necessary for a medical career that shall be satisfying to the man and of adequate service to society.

THE STUDENTS AS THEY ARRIVE IN THE CLINIC

Fortunately, students now enter the clinical years, or should do so if they take advantage of the opportunities offered them, habituated to the method of science. They have become familiar with the general principles of the three great preliminary natural sciences (physics, chemistry and biology) and of the three great preclinical medical sciences (anatomy, physiology and pathology), and to a certain extent they have been trained in the actual use of the practical-technical methods of investigation employed in the laboratories of these six sciences. By the time they have reached the clinics, we may assume that they know what the scientific method of inquiry is. We may take it for granted they have learned how problems are set and solved, that they have acquired a feeling for accurate observation, for the critical sifting of facts, and for resorting to experiment to perfect their observations. Students thus trained will enjoy considerations of comparison and of regularity of sequence. They will be acquainted with libraries and will know how quickly to consult sources. Many of them will have learned properly to doubt when convincing evidence has not been brought, whereas they will also, through their experiences, have found that they may confidently act after inquiry has shown that action can be taken along lines of sequences known to be invariable.

The student's knowledge of man and of his relations to the rest of Nature should by this time be fairly large. The student knows man as a living, thinking, feeling, acting social organism, very much like other living beings and yet differing strangely from them. He has opened the body of man after death and knows what his organs, tissues and cells look like to the naked eye and under the microscope, and he remembers how these have all gradually grown from the fused germ cells. He has had a glimpse of the materials of which the cells and juices of man's body are composed, has isolated some of these materials and studied their properties and origins. He has found out that the materials in man are constantly undergoing change, that with these changes, synthetic and analytical, remarkable transformations of energy go on, under special conditions it is true (colloidal states; ferment-activities, etc.), but always in obedience to the laws of the conservation of mass and energy. He has been fascinated by the

study of processes known as irritability, contraction, circulation, respiration, secretion, digestion, absorption, metabolism, excretion and reproduction. He has seen how these various functions can be modified by environmental influences and has come to look on the body and mind of an organism at any given moment as the direct resultant of the energies in the germ cells and the energies that have acted upon the organism from without from the time of germ-cell fusion until that moment. He has come to see that what we call "disease" is modification of structure and function beyond certain limits, whereas maintenance of structure and function within these limits is designated as "health."

In the bodies of men dead of long-continued disease, he has studied the coarser and finer changes in the organs, tissues and cells and has contrasted them with the findings in a healthy man of the same age killed by accident. His teachers have shown him specimens illustrating transition stages between coarser structural changes and the beginnings of organic disease. Studies of pathologic chemistry have convinced him that, in the absence of changes in form recognizable by our present methods, deviations of the chemical composition from that of health can often be found. Among the many deleterious environmental influences, he has found bacterial and parasitic invasion to be especially important; he has studied these bacteria and parasites, and has used them to produce diseases in animals for experimental comparative study. He has observed striking differences in susceptibility to noxae among these experimental animals, and has seen that this susceptibility is capable of artificial modification. His studies in immunology and in pharmacology have convinced him that man can often intervene in a strictly rational way favorably to modify the processes that go on in an organism.

During this whole period of preliminary and preclinical study, the student's background has been gradually and extensively elaborated. His studies in each successive science have been, to a certain extent, a review of the sciences preceding. *Repetitio est mater studiorum*. And yet, even more important for the clinic than the actual content of the student's mind as regards the ancillary sciences, is the long discipline that his mind has had in observing and reflecting, I mean, the development in it of a permanent scientific habit.

MEDICAL WARDS; AMBULATORIUM; THE INSTITUTE FOR CLINICAL MEDICINE

The teaching of clinical medicine as a science demands conditions very different from those that formerly existed, and very different from those that are even at present available in any of our medical schools, though some schools have been fortunate enough to secure conditions that approach what is needed. Briefly

stated, the conditions that a department of clinical medicine should control include (1) a medical clinic to which may be admitted a sufficient number of patients suffering from all varieties of both acute and chronic internal diseases (infectious, parasitic, respiratory, circulatory, hemopoietic, digestive, urogenital, locomotory, nervous, metabolic), with ward laboratories for routine application of the commoner laboratory methods; (2) a medical dispensary, or ambulatorium, to which a large number of patients, who, for various reasons, do not enter the stationary clinic, apply for diagnosis and treatment, and in connection with which there are large and small teaching rooms, a laboratory, and also quarters in which the various special branches of internal medicine apply their special methods of examination; (3) a large clinical institute adjacent to the wards and dispensary, containing (a) a clinical amphitheater for lectures, clinics, and lantern-slide demonstrations to a whole class; (b) a general clinical laboratory in which systematic courses in clinical chemistry, clinical microscopy, etc., can be given to the whole class at the beginning of their clinical work; (c) a series of smaller laboratories especially equipped for routine work in clinical bacteriology, clinical immunology, clinical physiology, etc.; (d) other laboratories for advanced investigative work in metabolism, for the study of materials from clinical autopsies, and for animal experimentation; (e) a "heart station" in which sphygmographic and electrocardiographic and other graphic registrations can be made; (f) a capacious roentgenologic laboratory with complete outfit for modern roentgenographic and roentgenoscopic studies; and (g) many small rooms for special examinations with instruments of precision (ophthalmoscope, pharyngoscope, laryngoscope, esophagoscope, cystoscope, etc.), for members of the staff, for advanced students (undergraduate or graduate), for an artist, for photography, for technical assistants, for clinical records and for supplies. The institute should also contain at least a small departmental library for immediate reference; though for books and journals not daily in use, the general library of the medical school and hospital will suffice.

THE INSTRUCTION AND EDUCATION OF THE STUDENT IN THE METHODS OF CLINICAL DIAGNOSIS

At the very beginning of the clinical work, a few general lectures should be given to the students offering a bird's-eye view of the scope of the sciences of diagnosis and therapy, explaining the relation of these sciences to the student's earlier studies, discussing the nature of the undergraduate curriculum in clinical medicine, and giving the reasons for the arrangement of the courses in a certain sequence. The first year of clinical work should consist almost entirely of a systematic education in the

methods of clinical examination of the normal and the diseased human being and of substances derived from normal and from diseased people. Some lectures and demonstrations will be necessary properly to coordinate this work and to determine its being done intelligently, but the education at this time will depend mainly on closely supervised personal work of the student in the study and practice of methods of history-taking and of physical and instrumental examinations of healthy people and of dispensary patients, and in the laboratory study of materials derived from healthy and diseased living persons.

In teaching *history-taking*, the various parts of the clinical history—anamnesis, status praesens, catamnesis, epicrisis—should be systematically described, and each student should be given opportunity for personally questioning dispensary patients and recording the anamnesis he obtains from each.

In teaching *physical diagnosis*, a fundamental course in the clinic, the physical principles involved should be succinctly reviewed and the application of these principles to diagnostic methods, especially to auscultation and percussion, should be thoroughly described and illustrated by a teacher of ability that has had a sufficient training in the science of physics himself and also an extended clinical experience. This course in physical diagnosis will also be a course in medical applied anatomy, which should be illustrated by models, dissections, and sections of formalized cadavers. The theoretical and demonstrative side of this course in physical diagnosis should run parallel to a strict drilling of the student in the practical-technical details of the methods of physical examination, small groups of students carrying out the several procedures themselves on fellow students or on dispensary patients (the latter perhaps paid a small sum) under the eyes of young instructors that see to it that skill in the technic is gradually acquired. Much time should be devoted to these practical courses—enough to ensure mastery of method and the confidence of the student in the reports that his sense organs yield.

At this stage too, a course in chemical physiology like that advised by Professor Lee, will be of great advantage to the student.

The *general course in clinical laboratory work*, properly given, is one of the most important courses offered in the medical school. It should consist of three half-day exercises in the laboratory, extending over a period of at least six months. With judicious selection, a large amount of ground can be thoroughly covered, each student learning and practicing the best methods of the time for the physical, chemical and microscopic study of the urine, the gastric contents, the duodenal contents, the feces, the sputum, the blood and the fluids obtained by exploratory puncture. Many of the methods need only be done once, but certain of them should

be practiced under control until the student satisfies himself and his instructors that he has acquired skill and accuracy enough in the technic to permit him to participate, in his last year, in the actual investigation of patients with recording of his results in the official records of the hospital. This extra practice will be especially necessary in quantitative chemical examinations of urine and stomach contents, in blood counting and hemoglobin-determinations, in differential counting of white blood cells in stained smears, in examinations of cerebrospinal fluid, and in agglutination and complement-fixation tests.

During this first year of clinical work, the student should also acquire the *technic of a whole series of special and instrumental methods of examination*. Hitherto, students have too often been led to think that these special methods are beyond the scope of the work of the general practitioner, that there is something mysterious about them, and that the technic of their use is the prerogative of specialists upon whose rights and privileges the general student of medicine dare not encroach. Now, I am convinced that this is a great mistake. I think it exceedingly important that the minds of students and of general internists should be disabused of this fallacy. Most of the methods are very easy to learn and apply, and these every student should actually learn and practice.

The mystery should be taken away from all these methods. Even if, later on, as a practitioner he evoke the aid of specialists in his work, the student will find that the training he has had in the methods of the medical specialties giving him an acquaintance with these means of diagnosis and the power to interpret their applications, will place him distinctly at an advantage over practitioners whose schooling has not included training in such technic. Thus, in my opinion, every student should at this period of his growth become acquainted with Roentgen-ray apparatus and the technic of *roentgenoscopy* and *roentgenography* as applied to the study of different parts of the body. In the clinical, bacteriologic and immunologic laboratories, he should learn the clinical applications of *bacteriologic methods* (collection of materials; diagnostic examinations by microscopic and cultural methods, or by animal inoculations and virulence tests), and the application to the clinic of the *doctrines and technic of immunology* (clinical studies of agglutinins, bacteriolysins, hemolysins, precipitins, opsonins and ergins), with especial emphasis on, say, the Widal reaction, the Wassermann reaction, the Schick reaction and the tuberculin tests. Next, might come training in special methods of studying the *respiratory apparatus* (rhinoscopy, pharyngoscopy, transillumination of the paranasal sinuses, laryngoscopy, a demonstration of the use of the bronchoscope and of exploratory puncture of the pleural cavity); such studies, supplementing the

course in general physical diagnosis of the lungs and pleurae, the course in the examination of the sputum, and the course in roentgenology of the thorax, bronchi, lungs, pleura and diaphragm, will be the best possible preparation for the investigation of the special diseases of the respiratory system to follow in the last year of the student's course. Similarly, the special methods useful in investigating conditions in the *circulatory apparatus* may now be rapidly acquired.

It is not as though we were educating raw high-school graduates; the students that are arriving in the clinics now are accustomed to the use of instruments of precision of various sorts and are familiar with the general mechanical, optic, acoustic, and electrical principles underlying them; they can therefore acquire much more rapidly an acquaintance with and skill in the use of clinical instruments and graphic methods of registration than would be possible for students untrained in the natural sciences. Roentgenoscopy of the cardiovascular stripe, so helpful for examining the configuration of the heart and in the recognition of aortic dilatations, will present no difficulties to our clinical student, and he will be fascinated by the simplicity and precision of teleroentgenography, which has largely replaced orthodiagraphy and which serves as a salutary control of the results obtained on percussion of the relative cardiac dulness.

Even the precise methods of mechanical registration of the movements of the heart and blood vessels (sphygmography, cardiography), of the heart sounds (phonocardiography), of the electrical currents generated in the heart during its activity (electrocardiography), and of the pressure of the blood within the arteries and veins (sphygmomanometry or tonometry of the blood-vessels) can be speedily acquired, for the student has already had at least a glimpse of them in the laboratory of physiology. Though as yet we do not know how to value the results clinically as well as we should like, the methods that have been devised for determining the functional capacity of the heart should be demonstrated. The student thus trained at the beginning of his clinical studies in the special methods of clinical angiological examination, in addition to the ordinary physical methods, should have no difficulty in his later studies in accumulating the necessary data for forming a diagnosis when confronted by a cardiac arrhythmia, an inflammatory or a degenerative cardiopathy, or a hypertensive arterial malady.

Turning to the special methods useful in investigating the *digestive system*, the student has a considerable technic to acquire in addition to the ordinary physical methods of examination of the viscera, and the laboratory studies of the secretions and excretions. Thus, instruction should be given in the methods of examining the teeth and gums preferably by a dentist attached to

the clinic. Dental caries, paradental infections with formation of blind abscesses at the roots of teeth, and pyorrhea alveolaris are now so important, not only for themselves, but also in their bearings on disease elsewhere in the body that students dare not be permitted to leave the medical school without knowing how they may be recognized by inspection, by percussion, and by special roentgenograms on dental films, so that dental aid may, when required, be obtained. Then the newer technic of examining the esophagus should be demonstrated, though it may not be possible to give the undergraduate student actual practice in the passage of esophageal bougies, in roentgenology of the esophagus or in esophagoscopy. The physical exploration of the abdominal viscera will be taught in the general course on physical diagnosis.

Actual practice in gastric intubation of the fasting stomach and of the stomach after a test diet, and actual experience in roentgenoscopy and roentgenography of the stomach and intestines after a contrast meal and a contrast enema, should now, in my opinion, be required of all students. The roentgenologist of the clinic should have a large demonstration room that students may visit; there they should see typical normal and pathologic roentgenologic findings serially displayed; moreover, a few systematic demonstrations of these should be made by the roentgenologist to the class, so that every student may become familiar with the roentgenographic appearances of conditions like idiopathic dilatation of the esophagus, filling defects due to ulcer, or carcinoma, of the stomach and duodenum, intestinal stasis, kinks, adhesions, and other forms of intestinal obstruction, diverticula of the sigmoid, etc., and will know how to make use of the Roentgen ray method for recognizing them.

The special methods of studying the pancreatic functions by examination of the duodenal contents (obtained by the duodenal pump), the feces, and the urine will require but little time; the same applies to the special methods of examining the liver and the biliary passages and their functions. Instruction in digital exploration of the rectum and demonstrations of proctoscopy and of rectosigmoidoscopy should form a part of the course.

As regards the *urogenital* system, its examination dare not be omitted in the teaching of clinical medicine. This part of the body should be systematically examined, as is every other part, for otherwise conditions of great importance for the general medical diagnosis frequently will be overlooked. It may be desirable, however, for obvious reasons, to have certain parts of urogenital methodology taught in the surgical and gynecologic clinics. The teaching of methods for examining the urine, of physical and roentgenologic methods of examination of the kidneys, and of methods of testing the capacity of the kidneys to excrete certain substances, belong in the medical clinic; and if, for any reason, the

other clinics do not demonstrate urethroscopy, cystoscopy, ureteral catheterization, pyelography, etc., the medical clinic would have to provide for this teaching.

As to the special methods of examination of the *bones, muscles and joints*, only brief instruction will be necessary in the medical clinic, since by custom those methods are usually very extensively taught in the surgical clinic, especially in its orthopedic subdivision. For a rounded view of clinical medicine, however, some attention to them is necessary in the medical clinic where examinations for pain, limitations of movement, Roentgen-ray examination, trichinae in muscles, etc., may often have to be made. The examination of the skeleton is often very important for the internist as throwing light on the metabolic functions and especially on the functions of the endocrine glands. I shall not be surprised if, later on, all the patients entering a general hospital, except those of surgical emergency, will first be sent to the medical clinic for thorough diagnostic study, before being distributed to the surgical, gynecologic, urogenital or other special clinics for therapy, should the diagnostic study reveal that the patient requires surgical treatment.

The teaching of *neurologic and psychologic methods of examination* should occupy enough time to enable the students to acquire competence in at least the main procedures of clinical medical inquiry. It is best to divide this work into three parts, the first part dealing with the methods of accumulating neurologic and psychologic data from the patient, the second part dealing with the utilization of the accumulated data for deciding on the site of any lesions or of any abnormal processes present in the nervous system, topical diagnosis, and the third part dealing with the considerations that permit the drawing of inferences regarding the nature of the lesions or of the pathologic processes. Thus, in the first place, the student will be taught how to make accurate examinations of the senses and of the sense organs (cutaneous, deep, gustatory, olfactory, acoustic, vestibular and visual); of the motor functions and the reflexes; of the coordinating powers; of the capacity for speech, for writing, and for other complex movements; of the functions of the smooth muscle and of the secreting glands; of the sphincters; and of the trophic functions.

In this connection, certain applications of anthropologic methods of measurement may be practiced, as well as the technic of roentgenologic examinations of the nervous system, skull and spine, that of lumbar puncture, and that of diagnostic electrical examinations of the muscles and nerves. He will be taught at this time, too, how to examine the mental state of a patient, paying attention not only to the patient's consciousness as a whole, but also to the special powers of attention, of perception, of identification and of diction, to the affective life of the patient as revealed

by his feelings, emotions and moods, and to his conative functions, often called "the will," and judged of by the person's behavior or conduct.

The second part of this instruction in clinical neurology will involve a review of the architectonics of the nervous system and of the psychology of the several nervous systems (centripetal, centrifugal and associative), in as far as these subjects can be applied to localizing diagnosis; the student will quickly see the reasons for deciding whether the lesions present, or the pathologic processes going on, concern the peripheral nerves, the spinal cord, the medulla, pons or cerebellum, the midbrain, the interbrain or the end-brain, and whether they are focal or diffuse, single or multiple.

And in the third part of the neurologic work, instruction will be given in the principles on which the diagnosis of the nature of a nervous disease is arrived at. The difference between the so-called "organic" and "functional" diseases of the nervous system will be discussed, and the criteria for recognizing whether a given organic disease has been due to disturbances of development, of the blood supply, or of the nutrition, to toxic or infectious processes causing degeneration or inflammation, to trauma, to parasitic invasion, or to tumor growth, will be established.

Instruction in methods should include finally the procedures used for the *clinical study of metabolism*. After a brief review of the physiology of metabolism, the student should be taught the requirements of systematic metabolic studies. Though there may not be time to do actual practical work in the quantitative chemical analysis of foods and excreta, the organization of a modern metabolic study will be illustrated and the students will become acquainted with the manner of preparing a patient for such a study with the periods of observation required, with the doctrine of "balances," and with the preliminary tests that may have to be made of assimilation, digestion and absorption. After this introduction, the methods of determining in man the metabolism of proteins, nucleus, and purins, carbohydrates, fats, water, mineral substances and vitamins will be demonstrated. The different forms of apparatus for direct and indirect calorimetry will be described and the use of at least some of them actually demonstrated. Such a preliminary discipline in the practical-technical methods of metabolic study I regard as essential if the students are later in their course to proceed to the study of states of under-nutrition and overnutrition, of the several amino-acid diatheses, of diabetes mellitus, and of gout, armed with the knowledge and technic that the science of medical diagnosis has now made available. Teaching hospitals should take the lead in making suitable provision for these studies of metabolism that are now indispensable for satisfactory diagnostic and therapeutic work.

As an appendix to the doctrines of metabolism the methods of investigating the disturbances of function of the *endocrine glands*, so interesting at the present time to all workers in internal medicine, should be taught. Aside from certain pharmacodynamic tests to be made with epinephrin, atropin, pilocarpin, etc., judgments regarding the activities of the several endocrine glands depend largely upon (1) observations of the general *exterieur* of the body (facies, height, bony skeleton, span, skin, hairs, mass and distribution of subcutaneous fat, shape of pelvis, appearances of the acra, and of the genitalia, teeth); (2) systematic metabolic studies; and (3) systematic studies of the functions of the autonomic nervous system. The main diagnostic facts in this active area of clinical medicine can be quickly assembled and given in concise form to the students; thereafter, they may apply them in their work in the wards to the analysis of endocrinopathic cases.

PRACTICAL APPLICATIONS OF THE PRINCIPLES AND METHODS THUS
LEARNED IN THE ACTUAL STUDY OF PATIENTS ENTERING
THE CLINIC FOR DIAGNOSIS

The rather extensive propaedeutic clinical training that I have just described should I think be undertaken and finished before the students take up the complete diagnostic study of single unknown cases.

They may then enter the wards for a period of say three months of concentrated clinical study of patients, and though still under strict control become an integral part of the working force of the clinic. If the wards of the clinic are under the close supervision of a junior and a graded senior resident staff and are also daily visited by professors and associate professors, there is no reason why students educated in the way mentioned may not make possible more exhaustive studies of the patients than could otherwise be obtained, to the benefit of the patients and the staff, while the students themselves are gaining an invaluable clinical experience.

During this period of the *clinical clerkship*, the student should spend practically his whole day in the medical wards and in the laboratories and library adjacent to the wards, very much as does the regular medical house officer. A certain number of beds—say three or four—are assigned to each student. When a new patient enters one of these beds, the anamnesis is taken by the student, who submits it to the resident house officer for criticism or approval. The student makes a general physical examination, the results of which he records for himself, though this record may or may not be incorporated in the hospital records. In any case, the student has had an opportunity of making a physical examination without prejudice and of recording a status praesens, and he later has opportunity to compare his findings with those

of the resident staff and with those of the visiting physicians. Certain routine laboratory and instrumental examinations he makes at once and records the results in the history, so that any member of the staff on coming to the patient finds not only a complete anamnesis ready for him, but also some reports on the urine, the feces, the blood, and the blood pressure. After a review of the anamnesis and of the general physical findings by a member of the senior resident staff, further steps to be taken in the diagnostic study are discussed and a decision arrived at concerning the series of examinations next to be made. The student accompanies the patient to the special examining rooms and assists with the technic of the roentgenologic, immunologic, ophthalmologic, urogenital and other methods of examination employed.

Gradually the data bearing on the case are accumulated. The student is asked his opinion of their meaning, and every effort is made to lead him to form his own independent ideas regarding (1) the structural changes that have occurred in the patient's body; (2) the pathologic-physiologic processes that are going on; and (3) the etiology and pathogenesis of the disease. To his surprise, the student often finds that, at first, he cannot see the woods on account of the trees. He is confused by the wealth of abnormal findings the study has yielded. He is in doubt as to the relative importance of the several findings, and may have difficulty in seeing internal connections that exist. He does not know yet how to arrange the findings in logical sequence. He has had no experience in the epitomizing of a group of observations in the form of a so called "syndrome." He is not yet an adept in the construction of a clinical (or pathological-physiological) picture. And this is as it should be. The student who begins his clinical studies by looking for ready-made clinical pictures or syndromes goes at his work at the wrong end. Only after long experience at clinical analysis is the synthetic work of syndrome formation desirable or profitable. For working in the right way he finds that what is called a syndrome is only a generalization, or kind of shorthand expression, to abbreviate description—for proper use, not for abuse.

Through the whole period of the patient's stay in the hospital, the student follows the case closely. The course of the disease is observed and recorded. Complications are watched for. Early erroneous impressions are corrected. The student goes to textbooks, handbooks, monographs, and journals in search of descriptions of similar cases.

When therapeutic measures are instituted, their effects are observed. Should surgical operation become necessary a student knows it and is present to observe what is found. Should death occur, the student assists at the autopsy, makes histologic and bacteriologic examinations of the organs, and, later, attends the

clinical-pathological conference at which the case is discussed by the professor of pathology and the professor of medicine. After the study of any case has been finished, the student writes down his final impression of the whole case, in the form of an "epicrisis."

It is a disadvantage to the clinical clerk to be responsible for over three or four patients at once. He should not be hurried or overburdened at this stage of his development. It is better that he study one patient thoroughly and read and reflect on the case carefully, than that he study superficially a dozen different patients. During a clerkship of three months he will have studied a number of patients in a careful way, and rubbing elbows with his fellow clerks in the ward will have benefited by their studies of patients nearby.

Moreover at the *daily ward rounds* he hears staff and students discuss various cases, and at the *amphitheater clinics*, which he can now really begin to enjoy, he listens to the presentation of a case, or of a subject in its entirety, and revels in the beauty and artistry of the clinical pictures that the experienced clinical teacher finds it possible and legitimate to compose.

In the clinics he hears also the results of the original inquiries that are under way and if he has an original mind the atmosphere of the clinic may incite in him visions of some new application of an ancillary science to the solution of some clinical problem and the desire to make a trial of it. Such a student will be very sorry when his clerkship in the clinic comes to an end.

Were the time of undergraduate medical study longer, the student could profit by attending *special courses* on clinical medicine in which a single group of diseases is intensively treated, say those of the digestive system, those of the circulatory system, those of the nervous system, etc. Such courses should be offered in every medical center. They should be optional for medical students, not obligatory, and should be open to physicians that apply to the medical clinic for "continuation courses." It may be that, sometime, as Professor Ewing yesterday advised, we may add a fifth year to the medical curriculum in order that more of this training may be given.

During his first year of clinical work, the student should study carefully a *textbook* of clinical methods of investigation; during his second year of clinical work he should study a good textbook of medical practice in which both the diagnosis and treatment of internal diseases are dealt with. Such texts replace, to a large extent, the formal systematic lectures that were earlier given on medicine in the medical schools.

Above I have dealt only with the development of the teaching of medical diagnosis. The teaching of clinical medicine includes, of course, that of therapy, and it, in my opinion, should be taught

in a similar way, that is to say, first by a thorough education in the principles and technical methods of therapy, general and special; and, second, by first-hand experience in the application of these methods to the actual treatment of patients during the clinical clerkship. Unfortunately, the medical wards of our hospitals are all too often mere *diagnostic institutes*, unprepared for the teaching and application of therapeutics. It seems to me very desirable that each university medical clinic should have associated with it, not only an institution for clinical diagnosis, but also an *institute for therapy*, in which the methods of modern therapy may be systematically taught and applied.

TEACHING OF CLINICAL SURGERY

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The teaching of surgery is a question in pedagogy. Not only must the pedagogy of abstract science be employed, but also that of the applied sciences. The pedagogy of pure science has been much discussed, but that of applied science, particularly that pertaining to the teaching of surgery, has been very sparsely considered in the literature.

It is simpler to teach theoretical science than to teach the application of that science to the economy of living. It is more simple to demonstrate a theoretical proposition than it is to apply the demonstration. The teaching of the application of the principles of surgery is far more difficult than the teaching of sciences related to surgery. The clinical teacher of surgery has a more difficult task than the teacher of pathology or of anatomy.

Surgery is essentially a practical art, and to learn surgery is required not so much equipment as opportunity. To impart the scientific principles, the professional ethics necessary for the preservation of the art and the protection of the sick should be the aim of the teacher. Although it is not the chief purpose of this paper, a word or two regarding the requisites of the surgical teacher may be opportune.

First, the teacher must have technical knowledge of the principles of the sciences of which surgery is a composite, and he must be so well versed in these that he can draw on them at will for the diagnosis, the pathology and the treatment of surgical diseases. It is a paradox to hear a surgeon, much less a clinical surgical teacher, explain that he is not familiar with the technical anatomy or the possible pathology of the region on which he is operating.

Second, a clinical teacher of surgery should be a good pedagog. Imparting knowledge to others is a difficult matter, not always appreciated by the erudite professor. The stumbling block seems to be the endeavor to impart too much knowledge, to cover too much ground, and that without careful systematization. The teacher must be able to emphasize the principles of his science and present them to the students in such a way that they have a fixed relation and a formal classification in the mind of the student. He must be careful to avoid the pitfall of allowing students to deduce principles from cases. Case teaching, so much in vogue, is apt to fail in that the tendency is to deduce surgical principles from cases rather than to place the particular case under consideration in its proper class.

The third qualification of a good teacher of clinical surgery is some years spent in private practice. We are, no doubt, all practically agreed on the amount of preliminary education, the amount of medical college and hospital education and training that is necessary to make a good clinical teacher but we are not agreed on the question of the value of private practice to clinical teachers. Private practice emphasizes the important and differentiates the unimportant. It removes from the clinical teacher some of the dogmatism and "cock-suredness" of the hospital and laboratory man. We must not forget that the chief object of medical education is to make good physicians. Men who will treat the sick not as so much clinical material but as valued members of society. Medical teaching must not forget the human side of medical practice which is such an important factor in the physician's value to the community. Teaching in engineering schools and teaching in medical schools must have somewhat different objectives because the engineer deals with material, the physician with humanity. The surgical teacher should have done original research and be a productive scientist.

A careful study has been made of the teaching of surgery in about thirty medical colleges in the Class A group, and this study, together with personal experiences in teaching surgery, forms the basis for this paper.

This discussion is confined to the dispensary, clinical clerk, ward walk, amphitheater clinic and laboratory teaching of surgery. The reports received from medical schools represent different grades of medical teaching in the United States.

DISPENSARY: Of the schools reporting about four have a properly organized dispensary. Some dispensary work is not credited by the college of medicine. In some schools dispensary service does not seem to be compulsory. In all, with the exception of perhaps two schools, the instructors are of the lower grades in the departments of surgery and the catalogs do not indicate direct supervision by the heads of the surgical departments. The dispensary is introduced to the student usually in his third year, sometimes in his fourth, sometimes it is continued through the third and fourth, and less frequently completed in the third. In only one report was there an equivalent evaluation of the dispensary service. In this school the dispensary is evaluated in terms of hours, and the hours are evaluated on the same plan and in the same ratio as the hour credits of the entire curriculum.

In some dispensaries minor surgery is taught, in some the treatment of wounds is emphasized and in others emphasis is placed on bandaging and surgical dressings. The instruction given the students in dispensary clinics is without common purpose or classification as to scope and function. Good instruction is being given in many of the dispensary clinics, a much larger percentage

than a careful study of school catalogs and reports show, but it is accidental rather than the result of a properly directed system or organization. *The dispensary is the elementary school for the teaching of clinical surgery.*

It does not seem that instructors who are beginners should come in contact with the students at this point or that they should be expected to impart to students systematic instruction from dispensary cases. From public school work we have learned that the instruction of beginners is far more difficult than that to older and advanced students. Far greater teaching skill is required of those who conduct dispensary clinics than of the instructors who discuss the cases in final analysis. These dispensary instructors should serve a period of apprenticeship under some man who has already made good in this type of teaching. They should be taught the principles of surgical teaching, and be drilled in a system of presenting clinical cases before they are allowed to be responsible for dispensary instruction.

In many of the colleges the dispensary does not seem to be connected with a hospital. Under these conditions, hospital cases which come to the dispensary must be sent to some distant point. They usually disappear from the observation of the student and the instructor in the dispensary and are turned over to an entirely different man, much to the perplexity of the patient and loss to the teaching value of the dispensary. Such cases from a teaching standpoint are only half utilized. The students in the dispensary do not see the end of the case and those in the distant hospital do not see the beginning.

Since the dispensary is the first place that the student meets clinical teaching this teaching must inculcate early proper habits of clinical study and thought. Records should be kept accurately, histories complete, examinations and diagnoses well studied, cases indexed and followed to conclusion. A careful analysis of every case should be insisted on. In most dispensaries there is not so much a lack of cases as a lack of study of the cases. Three or four new surgical cases in two hours are all that can be recorded properly and analyzed. A simple infection following an ingrown toenail furnishes an opportunity for splendid dispensary teaching, while a Colles fracture may be so presented as to fail utterly in teaching value. Each new case should be discussed under heads of etiology, pathology, diagnosis, prognosis and treatment, and the student should be made to analyze in a systematic, logical manner the different phases of his case, emphasizing the anatomy, pathology and physiology of the region involved. He should be made to correlate his first clinical teaching with the previous studies of the medical curriculum. For example: A swollen gland in the neck should be studied from its anatomic position; the bacteri-

ology of the throat or tonsil or teeth; the lymphatic drainage of the neck, the probable prognosis and a more or less complete study of treatment. The case then forms a complete whole in the mind of the student from the standpoint of ancillary sciences. Treatment is to the patient *the desideratum*, but not so to the beginning student. Nevertheless, the treatment of minor surgical ailments is an important function of the dispensary. It should be the conclusion of the argument in the case and should follow naturally the discussion of the principles as illustrated above.

CLINICAL CLERK: The clinical clerk as a potent factor in surgical teaching is becoming more and more generally recognized and employed. This has long been the method of teaching in England. It seems to offer the best possible manner of bringing the student in actual contact with surgical cases in a way that is not obnoxious to the patient, to the instructor, to the hospital nor to the student. By clinical clerkships is understood a group of two or more students who are assigned to a case after it enters the hospital and who study the case as their own until the course of the disease is finished. These cases are studied thoroughly and in detail. The physical findings are made, the laboratory work done, the history well worked out. The student is then instructed to report to the chief of the clinic for further assignments relative to the case.

It is, therefore, the instructor's duty to study with this group of students the findings in a particular case as soon as they are complete. The pathology, etiology, diagnosis, prognosis and treatment are gone over in detail. The clerk is often asked to investigate the literature and prepare a short bibliography of the case. If the findings are not all in accord, the student is required to review them, determine the cause of the discrepancy and report his amended findings to the chief of the clinic at a subsequent meeting. He should be given the widest field possible for speculation and original thought under proper guidance, and should be made to report a logical conclusion based on his findings in the case, his study of the literature and his speculation. The clinical clerk may suggest treatment, but he is not allowed to initiate treatment without the approval of the chief of the clinic.

The instructor should emphasize the most important principles in the findings and correlate them in a definite sequence leading to a diagnosis. He may discuss the variations from the normal, and attempt a rational explanation. He may require further investigation along other lines. Some one symptom or group of symptoms which the clerk has overlooked may need special study. The instructor can often challenge results of the clerk and require him to produce more evidence for his conclusion. The teacher can point out to the student better here than in any course the good and bad forms of evidence, he can show the difference

between an assumption and a fact, between an inductive conclusion and a deductive one. *The instructor should make each case an elementary problem in clinical research.*

In no course in the surgical department is the teacher of as much value to the student as here. If he has an open mind and can lead rather than drive the student great results are possible. Dogmatism and illogical conclusions have no place here. When the student comes to his clinical clerkship he should have completed general pathology; his beginning clinical teaching in the dispensary and have had a didactic classification of the principles of surgery. He is now ready to apply all of these in his service as clinical clerk. He must be taught to correlate the past teachings and show the proper methods of clinical investigation.

If the treatment is operative, the student sees the operation. He should have had sufficient teaching in surgical technic to be able to wash up and come in contact with the case as a second or third assistant. It then becomes the duty of the clinical clerk to watch the case until it leaves the hospital. From the standpoint of the surgeon and the student this is the most effective method of teaching. The amount of clinical material required is not excessive. A group of students will not study thoroughly more than one case in the assigned two hours each day. Forty students with three clinical clerks to each group for one month each, sixteen groups or one group each month on two separate services. This would mean two cases daily, one on each service. The clinical clerks should be required to study as many cases as possible from the beginning of the case to the end.

The ordinary assignment of clinical clerks does not admit of as complete study of many cases as would seem wise, particularly if the assignment is short on a given service. The clinical clerk should expect that his history and findings in each case will be studied by the head of the surgical department and passed on by him finally.

WARD WALKS: Ward walks in sections of five or ten students is only one step removed from the amphitheater clinic. An instructor in surgery demonstrates the case in the presence of the students. They may be able to make a superficial examination, and to listen to the recitation of the case by the professor, but they themselves have little part in the unraveling of the symptoms, diagnosis and the classification of the disease.

A keen clinical teacher may do a great deal in ward walks in developing the observation of the students. When students report on cases at ward walk clinics the value of the ward walk is enhanced. This approaches the clinical clerkship, but has the usual disadvantage of a very superficial study of each case. The teaching value of a few cases thoroughly worked out is far greater than any panorama. The value of intensive study cannot be ques-

tioned. The spirit of inquiry which should characterize the practice of the physician must be encouraged and fostered in the students' undergraduate years.

The large *operative amphitheater* clinic is rapidly disappearing from the curriculum of the medical school. It is the lecture table demonstration in the older teaching of chemistry. In most cases students observing difficult operations done by a master are anxious to attempt the same problem without sufficient training. The dangers and the difficulties are not appreciated. The little knowledge of surgical conditions and operations derived from spectacular demonstration clinics is a dangerous thing.

A student should see a number of the simpler operations which he may be expected to do or may have to do in emergencies, he should learn their technic well, but he should not be compelled to sit day after day in an amphitheater clinic where about all that he can see is the surgeon, his assistants and the patient on the table. He really learns little of methods of diagnosis and very little of the pathology or technic. Amphitheater clinics given under certain conditions offer valuable opportunities for teaching, but in order to be effective, the history, physical findings and diagnosis must be emphasized to the exclusion of the actual operative technic. It must be a diagnostic clinic, if we expect the student to obtain any real benefit from such a clinic. If the instructor is a good teacher, he will set an example of method in analysis of cases which will be invaluable. Much of the inspiration of many successful surgeons of today has been obtained from the manner of teaching and method of analysis of American and Continental instructors, rather than from the mere facts learned and the cases studied. The amphitheater clinic can in no sense take the place of the clinical clerk, but it can take the place of the sectional ward walk and save considerable time with little loss of efficiency.

Just how much time in a senior medical course can be given up to such clinics is a debatable question. Such a clinic held for two periods a week of two hours each is not too much for a senior curriculum with occasional minor operations or operations illustrative of some point in diagnosis or pathology.

There remain now for discussion the so-called courses on surgical technic or experimental surgery on the cadaver or on animals.

Early in the teaching of Cushing there was developed at Johns Hopkins University a technic course in operative surgery. For the past dozen years similar courses have been offered in many medical schools. In such a laboratory course may be studied inflammation, pyemias, peritonitis, thrombosis, together with the principles of technic such as the use of stitches, knots, needles and clamps. The methods of washing the hands, of arranging the

operating room, the duties of the surgeon, the assistant and the anesthetist, the internist, the nurses and attendants should receive careful attention. The general principles of sutures may be taught by means of anastomoses on intestines obtained from the packing house. The student can be shown the loss of time occasioned by indefinite movements of hands and fingers. He learns also a definite arrangement for his instruments on the table and institutes such system that this arrangement will be maintained throughout the stress of the operation.

This course offers a series of operations on animals (with every precaution taken against causing pain). The schedule of operations includes those procedures which may be emergency with any physician and minor operations that are of almost daily occurrence. Each member of the class fills each position in the operating room in rotation.

A didactic hour should precede the operative exercise. In this hour the technic of the operation is explained in detail and the indications for doing such an operation are stated. The instructor assigns one student from each of the operating groups of five to assume a hypothetical case and in the capacity of internist report this case at the beginning of the subsequent laboratory exercise. The student who is to act as surgeon reports the surgical phase. These reports are discussed by the instructor and any fallacies pointed out. The operation is begun by students acting in the following positions: Operator, assistant, anesthetist, instrument nurse and "dirty" nurse. The animal is regarded and treated as nearly like a hospital patient as possible, each student being held responsible for his particular duty. At the next didactic hour the results of the operation, the after-history of the case and the after-treatment are reported by the surgeon and discussed before the entire class. By this means students are taught the elements of surgical technic, the ethics of the relations of the consultant and the indications for many of the minor operations which they may well be expected to do. They are taught the difficulties and problems of sepsis, and the uncertainties and dangers of surgical procedures. This knowledge makes them safer physicians and surgeons.

It is interesting to note the different reports from medical colleges relative to the aims of operative technic courses. One school replied to the effect that in a course of ninety-six hours the student is taught to perform amputations, intestinal anastomoses, the repair of hernia, the removal of the appendix and gastro-enterostomy. *A course of this kind taught with the idea that the students are prepared to perform these operations is pernicious.*

The aim of the course should be directed to such problems as the technic of opening the abdomen, handling the intestines, with a discussion of peristalsis, opening the pleura, with a study of

intrathoracic pressure, ligating large vessels, followed by an investigation of the collateral blood supply and the performance of such operations as hernia, laying particular stress on the anatomy, etc. This course with some additions may be combined with a careful text book study.

There is not enough intensive study of surgical text books and there is too much lecturing. An ideal junior course might be arranged in which three hours per week are spent in studying assigned pages in a standard textbook on which the student is quizzed and these assignments accompanied and illustrated by laboratory or hospital exercises. This laboratory outline should be a composite course made up of work in surgical pathology, work on gross specimens, work in the animal room, and in the hospital. Exercises should be chosen which illustrate the sections under consideration in the text.

Such a course, together with a course on surgical technic would include nearly all the subjects taught in so-called surgical anatomy, surgical pathology and surgical physiology.

The study of the relation of the bile ducts to the duodenum, or of the stomach to the mesocolon could be learned equally well on the cadaver or on the animal so that an instructor by properly combining the didactic quiz with the laboratory exercises in surgery could render concrete the principles of surgery. If this course were given in the junior year, the entire time of the senior year could be employed in the study of clinical surgery by a student who has already a fairly clear conception of the classification and principles of the subject.

The superfluous number of courses given under the head of surgery, as shown by some catalogs and as actually taught by some schools reminds one of the old "shot-gun" prescription. Many of these courses seem to be arranged to care for an oversupply of instructors, rather than for efficiency.

Should a surgical course in diagnosis be given outside of the general surgical clinic? Is it necessary to spend hours in studying surgical pathology as a course separated from the senior clinic? Why not make this course supplementary to the surgical clinic and directly related to it? Why not use the material from the surgical clinic as the basis for the next exercise in surgical pathology, and the instructor in surgical pathology be one of the instructors present at the clinic. The rationale of a great many surgical courses does not appear. Observation seems to develop the fact that the weakest point in the teaching of surgery is often the lack of a responsible head of the surgical department.

To SUMMARIZE: 1. The dispensary should be so organized and so supervised by the head of the department that he may at all times place his finger on the progress of teaching in this department.

2. The dispensary has not fully come into its own as a teaching factor in surgical education. Sufficient emphasis is not laid on case studies leading to diagnosis.

3. There is still too much didactic lecturing and not enough intensive study of a systematic textbook in the beginning of the student's surgical education.

4. Clinical clerkships are slowly becoming more generally utilized and their teaching value is being recognized.

5. Ward walks and amphitheater diagnostic clinics have much the same value, the only difference being that in one case the patient is brought to the student and in the other the student goes to the patient.

6. The amphitheater operative clinic is of little value but the amphitheater diagnostic clinic, conducted by a real teacher, has much value.

7. It is exceedingly important that didactic courses be combined with laboratory and clinical courses which illustrate the principles taught in the text book.

8. More correlation in the departments of surgery is imperative for the best results to the student, teacher and school.

9. The pedagogy of surgery has not received sufficient attention.

The following required course outline is offered as a basis for discussion and criticism (possible research courses optional and elective ones have not been considered):

JUNIOR YEAR

Course No.	Hours
1. Dispensary—96 hours in sections of three or four.....	96
2. General Surgery—3 hours per week didactic. Two semesters	96
3. Laboratory Surgery—2 hours per week.....	64
Course 3 includes the following: a. Surgical pathology. b. Cadaver work. c. Dog work. d. Hospital. Each exercise correlated with didactic work of Course 2.	
4. Fractures and Dislocation—2 hours per week, one semester	32
5. Orthopedic Surgery—2 hours per week, one semester....	32
Senior Year	— 320
1. Clinical Clerkship—2 hours daily for 8 weeks.....	96
2. Amphitheater Clinics and Ward Walks—diagnostic, 4 hours per week, two semesters.....	128
3. Surgical Pathology—3 hours per week through the year.	96
4. Genito-Urinary Surgery—2 hours per week, one semester..	32
5. Roentgen-Ray Diagnosis—2 hours per week, 6 weeks....	12
Senior	— 364
Total hours	684

THE MUNICIPAL HOSPITAL AS A FACTOR IN CLINICAL TEACHING

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Since the establishment of the first medical school in America there has been a tacit understanding that the patients in public institutions should be placed at the disposal of the medical colleges for clinical instruction. While this understanding has been more or less indeterminate, and has been, in fact, frequently set aside by public or private action, there has been, in the main, an admission of the right of medical education in this particular.

This right has not infrequently been subject to revision or abrogation by officials temporarily in power; in some cases the exercise of the right has been attended with difficulties, complex in character, and in other cases the right was established or implied by statute. For instance, as far back as 1876, the St. Louis City charter adopted that year, specifically gave to the medical schools of the city the authority to conduct clinical instruction in the city hospital, but denied it in the Female Hospital, which was at that time a social evil hospital.

Until the adoption of the staff plan, six years ago, the St. Louis City Hospital was under the direction of a superintendent, often the mayor's personal physician, who was clothed with the business management of the institution, subject, however, to considerable political pressure. The superintendent was the sole arbiter of the medical care of the patients of the hospital, unhampered by any interference on the part of politics which was so impressively concerned with the business side of the institution.

The consequence was that each four-year period found a new incumbent, generally without business or institutional experience, with an overweening desire and hope to achieve triumphs in surgical practice when the turn of politics brought forth his successor. In a few instances—by accident let us say—a trained surgeon secured the position, but these were the few hopeful exceptions. As to the nonsurgical care of the patients in the early days, it was either ignored or placed entirely in the hands of the interns. Later, however, a more or less irregular attendance on the part of a few earnest physicians of the city, without official appointment or without official authority, supplemented the service and improved it to a great extent. Later still, the medical service was placed under the charge of one of the assistant superintendents.

This type of organization, if it can be called such, offered very little hope for clinical instruction in the municipal institutions of

St. Louis, and as a consequence the private hospitals of the city were utilized by the better medical schools, the municipal hospitals being either ignored or used only in a perfunctory and certainly in an unsatisfactory manner. At one time eight colleges were using the city hospital, and as many as eight lectures were delivered in one week on one poor patient—without harm to him, of course, for he was not examined by the multitudes of eager aspirants for knowledge in the eight different colleges, but he was *looked at* from a distance by eight more or less sleepy crowds and *talked about* by eight professors, who were prepared to lecture on the patient, even if their examination consisted of a few minutes previous conversation with the intern in charge.

Instruction was practically limited to amphitheater talks and discussions by men who had no professional charge of any patients in the hospital and bedside work was absolutely prohibited.

I have given this short sketch of the teaching history of the St. Louis City Hospital because, in great measure, it is the history of such institutions in other cities, somewhat modified, it is true, by the local environment and by the reactions consequent on local medical activity.

Apart from the irrationality of appointing an inexperienced man to be both administrator and sole surgical operator in an 800-bed hospital, there existed the stupid provision of changing him every four years for another, who was almost necessarily less trained in hospital administration if not in operative work.

In America, on account of the doctrine of equality before the law, the appointing power does not and often cannot exercise a proper discrimination between the qualified and the unqualified, and besides, the exigencies of political administration and party patronage are often interfering factors. The consequence was that when a really good man was made superintendent, it was due either to an unusual ability and foresight of the authorities with a strong regard for justice to the community or to a strange concatenation of circumstances that transpires "once in a blue moon."

Where the staff plan has been in evidence, the scheme of appointment has been subject to the same objection as in the other plan. For the qualification of the appointees was not the basis of selection, except in rare instances; generally the designation of the degree "Doctor of Medicine" satisfied the question of qualification and political relations determined the appointment. But in the last ten years a tremendous change has taken place, brought on perhaps by the drift of medical education and perhaps also by an awakening sense on the part of the profession which has influenced the "powers that be" in the proper direction.

The truth of this is shown in the responses to the following question, which I submitted, among others, to the class A schools

of this country: "Have you more control over the material in the municipal hospitals than you had ten years ago?"

Some of the colleges in the larger communities where there has been no need of the municipal hospital for the purpose of clinical instruction, and institutions such as Tulane, Texas, etc., which have had for years the fullest control over the municipal hospital, note no improvement in this regard. This is also true of the colleges in New York which share the material at Bellevue Hospital. The answers of the other colleges, however, indicate a tremendous increase of the college influence, and manifest the growing tendency all over the country of the feeling that the best interest of patients in municipal hospitals is conserved and promoted by a closer relation with medical colleges both in treatment and clinical instruction.

The system in vogue in St. Louis for many years was changed about six years ago and the municipal hospitals were placed under the control of a hospital board and hospital commissioner. In place of a single superintendent with both medical and administrative functions, the medical control was vested entirely in a staff of physicians who were appointed by the board, and a superintendent was placed in charge of the administration.

This was a tremendous step in advance, for such attending physicians as were connected with medical colleges had under this new arrangement the control over their patients necessary to use them for clinical instruction if they so desired. While here and there men were appointed without the proper qualification, a group of men were gathered together eminently fitted for the work. Naturally, the college men were larger in number than those not attached, and it was therefore possible to utilize the institution better for clinical purposes than ever before.

The new charter adopted in 1914 made the foregoing plan a part of the organic law of the city, except that the director of public welfare was given general direction, taking the place of the hospital board which was abolished, and the hospital commissioner was given full power of appointment.

While this latter arrangement was a great improvement over the preceding system, there still remained much to be achieved, more particularly with respect to organization. The positions on the staff belonged, as it were, to the attending physicians and not to the colleges, and hence the colleges were obligated for clinical material to the attending physicians and were dependent on their good will for clinical instruction, so far as the municipal hospitals were concerned. This was, to say the least, not conducive to efficiency or coordination of teaching. Furthermore, the appointments were for two years, and therefore there was no assurance that even the best clinical instructor would be continued in office for a longer period. This made it impossible either to perfect an

efficient organization or to establish a definite policy. While enthusiasm and activity of a corps of instructors may make up for deficiency of organization, these good qualities may be in time supplanted by indifference or neglect.

To obviate this and to provide a plan of appointment subject to less pressure from friends and political associates, the hospital commissioner (Dr. C. H. Shutt), with the consent of the director of public welfare, accepted a plan which was the result of numerous conferences with the deans of the Washington University and St. Louis University Medical Schools—a plan which could not have been adopted if the representatives of these two institutions and the hospital commissioner had not constantly kept in mind the civic responsibilities brought about by the situation.

The plan is as follows: The hospital is divided as equally as possible into three units. For Unit 1 the appointments are made, without reserve, on nomination of Washington University; for Unit 2 they are made similarly on nomination of St. Louis University, and for Unit 3 the hospital commissioner appoints whom he pleases, no instructors in either of the universities being eligible. Units 1 and 2 are entirely under the control of the respective universities, and thus it has been possible to establish the rank of appointees which was impossible heretofore. Hence it is that in each of these units there is a complete organization in each department and each clinician's position in the unit is dependent on the University controlling it. Furthermore, as a later development, definite members of the resident staff have been attached to the different units and definite wards have been assigned.

While the outside unit cannot possibly effect an organization similar to that of the teaching units, especially in view of the equality of rank and the absence of institutional control of the clinicians, much has been done to establish its efficiency. In the assignment of wards, Units 1 and 2 have properly given first selection to Unit 3.

The immediate policy of the staff is under the charge of an executive committee composed of two representatives from each unit, and I may say that there has been the utmost harmony in all of its transactions. Although the plan has now been in operation for eighteen months, it has been productive of good results, not only as to clinical teaching, but also in efficiency, which is even more important. Without giving the details of this improved order of things which must be manifest to any one who understands the value of organization, I will content myself with mentioning that during the year ending Dec. 1, 1914, 5,238 visits were made by the staff, whereas during the following year under the new plan there were 10,930.

This whole plan is dependent on the will of the hospital commissioner and the director of public welfare, but we feel that the

value of a consistent organization to the patients of the municipal hospitals will become increasingly manifest, and that the influence of the two universities cooperating in this great civic and educational activity, will be potent enough to cause its continuance indefinitely.

This same plan can be adopted anywhere provided the medical colleges of the highest class work together to the end that public charges in municipal hospitals shall be under the direction of a staff that is appointed on the basis of a definite policy, which comprehends only the highest ideals of medicine. Provision must always be made for the large number of medical men not connected with medical colleges possessing ideals and qualifications equal to those of the instructors in medical colleges.

The dean of one medical college wrote of his most excellent plan by which under private arrangement made with the constituted authority, the college makes the appointments. He asked me not to mention the name of the institution for fear that, if it were known, the privilege would be lost. Without knowing the local conditions, I venture the opinion that publicity in this regard, fortified with the civic and professional validity of such practice, will do more to perpetuate it than the secret understanding which is likely to be abrogated in time as the arguments for its continuance have been carefully concealed.

In administering the St. Louis University unit, we have kept in mind the two important organization requirements: first the patient's welfare and secondly the student's opportunity. We have felt that these could be best achieved by organizing each department on the basis of a head, responsible to the institution, with associates and assistants under his direction. As our appointments are not limited to any specified number except as to the minimum, we can exercise our best judgment as to the personnel.

It was soon determined that the organization in prospect required far more of the clinician's time than under the previous plan. It was, for this reason, found advisable to provide compensation for some of the men in medicine and surgery, at the same time requiring them to spend from three to five hours a day in attendance on patients and in instructing students assigned to work at the City Hospital.

At present, three of the attending physicians and three of the attending surgeons are paid, not an extravagant amount, but at least enough to justify them to give the time which the service and instruction require. In addition, there are two men in medicine and two in surgery who are not paid. Our purpose is to increase the number of men who are paid for part time and to add men with proper compensation in these two departments who will give their full time to the work. At present, no provision has been made for compensation in the specialties; in fact, under our con-

ditions, it is hardly necessary; still it would not be amiss if full or part pay men were provided in children's diseases, obstetrics, and nervous and mental diseases.

It is thus seen that our institution is provided with 350 beds in the municipal hospitals, entirely under our charge, with paid instructors in medicine and surgery, with definite assignment of wards under our own members of the resident staff, and with authority to train our students according to the opportunities present.

I would not have you think that this implies that the condition is absolutely satisfactory or that there are not many difficulties in the way of an ideal accomplishment, but at any rate we are approximating the rational solution of the question.

The type of clinical material in municipal hospitals in America has not been altogether the best for teaching purposes, especially in the surgical service. The variety is limited and the stay of patients in the hospital is too short, for few, except those who find it impossible to go elsewhere, apply for admission to the city hospital. Why should it be otherwise in an institution that can have no definite policy, that has no consistent organization, and that is administered by men who, whether they are qualified or not, are in the main appointed by those who do not know and cannot know? Why should the people if they can avoid it place themselves under the care of physicians whose appointment is not on a qualification basis and whose tenure of office does not depend on the presence or absence of their efficiency or attention to duty?

How much better is it to hold the universities or medical colleges of the highest class responsible for a definite portion of a hospital, bringing to the institution, the influence, the organization and efficiency which this plan assures. Not by concealing its potentiality, but by openly advocating the measure on the well-grounded, easily proved claim that it is the best for the people and for the hospital. A general adoption of this plan, particularly if the clinicians are paid by the universities, must be followed by an improvement in the character of the clinical material and a more perfect fulfillment of the function of the city in respect to its indigent wards.

Think of the economic waste of thousands of patients in municipal hospitals who under present conditions are lost to instruction of students in medicine. Think of the vast amount of funds required by the more fortunately endowed institutions to furnish their students with material for study. Think how much less money would be required or how much more material would be available, if these same institutions could perfect a proper organization of their legitimate share of the municipal hospitals.

We must not evade this issue by saying that the municipal hospitals are necessarily a part of the municipal political machine, and therefore unworthy of our concern. Our obligation, both educational and civic, demands of us that we exert our utmost to the end that they be made to serve their highest functions in medicine and pedagogies.

Politics and practical politicians have the greatest regard for the demands of the people and they listen with keen ears to those who are honestly working for the good of the people. For this reason, cooperation and public propaganda of the good to be accomplished by this plan of organization, efficiency and consistency of policy will be followed by its adoption and continuance, without any opposition or with only the feeblest protest on the part of those who are looking for personal perquisites.

The result will be that American medical institutions, like the European, will be able to bring the highest ideals of medicine into municipal hospitals and to provide their students with what is absolutely essential if the physician of the future is to be the beneficiary of the best sources of instruction in his profession.

DISCUSSION

DR. FRANK BILLINGS, Chicago: Mr. President: These papers are, of course, of great interest to all of us. One is struck with the difference in the sentiments expressed by the speakers today and those of a few years ago, particularly of the details as to teaching and the plans of the different departments. The internist, as represented by Dr. Barker, outlines a plan which any teacher of medicine must agree with, although it carries with it an enormous expenditure for apparatus, rooms, etc., which are absolutely necessary, however, if one would carry out an ideal plan. It also implies an enormous amount of time to the student as compared with the remainder of the curriculum.

Dr. Stokes, in going over his ideal plan of the surgical teaching states at the end of his address that 640 hours will mean an ideal course for the two years of clinical surgery. I do not doubt that Dr. Barker would want that many hours, perhaps 840. When we know that the minimum number of hours for the clinical year is placed at 1,000 hours for all departments, one wonders where the rest are going to get off or in. While that is not, in a sense, a criticism of any ideal plan which is presented by a teacher, still it is an important point to be considered.

Yesterday, in speaking before the Council on Medical Education, I made the statement that we were offering our students more than they can mentally digest, and one listening today may know something of the reason why. And that is particularly what I want to speak to you about this afternoon. We have for years separated the departments of teaching too much. We divide our curriculum into too many parts. We demand so many hours for each part. Each one is sure the other departments get too much time, and any of you who are teachers and who have thought about the matter at all must have seen that we repeat a great deal in teaching clinical medicine. We overlap. We find a repetition of the courses involving certain principles in different departments.

We inaugurate a special study which is necessary to carry out our plan of teaching and go into some principle that the student should have learned somewhere else.

To make it short, let me say what I would plan if I were going to build up a clinical department tomorrow, and could have a hospital of a certain number of beds, suitable for the number of students to be taught. First of all, I would recognize four main departments, and I would put at the top of those departments pathology. I would want at the head of that department a man like Councilman to supervise the teaching of that fundamental thing which we call morbid anatomy, the result of disease as expressed in the human being, and I would want him to have supervision of all the special pathology taught in every department. I would want general medicine with all of its specialties in one department. I would want surgery with all of its specialties in one department, and obstetrics as the fourth one. That would make four fundamental departments, with pathology as the main department of the whole organization.

This clinical school, this hospital, of course, would have its wards. It is necessary to have an obstetrical ward to teach obstetrics. It would have its emergency wards for medicine and surgery, and for the specialties that come under those several heads. But the remainder of all the patients who entered that hospital would go into observation wards, and would be studied by the various departments of the hospital. I would not have a patient enter the special wards for treatment whose diagnosis was not known. Every patient would have to go into that observation ward to be studied by the general staff, which would be qualified to pass on some part of the diagnosis in each patient, whatever it might be. And such serologic and bacteriologic work, and other laboratory tests, that might be done by members of the department, would be passed on by the man qualified by his long study as a pathologist in the full meaning of the word.

When the diagnosis is made, the patient is to be passed on to the respective department to receive the necessary treatment, whether medical or surgical.

Then I would be teaching my students that disease as expressed in the human body was to be recognized by certain phenomena, and when the diagnosis is made then the patient should receive treatment.

How many students do you hear say, when they register in a clinical department: I prefer medicine, surgery, or eye, or stomach disease as a specialty? Why do we hear that? Because their experience among people before beginning medicine is that such and such a specialty is perhaps cleaner, less fatiguing, or perhaps carries more fees with it. However, we hear surgery selected more frequently than any other specialty. We have reached the point, too, if we will stop to think about it—when we say: "This is a surgical disease," "this is a surgical ulcer," "this is a surgical gallbladder," "this is a surgical or medical, this and that." There is no such a thing on earth as a surgical or medical disease. If in its evolution it pass on to conditions that nothing but surgery will relieve, either by removal in toto or some measure which will relieve it, then the case receives surgical treatment. But this does not make it a surgical disease.

Is there such a thing as surgical diagnosis in certain things differing from medical diagnosis? No. Then why should not the surgical stu-

dent have certain hours for bedside work to recognize disease as it is expressed in the individual? The majority of your senior students should work in the observation ward—some are assigned to the surgical treatment wards and observe methods of surgical management, and the after-treatment. Some are working in the medical wards observing medical management. The way we double up the work is perfectly ridiculous. Also the amount of reduplication of paraphernalia we ask for different departments.

I perfectly agree with what Dr. Barker said about the apparatus needed for the study of internal medicine, excepting that he should have said for the study of disease, in every department of the school. Then, when that is understood, it is not necessary to duplicate apparatus.

Prof. Friedrich Mueller of Munich teaches in a municipal hospital, and, irrespective of the cost, he has all the things Dr. Barker mentioned, including a Roentgen ray outfit. Four years ago, when I went over the hospital, there were four different Roentgen apparatuses in that hospital, one for medicine, one for surgery, and for this and that department. But how foolish! It is a teaching institution. Does your roentgenologist learn anything different in a medical case or a surgical case? No. So you diminish your expense for apparatus, and you increase the time of the student relatively to study these things, and, above everything else, you teach him to recognize disease as disease expression, and not as to what is going to be done for the patient. If that were done, we would also relieve ourselves of many of the disputes which exist between us now.

We talk about borderline diseases. Borderline what? Between medicine and surgery. What rot! It is borderline because you have come to the point where you say it is difficult to say whether the patient should have medical or surgical treatment. Is it a borderline disease? Certainly not. Unless you are going to put surgery over on that side of a partition and medicine here. And we are fostering that thing in our papers and our discussion today, and it is something we ought to get away from.

Of the details brought out by Dr. Barker and Dr. McCrudden I approve. We should apply them to the whole class.

As to the municipal hospital: First, let me say that I have had more or less to do with municipal hospitals all my life. I served in our own as an intern thirty-five years ago. I was on the attending staff for over fifteen years. I have watched it rise and fall in its efficiency in regular waves. We are governed here by a board of commissioners, fifteen in number, ten elected in the city and five in the country. It is a county hospital. Formerly, these commissioners were elected for two years and the waves of improvement ran for two years with a certain set of officials, and dropped two or more with another set. The only difference now is that the commissioners are elected for four years. It happens to be on a rather high plane of efficiency now. Dr. Councilman can tell you a good story about a municipal hospital in Boston. It was a good hospital when Dr. Councilman had charge of it, but politics change in the Hub once in a while. And yet municipal hospitals may be used as teaching institutions.

But, first of all, a teaching institution must absolutely command its hospital. I would rather have 100 beds absolutely under command than 500 that I could not command, as a teaching institution. I would accom-

plish more with the 100 than the 500. And yet we must, of course, be economical. We must educate the public. We must utilize these hospitals, so far as we can, and what Dr. Loeb has said of the St. Louis Municipal Hospital, and what they have accomplished there, is mighty good. The evolution in Bellevue is still more wonderful, for only about forty years ago Bellevue was like Cook county now—it had a big body of commissioners. Then the management was changed to state commissioners, and it has since been under better control, especially now. Above everything else, we must educate the people who manage the sectarian hospitals; they can be utilized. It is not very difficult to teach the community served by a hospital that, as a teaching institution, it improves commensurately with the work that it does in teaching. They soon learn this fact. They see that publicity, in other words, relieves all fear of abuse of the patients. This is true not only of the ordinary hospital, but true of the state institutions.

The main thing I want to say, and repeat, is that we are cramming our students too much, and doing it because we do not coordinate enough in the different departments. We ought to get away from this schism between the different departments, and recognize disease as disease, without any added adjective to it. Finally, when we are through with that, to pass the patient on to be treated as may be necessary.

DR. ARTHUR DEAN BEVAN, Chicago. Mr. President: I have been very much interested in the papers that have been read on the teaching especially of clinical medicine and clinical surgery. One or two thoughts have come to me that may be worth while presenting to you.

The first point I want to make is this: that in teaching medicine and surgery we must first decide on what we are going to accomplish. In undergraduate teaching, with the limited time at our disposal, I think we must be satisfied with an effort to turn out what might be called general practitioners of medicine, that is, men who have sufficient knowledge to warrant their entering on independent practice. I think we must recognize the fact that it is absolutely impossible to develop a specialist in an undergraduate course of instruction. That, in order to prepare a man to do the work of a specialist, we must give him a number of years beyond his course in undergraduate work.

I fully agree with several statements made here, that we are trying to do too much, that our curriculum is overcrowded, and the suggestion that Dr. Billings has made has impressed me for a long time as being one that should be put in actual practice, so far as it can be done, namely, that in a teaching hospital the methods of diagnosis that are necessary in analyzing a given case should be given as methods of diagnosis to the students discriminately; that they should not be duplicated in medicine and surgery and in obstetrics. I think there has been an effort made toward this in most of our better schools.

In regard to the undergraduate teaching in clinical surgery, I want to say, first, that I regard the two big facts that stand before us, namely, diagnosis and methods of handling the case.

In teaching modern scientific surgery, you must carry into your surgical work the sciences of the preceding two years. For instance, I am very much in favor of carrying pathology in the surgical course. I do not know that I would want to label it as surgical pathology, but I should want to continue the study of pathology in the surgical course

as a very essential part of the surgical instruction—the pathology that the student actually must deal with in the individual case, so that he must be familiar with section cutting, with neoplasms, with a certain amount of what might be called clinical bacteriology, and he must be especially familiar with gross pathology. It is necessary that he should follow the cases that go to the dead house. I think the same thing is true of anatomy. It is a very bad thing to drop anatomy at the end of the second year. As a rule, the students who come from the best schools in the United States after two years of anatomy do not know enough clinical anatomy to wad a gun. That is not necessarily a criticism. I used to think it was a criticism on the men who taught anatomy. Students who have been taught anatomy very well come to us without any sense of the realization of how they are to apply their anatomy to the patient. That would be a part of the teaching of clinical surgery. It is up to the surgeon to show the student the application of anatomy to the particular case; you must carry on your anatomy through your third and fourth years of work, and, of course, in every year of a man's practice, so far as that is concerned.

The same thing is true of bacteriology. The same thing is true of embryology. Many men come to me who have had a very good course in embryology, but very few of them realize the application of embryology to clinical surgery. It is a part of my business to show them the application of embryology to clinical surgery. There is really a good deal to that subject.

I think the same thing is true of physiology. Unfortunately, physiology has not been as well carried out in our surgical curriculum as it should be. In a way, physiology has a much broader relationship, or more definite relationship, to internal medicine than to surgery. The few men in this country who have attempted to carry on their physiologic work as a part of their surgical course have usually, in the opinion of most of our physiologists, made a mess of it. At the same time, there is a certain relationship between physiology and surgery that should be recognized, and should be carried into the third and fourth years of work.

To begin with, you are confronted with a very definite fact in handling the work of teaching of clinical surgery by the time element. As Dr. Billings said, you cannot give to the surgical department 1,000 hours, and to the medical department 2,000 hours, and to each specialty the amount of time desired. Two years ago, when we appointed a committee of 100 to get up that curriculum for the American Medical Association, we had an "all-star faculty" appointed. There were ten committees of ten men, each with a chairman. I think the work that all-star faculty did in developing a curriculum was excellent, but it had to be done with a club. When they reported for the first time, instead of 4,000 hours that they had finally agreed on, if we had given to each department what they wanted it would have meant a curriculum that could not be covered in four years. These men were all honest and enthusiastic. But that simply illustrates the fact that the time element is a very important thing in your work.

If I am right, that anatomy and pathology must be carried on in the third and fourth years, you must make definite provision for these courses. I think they should be made laboratory courses and confer-

ence courses largely, your surgical pathology—if you please to accept that term—covering largely neoplasms, the subject of acute and chronic infections as they present themselves especially in surgical cases, the subject of bacteriology as it presents itself largely in surgical cases, and the course should be carried on in the way of a conference course—what the Germans call general surgery—the principles of surgery, as the English call it. Your anatomy should be carried through the third and fourth years with the cadaver, as a course in clinical anatomy and of operative surgery.

We have combined in our own school the course of operative surgery and surgical anatomy on the cadaver, and have made it a third-year course. Anatomy should also be further carried on in the fourth year, probably best in the course on operations on animals—as a course of operative surgery.

Now, the backbone of a clinical course should be the general teaching clinic. I am not at all in sympathy with the idea of eliminating the big teaching clinic from the clinical course. I think one of the mistakes that has been made in many of the schools in the United States in the last few years has been the tendency to eliminate the teaching clinic of the chief of the department from that clinical course, and I want, Mr. Chairman, if I have time, to call attention to a very interesting comparison that has developed, showing this point in connection with the study of law.

A few years ago the Carnegie Foundation attempted to do with law what they have done with medicine. They looked over this country and attempted to find some individual who would investigate the law schools of this country and make a report on the subject of instruction in those law schools, as they had done in institutions of medical teaching. They finally decided on and selected an outsider instead of a man of this country, namely, the professor of law of the University of Vienna. He made a very elaborate study of the law schools of this country, and especially regarding the case teaching in law. He studied the best schools, such as Harvard, Columbia and the University of Chicago. He made one of the most illuminating reports that I have ever read, and I think that it would pay every instructor in medicine to read that report. He analyzed the case teaching of law. I have no doubt that if any of you will write to President Pritchett he will be glad to send you this rather elaborate pamphlet. He analyzed the teaching of law as developed in this country. He analyzed the teaching of law in Europe, and in a very dispassionate way, after making a very careful study of the entire subject, he came to this conclusion, that the case teaching of law had some excellent points in its favor, but that it was not at all sufficient; that, used alone, as used in this country (and the parallel is very close to case teaching of medicine in small groups or individual student with his patient), it was a failure; that the student was not prepared to take a case and analyze it; he had not as yet the broad principles of law presented to him at all. So that his general conclusion was this: That the student must have presented to him first the general principles of law by some one who is an authority on that subject. After he had this to a sufficient extent, then he was given the advantage of case teaching under instruction, but throughout the course, and as a final summary of his work, a series of lectures by an expert and an authority, giving him a broad generalization of the entire subject.

Now, that is true also of medicine. In a school where the attempt is made to eliminate the teaching clinic, a great mistake is being made. I want to emphasize the fact that I say "teaching clinic." The old-fashioned, grand-stand, operative clinic is a failure. There is no question about it. But the teaching clinic is not. The teaching clinic, of course, must have added to it your dispensary work in surgery, general surgical cases, genito-urinary cases, and orthopedic cases. It must have added to it, of course, the hospital work in the wards. These are all absolutely essential.

Then, of course, in surgery, provision must be made for such special instruction as in anesthesia, bandaging, etc. I should not duplicate in surgical instruction many of the laboratory courses presented by Dr. Barker. I think that would be a mistake—such as giving to the student an elaborate course in laboratory diagnosis on the stomach, urine, and blood. I do not think, however, that certain laboratory courses, such as special bacteriology, determination of actinomycosis, blastomycosis, ordinary pus microbes, etc., that are handled in every-day surgical work, should be carried on as a special part of the surgical course.

I feel very strongly, that in surgery, possibly more than in any other part of the course, the man who graduates from a medical school, no matter how much hospital work he has had in his senior year, must have in addition a training as an intern in a hospital. The amount of hospital work that can be given to a student of surgery in his senior year is pretty small, when you take out of the time allotted all of this other work that must be done. So that I regard it as an absolutely essential thing that the intern year should be added to the course.

Just one further thing: What is your product at the end of your surgical course? Is it a surgeon? Certainly not. I have been interested for the last ten years in developing a group of young men. I believe I have been more intensely interested in that than anything else I have ever done in my life. I think it has been more stimulating. I have had much pleasure out of it. The group of young men who come into my department after graduation, and the young men who come in as house surgeons. If you are going to go still further and develop men who will be able to practice surgery, then you must give them three years, five years, eight years, of training in the clinic, in doing those things that are done in a scientific surgical clinic. They climb up one rung after the other until at the end of the third, fourth, fifth or eighth year they are perfectly competent to meet any emergency. They take the place of the chief in his absence or in case of his death, or may be go to some other surgical clinic and establish a well-organized clinic along sound lines. I do not wish to be egotistical, but, adopting these general propositions, I believe that I have developed five or six young men, who know a good deal more surgery than I, and who are for the most part quite as competent to conduct the department as I am.

You want to make a sharp dividing line, if you are going to talk about the teaching of clinical surgery, between the man who is simply prepared to go out and practice medicine, and the development of the surgical specialist.

DR. W. T. COUNCILMAN, Boston: I do not think I have ever spent a more profitable afternoon than this, nor a more interesting afternoon. All of the points made in the papers and discussions seem so obvious to

me that it seemed to me they might be regarded almost as platitudes. I think it is a very great compliment to any one if his paper is regarded as platitudinous, because that merely means it is a compliment both to the individual who has listened to the paper and also a compliment to the paper, because it makes the listener think he has been a very wise man to have thought the things that seem familiar to him when he hears them, and that was the impression I got from these papers. They were also interesting to me in that they have taken up the matter of medical education in its different phases without very much reference to the past, and that they have handled the matter as it presents itself now. Of course, I agree with everything which has been said.

With regard to one thing in Dr. McCrudden's very admirable paper, he seemed to me to put the pathologist or, if you choose, pathologico-anatomists in rather an unfortunate position, in that he made such a very wide distinction between the anatomic and the functional side of disease. No pathologist should ever make that distinction; the great master of pathology gave as a definition of disease "life under altered conditions." I quite agree with the idea which Dr. Billings advanced, although I might very modestly withdraw from the possibility of filling any such position as he indicated. Still, I think that pathology taught in association with the clinic is of fundamental importance. It must be remembered, further, that much of the work which we do in the so-called preliminary years of medicine, should be needless. In other words, we lose a large amount of time in those years in giving students the scientific conception of things which they should have learned before they came to the medical school and which they do not know. They do not get it, and whether or not they have gone through a university or college makes but little difference. They do not come to us with any thorough knowledge nor with the capacity of acquiring knowledge either by the use of books or the study of objects. Very often they seem to me not to have acquired even in college what one might demand. They talk a good deal about culture. Of course, that is a very indefinite sort of thing, but if one supposes that it means some appreciation of the best in literature, for instance, they do not seem to have gotten that. I gain an idea that they get very little acquaintance with literature. I noticed that in one of my lectures some time ago, I think it was in connection with a malformation which I was showing, I happened to speak of Polyphemus, and I saw a look of anxiety and more or less despair pass over the class, as though that had been the name of some German pathologist that they might have heard of before. So that in the early years of the medical instruction, we have to do an enormous amount of work which we should not do, and sometimes we do not do it well. We often get the men too late, and I do not think that is sufficiently emphasized. Preliminary training is all right, provided it really is training. I think we are fully justified in making demands on the colleges, that they give us really very much better educated men than they do give us; that they give us men who really have had some training in the methods of acquiring knowledge.

DR. MCCRUDDEN (closing the discussion on his part): The thing that struck me in listening to the papers that followed mine was that all of us seem to have certain ideas very much alike. Dr. Barker emphasized the difference between the teaching of medicine and of an engineer-

ing subject in that he showed we had to do with humanity. What I tried to bring out also was that the treatment of patients was not alone one of applied physiology, but also applied sociology. It is not alone a question of pharmacology. Dr. Barker and others also emphasized the fact that the treatment of a patient as a whole should be under the supervision of one individual; that he should not be under the independent care of a number of specialists.

With reference to Dr. Councilman's statement regarding the newness of this point of view, that therapeutics is a branch of applied physiology. The facts on which this point of view is based have been known before, and individual physicians have adopted this point of view with respect to certain patients and even certain chronic diseases; but the bearing of the facts on the treatment of chronic diseases in general has not, heretofore, been emphasized to the extent of founding an institution with this point of view as the basis for all its activities. The Robert Brigham Hospital where the course is given was endowed under the wills of Robert and Elizabeth Brigham "for the care and support, and medical and surgical treatment, of those citizens of Boston who are without necessary means of support, and are incapable of obtaining a comfortable livelihood by reason of chronic or incurable disease or permanent physical disability," and opened its doors about a year and a half ago. At its inception two widely different courses were opened to those responsible for the character of the hospital: They might have adopted the hopeless anatomic view of disease and founded a home in which decrepit old men and women could receive shelter and food, and pass their declining days in peace—a dreary congeries of helpless and hopeless misery, with death as its goal; or they might take the stand that provision of this kind was already abundant, and that the broad point of view expressed in the will gave them a glorious opportunity to found a hospital for chronic disease where the outlook given by the physiologic view of disease, not helplessness and hopelessness, but help and hope, were to be the guides, and an efficient life the goal. It was decided that the broad, hopeful attitude should be taken. This gave the community, for the first time, the benefit of a hospital where this hopeful physiologic aspect of the purpose and principles of therapeutics in chronic disease is definitely emphasized. This is the vital point in determining priority in recognizing the truth. Priority concerning the discovery and publication of a fact—often enough, indeed, the subject of dispute—can, nevertheless, usually be determined with some degree of certainty. A determination of the originality of a truth, a point of view, is much more difficult. If the facts on which the point of view is based have been known, and some parts of the truth have been previously recognized, it is comparatively easy for any one with even a moderate amount of analytical ability and dialectical skill, who wishes to show that the whole point of view is an old one, to so emphasize these known and recognized elements that the whole truth seems merely a restatement of old knowledge.

The important thing here, however, is not the elements that go to make up the truth, but the way in which these elements are selected, arranged and emphasized. This is a matter of synthesis; and judgment regarding the potency, vitality and originality of the point of view so developed must rest, not on an analysis of the point of view into its original dead elements, but on the effect resulting from adopting the

point of view. Every restatement of the facts with a new arrangement and new distribution of emphasis does not establish a new truth. The deciding factor must be whether the truth, as stated, is a distinct entity that has, as such, a force for stimulating and directing the activities to accomplish something new. Such a truth is a live and vital thing; and its power and originality must be judged by the character and extent of these stimulating, guiding, and illuminating effects. I do not wish to engage in any futile discussion regarding the originality of this point of view. Let it suffice to say that the Robert Brigham Hospital is the first hospital where the physiologic point of view regarding the purpose and principles of treating chronic disease has served to guide, direct, stimulate and illuminate all the activities and problems of the hospital.

DR. BARKER (closing the discussion on his part): Just a word. I was astonished at the unanimity of opinion that has been manifest this afternoon. I think that it is really matter for congratulation, that we are so unanimous about the methods that should be employed.

Dr. Billings pointed out a most important fact, namely, that there is no sharp dividing line between medicine and surgery in the science of diagnosis. What we are all interested in is the *diagnosis of disease*. I think he will be glad to know that in the part of my paper that I did not read I have a paragraph in which it is suggested that all the patients entering a general hospital should enter one department for diagnosis. Personally—I suppose, because of my prejudice—I think that ought to be the medical department. Diagnosis is a very broad subject. All the methods and engines of diagnosis should be turned on the patient. Somebody has to be responsible, however, for the conduction of the diagnostic study. Whoever it is, he should be the broadest possible sort of man, with the broadest possible sympathies—not egotistical enough to think that he alone controls the methods—but big enough to call to his aid everyone who can throw light on the case, and finally weighing the evidence, sifting out the relatively unimportant and arriving at a diagnosis finally at which no one should cavil. Then the patient could be turned over to the proper special department for treatment. As we all know, surgery is one of the most important departments of therapy. A large number of the patients would naturally go to the surgical clinic for treatment; others to the clinics of the different specialties.

Dr. Bevan and Dr. Billings both emphasized the time-element in medical education. We can put only so much into a student in a given period. There should be no attempt to teach too much. If we can teach a student how to investigate a case thoroughly from the diagnostic side, and how to apply the general principles of therapy, he may safely go out as a general practitioner. We cannot make him an expert surgeon, or ophthalmologist, but we can make him a good general practitioner, especially if he has a year's hospital internship after he graduates.

Dr. Bevan touched on another important point, namely, the necessity of devising some way of developing real experts in the different chemical branches after graduation. I believe that before long we shall give a good deal of thought and discussion in this Association to the development of medical and surgical specialists, that is, to the higher sort of postgraduate instruction. But at present we have, perhaps, enough to do in trying to settle the fundamental questions of undergraduate instruction!

DR. STOKES (closing the discussion on his part): The papers and discussions have been very much alike in sentiment. However, there are a number of things about which I would like to speak. First, with reference to the number of hours: The number of hours is 1,000 a year instead of 1,000 for the two clinical years as indicated. Our outline gave 316 hours for the junior year, 344 hours for the senior year, leaving about 300 more hours for the medical department and 300 for specialties, which we thought was a fairly good balance of the number of hours. (Laughter.) I quite agree with Dr. Barker in his last proposition, namely, that all cases coming into the hospital should go through the medical department. So we are unanimous in that regard.

The few remarks made by Dr. Bevan, I can only emphasize. The teaching of clinical pathology, of clinical anatomy or applied anatomy, of clinical physiology or applied physiology does not mean much. I cannot see any difference between pathology and clinical pathology. In the so-called pathologic courses, the student is studying technic and when he comes to the clinical side of it he is studying the actual pathology.

My aim in this paper was to omit, so far as might be, references to the clinical, as differentiated from technical pathology. The program that was outlined emphasized two courses. Coming second in each group. In the junior year this course included classification and principles of surgery accompanied by a laboratory course. In the senior year the general surgical clinics, accompanied by the pathologic study of the material from those clinics is the predominating course. The endeavor was to correlate these subjects in such a way as to reduce to a minimum the number of assigned hours.

DR. LOEB (closing the discussion): Dr. Billings' characterization of the political side of the Cook County Hospital is quite in keeping with what is found in other municipal institutions. I think, though, that the trouble has been that the Chicago men, those who are working from the proper standpoint, have been trying to get good men into the County Hospital, so that certain men could teach in whatever school with which they happened to be connected. I do not think, so far as my knowledge goes, that there has been any effort for the better schools to get together and to have the positions offered to them, for the purpose of distributing the positions among the men whom the universities themselves would care to appoint for teaching requirements. As the situation now exists, the men are subject to examinations—Dr. Billings would have to take an examination, I believe, if he wanted a place there—and the consequence is that they get good men, but they are individuals, and there is no coordination. There is no body controlling them. There is no possibility of any regular succession of authority, and the clinicians are not responsible to anybody but themselves.

My plea is for a propaganda for the universities to have their share, as universities, in the municipal hospitals, and also that the outside physicians should have their share, because they are entitled to it just as much as the universities. I feel that by making this public, and bringing arguments to bear on the value of a consistent policy, and letting the people know of the tremendous advantage that would accrue to the hospital by such a policy, there would be very little difficulty found in obtaining its universal adoption.

ASSOCIATION OF AMERICAN MEDICAL COLLEGES

MINUTES OF THE TWENTY-SIXTH ANNUAL MEETING, HELD AT
CHICAGO, FEB. 8, 1916, UNDER THE PRESIDENCY OF DR.

CHARLES R. BARDEEN, UNIVERSITY OF WISCONSIN,
COLLEGE OF MEDICINE

MORNING SESSION

The meeting was called to order by the President at 9:45
A. M., in the Auditorium Hotel.

ROLL CALL

The roll call showed that forty-six colleges in membership
were represented by delegates as follows:

University of Alabama, School of Medicine.—Tucker H.
Frazer.

Leland Stanford, Jr., University Medical School.—William F.
Snow.

University of California, Medical Department.—William
Palmer Lucas.

Yale Medical School.—George Blumer.

George Washington University, Department of Medicine.—
William C. Borden.

Georgetown University School of Medicine.—William C.
Woodward.

Howard University School of Medicine.—Edward A. Balloch.

University of Georgia, College of Medicine.—W. H.
Doughty, Jr.

Northwestern University Medical School.—H. McGuigan.

Rush Medical College.—John M. Dodson.

University of Illinois, College of Medicine.—D. A. K. Steele.

Indiana University, School of Medicine.—Chas. P. Emerson.

State University of Iowa, College of Medicine.—L. W. Dean.

University of Kansas, School of Medicine.—Mervin T. Sudler.

University of Louisville, Medical Department.—Henry E.
Tuley.

Tulane University, School of Medicine.—Isadore Dyer.

Johns Hopkins University, Medical Department.—Lewellys
F. Barker.

University of Maryland, School of Medicine; College of Phy-
sicians and Surgeons.—Caleb Winslow.

Medical School of Harvard University.—Edward H. Brad-
ford.

Tufts College Medical School.—Charles F. Painter.

Detroit College of Medicine and Surgery.—Joseph H. Hathaway.

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

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

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

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

Washington University Medical School.—P. A. Shaffer.

John A. Creighton Medical College.—Robert Retzer.

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

Columbia University, College of Physicians and Surgeons.—Samuel W. Lambert.

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

University and Bellevue Hospital Medical College.—S. A. Brown.

University of Buffalo Medical Department.—T. H. McKee.

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

Ohio State University, College of Medicine.—W. J. Means.

University of Cincinnati College of Medicine.—Charles William Dabney.

Western Reserve University, School of Medicine.—F. C. Waite.

University of Oklahoma, School of Medicine.—Le Roy Long.

Hahnemann Medical College and Hospital.—W. A. Pearson.

University of Tennessee, College of Medicine.—Herbert T. Brooks.

Vanderbilt University, Medical Department.—Lucius E.

Burch.

Meharry Medical College.—George W. Hubbard.

University of Texas, Department of Medicine.—William S. Carter.

University of Utah, School of Medicine.—Perry G. Snow.

University of Vermont, College of Medicine.—Henry C. Tinkham.

Medical College of Virginia.—A. L. Gray.

University of Wisconsin, College of Medicine.—C. R. Bardeen.

VISITORS

The following colleges not in membership in the Association were also represented:

Fordham University, School of Medicine.—William P. Healy.

Medical College, State of South Carolina.—Robert Wilson, Jr.

University of South Dakota, College of Medicine.—C. P. Lommen.

Jefferson Medical College.—James W. Holland.

Woman's Medical College of Pennsylvania.—Clara Marshall.

Marquette University, School of Medicine.—J. Van de Erve,
 Charles B. Moulinier, L. F. Jermain and Henry C. Tracy.
 Dartmouth College, School of Medicine.—J. M. Gile.
 Baylor University, School of Medicine.—E. H. Cary.
 Long Island College Hospital.—Otto V. Huffman.
 McGill University, Faculty of Medicine.—John W. Scane.
 Toronto University, Medical School.—D. J. G. Wishard.
 University of Manitoba Medical School.—E. S. Popham.

ACCREDITED REPRESENTATIVES

The following were the accredited representatives from the U. S. government medical services, national and state medical societies, and state medical examining boards:

UNITED STATES GOVERNMENT

Bureau of Medicine and Surgery, Navy Department.—Charles C. Grieve.
 Medical Corps, U. S. Army.—Merritte W. Ireland.
 U. S. Public Health Service.—J. W. Kerr.

NATIONAL SOCIETIES

Council on Medical Education, American Medical Association.
 —N. P. Colwell.

STATE MEDICAL EXAMING BOARDS

California.—Chas. B. Pinkham, San Francisco.
 Florida.—E. W. Warren, Palatka.
 Georgia.—C. T. Nolan, Marietta.
 Illinois.—John A. Robison, Chicago.
 Iowa.—Guilford H. Sumner, Des Moines.
 Kentucky.—Arthur T. MacCormack, Bowling Green.
 Louisiana.—E. L. Leckert, New Orleans.
 Maryland.—Herbert Harlan, Baltimore.
 Massachusetts.—George W. Cook, Natick.
 Michigan.—B. D. Harison, Detroit.
 Nebraska.—H. B. Cummins, Seward.
 New York.—Augustus S. Downing, Albany.
 North Carolina.—H. A. Royster, Raleigh.
 North Dakota.—G. M. Williamson, Grand Forks.
 Ohio.—George H. Matson, Columbus.
 Pennsylvania.—J. M. Baldy, Philadelphia, and Irvin D. Metzger, Pittsburgh.
 Utah.—D. C. Budge, Logan.
 Vermont.—E. B. Whitaker, Barre, and W. Scott Nay, Underhill.
 Wisconsin.—J. M. Dodd, Ashland.

STATE MEDICAL SOCIETIES

Arkansas.—Morgan Smith, Little Rock.
 California.—William F. Snow, San Francisco.
 District of Columbia.—William C. Borden, Washington.
 Florida.—E. W. Warren, Palatka.
 Illinois.—E. S. Gillespie, Wenona.
 Indiana.—Chas. P. Emerson, Indianapolis.
 Iowa.—L. W. Dean, Iowa City.
 Louisiana.—E. L. Leckert, New Orleans.
 Maryland.—Herbert Harlan, Baltimore.
 Massachusetts.—Walter P. Bowers, Clinton.
 Michigan.—Reuben Peterson, Ann Arbor.
 Minnesota.—W. L. Beebe, St. Cloud.
 Missouri.—C. R. Woodson, St. Joseph.
 Nebraska.—Joseph M. Aikin, Omaha.
 North Carolina.—H. A. Royster, Raleigh.
 Ohio.—J. H. J. Upham, Columbus.
 Oklahoma.—Le Roy Long, Oklahoma City.
 Pennsylvania.—Wilmer Krusen, Philadelphia.
 Tennessee.—H. T. Brooks, Memphis.
 Texas.—C. E. Cantrell, Greenville.
 Virginia.—A. L. Gray, Richmond.
 Washington.—T. D. Tuttle, Seattle.
 Wisconsin.—Arthur J. Patek, Milwaukee.

OTHERS PRESENT

Council on Medical Education, American Medical Association.
 —Arthur Dean Bevan, Chicago; J. W. Holland, Philadelphia; H. D. Arnold, Boston. L. A. La Garde, U. S. Army Medical Corps, Washington; Mayo Foundation.—C. H. Mayo and Louis B. Wilson, Rochester, Minn.; International Health Commission, Wickliffe Rose, New York City; B. H. Stone, Burlington, Vt.; Rev. W. J. Huley, Frederick S. Lee, and J. Ewing, New York City; Wm. D. Cutter, Augusta, Ga.; Walter L. Bierring, Des Moines, Iowa; E. J. Strick, Amoy, China; H. F. Thomson, Monticello, Fla.; A. C. Stokes, and A. D. Dunn, Omaha; Frederick H. Pratt, and James A. Gibson, Buffalo; W. F. R. Phillips, Charleston, S. C.; Francis C. McCrudden, and William T. Councilman, Boston; A. Y. Ford, Louisville, Ky.; Burton D. Myers, Bloomington, Ind.; Henry Albert and John T. McClintock, Iowa City, Ia.; Victor C. Vaughan, Ann Arbor, Mich.; L. J. Herschman, and W. H. MacCraken, Detroit; Richard Olding Beard and James E. Moore, Minneapolis; F. R. Zeit, C. W. Patterson, George P. Dreyer, D. J. Davis, J. Hess, B. Fantus, D. Bouton, L. Hall, O. J. Stein, J. R. Pennington, A. J. Carlson and Frank Billings, Chicago; John McDill, Milwaukee, and Kendric C. Babcock, Urbana, Ill.

Randolph Winslow, member of the Executive Council, and Fred C. Zapffe, secretary-treasurer of the Association, were also present.

MINUTES OF PREVIOUS MEETING

The reading of the minutes of the previous meeting being called for, the Secretary submitted the minutes as published in the volume of Transactions for 1915, pages 71-112, and, on motion, they were adopted as printed.

The Chair here announced that, in order to save time, the following Auditing Committee had been appointed to audit the accounts of the Treasurer: Drs. Samuel W. Lambert, Wm. C. Borden, and L. W. Dean.

REPORT OF SECRETARY-TREASURER

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

The program, as published, was projected rather late; in fact, some time after the separate program for this association had been in the hands of the printer; therefore, it was not possible to send the program to the colleges as early as had been intended. However, there was probably no harm done, and the scheme as carried out was of such great advantage that it was well worth while to have lost the time. To make a congress of these meetings was a splendid idea, and has received the hearty endorsement of every one.

As to the content of the program for this particular meeting of this Association, that was discussed with the membership by correspondence, and the program is offered to you with the expectation that it will be fully as good as it looks. The subject of clinical teaching surely is a live one at this time, and the participants in the program are well qualified to present the various aspects of this subject as indicated in the titles of the papers.

As in previous years, the government medical services, national and state medical societies and state boards of examiners have been invited to send delegates to the meeting. The responses have been prompt and cordial. A large number of delegates have been named to represent these various institutions at this meeting.

The association has also been honored by the appointment of one of its members, an ex-President, Dr. Isadore Dyer, as a member of the National Board of Examiners, of which full details have been given in various medical publications during the past six months.

Six hundred copies of the Transactions were printed this year, and five hundred and ninety-two copies were distributed. The mailing list is increasing in size each year, and many additional requests are made for extra copies of the Transactions.

The membership of the Association at this time numbers fifty-five, one less than last year, by reason of the merger of two Baltimore colleges, the College of Physicians and Surgeons and the University of Maryland School of Physic. One new application was received during the year, that of the Marquette University School of Medicine. Three applications

received during the meeting last year, too late to be acted on at that time, are in the hands of the Executive Council for action.

The secretary has been in active correspondence during the year with many of the colleges on some things and all of the colleges on others, and with many other correspondents in regard to matters pertaining to the rules and regulations. Some things have been referred to the Executive council for action, and others will be brought up for consideration at this meeting and therefore need not be mentioned specially in this report.

The treasurer's account shows a balance on hand of \$522.12.

Respectfully submitted,

(Signed) FRED C. ZAPFFE, *Secretary-Treasurer.*

Dr. Lambert, the Chairman of the Auditing Committee, reported that the Treasurer's accounts had been duly audited and found to be correct.

On motion of Dr. Randolph Winslow, the report of the Committee was accepted.

REPORT OF EXECUTIVE COUNCIL

The report of the Executive Council was called for and presented by the Chairman of the Council, Dr. Means:

1. Report on applications for membership.

(a) *Medical College of the State of South Carolina, Charleston, S. C.*

Two inspections of this college were made—one in March, 1915, and the other in January, 1916. At the first inspection, made by Drs. Waite and Means for the Association, and Dr. Colwell for the Council on Medical Education, American Medical Association, the conditions of the college were not acceptable. Suggestions for improvement were made, and a promise given that when they had been complied with another inspection would follow. At the last inspection made by Drs. Means and Colwell it was found that the suggestions previously made had been acted on in all departments. The inspectors feel that if the present status of the college is acceptable, and that if the same spirit of progress is continued in the future, it will become a credit to the state. The Council recommends that the Medical College of the State of South Carolina be admitted to membership.

(b) *Atlanta Medical College, Atlanta, Ga., now the Medical Department of Emory University.*

This college, you will recall, made application for membership one year ago. It was inspected by Drs. Waite and Means for the Association, and Dr. Colwell for the Council on Medical Education, and was not considerable acceptable. On this report the application was postponed one year. Another inspection was made by Drs. Colwell and Means in January. They reported that while the college had made some substantial improvements in the laboratories and in the dispensary, they did not consider that the clinical teaching, owing to the physical conditions of Grady Hospital, was acceptable. They also found a manifest disregard of the rules in the admission of students to advanced standing. It should be said for the college that it has a bright future. It is now the Medical Department of Emory University, and will receive substantial financial support in the

future. A donation of \$250,000 has already been made for the erection of a hospital on the college campus that will be strictly under the control of the teaching faculty.

Suggestions were made that the admission of students—whether freshmen or to advanced standing—should be placed in the hands of a committee composed of men who are familiar with educational matters. Information has reached us that this has already been done. After considering the report the Council recommends that the application for membership be postponed for one year.

(c) *Fordham University School of Medicine, New York City.*

Inasmuch as no inspection was made of this college by any member of the Council, definite action toward membership was not considered. A report was received from Dr. Colwell that he and Dr. Baldy of Philadelphia had inspected the college within the last thirty days, and found conditions very favorable. With this report before them, the Council felt that it would be unjust to postpone membership a year. The Council asks, therefore, that the college be admitted to membership, subject to an inspection which should be made at an early date. Council doubts the wisdom of admitting colleges to membership without an inspection by one or more of its own members.

(d) *Marquette University School of Medicine, Milwaukee, Wis.*

Visits were made during the last two years by President Bardeen and Dr. Zapffe. Both reported favorably on the standing of the college. It has also been inspected recently by Dr. Colwell, who gave a very favorable report. The Executive Council, therefore, feels that the institution is worthy of membership in the Association, and a recommendation is made to this effect.

(e) *Baylor University School of Medicine, Dallas, Texas.*

This college made application for membership two or three years ago. The first inspection was made by Drs. Waite and Means in 1914. On their report the Executive Council recommended at the meeting in February, 1915, that membership be refused. Application for membership was again made last fall, and an inspection requested. Drs. Waite and Means visited the college in November, 1915, and made a thorough examination. Their report indicated that the school had made material progress and for that deserved great credit. During the summer of 1915 the college absorbed the Southwestern Methodist University Medical College located in the same city, and thereby added to the faculty several good teachers and added considerably to the laboratory equipment. Dallas is a growing city of 125,000 inhabitants, and can furnish ample clinical facilities for a first-class medical college. It has a new municipal hospital which is used for clinical teaching. The college has plans which, if carried into execution, will place it among the acceptable colleges of the country. At the present time, however, these plans have not fully matured, and the inspectors felt that the application should be postponed one year. Acting on this report the Executive Council recommends to the Association such a postponement of action.

2. Consideration of colleges members of the Association.

(a) *School of Medicine, University of Utah.*

After due consideration of the reports of the condition of this college made by Drs. Means, Waite and Colwell, and in consideration of the

demotion of the school from the acceptable list by the Council on Medical Education, the Executive Council recommends that the School of Medicine of the University of Utah be suspended from membership.

(b) *The Medical Department of the University of Southern California.*

The standing of this college has been under consideration for two or three years, and it has been continued in membership from year to year because of its many excellent qualities and on promises of substantial improvement. An inspection was made by Drs. Means and Colwell in December, 1914. Their report indicated that the school had many points of excellence, and that the prospects for future development were exceedingly bright. The Association at the meeting one year ago continued the college in membership. Dr. Colwell made an investigation in January, 1916, and reported that there should be further development in certain lines before the school could receive an "A" rating. The city of Los Angeles has almost one-half million people. The clinical facilities are not surpassed in any section of the country. The Municipal Hospital which is open to teaching is one of the best in the United States. A school of medicine is needed in that section of California and this school is the only one that is worthy of recognition. The greatest and most serious defects are in the size of the laboratories. Until there is a new and more commodious laboratory building the college can scarcely hope to receive a higher classification. After due consideration of the reports, the Executive Council feels that the college should be continued in membership, thus encouraging the management to make the improvements that have been suggested by the inspectors on various occasions.

(c) *Creighton Medical College, Omaha.*

In certain particulars this college has not been acceptable for some time. It was given a rating of "B" in the classification of the Council on Medical Education some time ago. Several inspections were made in the last two years by Drs. Waite, Means and Lyon representing the Association, and Dr. Colwell for the Council on Medical Education. The last inspection was made in January, 1916, by Drs. Lyon and Colwell. The reports of their findings were to the effect that the defects mentioned in former reports had not been remedied to such a degree that the college could consistently be classed as acceptable. The Executive Council, therefore, reaffirms the recommendation of last year that "there is a manifest spirit prevailing throughout the faculty to bring the institution to an acceptable standard. The Council recommends, therefore, that the college be continued in membership, pending further development."

It may be of interest to the members, and in support of the above recommendation, that Creighton University is showing considerable activity in the development of its medical school. A new dean has been placed in charge, and from what we can learn, is given a free hand to reorganize the college on an acceptable basis, and has been promised financial support toward carrying out his ideas. It is felt that another year will demonstrate the full purpose of the university authorities to make the medical school acceptable.

(d) *The Medical Department of the University of Cincinnati.*

Referring to the charges against the University of Cincinnati published in the minutes of the meeting one year ago, the Chairman of the Executive Council reported that the conditions imposed on the college had been

fully met, except the dismissal of the students. The dean of the college made a request last summer for permission to retain these students as candidates for graduation, session 1915-1916. After a careful investigation of the character of the men, and on the advice of Dr. Colwell, the Chairman felt that if the University of Cincinnati cared to assume the responsibility, the Association could afford to modify the conditions imposed. The following resolution was submitted to the members of the Executive Council.

"That the Executive Council shall recommend to the Association at its next meeting a modification of the requirement that these students shall be dismissed at the end of the session 1914-15, and shall not be readmitted until such time as they may satisfy the Committee on Admission of the College of Liberal Arts that they have met the published entrance requirements, upon condition that the University assumes the responsibility of continuing said students as candidates for graduation."

A majority of the Council voted for the modification. It is recommended that the opinion be sustained.

(Signed) W. J. MEANS, *Chairman*,
F. C. WAITE,
S. W. LAMBERT.
ISADORE DYER.
RANDOLPH WINSLOW.
C. R. BARDEEN.
FRED C. ZAPFFE.

PERSONAL STATEMENT BY THE CHAIRMAN, W. J. MEANS:

In November, 1914, I sent a questionnaire to all the colleges members of the Association relative to their experience in matriculating students on the requirement of one year of college work. The answers indicated that few students were entered without conditions, especially in biology and physics. Conditions were allowed by all the colleges in one subject or another. This questionnaire was not sent out in a spirit of hyper-criticism, but for the purpose of getting at the educational conditions prevailing in different parts of the country.

Previous to the adoption of the higher standard there were doubts in the minds of many of the deans as to the possibility of obtaining eight hours of chemistry, eight of biology, eight of physics and eight of a foreign language. The contention was made that it would take two years of college work to comply with this standard. The answers demonstrated that in some localities students presenting credits for one year of college work had no training, or a very limited training, in biology; some were deficient in chemistry, and most of them were deficient in physics. A tabulation was presented to the Association but was not intended for publication. The purpose of this tabulation was to emphasize a matter of considerable importance to the colleges.

Following the report a committee was appointed, with power to act, to consider the matter and to make such changes and modifications as might seem best. A report was formulated and published at an early date following the meeting. It modified to a considerable extent the original requirements.

My observation during the year has been that colleges found it much easier to meet the requirements for 1915-1916 than for 1914-1915, and it

is my judgment that in the main a closer adherence has been observed. This is manifested by greater care in the evaluation of credentials and better record systems. Here and there I have found derelictions, but they have been due more to the fact that the work has been left to secretaries or clerks who are not familiar with college matters.

No charges have been preferred during the year against any college of the Association. Rumors have come to the Executive Council that some of the colleges have been careless in the admission of students to advanced standing. This should receive attention during the coming year. No college of this Association can afford to be under suspicion. Now that the requirements have been modified temporarily, there is no good reason why a strict compliance should not be followed.

I wish to call your particular attention to the admission of migratory students. It has been my observation that more colleges are censurable in the admission of students to advanced standing than to the freshman year. There seems to be a prevailing feeling that a student from a Class "A" college may be admitted under almost any circumstances. This is certainly erroneous. There is only one criterion and that is: Do the credits of the applicant measure up to the standard of your college? It is not a question of whether he comes from a "Class A Plus" or a "Class A" school. Each college must have its own standard and ideals, and these should be as high as the best. When a student presents himself for admission, it matters not whether he comes from Harvard, Johns Hopkins, Western Reserve, Rush, or any other acceptable college; his credentials should be very carefully considered and verified by correspondence with the school granting them. No applicant should be admitted to a higher standing than that which he could obtain in the college from which he comes, nor should a college undertake to remove by examinations conditions that were given by another college.

The rating of a college in the classification of the Council on Medical Education should not, therefore, be the only guide. The Council does not insist on this subservience. Dr. Colwell has at various times suggested that colleges should exercise their own judgment concerning the qualification of students seeking admission to advanced standing. For fear that I may be misunderstood, I will suggest that I am referring to students from acceptable colleges. There are rules governing the admission of students from colleges rated "B" and "C" that should be observed carefully. In our inspection we have criticized colleges more severely for the admission of students to advanced standing than for any other one thing. Did you ever stop to think that colleges are anxious oftentimes to get rid of their "lame ducks," and will make a favorable shading of credits on condition that the undesirable shall go elsewhere? My final warning is to beware of the migratory student.

One more thought and I am through. The evaluation of credentials is no easy matter and should not be left to any one individual. There should be a committee composed of men who are familiar with college rules and college credentials. The Secretary's duties are oftentimes multiple and should, perhaps, be purely clerical. As a matter of course this recommendation does not apply to universities where there is an entrance board by which all credentials are examined and evaluated.

W. J. MEANS.

The report was considered item by item.

On motion of Dr. Means, the recommendation to accept the application for membership of the Medical College of the University of South Carolina was carried.

On motion of Dr. Means, the recommendation to accept the application for membership of the Marquette University School of Medicine was carried.

Dr. Means moved to adopt the recommendation of the Council with regard to the Fordham University School of Medicine. Seconded and carried.

On motion of Dr. Means, action on the application of the Atlanta Medical College was postponed for one year.

On motion of Dr. Means, action on the application of the Baylor University School of Medicine was postponed for one year.

On motion of Dr. Means, the School of Medicine of the University of Utah was suspended from membership.

On motion of Dr. Means, the John A. Creighton Medical College was continued in membership pending further development, as recommended by the Executive Council.

On motion of Dr. Means, the Medical Department of the University of Southern California was continued in membership pending further development, as recommended by the Executive Council.

Dr. Means moved that the recommendations made by the Executive Council with reference to the Medical Department of the University of Cincinnati be adopted. Seconded and carried.

On motion of Dr. Blumer, duly seconded, the report of the Executive Council was adopted as a whole.

REPORT OF COMMITTEE ON MEDICAL EDUCATION AND PEDAGOGICS

The Secretary announced that Dr. William P. Harlow, the chairman of this committee, had resigned, and that, therefore, the report would be made by Dr. Kendrick C. Babcock, a member of the committee, with whom Dr. Harlow had been in correspondence. Dr. Babcock presented the following report:

Your committee has been changed in such a way that it is not able at this time to make a formal report. The withdrawal of Dr. Harlow and the death of Dr. Coale from the committee left me as the residuary legatee, and I have been asked to serve as chairman. As the request came late in December, and I was already under first, second and third mortgages for other work outside of my regular job, the result is that the committee has had only one meeting—this morning—and desires to present to you certain matters for consideration, and, if you choose, action, or, perchance, reference back to the committee as newly constituted this session for further consideration.

There are printed on the back of the program certain proposals for modifications of the Constitution. The first involves two or three matters, and your committee is inclined to recommend the adoption of part of the modifications suggested.

First, concerning the change from the use of the words "German or French" to "a foreign language." The committee is in doubt as to whether the purpose of this requirement is to provide the students with a tool or give them additional general equipment. I suppose the word "culture" is taboo just now, and so we will not use that, but at any rate the committee is of the opinion that the use of the words "foreign language" might perhaps be modified to the form used in the Report of the Council on Medical Education, using the wording, "a modern language other than English," in place of "foreign language." That would leave it for the individual college to take any modern foreign language, Syrian or Russian or Lithuanian or Bohemian or Hindu or anything else it pleases. As a matter of fact, several of the colleges are insistent that there should be only one language, and that German, and they insist that it shall be tested out by individual examination to prove that the student has the reading knowledge of the language presented.

Those are the extremes—any foreign language or German alone.

Your committee recommends that this phrase be "a modern language other than English, preferably French or German," following the phraseology of the report of the Council on Medical Education. This would introduce into the Constitution, on pages 4 and 5, several formal modifications to correspond with this. For example, Section C would read, "a modern language other than English, preferably French or German," and in the paragraph E a similar change, and the change of the words "either language" to "one."

Your committee, by unanimous vote, recommends the abandonment, therefore, of the first proviso, and recommends the second proviso be omitted. The effect of the second proviso is to make it possible for a student to enter the medical college with no language other than that which he had in his high school course, and to reduce that from three units to two units. This is thought by the Committee to be advisable by a two to one vote.

In the matter of the modification of physics, the committee does not find itself with sufficient information to warrant a recommendation. At most, this modification should be confined, so far as the conditions are concerned, to a single year, since beginning with the next academic year the condition is not permitted. It is uncertain just what the effect of this would be on the colleges not connected with large universities and therefore not quickly responsive to the needs of the requirement of the medical college of the university, because a large number of students are coming up from the smaller colleges. Personally, I am inclined to think that most of the colleges would prefer the three-hour didactic and one-hour laboratory procedure in physics to the two and two proposed here, but it ought to be investigated rather carefully before action is taken, even in this single year.

The committee recommends also one other modification in the phrasing of the suggested requirement for admission to colleges.

An investigation of the actual practice of universities and colleges of liberal arts and sciences makes it fairly clear that the unit of history is

no longer American history and civics, invariably and as a fixed requirement. It has come rather to be history, one unit, as a requirement in the group of fixed units, and not American history and civics. Your committee recommends, therefore, that in Article III, Paragraphs A and B, where the words "American History and Civics" occur, that the word "American" and the words "and Civics" be omitted, leaving the requirement of one unit of history, but without prescription as to the content of that unit. This would probably accord much more nearly with the practice of institutions in their administration of entrance requirements. As many of you know, there has been a pretty steady movement to decrease the amount of exact prescription, and to eliminate exact prescription as to content also, for example, in English.

There is one other matter which I would like to lay before the Association. I am not sure that the committee would care to make a recommendation at the present time, but it deals with a few of our procedures which are bound to become important from time to time. In the Constitution the words "preliminary college year" occur several times in Article III, and in the description of standards of acceptable medical colleges issued by the Council on Medical Education the same phrase occurs in the second section, "preliminary college year and preliminary college credit" until you come to No. 3, then a change takes place, so that on page 7 of this pamphlet, if you have it, "Making the Right Start," the phrase "An approved college of liberal arts and sciences," appears in place of the preliminary college year, perhaps, as a supplement to that earlier phrase. The general phrasing is in Section 2, paragraphs C, D, E, F and G. In other words, you have, in the first place, general credits from the preliminary college year or years without a definition of what your college is. The question has come up in some of our schools as to what a "college" is in this connection. I found, for example, in recent investigations that a college of agriculture, requiring the same fifteen units and exacting the same entrance requirements as the State University of the same state, desired to send one of its students to a medical college in the State University. That student was refused—although he had had all the prescribed sciences in an acceptable fashion—because he did not come from a college of liberal arts and sciences. It is conceivable that a student might come from a thoroughly good engineering college and have the physics and chemistry and modern language in good shape, and by summer session have made up his work in biology, taking two years of engineering. But would that satisfy your requirement? Would you accept a student coming from the College of Agriculture, in which course there had been substituted the studies of animal husbandry and horticulture for economics, English, or public speaking? It is a practical question for you to interpret—namely, the preliminary college year.

One way to define it is to say that a medical college would accept for admission two years of work which would be accepted by the college of liberal arts and sciences. It is not altogether a correct definition. Many of the liberal arts colleges will not accept all the work done in the first two years of the college of agriculture. For example, in the University of Illinois that is true. We will not accept stock judging and farm mechanics as the equivalents of bacteriology or physiologic chemistry. The committee is not prepared at this time to make a recommendation, but some of you may have to answer this practical question, possibly during the next year.

That concludes the recommendations of the committee, I think, so far as we have been able to formulate them, and we beg to apologize for the form in which they are presented.

(Signed) KENDRIC C. BABCOCK.
IRVING S. CUTTER.
W. F. R. PHILLIPS.

At the conclusion of this report the Chair announced that inasmuch as the report of the Special Committee appointed last year to formulate methods of administering the college requirement for admission to medical schools had a direct bearing on some of the recommendations made by the Committee on Medical Education and Pedagogics, it would be advisable to hear this report now, before taking action on the recommendations referred to.

Dr. F. C. Waite, the representative of the Association on this Committee, therefore reported as follows:

REPORT OF THE SPECIAL COMMITTEE

I am not chairman of this committee, but was appointed as a member representing this Association on a cooperative committee. A year ago when the Executive Council reported on its investigation of the actual conditions of granting admission on the one year of college work, it was evident that the requirements as laid down had not been met in many cases. It was the opinion of the delegates that some definition should be made as to the rigidity of enforcement of the requirements which had been published as effecting all the men entering in the fall of 1914. Hence, this body appointed me to confer with Dr. Colwell, and asked us to call Dr. Babcock as a guide to prepare an outline of some possible amelioration of the entrance requirements that had been laid down. That committee of three held two meetings here in Chicago, and published a report (American Medical Association pamphlet, No. 89), which was mailed out in April. The vote of this Association was to give that committee power, and my interpretation was that that power extended only until this present meeting. That power now lapses. This report published by the committee, represents its work.

I wish to make clear the bases on which these changes from the constitutional requirements were made. The first point was that we should require of every student entering any college in membership in this Association three things—absolutely required—namely, fourteen units of high school work, a year of college work of thirty semester hours, and eight semester hours of chemistry, of which one-half must be credit for laboratory work. That is required of every man, and you will find it repeated several times in the pamphlet to which I have referred. The opening sentence in paragraph e on page 5 is really the basis of the report. "This preliminary college year shall consist of at least thirty semester hours *fully completed* before the student enters the medical school." No condition can be allowed as to this total amount of work. "This is entirely in addition to fourteen units of secondary school work." The language of these statements was hoped to be strong enough to clearly indicate that every student who enters a school, in membership in this Association,

must have fourteen units of high school work and thirty semester hours of college work. Unless he has completed those two factors of work he is ineligible. He can not be admitted conditioned on six (or any other number) semester hours of his required total of college work.

The committee believed that of the several specified subjects, the most important and the one that surely must be presented on entrance was chemistry; so you will find recurring in the report again and again—so often said that it is redundant—the statement that eight semester hours of chemistry must be presented. So far that is in accord with the constitutional requirements. The modifications were these:

FIRST. The constitutional requirements do not permit any conditions in biology. This report does permit some conditions in biology, as indicated in Paragraph 1, namely, that one half of the required work in biology may be carried as a condition until the beginning of the second year, provided the student has a full year of thirty semester hours of college work.

SECOND. The specified requirement as to modern languages was changed making an elective. This elective may be satisfied by French or German. It also may be satisfied by history, psychology or any other kind of college work. The difficulty to be overcome was too great a specific subject requirement and the effort was to reduce these specifications and make the requirement more elastic.

THIRD. In regard to the biology, the report permits (paragraph f) that six semester hours of college zoology may be accepted instead of eight semester hours of biology. The zoology seems to be the subject that is most desired. Biology could be made up entirely, or in large part, of botany. Six semester hours of college zoology may be accepted as completing the requirement in biology, but only in case the student has thirty semester hours of college work.

FOURTH. In regard to biology a privilege similar to that in use for physics is permitted. If the student has four semester hours of college zoology he may substitute one unit of high school biology which included laboratory work for the remaining two semester hours of college zoology. This does not alter the fact that he must present full thirty semester hours of college work nor is this privilege given when the college work in biologic science has been other than zoology.

Finally, the report permits that these interpretations as to conditions for entrance may be made retroactive for those students entering in the fall of 1914.

The pamphlet to which I have referred is the report of the committee.

This was sent to all the members of the Association, and while the committee was given power, I should like to know whether the actions of the committee meet with the approval of this body. If so, a formal vote to legalize these actions would be advisable. I believe, also, it would be wise to formally rule on my interpretation that the actions outlined in this report lapse with this present business meeting of the Association, unless further action is taken.

(Signed) F. C. WAITE.

Dr. Waite moved that the work of the Committee be endorsed. The motion was seconded and carried.

(The report of this Committee is contained in Pamphlet No. 89, published by the Council on Medical Education of the American Medical Association.)

That portion of the report which bears on the entrance requirements of this Association, and conditions which may be allowed until Jan. 1, 1917, is as follows:

3. Entrance conditions until Jan. 1, 1917:

(k) A student may be admitted with certain subject conditions, provided he has completed at least one year (thirty semester hours . . .) of work in an approved college of liberal arts or science, provided no conditions may be permitted in the prescribed eight semester hours of college chemistry. These conditions may be either in (1) or (2), but not in both: (1) In one-half (four semester hours) of the required course in physics, or (2) in one half of the required course in biology (four semester hours), or in zoology (three semester hours). These conditions must be removed before the beginning of the work of the second medical year, and the credits for these conditions must be in addition to the required thirty semester hours.

(NOTE.—Deficiencies in preparation may be made up in large part in attendance at a summer session of the university, either before or following the freshman medical year.)

On motion of Dr. Cutter, duly seconded, the recommendation of the Committee on Medical Education and Pedagogics with reference to the history requirement was adopted. On motion, duly seconded, the report, as a whole, was received.

REPORT OF COMMITTEE ON EQUIPMENT

The report of this Committee was read by the Chairman, Dr. George Blumer, and is as follows:

It was suggested to the committee by the president of the Association that the dispensary or outpatient department as a factor in medical instruction should be taken up for discussion this year. In presenting their report, the members of the committee wish to state that in its preparation the executive officers of many medical schools were consulted, and they desire to express their gratitude to these gentlemen for their many helpful suggestions.

A satisfactory discussion of the part which may be played by the outpatient department in medical instruction is hardly possible without a consideration of the functions, organization and equipment of such a department. It is, we think, fair to state that the dispensary or outpatient department has in but few institutions received the attention which it has deserved. As one of our correspondents remarks, "The dispensary . . . has been treated in a stepmotherly fashion while the hospital has been the favored child." It is difficult

to see why this should have been the case for, after all, the functions of a dispensary are essentially the same as the functions of a hospital, namely, the adequate care of the patient, the instruction of medical students, and the advancement of medical knowledge. From most points of view the same conditions hold in the dispensary as hold in the hospital. Adequate care of the patient must include not only careful examination and proper treatment, but also instruction in methods of life and the prophylaxis of disease. The dispensary should be a center for the dissemination among the public of knowledge of preventive medicine. In the dispensary, just as in the hospital, the presence of the medical student not only adds to the effective working force, but also stimulates the attending physicians to a better type of work. The advancement of medical knowledge by means of research has been, we believe, sadly neglected in most dispensaries, but there is no reason why adequately equipped dispensaries should not be a source of material for research, and on the other hand, there are some reasons why they are likely to be one of the main sources of material for the investigation of the early stages of many chronic diseases.

There are certain fundamental differences between dispensary patients and hospital patients, even though there is frequently no sharp line of demarcation between the two. The nonresident character of dispensary patients renders them less capable of control, and for that reason less subject to continuous study and supervised treatment. Under the newer conditions of dispensary organization, however, these difficulties can be largely minimized. It is true also that the patients encountered in dispensary practice ordinarily differ from the hospital patient in the type of disease they present. The hospital patient is usually suffering from an acute infectious disease or from the terminal stages of a chronic disease. The dispensary patient is usually suffering either from some minor ailment, from a chronic disease in its incipiency, or from an advanced chronic disease still in the ambulatory stage. In brief, the dispensary patient represents the type of patient that usually consults a physician at his office. As contrasted with the hospital, therefore, the dispensary offers much greater opportunities for the study of minor ailments and for the study of incipient chronic diseases. For the last reason alone, all possible diagnostic methods capable of application in ambulatory patients should be at the disposal of the dispensary physician. It is the dispensary physician who has the greatest opportunity of discovering the early manifestation of those serious chronic diseases which at the present time so frequently reach the hospital at a period when they have already become incurable. The problems presented to the dispensary physician, therefore, are by no means simple, and it is a common but mistaken assumption that medical fledglings are capable of adequately caring for this important work.

The deficiencies in organization of many existing dispensaries have to do with both their physical and human equipment. Through lack of foresight, lack of means or faulty arrangement of space, many of our dispensaries are woefully overcrowded. In many outpatient departments, even in large cities, trained supervision of the dispensary work is lacking. An insufficient social service department, or indeed the complete absence of such a department, is frequently to be noted. The clinics often attempt to cover too much ground, the medical assistance is frequently insufficient and badly classified, the records are often hardly worthy of the name, and in some institutions the lack of unity between the hospital and dispensary work is a serious defect.

In these days of efficiency experts it is hardly necessary to point out that the work of a dispensary can be greatly facilitated by sufficient space and, what is even more important, proper arrangement of that space. We believe that it is possible to work out a satisfactory unit arrangement for a teaching dispensary, and we have attempted in the accompanying sketch to suggest such a unit. We believe that the best general dispensary plan is one in which there is a central waiting room or corridor surrounded by suites of examining or dressing rooms entered from an inner corridor. Each clinic should control a working unit, and each unit should consist of a central admitting room which connects directly with the general waiting room, flanked on either side by a series of unit rooms, modified according to the need of the particular clinic. In the central admitting room of each unit the current records are kept, and the room is divided into a series of cubicles in which the histories of the patients are taken. The patient is examined or dressed in one of the small rooms which do not connect directly with the general waiting room but are separated from it by an interior corridor. The idea of the plan is that, inasmuch as many old patients do not require a complete physical examination, the cubicles of the admitting room can be used for handling them as well as for taking the histories of new patients. Each new patient, after having the history taken in the admitting room, is transferred to an examining room for a thorough physical examination. The division of the examining room into two groups by the admitting room separates the males from the females. It is a simple matter for an architect to arrange the fenestration so that rooms consisting of units or combinations of units are obtainable.

For the proper administration of the dispensary there should be in charge of it a superintendent who may or may not be a physician, but who must have had training in the social side of dispensary work. The superintendent should devote his entire time and energy to the work, and should be sufficiently well remunerated so that he can afford to do this. There should be a sufficient force of admitting clerks properly to register and index the patients, the clinics should be properly supplied with nurses, particularly those clinics

in which women are patients, and clinic secretaries have proved of great value in the Massachusetts General Hospital outpatient department. The latter are young women who are desirous of doing philanthropic work and who volunteer to keep the clinics running by taking general charge of the patients, seeing that their records are properly distributed and properly filed after the daily session, caring for the transfer of patients from one department to another, caring for the follow-up systems, weighing patients, taking temperatures, and other minor duties.

It has yearly become more evident that no dispensary can be satisfactorily conducted without an adequate social service department. Those of us who have had an opportunity of working with a social service department can look back with feelings almost of horror to the time when we attempted to do without one. The reasons underlying the necessity for this department are now so obvious and well recognized that further comment is unnecessary.

Perhaps the most important essential in the proper conduct of the dispensary is an adequate medical staff, and it would seem as though it was advantageous to divide the medical attendants into the teaching staff, who should be more or less permanent paid men responsible only for the supervision of students and for teaching, and the service staff, who are unpaid volunteers whose business it is to take care of the routine work of the dispensary. In our experience it is necessary to have at least one paid man in each department. Where the dispensary is affiliated with the hospital the house staff of the hospital may well spend part of their time in the outpatient department. In a teaching dispensary it is very important that the heads of departments shall give their services to the institution at regular intervals. One of the main difficulties in the conduct of many dispensaries has had to do with obtaining a sufficient number of well trained young men to conduct the routine work. The main source of this difficulty in our opinion has been the condition of overcrowding and hurry that is characteristic of so many dispensaries and which serves not only to rob the attending physician of whatever benefit he might obtain, but also tends to convert him into a slipshod routinist. We cannot expect to attract first class men to dispensary positions until we can so arrange dispensary conditions that the work they obtain is of distinct benefit to them.

The question of dispensary records is a very important one. Unless carefully and properly kept, the records are worthless. Making all allowances for the differences in conditions, they should be as carefully and accurately kept as hospital records. Indeed, the ideal system is to keep them on the same blanks as the hospital records and to have the records of the hospital and the outpatient department interchangeable. In some institutions the hospital and dispensary have a common history room and, while there may be local reasons why this may not always be desirable, the principle should be followed where possible.

The advantages to the dispensary of close affiliation with the hospital can be fully appreciated only by those who have worked in a dispensary which is not so situated. A dispensary is a natural feeder of a hospital, and where the two are separate the difficulties as to the transfer of patients from one to the other are great and each institution loses in efficiency on account of the unnecessary duplication in equipment and staff which such a separation involves.

The equipment of a dispensary can be summed up in a general way in a sentence. It must be such that thorough examination and treatment of all patients is possible. This means, of course, that the dispensary workers must have at their command all of the usual clinical instruments of precision—thermometers, stomach tubes, blood counters, microscopes, cystoscope, etc. Further than this, there must be the necessary laboratory space for the routine laboratory procedures. From the standpoint of dispensary efficiency, a central laboratory is perhaps the best. From the standpoint of medical teaching, small clinic laboratories are perhaps better, as they allow the student to study each patient completely himself. The dispensary should also have an efficient Roentgen-ray department both for diagnosis and for treatment, a heart station with the necessary instruments, and a department of physical therapy in which massage, electricity, hydrotherapy and mechanotherapy can be carried out. It goes without saying that certain departments will require specially equipped rooms, such as dark rooms, plaster rooms, rooms for stomach washing, cystoscopic rooms, etc.

The question of the use of the dispensary in teaching may be considered from the point of view of the teacher or of the student. All of the dispensary workers engaged in teaching should be appointees of the medical school, should be paid men, and should be required to make teaching their chief work. Each clinic should be in charge of a paid instructor who should conduct it and personally take charge of the students. There should be at least one such instructor to a group of five students—preferably to a group of three. The routine work should be attended to by the service physicians, who would, however, refer interesting cases to the chief of the clinic. It is easier to procure such paid instructors than to keep them. Many promising and properly trained young men are willing to accept such positions until their practice reaches a paying stage. After this stage is reached, it is difficult to retain them in the dispensary positions. This is one of the problems that must be faced in connection with dispensary instruction, and it would seem that we must either pay such instructors for their full time, or hold out to them the promise of promotion either in the dispensary itself or in the hospital.

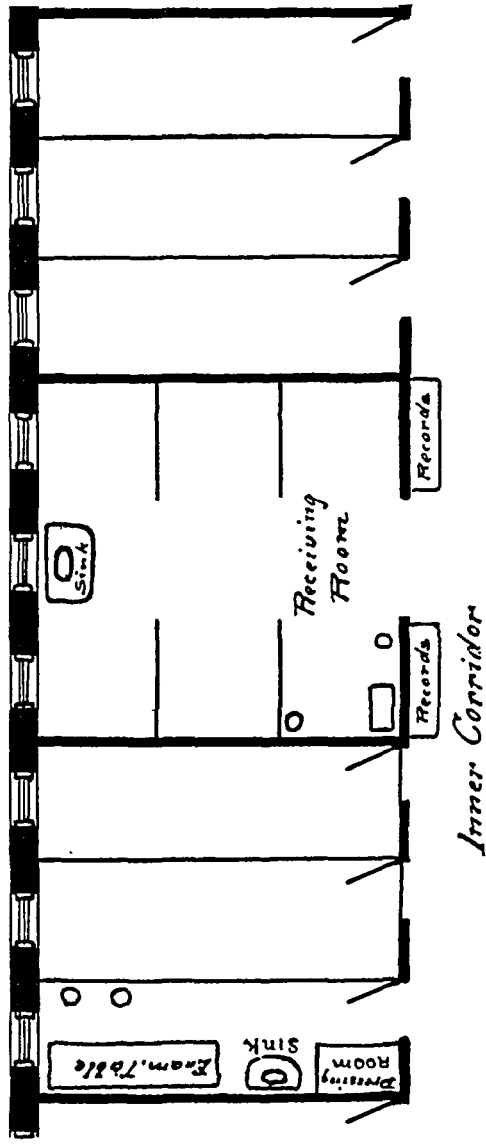
The particular stage at which students are best put into dispensary work will perhaps depend to some extent on local conditions. In a school where the clinical clerk system is in operation and where, therefore, the student's fourth year

work in medicine, surgery, pediatrics and diseases of women is adequately cared for in the hospital, it would seem as though the best disposition is to let the third year students devote their time in the dispensary to the general clinics and require the fourth year students, who obtain their general work in the hospital, to devote their dispensary period to the specialties. This can be satisfactorily done, however, only when great care is taken that the third year student shall receive adequate supervised instruction in his dispensary work so that he does not carry slipshod methods into his fourth year.

So far as the separate clinics themselves are concerned, in their relation to teaching, specialization should be encouraged. This will naturally be most feasible in the large city, much less so in the small one. There would seem to be no question that a student receives better instruction from a man who is specializing in some subject in which he is particularly interested than he does from a teacher who is not so engaged. Of great importance is the contact of the student with the working representatives of the various social organizations, which are nowadays so frequently affiliated with dispensaries. The student can learn much about such subjects as prenatal care, infant welfare, the mentally defective, and other aspects of preventive and social medicine, through the representatives of these agencies.

In connection with the teaching work of the dispensary, it seems to the committee that there are certain subjects of fundamental importance that may be covered in dispensary work and certain special methods of value. The third year student should be taught how to take histories and how to handle patients in a tactful and humane manner. He should learn how to make a thorough routine physical examination, and should preferably carry out himself the necessary work in the clinical laboratory in connection with each of his patients. He should obtain instruction and practice in the use of such instruments as the thermometer, sphygmomanometer, ophthalmoscope, etc. He should take charge of his patient throughout all special examinations, thus learning to appreciate the necessity of such examinations, and should gain some insight into the interpretation of roentgenoscopic findings, serum reactions, and similar special tests.

Certain methods are of special value in the instruction of students as well as in the care of dispensary patients. It seems to us that the class method, originally advocated for groups of tuberculous patients, could be widely extended to great advantage. It would be distinctly beneficial not only to the patient but also to the student to have classes of cardiacs, of nephritics, diabetics, neurasthenics, and patients with stomach trouble and leg ulcers. It goes without saying that this method could be extended indefinitely and should serve to stimulate interest not only in the student but also in the instructor to whom the particular cases are assigned. The proper use of the social service department and the clinic



General Waiting Room

(Scale $\frac{1}{8}$ in. = 1 ft.)

secretaries is also of great value to the teacher and student as well as to the patient. By means of card indexes and follow-up systems in the hands of the social workers, patients can be studied with much greater regularity than was formerly the case, and groups of patients presenting similar lesions can be brought together at intervals for purposes of study and instruction.

The main conclusions of the committee may be summarized as follows:

1. The dispensary or outpatient department, as a means both for the study of disease and systematic instruction of students, has been greatly neglected.

2. This will continue to be the case until our dispensaries are adequately housed, adequately equipped and adequately manned.

3. The present overcrowded condition of most of our dispensaries results in slipshod methods on the part of the assistants, and tends to the acquisition of slipshod methods by the student. It makes it difficult to procure men of the right caliber in dispensary work.

4. There is an urgent need for the recognition of the importance of dispensary work by the profession, and a recognition of the importance of adequate endowments by the laity.

5. A properly equipped and adequately manned dispensary is one of the most important factors in clinical instruction.

WILLIAM PEPPER, M.D.,

Dean of the University of Pennsylvania, School of Medicine, Philadelphia.

PAUL G. WOOLLEY, M.D.,

Professor of Pathology, University of Cincinnati, College of Medicine.

GEORGE BLUMER, M.D., Chairman.

Dean of Yale University, School of Medicine, New Haven, Conn.

On motion, the report of this committee was accepted and the Secretary was instructed to order a sufficient number of reprints of the report so that each college in membership could be furnished with as many copies as desired.

The Chair here appointed the following Nominating Committee: Drs. George Blumer, A. L. Gray and H. W. Loeb.

The Report of the Committee on Medical Research was called for, but no member of the Committee was present, and, therefore, no report could be made.

REPORTS OF DELEGATES

Dr. Means, the representative of the Association to the Council on Medical Education of the American Medical Association, made the following verbal report:

REPORT OF DELEGATE TO THE COUNCIL ON MEDICAL EDUCATION OF THE
AMERICAN MEDICAL ASSOCIATION

It has been my pleasure to serve the Association as its representative to the Council on Medical Education for several years. I have no special report to make this year, further than to say that as your delegate I was given a cordial reception by members of the Council, and was invited to participate in the business of the meeting. The purpose of this Association and that of the Council is to promote and advance medical education in this country. Therefore, the activities of the two great educational organizations are in many ways similar and run parallel to each other. As stated in former reports, joint inspections of colleges seeking membership in the Association and inspections of colleges in membership, concerning which there has been raised some question as to proper conduct, have been found much more satisfactory than when done separately. In some instances representatives of this organization were notified to inspect colleges not applying for membership, and their opinions have been given due consideration. While the two bodies are independent in their activities and differ materially in methods, there is and should be a very close working relationship that is exceedingly helpful to the cause of medical education. Dr. Colwell and I keep in close touch in the general work. We frequently consult as to the proper disposition of problems pertaining to evaluation of entrance credits, admission of migratory students and other matters of interest to colleges. Before rendering opinions on the problems which come to us, we usually consult each other as to the proper thing to do. While the Association should not be and is not subservient to the will of the Council, a close relationship can materially benefit the cause for which we are working. The next year will be rather an important one to some colleges members of this Association. If a general inspection is made by the Council and a rating published, some colleges may fall below the acceptable line. It will be of material importance, therefore, that joint inspections should be made before a demotion is published.

(Signed) W. J. MEANS.

REPORT OF DELEGATE TO THE FEDERATION OF STATE
MEDICAL BOARDS

Dr. Zapffe, the delegate to the Federation of State Medical Boards, reported as follows:

There is absolute harmony of thought and unanimity of action on the part of the Federation and this Association. The Federation has not taken any active step in any one direction in the last two years, so that I cannot report anything of that nature. The first thing that it has attempted to do will, I believe, come up for action at the meeting tonight; therefore those of the members who will still be in the city this evening should attend the meeting, when the report by Dr. Harrison on Uniform Preliminary Requirements will be presented. By doing so you will get a better and more comprehensive idea of the work the Federation is trying to do than from anything I could tell you.

(Signed) FRED C. ZAPFFE.

REPORT OF NOMINATING COMMITTEE

Dr. Blumer, chairman of this committee, stated that the committee was ready to report. The report was as follows:

For President: John L. Heffron, Syracuse, N. Y., and Reuben Peterson, Ann Arbor, Mich.

For Vice President: W. S. Carter, Galveston, Texas, and A. C. Eycleshymer, Chicago.

For Secretary-Treasurer: Fred C. Zapffe, Chicago, and Philip A. Shaffer, St. Louis.

For Executive Council: W. J. Means, Columbus; Isadore Dyer, New Orleans; Randolph Winslow, Baltimore, and W. F. R. Phillips, Charleston, S. C.

(Signed)

GEORGE BLUMER,
A. L. GRAY,
H. W. LOEB.

The Chair appointed as tellers Drs. Joseph A. Hathaway and Henry C. Tracy.

The vote having been taken and counted, the tellers announced that the following nominees had received each the majority of votes cast for election to the office for which they were named:

President: Dr. John L. Heffron.

Vice President: Dr. William S. Carter.

Secretary-Treasurer: Dr. Fred C. Zapffe.

Members of Executive Council to serve two years: Drs. W. J. Means and Isadore Dyer.

The Chair then declared those having received the majority of votes cast duly elected to office.

COMMITTEE ON INSTRUCTION IN PUBLIC HEALTH, ETC.

Dr. Charles W. Dabney, president of the University of Cincinnati, expressed the opinion that there was great need for systematic teaching of students and laity on matters of public health, sanitation and hygiene, and therefore moved the appointment of a committee to take up this matter, outline a plan of procedure and report at the next annual meeting.

The motion was duly seconded and carried.

The Chair appointed on this Committee Drs. Victor C. Vaughan, William F. Snow, and Milton J. Rosenau.

Dr. Randolph Winslow here took the Chair, while the President delivered his Address, entitled "Aims, Methods and Results in Medical Education."

(See page 5.)

At the conclusion of this address the Secretary presented the request of the University of Maryland for permission to read a short paper on "Medical Education with Reference to Rural

Maryland," written by Dr. Gordon Wilson, a member of the faculty of that institution.

On motion, this request was granted. The paper was read by Mr. Caleb Winslow, the delegate from the University of Maryland.

(See page 23.)

Dr. Bardeen here again took the Chair.

COMMITTEE ON UNIFORMITY IN COLLEGE ANNOUNCEMENTS

Dr. George Blumer directed attention to the lack of method and conformity of outline existing at present in the published announcements of colleges in membership in this Association. He stated that he had had occasion to consult these announcements during the past year, seeking information with regard to certain courses of study offered by medical colleges. He was astonished and chagrined to find how difficult it was to secure this information from these announcements, and how important it is that all information with reference to each and every course offered by each individual medical school be available. Therefore, he recommended the appointment of a committee whose duty it shall be to investigate this matter, and report its findings as well as make recommendations how to remedy this deficiency at the next annual meeting.

This recommendation was put in the form of a motion, was duly seconded and carried.

The Chair appointed on this Committee Drs. George Blumer, F. C. Waite and Fred C. Zapffe.

COMMITTEE ON RURAL DISTRIBUTION OF GRADUATES

Dr. William C. Woodward moved that a committee be appointed to investigate the subject matter discussed in Dr. Gordon Winslow's paper, namely, the statistics with reference to the number of physicians located in rural districts as compared with those located in cities. Seconded and carried.

The Chair appointed on this committee Drs. Randolph Winslow, Wm. C. Woodward and E. P. Lyon.

RESOLUTIONS AND RECOMMENDATIONS

The Executive Council, through its Chairman, Dr. Means, presented the following resolution:

Recognizing the need and importance of a generally accepted standard for medical licensure, and appreciating the effort of the National Board of Medical Examiners to satisfy this need as well as to provide a source of supply of prepared candidates for the Medical Corps of the Government services; therefore, be it

Resolved, By the Association of American Medical Colleges, that the purposes of the National Board of Medical Examiners be approved and its objects encouraged.

On motion, duly seconded, this resolution was endorsed by the Association.

The Executive Council also presented the following resolution, which was offered as notice of an amendment to be discussed and acted on at the next annual meeting:

WHEREAS, The trend and development of medical education for higher standards for entrance to medical colleges has shown that the sixty hours of preliminary college credit requirement is logical and necessary, and in view of the establishment of a national board of examiners and the required standards for licensure in fourteen states demanding the sixty hours of college credit for entrance to medical schools; therefore, be it

Resolved, That this Association advance its entrance requirements from the present standard of thirty hours of college credits to sixty hours of college credits, to become effective for all matriculants entering on the study of medicine after Jan. 1. 1918.

Dr. Winslow moved that the recommendation of the Committee that such a step be taken in January, 1918, be changed to read Jan. 1, 1919. Seconded. Motion lost.

On motion, the recommendation of the Executive Council was then duly approved.

AMENDMENTS

There being no unfinished business to come before the Association, the item of new business was taken up. Under this head came the two amendments proposed:

In order to meet conditions existing in certain undergraduate colleges with reference to the instruction in physics, the Executive Council proposed that the present requirement with regard to physics be amended as follows:

After Jan. 1, 1917, the requirement in physics shall be eight semester hours of college work, of which at least two are laboratory, or 96 hours of didactic, plus sixty-four hours of laboratory, in periods of not less than two hours each, and that in 1916, when part of the physics requirement may be met by high school physics, the requirement should be either (a) eight semester hours of which at least two are laboratory, or ninety-six hours didactic plus sixty-four hours laboratory in periods of two hours each, or (b) one unit of high school physics plus four semester hours of college physics, of which at least two shall be laboratory work, or thirty-two hours didactic plus sixty-four hours laboratory in periods of two hours each.

After a brief discussion, by way of explanation largely, Dr. Cutter moved that the amendment, as proposed, be adopted. The motion was duly seconded and carried.

The Secretary then read the amendment proposed by the Indiana University School of Medicine, to the effect that Section C, Article III, be amended by the substitution of the words "foreign language," for the words "German and French," and that following Section C the following paragraphs be added:

Provided also that a student may satisfy the college requirement in foreign language by a college year's work in Spanish, French, German, Latin or Greek—French or German preferred.

Provided further that the college requirement may be satisfied by presentation of one unit of required high school work in a foreign language and completing one-half year of collegiate work in that language which continues and does not duplicate the work done in high school, or by presenting two units of regular high school work in a foreign language in addition to the high school requirement in foreign language.

Further, that Section E be amended by striking out the second paragraph.

This amendment was discussed at some length, without arriving at any definite solution of the question. Inasmuch as the matter is one of great importance, the consensus of opinion was that more time should be allowed for its consideration before a final disposition is attempted. Therefore, Dr. Cutter moved that the matter be referred to the Committee on Education and Pedagogics for consideration, and that the committee report at the next annual meeting, when the amendment could be disposed of properly.

This motion was seconded and carried.

An adjournment until 2 o'clock was then taken.

AFTERNOON SESSION

JOINT MEETING WITH THE FEDERATION OF STATE MEDICAL BOARDS

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

Dr. Bardeen introduced Dr. George H. Cook, the President of the Federation, as the presiding officer for the afternoon.

Dr. Cook addressed the meeting briefly, and the program of the afternoon was then taken up. It was as follows:

"Teaching of Applied Therapeutics," Francis C. McCrudden, Boston.

"Teaching of Clinical Medicine," Lewellys F. Barker, Baltimore.

"Teaching of Clinical Surgery," A. C. Stokes, Omaha.

"The Municipal Hospital as a Factor in Clinical Teaching," H. W. Loeb, St. Louis.

The discussion on these papers was opened by Dr. Frank Billings, Chicago, and participated in further by Drs. Arthur Dean

Bevan, Chicago; W. T. Councilman, Boston, and closed by the essayists, Drs. McCrudden, Barker, Stokes and Loeb.

This concluded the set program for the afternoon, and Dr. Cook withdrew from the Chair to make way for the President of the Association. Owing to the absence of Dr. Bardeen, Dr. Heffron took the Chair.

REVISION OF CURRICULUM

Dr. Phillips called attention to the fact that by reason of the requirement of inorganic chemistry for admission to the medical course, the curriculum now in force should be revised to meet this condition. He suggested that a general revision of the curriculum might be desirable.

On motion of Dr. Phillips, this matter was referred to the Committee on Medical Education and Pedagogics, with instructions to report thereon at the next annual meeting. The motion was seconded and carried.

Dr. Phillips then moved that Dr. Wm. P. Harlow, of Boulder, Colo., an ex-President of this Association, and always a willing and energetic worker, be elected to associate membership. The motion was duly seconded and carried.

The President suggested that each college in membership notify the Secretary as to the number of transactions they might desire, so that a sufficient quantity could be printed. The Secretary was asked to make inquiry of each college on this point.

Dr. Myers moved that the Transactions be published in two fasciculi, one to contain the record of the proceedings, and the other the papers read and the discussions thereon. This motion was seconded and carried.

Dr. Phillips moved that the Secretary be instructed to extend to the management of the Auditorium Hotel the thanks of the Association for the courtesy shown and the quarters provided. Seconded and carried.

There being no further business to come before the Association, an adjournment was taken subject to the call of the Executive Council.

(Signed) C. R. BARDEEN, President.
FRED C. ZAPFFE, Secretary.

MINUTES OF THE ORGANIZATION MEETING OF THE EXECUTIVE COUNCIL

The members of the Executive Council met in the Auditorium Hotel, Feb. 8, 1916. There were no absentees.

On motion of Dr. Bardeen, seconded by Dr. Lambert, Dr. Means was elected Chairman of the Council for the ensuing year.

On motion of Dr. Bardeen, seconded by Dr. Dyer, Dr. Means was appointed the delegate to the Council on Medical Education

of the American Medical Association, and Dr. Zapffe was appointed the delegate to the Federation of State Medical Boards.

Dr. Dyer moved that the stationery of the Association show not only the names of the officers, but also the names of the chairmen of the different standing committees. Seconded by Dr. Means, and carried.

On motion of Dr. Bardeen, seconded by Dr. Lambert, an honorarium of \$500 was voted to the Secretary-Treasurer for the ensuing year, and \$200 to the chairman of the Executive Council.

It was moved by Dr. Zapffe, and seconded by Dr. Dyer, that on approval of the chairman of a committee any expenses incurred by the committee be paid by the Association. Carried.

The President, Dr. Heffron, then announced the appointment of the following standing committees:

COMMITTEE ON EDUCATION AND PEDAGOGICS: Edw. H. Bradford, Chairman, Harvard Medical School, Boston; K. C. Babcock, University of Illinois, Urbana; I. S. Cutter, University of Nebraska, Omaha; William Ophüls, Leland Stanford, Junior, University, San Francisco; W. F. R. Phillips, Medical College of the State of South Carolina, Charleston.

COMMITTEE ON EQUIPMENT: Charles P. Emerson, Chairman, Indiana University, Indianapolis; Alfred L. Gray, Medical College of Virginia, Richmond; H. W. Loeb, St. Louis University, St. Louis.

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.

The Council then adjourned.

(Signed) WILLIAM J. MEANS, Chairman,
FRED C. ZAPFFE, Secretary.

OFFICERS AND COMMITTEES FOR 1916-1917

President: DR. JOHN L. HEFFRON, Syracuse, N. Y.

Vice-President: DR. WM. S. CARTER, Galveston, Tex.

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

EXECUTIVE COUNCIL

DR. WM. J. MEANS, 715 N. High Street, Columbus, Ohio.

DR. F. C. WAITE, Cleveland.

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