gram of dactinomycin in eight doses just before and after nephrectomy, followed by radiotherapy two weeks after completion of the course. The two-year survival in this group was 61 per cent as compared to 11 per cent in a nonconcurrent control group.

To evaluate the effect of any therapeutic program in Wilms's tumor, it is imperative that only one variable be introduced in comparative series. This investigation has limited selection of cases in both treatment groups to subjects more than one year of age who have had presumably completely resectable primary tumors without evidence of distant spread. It is, moreover, the only study to date in which two randomized concurrent comparative series of patients have been differentiated by only one treatment variable.

All acceptable Group 1 subjects had unequivocal diagnoses at the start of therapy and all recurrences consisted of unequivocal pulmonary metastases. As noted in Table 4, "metastases" to the contralateral kidney occurred in one of the three treatment failures in Group 2, and another was originally considered to have an "undifferentiated renal sarcoma (probably Wilms's tumor) without tubular elements" that metastasized to bone 10 months later.

In this series, as previously reported by others,[1] the immediate prognosis is better for younger subjects. In Group 2 none of the three subjects 1 to 2 years of age at diagnosis have had recurrences. Recurrence has occurred in only one of five in this age group in Group 1. Because of the small sample size at this age, statistical evaluation of the difference in recurrence rate between the two groups is not possible. Despite the fact that in both Group 1 and Group 2 radiotherapy was given simultaneously with dactinomycin, toxicity to the drug was not a significant problem. In only one patient did significant dermatitis at the site of irradiation develop. Vomiting, necessitating drug adjustment, occurred in three patients, and significant leukopenia in two. One patient had a generalized seizure that was probably related to dactinomycin administration. This was the only toxic side effect that required permanent withdrawal of drug therapy.

References

1. Gross, R. E., and Neuhauser, E. B. D. Treatment of mixed tumors of kidney in childhood. *Pediatrics* **6**:843-852, 1950.
2. Klapproth, H. J. Wilms tumor: report of 45 cases and analysis of 1,351 cases reported in world literature from 1940-1958. *J. Urol.* **81**:633-648, 1959.
3. Williams, B. I. Prognosis in nephroblastoma: results of treatment by surgery and radiotherapy. In *Tumors of the Kidney and Ureter.* General editor: D. W. Smithers. Vol. 5. Edited by E. W. Riches. Baltimore: Williams & Wilkins, 1964.
4. Conway, G. F. Personal communication.
5. Garcia, M., Douglass, C., and Schlosser, J. V. Classification and prognosis in Wilms's tumor. *Radiology* **80**:574-580, 1963.
6. Reiquam, C. W., Prosper, J. C., Akers, D. R., Allen, R. P., and Beatty, E. C., Jr. Wilms' tumors: study of 42 cases at Denver Children's Hospital (1943-1964). *Rocky Mountain M. J.* **62**:43-49, 1965.
7. D'Angio, G. J., Farber, S., and Maddock, C. L. Potentiation of x-ray effects by actinomycin-D. *Radiology* **73**:175-177, 1959.
8. Farber, S., Toch, R., Sears, E. M., and Pinkel, D. Advances in chemotherapy of cancer in man. *Advances in Cancer Research* **4**:1-71, 1956.
9. Farber, S., D'Angio, G. J., Evans, A., and Mitus, A. Clinical studies on actinomycin D with special reference to Wilms' tumor in children. *Ann. New York Acad. Sc.* **89**:421-425, 1960.
10. Tan, C. T., Dargeon, H. W., and Burchenal, J. H. Effect of actinomycin-D on cancer in childhood. *Pediatrics* **24**:544-561, 1959.
11. Pinkel, D. Actinomycin D in childhood cancer: preliminary report. *Pediatrics* **23**:342-347, 1959.
12. Keidan, S. E. Actinomycin D in treatment of cancer in children. *Brit. J. Surg.* **53**:614-618, 1966.
13. Johnson, D. G., Maceira, F., and Koop, C. E. Wilms' tumor treated with actinomycin D: relationship of age and extent of disease to survival. *J. Pediat. Surg.* **2**:13-21, 1967.
14. Sukarochana, K., and Kiesewetter, W. B. Wilms' tumor: factors influencing long-term survival. *J. Pediat.* **69**:747-752, 1966.
15. Burgert, E. O., Jr., and Glidewell, O. Dactinomycin in Wilms' tumor. *J.A.M.A.* **199**:464-468, 1967.
16. Fernbach, D. J., and Martyn, D. T. Role of dactinomycin in improved survival of children with Wilms' tumor. *J.A.M.A.* **195**:1005-1009, 1966.
17. Howard, R. Nephroblastoma (Wilms' tumor): improved prognosis with actinomycin-D. *M. J. Australia* **2**:141, 1964.
18. Farber, S. Lasker Award: chemotherapy in treatment of leukemia and Wilms' tumor. *J.A.M.A.* **198**:826-836, 1966.
19. Wolff, J. A. Personal communication.
20. Hartmann, J. R. Personal communication.

SPECIAL ARTICLE

ANNUAL DISCOURSE – MEDICAL EDUCATION AND THE UNIVERSITY (1901-1968)*

LAMAR SOUTTER, M.D.

MEDICAL schools are in a period of change owing to a number of influences, including the forces now reshaping the practice of medicine. It is of some interest, therefore, to review how the medical schools came into their present form, the benefits and deficits of the present educational system and what changes might be introduced.

In the early part of this century, reforms in medical education placed it more and more under the control of universities. The enormous increase in medical knowledge and the advances in patient care during the past 40 years must in large measure be attributed to the improvements in the medical

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schools under this sponsorship. The education of practicing physicians, with the exception of those attending a small number of independent schools, has taken place under this control.

Sixty years ago, there were 161 schools; 350 others had already gone out of existence, but new schools were still being formed almost as rapidly as old ones closed their doors. At that time, some 54 schools called themselves "university schools," although for many the university itself had only a remote connection or was nonexistent. Entrance requirements at the better schools consisted of certain high-school courses and a diploma; instruction at the majority was almost entirely by "didactic" lectures and had been since 1765. During the last part of the 19th century, however, attempts at improvement were introduced by the American Medical College Association, in the form of a set of standards and a uniform curriculum. The latter would have ruined the proprietary medical schools and was unacceptable to the better ones. The Association accordingly went out of existence. Its successor, the Association of American Medical Colleges, along with the Council on Education of the American Medical Association, bent its efforts toward introducing such reforms as laboratory work during the preclinical years, a lengthening of the course of study, introducing students to the problems of patients and an annual inspection of the schools. The AMA was also in favor of creating licensing boards to set standards for medical and premedical education. By 1906 there were boards in some 26 states, but in a number, the standards were set low enough to permit graduates of the most wretched school in the state to meet the qualifications for practice. Another potent force in the direction of reform was the example set by the leading medical schools in improving their educational programs. Johns Hopkins required a college degree for admission at its inception in 1893. By the turn of the century, other schools, such as Harvard and Columbia, had introduced laboratory studies, brought students into the hospitals to see patients, lengthened the school year and stiffened requirements for graduation. These reforms cost money. The bulk of the schools, being proprietary, ran at a profit, which was usually divided among the professors. Some paid dividends of as high as 15 per cent a year.[1] Since the schools were generally housed in a few rooms with little or no equipment, their costs were low. Expensive improvements were beyond them. Whereas the good schools could obtain endowment to pay for rising costs, poor ones could not attract such funds, and their fate was inevitable. The effect of this on student enrollment can be seen in Table 1. By 1908 there were almost 4000 fewer students than in 1901.[2] The ratio of enrolled medical students to population in 1901 as compared with 1967 (1:2876 vs. 1:5840) emphasizes the need for greater medical-school enrollment. It must be remembered, however, that there were too many doctors in 1901. Also, not only is the physician of 1968 more effective, but his services are extended by the help of ancillary personnel. Although the reform movement gathered great impetus as a result of Mr. Abraham Flexner's forthright and articulate report on medical education in 1910, it would probably have not been nearly so successful if medical educators and the AMA had not laid the groundwork of reform beforehand. After this, most of the schools, to continue, had to seek a university affiliation or strengthen their previous university ties.

TABLE 1. *Numbers of Enrolled Students in the United States Compared with the Population, 1901-1967.*

YR	MEDICAL STUDENTS*	TOTAL U.S. POPULATION
1901	26,417	75,994,575
1908	22,602	88,776,600†
1930	21,982	122,775,046
1950	26,186	150,697,361
1967	33,423	195,195,000

*Note: quality of students in 1901 & 1908 comparable with 1967.

†Approximate figure.

How the universities coped with the profitable but inadequate schools is quite interesting. As long as the students' fees went almost directly to the professors, there was strong opposition to reform. By having the fees go into the university treasury and running the school on a budget, the schools removed the profit motive, and reforms could begin.

The educational background of the students had been appallingly weak. What the Flexner report set as minimal requirements in the sciences and humanities, the universities introduced, and the licensing boards gradually enforced. This permitted a far better education in both clinical and medical science but caused problems for the weak schools that could not provide it. The admissions requirements introduced in this way have gradually become quite uniform, with little variation from school to school for many years. This is rather unrealistic in the light of advances in both high-school and college education, which should permit medical schools to increase premedical requirements. For students who have received credit at college for good secondary-school courses, more could be required in the way of courses in the social and other sciences, without violating any of the usual collegiate academic requirements.

The length of the medical course is important. In 1848 it was six months, after which the student began his apprenticeship with a practicing physician. By 1879 about 20 months of formal education were demanded. In 1908 the AMA recommended a program of 32 weeks for each of four years, as was already in vogue at the better schools. This permitted far more time to be devoted to the basic sciences, particularly for laboratory work. In the clinical years, time became available for actually

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working with patients, a matter of vital necessity since the postgraduation apprenticeship had disappeared and opportunities for hospital training were inadequate. Students up to this time were not well accepted on the hospital wards. At some hospitals – for example, at Cook County – they were only permitted in the amphitheater where the patients' diseases were demonstrated while they took notes. In 1900, the schools at only three universities (Iowa, Michigan and Virginia) actually owned their hospitals and were thus able to control both faculty appointments and teaching. At the others the hospitals appointed their staffs and usually promoted them on a seniority basis. By 1910 about 35 schools owned or controlled hospitals to some extent; 86 had some access to hospitals, but at the other 26, there was no exposure of the student to patients at any time.[3] Little by little, medical schools have formed relations with hospitals whereby they could take a dominant role, or at least act as a partner, so that appointments and promotions could be made for merit and the facilities used for teaching and research. With many of the older schools, this has been effected by the establishment of medical centers, but at others, including nearly all the newer ones, it has been achieved when the university built its own hospital. This control has led to a considerable improvement in educational programs.

The methods of scientific thought and analysis that were most common in the classrooms and laboratories of the university have extended gradually into the medical school and its teaching hospitals. More exciting ways of teaching that challenge the student to learn by active participation rather than passive acceptance have resulted from this influence. Small-group instruction, seminars and symposiums, individual laboratory experiments and close association with tutors and advisors also followed. The "case system" of instruction, of which the clinicopathological conference is a prominent example, was imported from the law school. Lectures have diminished, and both free time and electives have increased. A number of schools now have a required minimum curriculum supplemented by courses chosen by the student, permitting him to pursue a subject of interest to some depth.

Perhaps the clearest indication of the transformation of the medical schools from vocational institutions to centers for advanced learning is in the expansion of their medical libraries. In 1900 most medical schools had no libraries at all. Even at the best, the collections were not large. Since scholarship is unattainable without a library, at the beginning of the century medical scholarship was largely reserved to the members of the faculty who could afford to acquire their own books. In 1906 the Council on Medical Education began the inspection of medical schools. Facilities and equipment were of particular interest to the examiners. A regulation issued by the Council in 1908 required that each school have a library containing the more recent texts and references, as well as 10 or more of the leading periodicals.[4] A regulation by the Association of American Medical Colleges in 1912 called for the school's library to contain at least one publication on general medicine and one devoted to the work of each department. It added further that the collection should be catalogued and available for use. The expansion of medical knowledge through research, attributed in no small part to the intimate assocation of medical schools with universities, led to an increasing demand for larger and more complete libraries. It also produced what by now has become an annual deluge of medical publications. New medical libraries became established, old ones enlarged, and some merged with others. Some of the larger ones, aided by computers and copying devices, are forming networks for exchange of unusual and scarce items. Special education and training for medical librarians and their staffs has become mandatory. Statistical data, compiled by the Council on Medical Education for the year 1966-1967, are quite illuminating about the increasing importance of these collections. The average library budget for that year was $156,515, and the average number of volumes on hand 98,824; the number of periodicals received (titles, not issues) averaged 1684, and the average space occupied was 18,185 square feet.[5] The minimum library budget for any medical school in 1967 was $25,888, over twice as large as the entire budget for 56 of the schools in 1908.[6] It should be remembered that these libraries serve members of the allied health professions and practicing physicians, as well as medical students and faculty.

One of the great achievements of medical schools in the past 50 years has been the attraction of students of a higher quality in larger numbers. The ability to select students of strong motivation, good character and scholarly achievement is probably more important than facilities, curriculum or teaching methods. The importance of this is evident when one considers that from a number of the old Class B and C schools with their limited resources have occasionally come men of such character and determination that they not only have overcome their educational handicaps to become excellent practitioners but also have even gained faculty rank at leading medical schools. At the turn of the century, the proprietary schools catered largely to unselected students of minimal qualifications and ability whom they lured to their doors by false and misleading advertising. As the universities developed their schools into more scientific institutions, the attraction of the better students began. Both the rapidity of scientific advance and the quality of medical care have been due in a large measure to the increasing excellence of the students entering medicine.

Not all of what has happened to some of the

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medical schools that have become largely dominated by universities has been entirely beneficial or without problems. These other aspects of the relation need also to be examined.

As the student body has improved, so also has the quality of the faculty at schools located within or without the universities, but the better men have for the most part had their strongest interest in the academic rather than the vocational aspects of medicine. Table 2 presents some data on the number of full-time faculty and faculty-to-student ratios for 1908 and 1967. There were few full-time men in 1908, and those only at the leading schools. Their influence, therefore, on the large body of medical students was negligible. Average figures for the faculty and students for that year can only be considered as estimates because the data upon which they are based are not very accurate. Even if it is admitted that teacher-for-teacher the part-time man of 1908 cannot be compared with the full-time counterpart in 1967, the curriculum was shorter, and the amount to be learned and the depth in which it was pursued were far less. The average student-faculty ratio in 1908 was 1.9; the present ratio of students to full-time faculty is 1.7. It will not remain at this figure; the number of full-time men has increased by 74 per cent since 1960-61, and the number of students by only 10 per cent.[7] Also, there is a significant amount of teaching at present by voluntary faculty at a number of schools, which the figures fail to show. The great increase in full-time men not only indicates a more professional attitude toward teaching but also gives an idea why medical education has become so costly.

The difference between the practitioner of medicine in the community and the physician teacher in the school at the turn of the century was small. After all, nearly all the latter were actively engaged in practice. Little by little, the situation has changed as full-time men have increased in numbers and gradually gained control of clinical teaching within university-owned or affiliated hospitals. By 1930 these clinicians, in addition to patient care and teaching, were spending an average of 25 per cent of their time at research.[8] At present, the portion of time devoted to this activity is about 40 per cent. As the faculty has engaged more and more in appropriate scholarly activity within the medical school and hospital, it has become less and less closely associated with the practice of medicine in the community, in which most of its graduates participate.

TABLE 2. *Number of Enrolled Students as Compared with the Number of Faculty.*

YR	TOTAL STUDENTS	AVERAGE SIZE OF FACULTY	AVERAGE NO. OF STUDENTS	TOTAL NO. OF FULL-TIME FACULTY
1908	22,602	75	146	±200
1966-67	33,423	227*	384	19,247

*Full-time faculty at 4-yr schools.

The relations between the medical school and the rest of the university have varied greatly from one institution to another. The increasing academic strength of the schools, their growing importance in research and, more recently, the dispensing of health care have lent a luster to the university. On the other hand, the graduate school and other schools closely related to the college of arts and sciences have helped strengthen the programs of the medical schools and enlarge the scope of activities at their medical centers. Unfortunately, this is not universally the case. If the medical faculty has no great interest in developing scholastic ties with other schools of the university, such ties will not be formed. The proximity of the medical campus to the main one is also important. The greater the distance apart, the more difficult will be the interchange. Furthermore, points of friction exist. The clinical faculty has a strong service responsibility in furnishing patient care, and by habit its members are a group of "doers" as contrasted to the more contemplative liberal-arts faculty. The salary differential between the medical school and the other elements of the university causes friction, but even more so does the increasingly difficult problem of financing the school.

At the beginning of the century, the proprietary schools, with their meager scholastic offerings, ran at a profit, but the better schools, with laboratories, expensive equipment, a longer year and more salaries, were already running at a deficit. In Table 3 the average cost of educating a medical student at those schools is listed along with family income, costs of staple items of diet and tuition, and compared with the present-day expenses.[9] In 1901 the average tuition was $125 at about 20 of the better schools; the cost per student was $425. The difference (some $300) had to be made up from endowment. The present average cost per student of $4,000 is a ninefold increase over 1901, whereas family income has increased about 12 times.[10] The discrepancy between cost and the income from tuition comes to an average figure of $2,300 per student at private, and $3,400 at public, schools. Because the enrollment has gone up from an average of 146 students per school in 1908 to 384 now (Table 2), the effect of this deficit is multiplied well beyond the amount of any revenue that can be furnished by endowment. A varying amount of this expense is borne by the university. In comparing the increased cost of tuition at private schools with staple items of diet (1901 to 1967) in Table 3, we should remember that although food has increased less in cost, its quality is much the same, whereas the quality of medical education has vastly improved.

At state schools the competition for money furnished by the legislature is often keen between the medical school and the rest of the university and

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TABLE 3. *Comparison of Family Income and Costs of Staple Foods with Medical-School Tuitions and Costs (1901 and 1967).*

YR	AVERAGE FAMILY INCOME ($)	COST OF 5 LB OF FLOUR ($)	COST OF 5 LB OF SUGAR ($)	COST OF 1 LB OF BUTTER ($)	MEDIAN MEDICAL-SCHOOL TUITION ($)*		COSTS TO SCHOOL /STUDENT ($)
1901	651	0.125	0.30	0.26	125		425*
1967	7,990	0.60	0.60	0.80	600 (public)	1,700 (private)	4,000
Increase	X 12	X 5	X 2	X 3	X 5	X 14	X 9

*Approximate for better schools.

can be a source of difficulty unless the medical-school budget is supplied by a separate appropriation. At private schools the mounting costs of medical education put a serious strain on the university's financial resources. Since a university is usually centered about a college of arts and sciences, diversion of large sums of money to a peripheral interest, such as the medical campus, is often resented by the faculty. More and more varied sources of income have been sought by the medical schools as expenses have continued to rise. Gradually, the private schools have come increasingly to the conclusion that support of their educational programs will have to come from public (state or federal) sources if they are to survive.[11]

As a result of financial difficulties, ownership of medical schools has gradually changed. In 1908, out of 161 schools, 26 were public, and the rest were private. More and more public schools have been created, so that by 1963, they equaled the private schools in number. Since that time, some private schools have become public, whereas among the 16 new schools that are being created, only two are private and the rest public (one of the public ones, however, has a large amount of private support). The basic reason for this shift has been that it is easier for a public university to obtain the money to build and run a medical school than for a private one to do so.

At present, a good deal of public funds go into nearly all private schools, largely in the form of research grants. If public money is used to support the educational programs at these schools, they may become financially independent of their universities. If this comes about, it will be interesting to see how much freedom these schools will then seek from university control.

As medical schools have grown into immensely complicated research, teaching and patient-care institutions, their administrative difficulties have mounted. The problems faced by chairmen of departments and deans, who usually control the school, are far greater than they were even 15 years ago. The average period of service in these positions has diminished considerably, particularly for the deans. This short tenure is good neither for the institution nor for the individual. Part of the reason for this turnover is the selection process. In hospitals, industry and other community organizations, the qualifications of the man who heads the enterprise are usually based upon both formal training for the job and experience. Deans and often chairmen, however, are generally selected on a basis of their qualities of leadership and scholastic stature. No formal training is available. Usually, the experience of working as an associate dean or assistant departmental chairman has been lacking before the individual is thrust into an exceedingly complex job. This method of selection goes back to the medieval university. It is, furthermore, quite comparable to the basis upon which university presidents are often selected for an even more difficult task. Nevertheless, the time has come to recognize that this will no longer do. We need to have departmental chairmen and deans selected on the basis of training and experience in both administrative and fiscal matters if the administrations of our medical schools are to be able to meet the challenges that face them.

Despite internal problems, medical schools are becoming more involved in community programs. There has been a quickened interest in sociology and social anthropology as a background for the student's understanding of the health and welfare needs of society. Providing service in the community has been added at some schools in the form of pilot projects, usually with a definite involvement of students. The well known Columbia Point Project at Tufts is a good example of this. A variety of methods of getting students associated with practicing physicians and problems of patients in the home have been introduced at different schools. These include bringing general practitioners into university hospitals, the extension of home-care services, clinical clerkships in community hospitals, comprehensive-care clinics and programs in community medicine. Some of the impetus that has led to these developments has come from a realization that the cloistered atmosphere of the highly specialized and academically oriented university hospital cannot provide all that is needed to prepare the student for the practice of medicine in its usual environment.

Recognition by public officials of the potential resources of the large medical centers, most of which are built around medical schools, has brought about the involvement of the schools in the new federal health programs. This added burden of responsibility for health services outside the hospital is undoubtedly in the public interest and will be shouldered by the schools, but not without additional staff, better financing and a change in the objec-

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tives of the institution regarding the relative emphasis upon teaching, research and patient care. These new service programs are vocationally, not academically, oriented, and like some of the changes in teaching methods that draw the school more into the community, they tend to separate it further from the main university, which, because its core is a college of arts and sciences, has as its essential interest scholarship and not service.

A review of articles on medical education over the past 60 years reveals almost constant references to the "present crisis in medical education." At the moment, we are hardly in a quiet period, considering expansion of old schools, construction of many new ones, widespread liberalizing of curriculums, financial difficulties, assumption of service responsibilities and, last but not least, development at the medical center of programs of education and training for the allied health professions that furnish so much of health care. In the light of so many changes, can we say that the control of the medical school by the university still provides the best sponsorship of education and training for the practice of medicine? In answering this, we should remember that there are a number of successful independent schools as well as a number of medical schools with almost meaningless university relations, most of which function quite well. It is also an important fact that universities organizationally are followers of tradition and hence are unlikely to give up portions of their heritage that embellish their reputation, even if those portions might function better elsewhere. With expanding responsibilities for patient care within and without the university hospitals and more federal and state support for education, it is likely that the schools will expand their activities at the medical centers and lessen their ties to the main campus. This will be particularly true at schools situated off the campus, where the ties are already difficult to maintain and sometimes largely artificial.

The improvement of medical-school faculties and educational standards over the past fifty years has been achieved largely because of university guidance, for which the schools are much indebted, but by now they have learned their academic lessons, and proper scholastic standards have been acquired and can be maintained. Continued intimacy with a university and its college of liberal arts is no longer a necessity, although it can be of mutual benefit. It might be better, in some instances, for the medical school and the other schools of the health professions to join with the various faculties in the physical and social sciences and engineering, to form a different type of university campus. They have many interests in common, among which are professionalism, an orientation toward science rather than the humanities and an interest in service. On such a campus, whether it had a single faculty or several in different schools, the whole span of education could be sponsored from secondary school to a variety of degrees, including the doctorate. It would be a better way of training physicians, because of the scientific atmosphere in which they would work, and because it would be easier to integrate the service responsibilities of the medical faculty into this type of university than at the usual one. It is to be hoped that such a campus might be set up somewhere on a trial basis where its merits and faults could be assessed and further experimentation conducted. Medical schools over most of the present century have confined their experimentations to the laboratory. They are now extending the process to the curriculum. The next logical step would be to explore other environments for medical education and its associated health sciences.

REFERENCES

1. *Minutes of Annual Meeting.* Prepared by Council on Medical Education, American Medical Association, Chicago, Illinois, 1912.
2. Editorial. Medical education in United States: statistics for college year 1907-8. *J.A.M.A.* **51**:607-610, 1908.
3. Flexner, A. *Medical Education in the United States and Canada.* New York: Carnegie Foundation, 1910. Pp. 185-319.
4. American Medical Association standards of medical education: ideal standard. *J.A.M.A.* **51**:584-604, 1908.
5. Medical education in United States: undergraduate medical education. *J.A.M.A.* **202**:729-735, 1967.
6. Flexner.[3] P. 140.
7. Medical education in United States: developing medical schools in Canada. *J.A.M.A.* **202**:744-752, 1967.
8. Commission on Medical Education. *Final Report of the Commission on Medical Education.* New York: The Commission, 1932. P. 285.
9. United States Bureau of Census. *Historical Statistics of the United States, Colonial Times to 1957.* Washington, D.C.: Government Printing Office, 1960. Pp. 128-180.
10. Powers, L. (Associate director, Association of American Medical Colleges.) Personal communication.
11. *Report of Committee on Medical Education.* Prepared by New York University School of Medicine, New York City, 1968. (Mimeographed – can be obtained from University.) Pp. 1-29.

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