THE REFORM OF MEDICAL EDUCATION IN

THE UNITED STATES, 1900-1932

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In 1900 the United States had more medical schools than the rest of the world combined. Many of them were commercial institutions devoted to making profits rather than to educating men to perform competently within the medical profession. The profit incentive precipitated low educational standards and made American medical practice decidedly inferior to medical practice almost anywhere else in the civilized world. By 1900 medical education had become pernicious, threatening the health of the nation and the future of the American medical profession.

After fruitless efforts to reform medical education early in the nineteenth century, responsible medical educators and practitioners organized the American Medical Association in 1847 for the expressed purpose of improving medical schools. Yet the AMA reformed medical education but little before 1905. Commercialism continued unabated. Although a few improvements were made between 1905 and 1908, reform stagnated and the AMA asked the Carnegie Foundation for the Advancement of Teaching for assistance. Consenting, the Carnegie Foundation published Medical Education in the United States and Canada by Abraham Flexner in 1910.

Flexner condemned commercialism for making a mockery of medical education. He blamed state governments, the medical profession, university administrators, and the public for the despicable condition of most medical schools. Yet his report was more than a sordid description of sorry medical schools. He developed a theoretical plan reformers could use in revamping medical education.

With the impetus of The Flexner Report, commercial schools were destroyed between 1910 and 1920, while those remaining were improved through enforced educational standards, better teaching methods, laboratory construction, and the acquisition of public and private money. By the First World War medical educators thought they were approaching scientific medical education, but the war demonstrated that many young doctors were incapable of practicing medicine. Many of them could not even administer an adequate physical examination. Although the causes for their inabilities were legion, excessive external regulation of the curriculum was the primary one. Schools had to adhere to obsolete course requirements while at the same time trying to keep abreast of new scientific discoveries. Medical educators intensified curriculum difficulties by emphasizing minute detail and rare diseases at the expense of general scientific principles and common illnesses.

It was not until 1925 that schools were freed from excessive regulation so that they could develop flexible

educational programs. By 1932, although the depression had its deleterious effects on medical schools, the reform movement achieved a goal reformers had set for medical education years before; that is, medical education, entering its final stage of reform, was becoming a scientifically based university discipline. While the reform movement had its positive and negative effects on medical schools in particular and American education in general, it was an extremely successful effort by sincere men to make their profession worthy of its responsibilities.

This study is based almost exclusively on primary sources. Medical educators and practitioners wrote almost all of them. N. P. Colwell, a medical educator, wrote all of the government documents dealing with medical education from 1913 to 1929. It appears that the few non-medical men who wrote on the subject did so by invitation; like the other writers, they were active participants in the reform movement. With the exception of Medical Education in the United States Before the Civil War by William Norwood, a medical educator, no definitive history of medical education has been published. Therefore, views on the reform movement by men not involved in it are unavailable.

THE REFORM OF MEDICAL EDUCATION IN THE UNITED STATES, 1900-1932

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CHAPTER I

THE PROBLEM OF MEDICAL EDUCATION IN THE UNITED STATES

In 1705 Robert Beverley of Virginia observed that the Planters were a blessed people:

> They have the Happiness to have very few Doctors, and those such as make use only of simple Remedies, of which their Woods afford great Plenty. And indeed, their Distempers are not many, and their Cures are so generally known that there is not Mystery enough, to make a Trade of Physick there, as the Learned do in other countries, to the great oppression of Mankind.[1]

Unfortunately, this could not be said of any Americans in 1910. On the contrary, their health was threatened by an over-abundance of inadequately trained medical practitioners who were incapable of combating ordinary disease and sickness.[2] Henry S. Pritchett, President of the Carnegie Foundation for the Advancement of Teaching, after considering existing sanitary and health conditions, said in 1910 that the United States needed only one doctor for every

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[1]Robert Beverley quoted in Daniel J. Boorstin, The Americans: The Colonial Experience (New York, 1958), p. 210.

[2]Abraham Flexner, Medical Education in the United States and Canada, A Report of the Carnegie Foundation for the Advancement of Teaching (New York, 1910). Hereinafter cited as The Flexner Report. The information here cited is from the Introduction to The Flexner Report by Henry S. Pritchett, p. xx.

fifteen hundred people. In 1904 there were 134,402 physicians in the United States which would provide one physician for every 568 people, almost three times the number needed to give the nation adequate medical care. Based upon one doctor per one thousand of population, the United States had twice as many doctors as England, four times as many as France, and five times as many as Germany.[3]

Although the over-supply of physicians caused members of the profession serious economic losses,[4] overcrowding was symptomatic of a far deeper and much more serious ailment. Abraham Flexner pinpointed the problem in his 1910 report, Medical Education in the United States and Canada. Flexner believed that the United States was fortunate to have some of the best doctors in the world, yet he knew of no other place on earth where there was "so great a distance and so fatal a difference between the best, the average, and the worst."[5] Flexner's point was that many American physicians were grossly ignorant of the human machine, of its diseases, and of modern scientific cures for them. Like

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[3]Commission on Medical Education, Final Report of the Commission on Medical Education (New York, 1932), Appendix, Table 60. Hereinafter cited as Final Report; Henry S. Pritchett, "The Obligations of the University to Medical Education," Journal of the American Medical Association, LIV (April 2, 1910), 1110.

[4]Frank Billings, "Medical Education in the United States," Journal of the American Medical Association, XL (May 9, 1903), 1272.

[5]Flexner, The Flexner Report, p. 20.

Flexner, many members of the medical profession thought American medical practice fell far below its potential. John H. Blackburn, for example, regarded as shameful the fact that in 1910 many medical schools still produced doctors who were "not qualified to take into their care the lives of human beings . . . ."[6]

For a number of reasons, Flexner, Blackburn, and many others blamed the poor quality of medical practice on the poor quality of medical education. In 1908 Arthur Dean Bevan, Chairman of the Committee on Medical Education of the American Medical Association, after investigating the nation's medical schools on a very liberal basis, determined that of the 161 schools only 82 were acceptable while 47 were of dubious value and 32 were entirely unsatisfactory. These 79 inferior schools, most of them commercial institutions, were causing the problems.[7]

The commercial schools were not teaching the sciences basic to an understanding of a healthy human body, much less a sick one. What they did teach was taught with antiquated methods inappropriate to the subject matter. Some of the schools had no teaching equipment at all, or if they had

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[6]John H. Blackburn, "The Course of Postgraduate Study of the American Medical Association," International Clinics, Twentieth Series, Vol. I (1910), 188.

[7]Arthur Dean Bevan, "Medical Education in the United States: Need for Uniform Standards," Journal of the American Medical Association, LI (August 15, 1908), 567.

any, it was little and of such poor quality that it was fruitless to embark on training with it. In some cases buildings were dilapidated fire-traps, while in many others scientific laboratories were non-existent. Many of the laboratories in use were so inadequate and filthy they hindered learning and endangered the health of teachers and students. Most of the commercial schools, depending solely upon student fees for financing, had not yet accepted the fact that modern medical education was impossible to provide at a price students could pay.[8]

The inferior medical schools were not even supplying their students with skills basic to an intellectual pursuit. In 1904 James Winfield, a medical educator, stated that many physicians did not know how to use a medical library. What was worse, many doctors possessed little if any appreciation for the library or for its essential function in the practice of modern medicine.[9] Winfield had also noticed that medical students were burdened to "well-nigh fruitless effort" in their attempts to "glean anything from the enormous mass of medical literature . . ."[10] which

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[8]Lewellys F. Barker, "Medicine and the Universities," American Medicine, IV (July 26, 1902), 143; Billings, "Medical Education in the United States," 1272; Flexner, The Flexner Report, pp. 6-7.

[9]James Winfield, "The Medical Library as a Factor in Medical Education," Medical Library and Historical Journal, II (June 6, 1904), 183-185.

[10]Ibid., p. 183.

was available. Thus by producing doctors who were unable to practice their profession competently and who were unable to teach themselves, commercial medical schools endangered the health of the nation and seriously threatened the future of the American medical profession. In almost half the nation's medical schools, medical education had become pernicious.

By 1910 the destructive character of medical education had been evolving for over a century. Voices pleading for reform had been whispering all the while, and the first decade of the twentieth century proved to be climactic, for the long festering sore finally came to a head. Sporadic spurts of reform preceded the publication of Flexner's 1910 report, Medical Education in the United States and Canada, but a virtual revolution followed it. By the turn of the century conscientious medical practitioners, deeply concerned for the future of their profession and with the health of the nation, were fed up and angry.[11]

In 1903 an angry Frank Billings said, "In the earlier days of our country . . . medical education was prostituted."[12] Seven years later, W. C. Borden, being less emotional and more analytical, observed that medical education had "had a somewhat peculiar history, a history

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[11]Billings, "Medical Education in the United States," 1271-1272.

[12]Ibid., p. 1271.

showing an intermingling of high ideals and great aspirations with the lower motives of opportunism and commercialism."[13] Borden's statement clearly describes the development of American medical education to that time.

That medical education was prostituted cannot be easily denied. Yet its beginnings, although short-sighted, were ambitious and hopeful. Nowhere in the world was eighteenth century medical practice or medical education based on pure science. Much of it was flagrant superstition. Even so, formal medical education in the United States began as a university discipline. For Flexner, the importance of this fact could not be overemphasized. He argued persuasively that getting away from the university proved detrimental to medical education, to the medical profession, and, ultimately, to the people. For good reasons, Flexner believed that medical education, had it remained an integral part of the universities where it originated, would have improved along with them.[14]

However, before medical education moved into the university, physicians received their training from preceptors. The preceptorial system, William F. Norwood writes in

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[13]William C. Borden, "The Trend of Medical Education in the United States," New York Medical Journal, XCII (July 2, 1910), 1.

[14]Erwin H. Ackerknecht, A Short History of Medicine (New York, 1955), pp. 204-207; Borden, "The Trend of Medical Education in the United States," 1; Flexner, The Flexner Report, pp. 4, 6, 20.

Medical Education in the United States Before the Civil War, "was not only well adapted to the unpolished state of society but was to some extent a product of the wilderness culture."[15] Necessary, useful, and practical, the preceptorial system was typically American. For many years it supplied most of the nation's doctors. It has been estimated that in 1775, a decade after the first medical school opened, only four hundred of the nation's thirty-five hundred physicians were university trained; the vast majority of those holding degrees earned them in Europe. Since most Americans aspiring to a medical profession could not afford an European education, they had to settle for a preceptor.[16]

Each preceptor decided for himself what preliminary education suited a man for a physician's training. Generally, however, the students had to possess some knowledge of classical languages, particularly Latin. They had to be competent in mathematics and English grammar, and a familiarity with natural history was beneficial.[17] As will be seen shortly, these requirements were vastly superior to

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[15]William F. Norwood, Medical Education in the United States Before the Civil War (Philadelphia, 1944), p. 37. Hereinafter cited as Civil War.

[16]Ackerknecht, A Short History of Medicine, pp. 204-205. The preceptorial system was a reversion to ancient Greek and Indian methods of medical education.

[17]Norwood, Civil War, pp. 32-33.

those of many medical schools in the first decade of the twentieth century.

Flexner thought the preceptorial system was well suited to the training of physicians. The very nature of the training, involving the students in the life and death struggle immediately, let students experience the joys and sorrows of medical practice. Immediate, practical, intense--preceptorial training was the best kind of education; and returning the student to the patient became one of the primary goals of the reform movement.[18]

Like Flexner, Norwood thought the preceptorial system was a practical teaching method suited to the times. But he was more willing to admit that the system had serious flaws:

> The chief virtue of the preceptorial system was that the students so trained were not inclined to be mere theorists. The practical clinical experience and observation which most students had from the first, though too often they were ill-prepared to appreciate what they saw, built into the American medical profession that spirit of self confidence and practicality which has characterized it down to the present time.[19]

The preceptorial system, by failing to prepare students for their learning experiences, failed to achieve, much less maintain, a pinnacle of quality better medical practitioners expected. Moreover, since there were no generally accepted or enforced rules or regulations on the training of doctors,

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[18]Flexner, The Flexner Report, p. 20.

[19]Norwood, Civil War, pp. 36-37. Italics mine.

instruction varied greatly from preceptor to preceptor. Some of the preceptors were demanding, efficient, and responsible while others misused their students, putting them to work at menial, non-medical chores like greasing buggy wheels and currying horses. Time could have been better spent reading.[20]

The preceptorial system undoubtedly trained better doctors at its inception than it did in later years. Most of the original preceptors had had some schooling before emigrating from their homelands. They tried to pass their schooling on to their students; but the new doctors, entering actively into the profession, took on students themselves; and training slowly but surely deteriorated. The systematic and comprehensive demands associated with educational institutions were missing. As deterioration became more and more prevalent, members of the profession who objected joined forces and asked their fellow physicians to refuse students unless they could be provided with an ample supply of books, diagrams, clinical experience, and other paraphernalia deemed essential in providing sound medical knowledge. Many doctors ignored the request.[21]

Attempts to supplement and improve upon preceptorial training were initiated as early as 1750, when classes in anatomy were offered. In 1762 William Shippen, who had

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[20] Ibid., pp. 32, 38-39.

[21] Ibid., pp. 32-39.

been educated at Edinburg, lectured on midwifery, hoping to share some of his European training with physicians less fortunate than himself. Flexner maintained that the first medical school in the colonies grew out of these lectures. According to Flexner, Shippen and John Morgan, also educated at Edinburg, opened the Philadelphia Medical School in 1765 under the auspices of the University of Philadelphia.[22]

Norwood, in his more detailed history of early American medical education, presents a much different story. Morgan and Shippen were both reared in Philadelphia. Shippen, a little older, was completing his medical course just as Morgan was beginning his. The two probably got together at Edinburg and talked about organizing a school back home. For reasons unknown, however, friendship waned and plans were interrupted. But Morgan went on with the plans alone. Winning the confidence of the trustees of the University of Philadelphia, Morgan was permitted to organize a medical department there in 1765. After the school had been started, Shippen claimed the idea for the school was originally his. Be that as it may, Norwood gives Morgan credit for organizing the first medical school in the colonies.[23]

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[22]Flexner, The Flexner Report, p. 3.

[23]Norwood, Civil War, pp. 4-6; There is much conflicting opinion on this point. F. R. Packard supports Shippen in F. R. Packard, "Early Methods of Medical Education in North America," Journal of the American Medical Association, XXXII (January 12, 1899), 636, yet Ackerknecht, A Short History of Medicine, pp. 204-207, supports Morgan.

In May, 1765, Morgan, energetic, intelligent, and inspired, spoke at the commencement exercises of the University of Philadelphia. His subject was reforming the medical profession in the colonies through improved medical education. Morgan stated frankly that a doctor without a formal education was dangerous because he possessed too limited a knowledge of medicine to be responsible for human life. Emphasizing the importance of appropriate pre-medical education, Morgan outlined a course of medical study that included a systematic classification of medical branches to be studied. While describing the condition of medical practice in the colonies, he gave convincing arguments for the need of a medical school. He outlined the advantages the university could expect from such a department and concluded by asking that prospective medical students be counseled before they entered their training to determine their qualifications, interests, and motives. On May 3, 1765, the trustees elected Morgan the first Professor of the Theory and Practice of Medicine in British North America.[24]

At Philadelphia Morgan established many precedents to which twentieth century reformers looked for support. Of particular importance were those concerning entrance and degree requirements. A student had to apprentice himself to a reputable physician. If the student held no degree, he had to satisfactorily demonstrate to the trustees and the

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[24]Norwood, Civil War, pp. 2-7.

professors that his abilities in Latin, mathematics, and natural and experimental philosophy indicated the possibility of his completing the medical course successfully. Requirements for the Bachelor of Medicine degree were strenuous. Besides preceptorial training, they included at least one course of lectures in anatomy, chemistry, materia medica, and the theory and practice of medicine. This was followed by a course of clinical lectures and one year of practice at the Pennsylvania Hospital, the best hospital in the colonies. In all, a three-year course, exclusive of preceptorial training, was organized. After completing the course, the student was required to pass examinations. Even then, however, he received his degree only if the trustees and the professors were satisfied with his work. The Doctor of Medicine degree required three years of study beyond the Bachelor's degree. The candidate had to be at least twenty-four years old and had to publicly defend his thesis, written in Latin. The thesis had to be published.[25]

Unfortunately, these requirements were short-lived. Unprofessional quarrels between faculty members, involvement in the politics of the American Revolution, and the inability of the university to attract doctors to take the higher degree precipitated a lowering of standards. The school did away with the Bachelor of Medicine degree and, except for

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[25]Ibid., pp. 65-66.

natural and experimental philosophy, all of its preliminary education requirements. The required course, shortened from three to two years, could be satisfied simply by repeating each subject area lecture in the second year. The school retained apprenticeship but dropped the hospital year completely. A thesis in English or Latin was acceptable. The student, after completing this watered-down course, received the degree, Doctor of Medicine.[26]

Harvard, Yale, and King's College followed the example of the University of Philadelphia in organizing medical departments.[27] But "American medical education was yet in its cradle," for many of the degrees conferred were honorary.[28] Norwood summed up eighteenth century medical education:

> The eighteenth century, with reference to medical education in the colonies and the young republic, was a period of orientation. A race of pioneers, devoted to the building of a nation, practiced the arts of statesmanship and theology but left the art of healing to Providence and practitioners, many of whom were ill-trained. Legislators gave transitory attention to regulation and protection of the profession. Organized education took no cognizance of medicine as a branch of learning. Practitioners trained apprentices. Each preceptor produced, after his kind, fledglings in the art of physic. Few were equipped to act as master. Through the agency of European-trained physicians and the writings of their masters, the profession in America emerged from fallow years. Lecture courses in midwifery and anatomy were given, dissections were made, hospitals

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[26]Ibid., pp. 67-68.

[27]Flexner, The Flexner Report, pp. 4-5.

[28]Norwood, Civil War, p. 60.

> were started. The profession served admirably through seven years of bloodshed and gathered from the experience scientific improvement and professional consciousness. Medicine was moving forward, but organized instruction was yet in its formative years. Schools were few and poorly equipped. Attendance, on the whole, was small. The practitioners office was still the school of medicine.[29]

Looking to the origins of medical education in the eighteenth century to find support for arguments against the medical schools of his own day, Flexner regretted that the "sound start of these early schools was not long maintained. Their scholarly ideals," he wrote, "were soon compromised and then forgotten."[30] But Flexner, less inclined than Norwood to accept the lowering of standards at Philadelphia as the inauguration of decline in American medical education, blamed degeneration on the University of Maryland and her establishment of a commercial medical school in 1812. Both Flexner and Norwood considered chartering the Maryland school a tragedy because it tried to make a medical school the nucleus for the entire university, grafting schools of law and theology onto it. The university was proprietary in nature and there was no central governing body. Since the professors ruled the university, they could maintain their positions indefinitely. But regardless of how commercial medical schools got their start or how well some few of them served the medical profession, in the view of twentieth

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[29] Ibid., p. 62.

[30] Flexner, The Flexner Report, p. 5.

century reformers commercial medical education was a cancerous growth. Commercial medical schools gave birth to all that was pernicious and corrupt in medical education and in the medical profession.[31]

Although commercial schools rose and fell constantly, after 1812 the number multiplied disgracefully. Norwood made the following observation:

> Schools sprang up like mushrooms in coastal cities, in interior valleys of the Piedmont, and in the expansive trans-Appalachian area from Michigan and Wisconsin to Alabama and Louisiana. Under the impetus of far-western expansion the movement reached the pacific coast in 1858 with the establishment in San Francisco of the University of the Pacific.[32]

In 1810 there were five medical schools. A decade later the number had doubled. Another decade saw the number double again as an average of one new school was organized each year. In 1850 there were fifty-two schools, and by the outbreak of the Civil War the number had reached sixty-five. Although twenty schools failed to survive the war, there were one hundred medical schools in 1880. Ten years later there were thirty-three more. The largest number, 161, was attained in 1906. Thereafter the number declined slowly until the publication of the Flexner Report in 1910 precipitated many closures throughout the United States. Apparently

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[31]Ibid.; Norwood, Civil War, pp. 240-241; Billings, "Medical Education in the United States," 1271-1276; Flexner, The Flexner Report, Pritchett's Introduction, p. x.

[32]Norwood, Civil War, p. 429.

several school administrators saw the coming fury. At any rate, there were 131 schools doing business at the close of 1910.[33]

Although many of these schools were nominally affiliated with established and oftentimes highly respected universities, most of them were commercial institutions. The universities supplied little more than their names, providing neither administrative nor financial support. Henry S. Pritchett and Lewellys F. Barker, to name only two, reprimanded the universities for their disastrous dereliction of duty.[34]

An irate Abraham Flexner described the expansion of medical schools thusly:

> These enterprizes--for the most part they can be called schools or institutions only by courtesy--were frequently set up regardless of opportunity or need: in small towns as readily as large, and at times almost in the heart of the wilderness.[35]

Whenever a handful of practitioners without school affiliations got together, the likelihood of a new school emerging was great. A school needed only a faculty to open. The

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[33]Ibid., pp. 139-140; The Statistical History of the United States from Colonial Times to the Present (Stamford, Connecticutt, 1965), p. 34; Commission on Medical Education, Final Report, Appendix, Table 104.

[34]Flexner, The Flexner Report, p. 8; Bevan, "Medical Education in the United States: Need for Uniform Standards," 566; Pritchett, "The Obligations of the University to Medical Education," 1110; Barker, "Medicine and the Universities," 147.

[35]Flexner, The Flexner Report, p. 6.

faculty did not have to be a good one, just one composed of men who were willing to teach in filthy, badly lighted buildings without books, laboratories, or clinics.[36]

Commercial medical education expanded rapidly for a number of reasons, chief among them being the failure of state legislatures to accept their responsibility of controlling it. In some cases they were unable to do so. For example, in New York before the Civil War, the Regents of the University of the State of New York were delegated supervisory powers over chartered institutions. The Regents, however, found it impossible to control the spread of commercial medical schools in their state, primarily because state medical societies, by lying about the quality of education the schools offered, encouraged and perpetuated their contagion.[37] "It is clear . . ." Norwood wrote, "that no uniform system of establishing or governing medical schools existed at the time."[38] This was true all over the country.

Rather than enact legislation aimed at controlling the organization of medical schools, state governments tried to regulate the practice of medicine. This, of course, only indirectly affected medical education. Laws with the intention of eliminating quackery were passed in the second half

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[36]Ibid., pp. 6-7.

[37]Norwood, Civil War, p. 385.

[38]Ibid.

of the eighteenth century. Ultimately, state medical societies were entrusted with licensing powers, and they became responsible for medical education when they accepted the Doctor of Medicine degree as sufficient proof of medical knowledge. Any man possessing a degree from a "recognized" school could practice medicine in any state without further proof of knowledge or ability. Even without a degree, candidates were licensed if they passed an examination that satisfied the medical societies. But these restrictions were nullified considerably when all but four states repealed their medical practice acts after 1842.[39]

By 1888 the American Medical Association was demanding effective state legislation to protect the public and the medical profession from quackery in all its forms whether psuedo-scientific or religious. It was, responsible physicians argued, the right and the duty of the state to protect the people from ignorance and fraud. Not long thereafter, advocates for medical legislation were denying the validity of a medical degree as bona-fide proof of the ability to practice competently. They began to demand that medical education be based upon medical science, and worked to bring about required examination before licensing. By 1895 most states had organized state boards of medical examiners, and in 1903 Billings was calling for a National Board of Medical

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[39] Ibid., pp. 29-30, 406.

Examiners. Thus, by the turn of the century, individual states were recognizing their responsibilities. Still, however, their actions only indirectly and, as it turned out, ineffectively controlled medical education. Medical educators merely turned to priming their students for the examinations. Poor schools continued only slightly hampered.[40]

There were other causes for the organization of so many medical schools. The rapid growth of the country made demands on the medical profession which university-preceptor based medical education could not meet. The university-preceptor system, which had hardly had time to stabilize, collapsed under the weight of massive and constant demands for doctors. Neither universities nor good doctors to act as preceptors could be made fast enough to supply the demand. In fact, in some localities the demand was so great that the organization of medical schools preceded the organization of high schools.[41]

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[40]"How Far Can Legislation Aid in Maintaining a Proper Standard of Medical Education," Journal of the American Medical Association, XI (November 3, 1888), 631-632; George H. Simmons, "What the American Medical Association Stands For," Journal of the American Medical Association, XLIX (November 23, 1907), 1735; Abraham Flexner, Funds and Foundations: Their Policies Past and Present (New York, 1952), p. 6; Billings, "Medical Education in the United States," 1276; Julius B. Richmond, Currents in American Medicine: A Developmental View of Medical Care and Education (Cambridge, Massachusetts, 1969), pp. 5-6.

[41]Bevan, "Medical Education in the United States: Need for Uniform Standards," 566.

Baser motives simply added fuel to the fire. Norwood observed that an unparalleled belief in the individual's inalienable rights brought about a despicable display of unprofessional behavior. Physicians exemplified Jacksonian Democracy at its worst. Intense individualism, Norwood wrote,

> led to bitter controversies between schools, between professors, and between faculties and trustees. Characters were dissected and reputations ravished. While pioneers fought Indians and subdued the wilderness, medical professors dissipated intellectual energy and professional dignity in vituperative attacks on each other.[42]

Out of the violence came new schools.

Perhaps more condemning than professional quarrels was the profit incentive which drove physicians to organize schools. "The schools were essentially private ventures," Flexner said, "money-making in spirit and object."[43] Once, even at the Harvard medical school, if a student settled his bill, he was almost guaranteed a license to practice. Teaching positions came to be of great value and doctors paid handsomely for them. As late as 1902, physicians paid as much as two thousand dollars for a professorship.[44] In 1910 Pritchett said teaching positions were "a direct means of

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[42]Norwood, Civil War, p. 432.

[43]Flexner, The Flexner Report, p. 7.

[44]Ibid.; Barker,"Medicine and the Universities," 143.

revenue and . . . a source for a wide circle of patients."[45] Undoubtedly, some physicians sought teaching positions, not because they loved medicine or because they loved to teach, but because they loved fame and pelf.

Rapid, uncontrolled expansion of medical schools, regardless of causes, broke the connection between what reformers called the "living" university and medical education. Flexner blamed the "collapse of certain standards and ideals, modest enough at the time, but destined to a development which medical education could, as experience proved, ill afford to forgo . . ."[46] on commercialism. Nothing that existed--not even the American Medical Association after 1847--was strong enough to stand in the way; the damage went on unabated; and, for the reformers, commercialism was the devil unleashed.

Although the evils of commercial medical education were legion, open and vicious competition among schools was the most ruinous. To attract large student bodies, schools resorted to advertising. Both Norwood and Flexner accused the schools of lying to attract students.[47] Flexner said, "The deans of these schools occasionally know more about

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[45]Pritchett, "The Obligations of the University to Medical Education," 1114.

[46]Flexner, The Flexner Report, p. 6.

[47]Ibid., pp. 19-20; Norwood, Civil War, p. 385.

modern advertising than about modern medical teaching."[48] Many of the students, lured by flamboyant, grandiose promises, were heavy-minded, unsophisticated boys improperly motivated for a physician's calling.[49]

Competition for larger student bodies undermined the educational value of commercial schools in several ways. First, entrance requirements were either lowered considerably until they were valueless or they were simply ignored all together. By the turn of the century, commercial schools had developed systems whereby boys with eighth grade educations could, if they had the tuition, earn a medical degree.[50]

Secondly, competition brought about reductions in fees which, like mutilated entrance requirements, went far toward destroying the quality of medical education. Most of the commercial schools did not have endowments to draw upon for financial support, and fees were their only means of income. Thus, fee reductions precipitated shorter periods of instruction, crowded classrooms, deteriorating buildings and equipment, as well as creating an astounding indifference to

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[48]Flexner, The Flexner Report, p. 19.

[49]Ibid.

[50]Barker, "Medicine and the Universities," 143; Billings, "Medical Education in the United States," 1275; N. S. Davis, "Requirements for Admission to Medical Schools," Journal of the American Medical Association, XLI (August 15, 1903), 409.

the inauguration of modern teaching methods and to the development of modern research laboratories.[51]

Finally, all of these things--low tuition, promises of ease, prestige and wealth, excessively lenient entrance requirements--resulted in far too many students. In 1904 there were 28,142 medical students in the United States. Although the number dropped to 21,526 in 1910, it had climbed consistently since 1880 when there had been 11,286 students. In 1890 there were 15,404, but at the turn of the century the number soared by almost ten thousand to 25,171.[52]

Large numbers of students naturally resulted in large numbers of physicians being licensed. In 1903 Billings said that the United States could support about three thousand graduates a year. That year the schools graduated about five thousand. In 1904, 5,675 were licensed and in 1905, 5,683 graduates passed their examinations. The largest number, 6,368, was licensed in 1906. The number declined to 5,726 the following year, but was over six thousand again in 1908. Decline returned in 1909 and 1910 when 5,860 and 5,712 were graduated, respectively. In all of these years the average

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[51]Norwood, Civil War, pp. 390, 404-406; W. W. Keen, "Endowment of Medical Colleges," Boston Medical and Surgical Journal, CXLII (June 7, 1900), 583-586; Barker, "Medicine and the Universities," 143-144; Bevan, "Medical Education in the United States: Need for Uniform Standards," 566.

[52]Commission on Medical Education, Final Report, Appendix, Table 104.

number of candidates failing their examinations was about fifteen hundred.[53]

The financial structure of commercial medical schools simply would not permit them to properly educate their large student bodies. By 1900 it was obvious that tuition could not pay for an adequate medical education. Endowment was essential, but since the commercial schools "were practically joint stock companies organized for the benefit of the faculties . . . one might as well expect the public to endow cotton-mills as to endow such a school."[54]

There was plenty of money in the United States for endowment purposes. Between 1894 and 1900, for example, philanthropists gave away almost 221 million dollars. Very little of it went to medical schools. Most of it went to universities, hospitals, theological seminaries, museums, and libraries. The disastrous results of commercialism and the contempt in which men with money held medical education may thus be seen. In 1899 the average endowment available for theology students was $2,280; the average endowment for medical students was $83. Obviously, the public was doing little for medical education; but the public undoubtedly saw that commercial medical education produced little of tangible value.[55] Probably the philanthropists thought, on seeing

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[53]Ibid.; Billings, "Medical Education in the United States," 1272.

[54]Keen, "Endowment of Medical Colleges," 583.

[55]Ibid., p. 586.

that huge mass of students and witnessing the void that existed in medical practice, to put money into medical education would have been more of a disservice than anything else.

For Flexner, Pritchett, and men within the medical profession, there were entirely too many students and too many graduates. A reasonable number of graduates needed to supply the nation with adequate medical care could be calculated. For example, in 1908 the southern United States needed about fifteen hundred new physicians to replace those who died and to provide for a growing population. That year the South licensed thirty-five hundred new doctors, more than twice the number needed.[56]

Thus by 1910 the medical profession was burdened with too much of everything except quality. There were too many schools offering bad training. There were too many bad students going to the schools to obtain inferior educations. Flexner bluntly told the medical profession that "the country needs fewer and better doctors, and the only way to get them better is to produce fewer."[57]

Not unlike the ridiculous spread of religious sects in the wake of Jacksonian Democracy, medical schools sprouted like well-watered seeds sown in a high wind. Medical

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[56]Pritchett, "The Obligations of the University to Medical Education," 1110.

[57]Flexner, The Flexner Report, p. 17.

education became a free-for-all of commercialism, and commercialism sacrificed quality and value on the unsavory altar of pride and avarice. A scientific approach to medical education and to medical practice implied truth and hope, but rarely was either found in commercial medical schools. The future of the American medical profession and the health and stamina--the happiness--of the American people lay in jeopardy, prostrate in a maze of confusion and ignorance. Indeed, as Pritchett said, the American people had no way of knowing whether their doctors were not in fact licensed murderers.[58] Their ignorance of medical science made them so.

Yet the time had arrived when unselfish, wise, and discriminating men of courage were waging a pitched battle to purify their profession. Commercial medical education was under fire and its day was about at an end. A revolution was being born, albeit a quiet one, for there was hardly any opposition to drastic reform. A few weak voices registered cries that the poor boy's right to a medical education was being taken away, but it was actually no cheaper to educate a bad doctor. The choice was between a good doctor or a bad doctor, not a rich or a poor one. The choice was obvious.[59]

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[58]Alice Felt Tyler, Freedom's Ferment: Phases of American Social History from the Colonial Period to the Outbreak of the Civil War (New York, 1962), pp. 46-244; Flexner, The Flexner Report, Pritchett's Introduction, p. x.

[59]Pritchett, "The Obligations of the University to Medical Education," 1110-1114.

CHAPTER II

THE EVOLUTION OF MEDICAL REFORM

Although visible reform in medical education did not take place until the passing of the first two decades of the twentieth century, those years would have been fruitless had it not been for ground work done in the preceding century and a half. As Egbert Lefevre wrote in 1913, "The problems of medical education are bound up with the progress in medicine and therefore can not be solved once and for all, but must be constantly under consideration and adjustment."[1] From 1800 to 1910, the inherent evil of American medical education, particularly of commercial medical education, was its refusal to accept the responsibility of teaching medical science and of engaging in original medical research. As the nineteenth century faded into the twentieth, concerned medical practitioners and educators became increasingly aware of this phenomenon.[2] Ultimately, it was medical science--or the lack of its being taught--that brought matters to a head because the best medical men knew there was much more they

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[1]Egbert Lefevre, "Some Problems of Medical Education," Science, New Series, XXXVIII (June 6, 1913), 851.

[2]Barker, "Medicine and the Universities," 143-147; Billings, "Medical Education in the United States," 1271-1276; Ackerknecht, A Short History of Medicine, pp. 210-211.

could do for the health of the nation. These men reorganized the American Medical Association in 1901, sought external assistance in 1908, and in 1910 won their battle against what Allan Nevins called a monster, "the dragon Medical Quackery."[3]

Any discussion of the reorganization of American medical education is inseparable from a presentation of the AMA's work in reforming medical schools. The AMA's work was a long and arduous labor of love. Indeed, the AMA originated primarily because American medical education failed to provide the best training possible.[4] It is reasonable to assume that had there been no organization to do the work the AMA did, American medical practice would still be floundering in a sea of ignorance and incompetence.

Numerous attempts to improve medical education in the United States preceded the organization of the AMA. That these attempts failed at the state and regional levels contributed greatly to the subsequent organization of the national association.

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[3]Abraham Flexner, Abraham Flexner: An Autobiography (New York, 1960). The information here cited is from the introduction to Abraham Flexner: An Autobiography by Allan Nevins, p. xiii.

[4]Victor Johnson, "The Council on Medical Education and Hospitals," in A History of the American Medical Association, edited by Morris Fishbein (Philadelphia, 1947), p. 887; Simmons, "What the American Medical Association Stands For," 1734.

In 1827 the medical societies of the New England states and New York convened in Northampton, Massachusetts. The delegates passed resolutions ranging from the organization of a national medical society to shorter vacations and longer terms for students. The resolutions were to become effective July 4, 1829; but when that day arrived, medical school administrators watched each other to see who would act first. No one did, so the ambitious Northampton meeting came to nothing.[5]

Doctors continued to decry the pitiful conditions that existed in medical schools. The shortness of terms, the neglect of established standards of preliminary education, the licensing of men who had never been inside a hospital, and basing teachers' salaries on the number of students they had came in for most of the criticism.[6]

Seeking to extend the school term and to improve teaching methods, the faculty of the Medical College of Georgia called for a meeting in 1835. This suggestion failed even to produce a convention. A similar suggestion by the medical faculty of Bowdoin met the same fate.[7]

In 1838 the physicians of Ohio made several ambitious proposals in convention in Columbus. They proposed to extend

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[5]Flexner, The Flexner Report, p. 10; Norwood, Civil War, pp. 422-423.

[6]Ibid., p. 422.

[7]Flexner, The Flexner Report, p. 10; Norwood, Civil War, p. 423.

the school term by one month and to require all students to attend all lectures. They denounced the fact that so little time was spent teaching the pre-medical sciences--biology, chemistry, physics--and suggested that a two-year curriculum be developed so that pre-clinical subjects would be taught the first year and clinical subjects the second year. They encouraged school administrators to enforce existing pre-medical education requirements and to abide by the twenty-one year age limit in conferring medical degrees. The Ohio doctors pointed out that no school would reform until all agreed to cooperate; but again, resolving produced nothing.[8]

A second fruitless convention was held at Northampton in 1838. Between 1838 and 1840, the Medical Society of New York attempted to separate teaching from licensure, but this also failed. By the middle of the 1840's, reform minded men, especially in New York, became convinced that statewide and regional reform was hopeless. Inter-school competition for students posed too great a threat. Yet the reformers assured themselves that they had to do something to protect their profession from bad schools. Too many schools were graduating incompetent physicians.[9]

Just a cursory glance at the curriculum that dominated medical education at the middle of the nineteenth century

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[8] Ibid., pp. 423-424.

[9] Ibid., pp. 424-425.

will provide a description of the situation as it existed when the AMA was organized. School authorities widely ignored entrance requirements. In some instances, students were admitted to medical schools without the ability to read and write. Uniformity in studies was unheard of throughout medical education.[10] Victor Johnson made the following observation in 1947:

> Depending upon the interests of the professors, the times devoted to a given subject varied widely from school to school: anatomy, 200 to 1248 hours; pathology, 54 to 512 hours; surgery, 64 to 1168 hours; medicine, 140 to 1232 hours; and obstetrics, 67 to 320 hours.[11]

Good schools attempting to offer quality education were the exception by far; while chaos, confusion, and corruption--the three elements of catastrophy--predominated and ruled medical education.[12] In A Short History of Medicine, Ackerknecht wrote that "As a whole the general level of medical education was probably higher at the end of the eighteenth century than it was at the middle of the nineteenth century."[13] Commercial medical schools precipitated the decline, and efforts to cure the malignancy, even those of the AMA, produced precious little results before 1910.

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[10]Johnson, "The Council on Medical Education and Hospitals," p. 889.

[11]Ibid.

[12]Ibid.

[13]Ackerknecht, A Short History of Medicine, p. 205.

Well aware of the condition of medical education, Nathaniel S. Davis of the Medical Society of New York forced through a resolution calling for a convention.[14] In the resolution, the Medical Society said, "It is believed that a national convention would be conducive to the elevation of the standard of medical education in the United States."[15]

Since school administrators outside New York thought a national convention would benefit New York schools at the expense of their own, they ignored the summons. But when the Medical Department of New York University criticized Davis's plan, school administrators in other states, recognizing that the intention was to organize a national association, supported Davis. Thus in May of 1846, delegates from the medical colleges and societies of sixteen states met, created a national organization, and set the May, 1847, National Medical Convention in Philadelphia.

By May of 1847, little or no change had been made in any school. It was obvious, however, that nationalizing the medical profession had caught on. Twenty-eight schools and more than forty medical societies from twenty-two states were represented at the Philadelphia convention. Some of the delegates went with the intention of protecting their vested interests, but most were there harboring the idea that they

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[14]Norwood, Civil War, p. 425.

[15]Johnson, "The Council on Medical Education and Hospitals," p. 887.

could reform the medical profession by reforming medical education.

The delegates of the Philadelphia convention recommended extending the school term from four to six months and enforcing attendance at all lectures. They proposed a three-year course that included one year of internship. They supported the often violated standard of granting medical degrees to persons who were at least twenty-one years of age. They encouraged all schools to teach all branches of medicine; and in an attempt to put some power behind their words, they asked preceptors to permit their students to attend only those schools that followed the program the National Medical Convention outlined.

As in the past, however, nothing much came of the resolutions. Between 1847 and 1849, little except acquiring the name, American Medical Association, was accomplished. No school would be first in implementing the proposals. Like the Medical College of the State of South Carolina, many schools eulogized the formation of the AMA; but they negated their apparent support by refusing to act until it had become common practice among schools to follow the AMA's program and until enforcement of recognized standards appeared practical.[16] As Norwood said, "The fear of destructive competition was greater than the love of elevated standards."[17]

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[16]Norwood, Civil War, pp. 257, 386, 425-427.

[17]Ibid., p. 257.

What few changes schools did make did not result in their loss of competitive position. Since the AMA possessed no executive power, it could only recommend that schools abide by the proposals it made. After seven years of convening, talking, and resolving, D. M. Reese bluntly announced, to Davis's chagrin, that the educational reform program of the AMA was an "utter failure."[18] Essentially the AMA's reform program remained a failure until 1904 when Arthur Dean Bevan became chairman of the reorganized AMA's Council on Medical Education.

In retrospect Reese's criticism of the AMA seems harsh and premature. The organization possessed no legal powers with which to force school administrators to do anything. Ultimately reform in medical education depended upon massive public dissatisfaction with the quality of medical care it received. Informing people that medical care and medical education were less than they should be required intelligent, searching publicity about conditions as they were. This in turn necessitated a public spirited effort by an organization the people respected. In 1855 no such organization existed. The AMA had only recently been formed, and growth into a truly national organization speaking for the whole American medical profession required much more time.

In 1900, although the AMA had accomplished some things of value, Reese's criticism would still have been justified.

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[18] Ibid., pp. 427-428.

The AMA had contributed greatly to the organization of state boards of medical examiners, and the Journal of the American Medical Association had become one of the most highly respected medical journals published in the United States. But the real work, the tedious labor of reforming medical education, remained to be done.[19] By the turn of the century, reforming medical education had become more necessary than ever before because medical science had made an awe-inspiring stride.

Louis Pasteur's discoveries in immunology and microbiology and Robert Koch's pioneering work in bacteriology made the practice of medicine a pure science. Thereafter good physicians were practicing scientists, and a proper medical education was a scientific course of study.[20] As Billings observed in 1903, medical science made it mandatory that physicians "have a good and working knowledge of general, physical and physiologic chemistry, of general biology, bacteriology, pathology, physiology, embryology, pharmacology, histology, and anatomy."[21] Developments in physics further revolutionized medicine by producing x-ray examinations and

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[19]Simmons, "What the American Medical Association Stands For," 1734-1740.

[20]Richmond, Currents in American Medicine, pp. 1-2; Billings, "Medical Education in the United States," 1273.

[21]Ibid.

the electrocardiograph, while chemistry developed indispensable laboratory examinations of body fluids.[22]

But in the United States, amid these scientific marvels, more and more schools grew less and less effective because they failed to alter their curriculums to keep abreast of the new science. Science might have been discussed in the classrooms, but practical laboratory instruction was not offered. In short, the most momentous achievements in the history of medicine were ignored. Commercial medical schools in particular possessed neither the talent, the facilities, the finances, nor the desire to teach scientific medicine. Looking squarely into the face of their obstinancy, twentieth century reformers established as their goal the teaching of scientific medicine in the United States.[23]

While medical science advanced in Europe, stagnation reigned supreme in most American medical schools.[24] It appeared that the AMA could do little better as it existed, and in 1901 George H. Simmons, editor of the Journal of the American Medical Association, spearheaded a complete reorganization of the association. The next year John A. Wyeth, President of the AMA, appointed a committee under

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[22]Richmond, Currents in American Medicine, p. 1.

[23]Flexner, The Flexner Report, pp. 8-20.

[24]Barker, "Medicine and the Universities," 143; Council on Medical Education, "Report of the Committee on Medical Education," Journal of the American Medical Association, XLII (June 11, 1904), 1576.

Bevan's direction to inform the AMA of its role in improving medical education.

Later in 1902 Bevan reported that since the national government was not the kind that could or would take the responsibility for improving medical education, concerned members of the profession would have to do it themselves. Bevan pointed out that accomplishing anything of value would require a strong organization with determined leadership. He believed the reorganized AMA to be such an organization.

Bevan was cautious, however. He insisted that the elevation of American medical education would have to be carefully planned and worked out. Proper planning was possible only through a permanent education committee, and in 1903 the AMA created the Council on Medical Education with Bevan as its chairman. The AMA instructed the Council to report annually on the condition of medical education, to inform the AMA as to how it might favorably assist medical education, and to act as the AMA's agent in completing proposals the House of Delegates approved.[25]

Bevan's selection as chairman was a fortunate one. He guided the AMA's educational reform program for nearly thirty years. He was a thorough, determined, forward looking leader who had a prophetic vision. In his first report to the House of Delegates in 1904, he rebuked the AMA for having failed in

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[25]Ibid.; Johnson, "The Council on Medical Education and Hospitals," 890-891.

its avowed purpose of reforming medical education. He iterated that the AMA existed primarily for the purpose of obtaining higher standards in medical education.[26] "The existing standards are not satisfactory," he said, "as compared to those of other great powers."[27] While Bevan believed the United States could be a great power, the ineptness of the American medical profession repelled him because he doubted the United States could remain a great power if she had an inferior medical profession.[28]

Lewellys F. Barker and Frank Billings were also concerned with the future of their profession. Like other reformers, they decried commercial medical education and tried to point out ways to improve medical schools. Barker contended that most American medical schools originated as commercial institutions. Originally, they were profitable because the nonexistence of preliminary education requirements lured inferior students, precipitated substandard curriculums, and otherwise kept costs at a minimum.

With the emergence of the new science, students demanded more scientific instruction and expenses soared. Since commercial schools were without endowment, standards searched

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[26]Council on Medical Education, "Report of the Committee on Medical Education," 1576.

[27]Ibid.

[28]Ibid.; Johnson, "The Council on Medical Education and Hospitals," 890.

for a new low because student fees could not pay for scientific education. Barker's point was the same as that of other reformers. Commercial schools failed to achieve a quality of education acceptable to the profession as a whole. They failed miserably in keeping pace with the expanding knowledge of medical science, and they refused to develop a truly scientific approach to medical teaching.[29]

Attempting to describe what a real medical school should be, Barker described four kinds of schools--the commercial school, the psuedo-university school, the semi-university school, and the real-university school. He condemned psuedo-university schools outright simply by saying that they were worse than commercial schools. Psuedo-university schools tried to hide their inadequacies while some commercial schools had done "excellent work in [their] day."[30]

Most psuedo-university schools were commercial institutions with many unattractive things to hide. These schools aligned themselves with universities, not to improve medical instruction, but to gain prestigious names with which they tried to cover up institutional inadequacies. Likewise, poorer universities, seeking an apparent completeness in their offerings, accepted the responsibility of these medical

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[29]Barker, "Medicine and the Universities," 143.

[30]Ibid.

departments "provided they did not cost them anything, or only a relatively small sum."[31]

Semi-university schools were the six or eight best schools in the United States--medical departments of institutions like Johns Hopkins, Harvard, and the University of Michigan. Semi-university schools were those schools in which premedical education of two years was offered by men who devoted their full time to teaching specialized scientific subjects. These schools sponsored departments of anatomy, physiology, and pathology which were "beehives of industry, centers of original investigation . . . ."[32] The last two years of the semi-university school were taught by men practicing medicine or one of its specialties. The school furnished laboratories, libraries, and other materials essential to medical instruction, things for which student fees were not expected to pay. In fact, student fees were expected to pay for little more than building maintenance.[33]

As Barker saw it, no real-university school existed anywhere in the United States in 1902. The real-university school would be composed of a faculty of investigator-teachers, medical scientists who were paid enough to live comfortably so that they might devote their life to their

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[31] Ibid.

[32] Ibid., p. 144.

[33] Ibid.

work and to their school.[34] "The professor of economics does not give a part of his time to the university and the other part to the financing of city banks,"[35] Barker argued. There was not a medical school in the United States that did not have at least a few teacher-practitioners on its faculty. Finally, the real-university school would operate and control its own hospital. American medical schools often had no hospital facilities at all, and in 1902 few owned them outright.[36]

Barker held out little hope for commercial and psuedo-university schools. He did believe that semi-university schools could be transformed into real-university schools by "putting all the departments . . . on a true university basis."[37]

Converting semi-university schools into real-university schools required at least two things--hospitals and properly appreciated teachers. Hospitals costing about two million dollars each would have to be built. Hospitals were essential to the teaching of modern medicine. Indeed a large, well equipped hospital efficiently operated was the most important laboratory medical students could have, for only there could

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[34] Ibid., pp. 144-145.

[35] Ibid., p. 145.

[36] Ibid., p. 144.

[37] Ibid., p. 146.

they learn all that the care of patients involved. The finest hospitals, however, were useless without good teachers; and to acquire good medical professors, they would have to be hired full-time, given adequate pay, and elevated to the same prestigious position occupied by other university professors.[38]

Although building hospitals and raising teachers' pay would be expensive, Barker contended that the foremost obstacle to converting semi-university schools into real-university schools was not lack of money; philanthropy sought worthwhile causes. For Barker, the real obstacle was academic snobbery. Barker said that the attitude of university administrators, a distinct prejudice against professional education, had contributed its hardy share in bringing medical education to its sorry condition. Barker believed that if university authorities fully understood the threat poor medical education posed to American health and science, they would divest themselves of their prejudice and elevate medical education and medical professors to their proper places.[39]

Like Barker, Billings also argued that medical education could be improved only when it became an integral part of the established university system. Only the university could provide medical education with what it had to have to reform--established educational standards, strict enforcement of

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[38]Ibid., pp. 146-147.

[39]Ibid., p. 147.

entrance requirements, and means of financing that medical schools could not acquire.[40]

Billings believed that medical schools had improved enormously since the 1880's. Although these improvements were encouraging to him, medical education still suffered from "too many medical schools, too many students, and inadequate facilities for the proper teaching of medicine."[41] The point was that no more than eighty percent of the medical schools "fulfilled the minimum requirements prescribed by the rules of the associations in regard to preliminary education of students, the length of the college course, and the character of the curriculum . . . ."[42] Since the schools could no longer pay for themselves, they did as little as they could get away with and still be permitted to confer degrees.

Billings concluded that the AMA should force commercial schools out of business. The AMA had the power to do it.[43] Besides, he wrote, "medical science demands it, the profession demand [sic] it, the people demand it, and [they] look to the American Medical Association as the chief influence which shall accomplish this end."[44] Moreover, since philanthropists

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[40]Billings, "Medical Education in the United States," 1275.

[41]Ibid., p. 1272.

[42]Ibid., p. 1271.

[43]Ibid., p. 1275.

[44]Ibid., p. 1276.

would not give to commercial schools, they could not "hope to improve their standards."[45]

More than anything else, medical science had brought the crisis to a head. As Ackerknecht said, "The new research and the new medicine could come into their own in the United States only when the problem of regulating medical education, solved centuries earlier in Europe, could finally be settled."[46] Regulation of medical education was achieved in the United States by the close of the second decade of the twentieth century primarily through the efforts of the AMA, the Rockefeller Foundation, and Flexner's exposé of medical education published by the Carnegie Foundation in 1910.[47]

Barker and Billings wrote their articles in 1902 and 1903, respectively. By 1905 Bevan and his Council on Medical Education were ready to develop a reform program. Their first problem was to pinpoint accurately the condition of medical education. They discovered that there were 160 schools, many of which admitted students without high school educations. Only five--Johns Hopkins, Harvard, Western Reserve, Rush Medical College, and the University of California--required two or more years of college level pre-medical training. Standards were obviously low. Facilities,

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[45]Ibid., p. 1272.

[46]Ackerknecht, A Short History of Medicine, p. 210-211.

[47]Johnson, "The Council on Medical Education and Hospitals," 890.

equipment, and faculties were substandard. Financial support was grossly inadequate, and failures on state board examinations were numerous.

As the organizers of the Johns Hopkins Medical School had done years before, Bevan and the Council decided to use European medical school standards to establish what were revolutionary goals for American medical education in 1905. After deciding that entrance requirements should be comparable to those that permitted students to enter recognized universities, the Council outlined a five-year medical course. During the first year, students would take physics, chemistry, and biology; in the second and third years, the laboratory sciences--anatomy, physiology, pathology, and pharmacology--would be studied; in the fourth and fifth years, the clinical subjects--surgery, obstetrics, and other specialty areas--would be covered. The last two years of the course would include valuable hospital and dispensary training. The Council suggested a sixth year internship.

With this program, the AMA aimed at raising the philosophy of medical education from that of a trade school to that of a university discipline. Yet the Council recognized the futility of demanding that all schools adopt the program at once or close their doors. While the AMA possessed no legal powers, it felt it could depend upon the wisdom of its counsel and the power of public opinion to achieve reform. Moreover, the Council recognized that in

certain geographical areas, the South in particular, compliance with the higher standards would probably be an impossibility for several years. Thus the Council wisely decided upon gradually increasing levels of improvement, aiming at the broader programs. At first, the Council required a high school education, a four year course, and acceptable grades on state board examinations. For many schools even these watered down requirements were insurmountable obstacles.

In order for schools to know where they stood in relation to the AMA requirements, the association classified schools using student performance records on state board examinations. Depending upon the number of examination failures each school had, it was put into one of four classes. Class One required less than ten percent failures; Class Two, from ten to twenty percent; Class Three, more than twenty percent; while Class Four included those colleges with less than ten graduates or those on which there was insufficient evidence for other classification.

While publication of the classification table stimulated some improvement, the Council recognized the limitations of testing alone. Thus the AMA decided to evaluate each school using a rating system of ten categories. In 1906 the Council investigated all the schools and graded them on the following points: the performance of graduates on state board examinations; the school's enforcement of pre-medical education

requirements; the character of the curriculum compared to the program outlined in 1905; the administration's efforts to maintain a clean, well-lighted plant; the quality of laboratories and instruction; the quality of hospital and dispensary facilities and instruction; the number of full-time teachers and the amount of original research being conducted; the extent of the profit incentive as compared to the ideal of medical education; and the quality of libraries, museums, and other materials necessary to good medical education.

The Council again grouped schools by classes. The Council, most generous in its grading, put eighty-two schools in Class A, the acceptable group; forty-six in Class B, the doubtful group; and thirty-two in Class C, the unacceptable group.

Although the results of the inspection were not published, the Council informed each school of its standing. At first the results were profound. Fifty schools agreed to raise their entrance requirements to at least one year of university physics, chemistry, and biology. A number of consolidations were proposed, and in a few instances state boards forced some schools out of business by refusing to give licensing examinations to their students. There were hopes, unadulterated optimism to be sure, that by 1910 the number of medical schools would be reduced to less than one hundred.[48]

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[48]Ibid., pp. 893-897.

This spurt of optimism was hardly justified. The original shock of the investigation undoubtedly frightened many school administrators, but it did not take them long to remember that the AMA possessed no real power. By 1909 the number of schools was reduced by only five.[49]

Bevan recognized that more had to be done. In 1908 he attempted to verbalize an American standard which, as it turned out, was only a slight negative alteration of the 1905 proposals. The new standard appeared to be an attempt at compromise since the number of years in the medical course was reduced from five to four.

The loss of one year in the medical course was probably the result of Bevan's recognizing that educational reform was hindered as much by the lack of qualified teachers as it was by the number of schools. Both went hand in hand because capable men found teaching in the existing crude conditions unsatisfying at best and repulsive most of the time. This was especially true when they compared the rewards of teaching with those of practice.[50]

After the initial shock and embarrassment of the 1906 investigation had worn off, many school authorities ignored the AMA's reform program. Resentment mounted against the

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[49]Morris Fishbein, editor, A History of the American Medical Association, 1847-1947, (Philadelphia, Pa., 1947), p. 258.

[50]Bevan, "Medical Education in the United States: Need for Uniform Standards," 567-570.

AMA over the classifications, and cries of favoritism and prejudice abounded. Reform had stagnated once more; almost as a last resort and hoping to pressure school authorities into initiating determined efforts to reform their schools, the AMA asked the Carnegie Foundation to approve and publish the findings of the 1906 investigation.[51]

As President of the Carnegie Foundation, Pritchett welcomed the opportunity to assist the AMA. Yet he felt it essential that the Foundation conduct its own investigation and that Canadian medical schools be included.[52]

Pritchett summoned Flexner in the fall of 1908. When Pritchett told Flexner what he wanted him for, Flexner thought he had been confused with his brother, Simon, a medical doctor. Pritchett assured Flexner that no mistake had been made and that the project he had in mind necessitated a layman and not a medical man.[53]

Flexner's qualifications for a study of an educational system were superb. At the age of nineteen his interest in educational administration had resulted in his being appointed assistant principal of a school in Louisville, Kentucky. Not long thereafter he began what came to be called "Mr. Flexner's

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[51]Johnson, "The Council on Medical Education and Hospitals," 897.

[52]Flexner, The Flexner Report, Pritchett's Introduction, p. ix-xi.

[53]Flexner, An Autobiography, p. 71.

School." The school was so successful that President Eliot of Harvard asked Flexner, who was attending the Harvard Graduate School, how he had been able to get his students ready to enter Harvard earlier with enough ability to leave the university sooner. Flexner replied that he simply treated his students as individuals.[54]

While attending Harvard, Flexner became "fully though vaguely convinced that all [schools, school systems, and colleges] were in need of thorough going reform."[55] With this on his mind, he went to England in 1906. While there he paid particular attention to the organizational structure of Oxford, Cambridge, Rugby, and Eaton. Later that year he began his first book, The American College, in which he presented his views on the inadequacies of American higher education. After the book's publication in 1908, Flexner was praised for being twenty-five years ahead of his time. Thus the book brought him to the attention of many prominent men, not the least of which was Pritchett.[56]

In the introduction to Abraham Flexner: An Autobiography, Allan Nevins described Flexner as being a "quiet, modest, and dedicated man . . ."[57] whose three abilities were rarely

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[54]Ibid., pp. 38-39, 44.

[55]Ibid., p. 61.

[56]Ibid., pp. 64-70.

[57]Ibid., Nevins' Introduction, p. x.

embodied in one man. He possessed the ability to see the possibility of reforming American life, particularly through education. He was the kind of man who always insisted on achieving goals of the highest order, never shirking until they were accomplished or until something better presented itself. Finally, he possessed unparalleled managerial powers. Together, these abilities made him a unique leader, critic, and organizer.[58]

Like other great men, Flexner recognized his own limitations and the part Providence plays in the lives of men. In his autobiography, he wrote:

> I was, despite outward reserve, venturesome to a degree that I recognized only after the event. I can realize now that I had come to see that America was still to be made; that that was a practical job; that I must garner from the old world whatever was likely to be of use; and that having in my possession these ideas and materials as well as those furnished by our own history, I must grasp every circumstance that offered to make them effective. I was not original, but I seem to have possessed the ability to seek out ideas and to take advantage of opportunities . . . . Opportunities to do what needed to be done have one after another fallen into my lap.[59]

In obvious admiration, Nevins ranked Flexner with Eliot as one of America's most outstanding men, a man who helped "prepare America for a role in world affairs far larger than anyone had dreamed of a generation earlier."[60] But Nevins

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[58] Ibid.

[59] Ibid., p. 62.

[60] Ibid., Nevins' Introduction, p. xiii.

probably gives Flexner too much credit when he writes that he "had slain a fearsome monster, the dragon Medical Quackery . . . ."[61] Certainly Flexner played a prominent, if not a leading, role in reforming medical education; but he did not do it alone. His study did raise the floodgates in 1910, but even then the work remained to be done. Indeed, only then could it really begin. In the history of American medical education, 1910 was both the end of one era and the beginning of a new one; Flexner and The Flexner Report have the distinction of being the external but essential forces in closing the one and in opening the other.

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[61] Ibid.

CHAPTER III

THE FLEXNER REPORT

Flexner was proud of Medical Education in the United States and Canada or, as it is commonly called, The Flexner Report. Along with others, he believed that it played an important part in bringing reform to medical education. In 1959, while reviewing the changes that took place in medical schools after the publication of the report in 1910, Flexner wrote:

> The graduate schools, research institutes, and medical schools now flourishing in the United States are not the slow outcome of evolution: they represent an unprecedented leap in the dark, with none of the gradual intervening stages characteristic of evolutionary change.[1]

In some respects, Flexner was correct in believing that his report had launched medical education into its "unprecedented leap in the dark . . . ." Some writers contend, however, that medical education was on the verge of reform when The Flexner Report was published, that reform would have come without it.[2] But futile speculation of this sort is like breathing into a hat; since it can be neither proved nor disproved, it is suffocating. The important point was

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[1]Flexner, An Autobiography, p. 36.

[2]Richmond, Currents in American Medicine, pp. 2-3; Johnson, "The Council on Medical Education," 894-897.

that The Flexner Report came at a time in the history of American medical education when it appeared to men who were well aware of the situation that little was going to be done to change things. That medical education began to change radically after the report was published at least lends strong support to the contention that Flexner's lacerating description acted as the catalyst.[3] Flexner hoped the report would become a guide for legislators and medical educators to follow.[4] He not only told them what was wrong with medical education, but he also told them how and why schools had gotten into the mess they were in. More important, however, he developed a theoretical program medical educators and legislators could use as a yardstick in determining how close to acceptable medical education they were. It does not matter that the theoretical program was not followed verbatim; it did matter that someone had described in explicit detail what medical schools should and could be. This was Flexner's great contribution.

Flexner divided his report into two parts. The first part describes medical education historically and includes the theoretical plan for the reorganization of medical schools. In the first part Flexner impresses upon the reader that medical science made demands upon medical education and

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[3]Richmond, Currents in American Medicine, p. 5.

[4]Flexner, The Flexner Report, p. 143.

that most American medical schools never attempted to meet them. In the second part he describes each school in relation to its determination to meet the demands of medical science as he had explained them in the first part.

Thus the basic premise of the report is that a proper medical education had to be founded upon medical science.[5] Flexner argued that medical schools in the United States had physically and intellectually separated medical education from medical science and that this unnatural separation had perpetuated empirical teaching when application of the scientific method in medical practice was the only way disease could be effectively combatted. Since empiricism in medical schools had deprived medical students of a scientific education, many physicians in the United States were dangerous. They threatened the health and, therefore, the happiness of the nation. Irresponsible medical schools, pernicious and criminal, had to be reformed or, preferably, shut down.[6]

To Flexner the physician was essentially a scientist. At the sick-bed the physician confronted a definite, although possibly unexplainable, scientific problem. Employing the scientific method, the scientific doctor developed his diagnosis--a hypothesis--based upon his knowledge of medical science, his past experience, and probability. If the disease

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[5] Ibid., pp. 52-55.

[6] Ibid., pp. 54-55.

were a baffling one, one about which little was known, the scientific doctor refused to further endanger the life and health of his patient by attempting to treat what he did not understand. The point was that the scientific doctor, unlike the empirical one, made definite distinctions between what he understood completely, what he understood partially, and what he understood not at all. While empirically trained doctors treated all illness alike--usually employing trial and error--the scientifically trained physician used his knowledge of medical science.[7] Billings described the difference in 1903 when he wrote that the physician could "no longer jiggle with the life of his patient by an attempt to cure with drugs or otherwise where no help is possible."[8]

Flexner's obvious conclusion was that to be of any value medical practice and medical education had to be based upon scientific fact. Where medical science was ignorant, practitioners dared not tread in treating their patients; instead, they had to wait unhappily but patiently on medical research to produce the necessary knowledge. Since the advance of the medical profession was thus based on the advance of medical science, Flexner reiterated that serious medical research on a huge scale had to be conducted in the United States. The only reasonable place to conduct it was in good medical schools

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[7] Ibid., pp. 55-56.

[8] Billings, "Medical Education in the United States," 1273.

properly equipped with hospitals, laboratories, and trained medical teacher-investigators. Medical teaching and medical research went hand in hand anyway, and good medical education could be offered only in schools where vigorous medical research was taking place. All good teachers did not have to be researchers, but schools to be good had a natural craving to discover the unknown and would die if that desire were quenched.[9]

Foremost among the obstacles to schools developing along scientific lines had been their refusal to develop satisfactory entrance requirements. Ultimately, Flexner traced all that was wrong with medical education directly to the inadequacies of entrance requirements. There was no uniform standard; in fact, it was impossible to find a common denominator. Flexner found that entrance requirements fell generally into three groups. The better schools, the medical departments of Harvard and Johns Hopkins, for example, required two or more years of college with emphasis on the basic sciences. There were sixteen schools in this category.[10] Fifty schools required high school or, as Flexner put it, they "oscillate about its supposed 'equivalent' . . . ."[11] The

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[9]Flexner, The Flexner Report, pp. 53-57.

[10]Ibid., p. 28.

[11]Ibid.

remaining eighty-nine schools required little more than the "rudiments or recollection of common school education."[12]

Flexner believed the real problem in reforming medical education lay with the fifty schools that claimed a high school education as their minimum entrance requirement. Although the sixteen best schools needed some financial assistance, they already produced good doctors and offered a reasonably high quality education. The worst schools were unredeemable and had to be forced out of business. Out of the fifty mediocre schools, however, the medical profession, supported by the public, had to create the superior schools that were needed to provide the nation with its supply of good, scientific doctors.[13]

Although the mediocre schools claimed high school education as their minimum entrance requirement, few of them enforced it. Instead, they depended on the "equivalent" which provided them with a means of circumventing the requirement. Medical schools nominally affiliated with state universities in Vermont, Pennsylvania, and Nebraska, for example, accepted credentials for entrance that the universities would reject. Where the equivalent was determined by examination, the examinations covered information usually mastered by the end of the sophomore year of a good high

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[12] Ibid.

[13] Ibid., pp. 28-30, 49.

school. Examinations were unsatisfactory at Bowdoin and Boston University and in Kentucky, Pennsylvania, Missouri, and Illinois, to name only a few. Where medical examiners were employed, they were powerless to enforce the requirement. Their methods of examination were casual and undemanding. Schools often ignored examination scores and registered failures along with students who met the requirement. Flexner's point was that although a high school education might have been the requirement, schools did not want it enforced and went out of their way to see that it was not.[14]

Low entrance requirements coupled with poor teaching resulted in large numbers of failures on licensing examinations. In 1908, for example, almost twenty-two percent of those taking the examination failed. In unapproved medical schools the percentage of failures was outrageously high as almost sixty-two percent failed in 1905, while the percentage was reduced to fifty in 1910.[15] Flexner argued that failures, even when cheaply educated, were expensive. On the average, about twenty percent of the three million dollars put into medical education every year was wasted. Flexner contended

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[14] Ibid., pp. 29-35.

[15] Ibid., p. 37; Commission on Medical Education, Final Report, Appendix, Tables 90 and 91.

that it would have cost no more to properly educate fewer students.[16]

Like the Council on Medical Education in 1905, Flexner understood that one universal standard for entrance into medical schools was untenable. He therefore advocated the development of three minimum standards. In the South the entrance requirement should be comparable to those which admitted students to state universities, that was an actual high school education. In the rest of the nation, the minimum requirement should be two years of college, while a few institutions might require a university degree.[17]

But even considerable improvement in requirements was useless without enforcement. Enforcement entailed proper evaluation and certification of credentials. Acceptable credentials included either a certificate of admission to a state university, a certificate of admission to any institution belonging to the Association of American Universities, medical student certification from the Regents of the University of the State of New York, or certificates issued by the College Entrance Examination Board. Unless a student possessed one of these, he should not be permitted to enroll in any medical school in the United States. These minimum requirements were necessary, Flexner insisted, because the

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[16]Flexner, The Flexner Report, pp. 43-46.

[17]Ibid., pp. 49-50.

medical student had to be familiar with the basic sciences to glean anything of value from his scientifically based medical course.[18]

In order to describe a proper medical course, Flexner divided it into two, two-year parts, the laboratory years and the clinical years. The medical student should spend his first laboratory year studying anatomy, histology, embryology, physiology, and biochemistry. His second year should be devoted to the study of pharmacology, pathology, bacteriology, and physical diagnosis. Through study of these laboratory sciences, the student was to learn what was normal and abnormal as such. In the third and fourth years--the clinical years--the student should not only expand his knowledge of medical science, but he should learn how to apply the knowledge he had to the treatment of disease. While clinical training along proper lines demanded extensive hospital training, the laboratory sciences demanded broad experience in scientific investigation.[19]

The medical school laboratories Flexner envisioned for use during the first two years of the medical course should be manned, equipped, and organized like university laboratories. The staff, hired full-time, should be composed of a department head, teacher-investigators, and intelligent people to care for the equipment. Adequate equipment included

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[18] Ibid., pp. 48-51.

[19] Ibid., p. 57.

classrooms, laboratories for student use as well as private laboratories for staff members, and all the paraphernalia that made them useful. By its very nature, laboratory training would supersede didactic instruction. The lecture was of limited use and scientific discovery, supervised by laboratory teachers, should make up the bulk of the learning experience.[20]

In 1910 the use of laboratories in medicine was less than a century old. Yet their value had been proven time and again. Using laboratories in medical research had permitted the medical profession to reduce the death rate by one-half and to extend life expectancy by ten or twelve years.[21] Quantitatively speaking, however, the laboratory method in medical education was not worth much because the student learned relatively little of what medical science had discovered. The value of laboratory training lay in its broader effects. "After a strenuous laboratory discipline," Flexner wrote, "the student will still be ignorant of many things, but at any rate he will respect facts: he will have learned how to obtain them and what to do with them when he has them."[22] In other words, laboratory training would transform the student into a scientist.

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[20] Ibid., pp. 60-66.

[21] Ibid., p. 62.

[22] Ibid., p. 69.

By the end of the first laboratory year, Flexner thought the student should know the normal structure and operation of the body, of its fluids, tissues, and organs. By the end of the second laboratory year, the student should have been exposed experimentally to the responses the body could be expected to make to medication. Only when the student possessed a thorough knowledge of the body and how it acted under varying conditions could he be turned loose on patients during the clinical years of his education.[23] This precaution had not been practiced in most American medical schools, and Flexner found it necessary to warn people that they would "do better to suffer in silence rather than to trust in . . . haphazard student medication . . . ."[24]

As essential as laboratory training was, it could not take the place of clinical training. Flexner said that more than any other factor, the quality of a medical school was determined by the quality of the clinical training it offered. If a medical school offered superior training on the laboratory side but neglected the clinical end, the doctors produced would be lame indeed; for, as Flexner put it, the school would be suffering "from a fatal organic lesion."[25]

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[23] Ibid., pp. 60-66.

[24] Ibid., p. 123.

[25] Ibid., p. 94.

Originally, clinical instruction was didactic. It became demonstrative, and students observed their masters in amphitheaters and wards. Scientific clinical instruction, however, demanded much more than demonstration and discussion. The modern medical school put the student rather than the teacher at the center of things. Flexner described scientific clinical teaching thusly:

> [The] student brings his own faculties into play at close range, gathering his own data, making his own construction, proposing his own course, and taking the consequences when the instructor who has worked through exactly the same process calls him to account: the instructor, no longer a fountain pouring forth a full stream of knowledge, nor a showman exhibiting marvelous sights, but by turn an aid or an antagonist in a strenuous contest with disease.[26]

Proper clinical instruction demanded that the school provide several things. It had to have a dispensary and a hospital, both equipped with extensive laboratory facilities. To be of any value, the dispensary and the hospital had to attract large numbers of patients representing a wide variety of disease. Dispensary training, offered during the third year of the medical course, taught the student how to treat minor illness, perform minor surgery, and make physical examinations. The last year of the medical course had to take place in a hospital. There, and only there, could the student learn how to be a doctor as he closely observed medical and natural progress against disease.

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[26] Ibid., p. 93.

Dispensary and hospital training permitted the student to learn through supervised experience. Flexner could not emphasize enough how important experience was in the training of doctors. The hospital year logically followed dispensary and laboratory training, because in the hospital the student would be required to put all of his previous learning to work curing people suffering from disease. The senior medical student had to know how to use the laboratory in arriving at his diagnosis and in suggesting a treatment. The instructor did not tell the student the answer to his problems; instead, he stimulated, advised, and corrected until the student became nothing less than a scientist. Only in this way, Flexner argued, could the student learn about the human machine, of its diseases, and of means whereby they could be cured.[27]

Flexner discovered that laboratory training, as inferior as it was in most American medical schools, was superior by far to clinical instruction. Many schools offered no clinical training at all or conducted it in such a haphazard, disorganized manner that it was practically useless. While dispensary training was deplorable in most places, schools slighted hospital training most. The primary obstacle to offering adequate clinical training was the absence of school ownership or control of hospital and dispensary facilities. Only rarely

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[27] Ibid., pp. 93-106.

were arrangements with public or private hospitals conducive to education. As it was, in most of the schools hospital and dispensary training proceeded sluggishly at best and not at all most of the time.[28]

Flexner found it unnecessary to describe in detail the conditions in which he found dispensary training since they paralleled those that predominated in hospital instruction. Basically, the problems caused by schools having to use public or private hospitals for clinical instruction tended to destroy the independence of the schools in controlling their faculties and their educational policies. Often schools had to depend upon local medical practitioners for clinical teachers because they controlled access to the patients. Although these physicians were in most cases successful practitioners, they were usually poor teachers. A doctor with a successful practice did not have time to be a good teacher. There were situations where schools were unable to dismiss faculty members because they controlled a needed hospital service.[29] Thus hospital appointments became valuable assets for, as Flexner stated, "every holder of a hospital service finds himself a potential professor of medicine, surgery, or what not . . . ."[30] simply because he

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[28] Ibid., pp. 100-105, 120-123.

[29] Ibid., pp. 109-111, 120.

[30] Ibid., p. 111.

had access to the patients. Some schools were so desperate for hospital services that they threatened their professors with the loss of their positions if they lost their hospital connections.[31]

Naturally Flexner thought all of this was extremely dangerous. By enslaving the schools, their academic freedom had been jeopardized, and Flexner believed that academic freedom was "the very life-breath of scientific progress, freedom on the part of the university to choose its own teachers, finding them where it may; freedom on the part of the teachers to strike out along whatever path they please."[32]

Neither public nor private hospitals had found it possible to allow medical schools to function freely. Schools often conducted themselves in such unprofessional ways that hospital directors had to usurp their authority in order to avoid friction and maintain peace. In some hospitals, students were not permitted inside the wards; in others, they were not permitted to touch the patients.[33] Very rarely were students allowed to use hospital laboratories; and if they wished to make laboratory examinations, they had to haul "specimens of urine, feces, and gastric contents on street cars across

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[31] Ibid., pp. 112-113.

[32] Ibid., p. 109.

[33] Ibid., pp. 110-116.

town . . . ."[34] Teachers had to use patients haphazardly, knowing only the day before instruction who their patients would be. All over the country, hospitals and medical schools worked together precariously, wasting money and compromising educational opportunity. Most students never followed a case from start to finish. They kept no progressive records. For them scientific study was an impossibility.[35]

Finally, schools often fell prey to political intrigue inside and outside of the hospital. Cook County Hospital in Chicago, for example, awarded staff positions by competitive examination every six years. Every six years medical schools had to clamor for favors from the winners. The medical department of Toledo University lost its clinical facilities when local politics ousted its benefactor. The University of Minnesota finally had to build its own hospital when politics threatened to deprive the school of its hospital privileges. Thus many medical school administrators found themselves involved in expensive and time wasting political maneuverings.[36]

Flexner concluded that the "clinical facilities of the ordinary medical school are put together of scraps . . . . They offer a medical clinic here, an obstetrical clinic there,

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[34] Ibid., p. 114.

[35] Ibid., pp. 110-120.

[36] Ibid., pp. 110-112.

and a skin clinic somewhere else . . . ."[37] Effective hospital training could not be conducted in such a fashion, and medical schools had to find better ways of offering clinical instruction if they were ever to become educational institutions. But Flexner thought the prospects for elevating clinical instruction were extremely few in 1910. School administrators had yet to comprehend fully the value of clinical training. They refused to admit that a well organized clinic in internal medicine was superior to what they already had.[38]

Although ownership of hospitals would have solved almost instantly many of the problems medical schools faced in offering clinical instruction, the possibility that very many schools could build them was indeed small. But Flexner was not arguing that ownership was the only acceptable way. Ownership was the best course, but the problem between medical schools and hospitals was a matter of control over instruction, educational policies, and teachers--not ownership of property. If schools could achieve control of their hospital facilities, it mattered little who owned them. In the United States, however, control without ownership had been practically impossible. With few exceptions--the University

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[37] Ibid., p. 115.

[38] Ibid., pp. 105-106.

of Virginia, Johns Hopkins, and the University of Michigan--American medical schools had developed apart from hospitals.[39]

To support his position, Flexner showed that in most cases where medical schools controlled the hospital facilities they used, whether through ownership or gratuity, clinical instruction was superior to that offered in other schools. The Johns Hopkins Hospital was his primary example:

> Nowhere else in the country has so consistent a scheme been so admirably realized. The student is made a factor in the conduct of the hospital: he assists as dresser, following the admirable method long in vogue in the Scotch and English schools. In each department he serves as appointed novitate, following his "case" from start to finish,--now to recovery, again to autopsy.[40]

The University of Michigan was another example of a school that owned its hospital and produced fine doctors. The medical department of Western Reserve did not own its hospital, but it was a good example of a school which, with cooperative hospital administrators, had made the best use of its privileges in a private hospital. Flexner encouraged other schools to follow these examples.[41]

Not all medical school hospitals were teaching assets, however. Barnes Medical College in St. Louis, Missouri, Lincoln Memorial University in Knoxville, Tennessee, the University Medical College and Hospital in Kansas City,

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[39] Ibid., pp. 99-107.

[40] Ibid., p. 107.

[41] Ibid., pp. 106-108.

Kansas, and Milwaukee Medical College and Trinity Hospital were all private concerns that used their hospitals to lure students for profit.[42]

Flexner saw no valid reason why medical schools could not develop clinical training along the same lines as Johns Hopkins, the University of Michigan, or Western Reserve. Flexner contended that the financing and administration of hospitals were distinctly separate from the teaching of medicine. Some schools would be able to build hospitals when philanthropy and taxation were brought to their support. Meanwhile, private and public hospitals could be effectively used for educational purposes if hospital authorities would leave medical schools free to conduct their own affairs. In any case, clinical instruction demanded that the school control its hospital facilities; until that time arrived, medical education could not be much improved.[43]

Obviously, reforming medical education from the laboratory to the hospital would require money. Historically, the low entrance requirements of most American medical schools, by making a farce of medical education, had driven philanthropy into more deserving areas; and medical schools were forced by their own folly to operate on fees alone.

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[42] Ibid., p. 107.

[43] Ibid., pp. 102, 107-108.

When Flexner examined the general financial instability of medical education, he was able to account for all of the conditions that existed. Like many before him, he contended that medical education could not be conducted at a profit. The best medical schools strained the resources provided for them by their universities or by their endowments in order to provide scientific medical education. The worst schools did operate at a profit, but the education offered in those institutions was hardly scientific. Making a profit was not condemned as such, but Flexner found it deplorable that teachers had pocketed the profits rather than putting them back into the schools.[44] Profits were made only "by slighting general equipment, by overworking laboratory teachers, by wholly omitting certain branches, by leaving certain departments undeveloped, or by resisting any decided elevation of standards."[45] At Bowdoin, for example, the $15,230 income was distributed thusly: two hundred dollars for maintenance of the bacteriological laboratory, two hundred dollars for chemistry, fifty dollars for physiology, two hundred dollars for books, and over twelve thousand dollars for salaries to professors not one of whom gave his full time to the school. This kind of budgeting took place all over the country.[46]

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[44] Ibid., pp. 126, 136-140.

[45] Ibid., p. 126.

[46] Ibid., pp. 138-139.

Some schools spent more money on advertising than they did on their laboratories. A large eastern school spent $4,700 on publicity and $3,500 on its laboratories. A New York school spent $2,100 on advertising and $1,160 on its laboratories. In the South, where the poorest and worst schools were located, one school spent $1,000 on advertising and $500 on its laboratories.[47]

Flexner discovered that he could tell where a school's heart lay by comparing its property holdings with its annual income. The thirty-year-old medical department of the University of Arkansas, which had an annual income of $14,100, was bare; Georgetown University, sixty years old, with an annual income of $11,000, had only meager facilities; the seventy-year-old Medical College of Georgia had no plant worth mentioning; the University of Chattanooga, twenty-one years old, had an annual income of $4,290 and would not have sold for five hundred dollars.[48]

For years in the United States almost three million dollars in student fees had been collected annually by medical schools.[49] The majority of those fees had not gone into buildings, laboratories, or equipment. The reluctance of philanthropists and tax payers to put money into such

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[47] Ibid., p. 139.

[48] Ibid., pp. 139-140.

[49] Ibid., p. 140.

mercenary enterprises was thus steeped in well-founded fears that the money would be handled unwisely if not stolen outright.

By 1910 the public and philanthropists were both willing to support medical education. Before schools could expect them to do so, however, the medical profession had to reduce the number of schools, raise educational standards, and close profit-oriented institutions. The long mistaken but popular notion that medical schools were essentially businesses operated for the benefit of those who controlled them had to be transformed into the idea that medical education served a social necessity and was, therefore, a social function operated for the benefit of the people. The whole medical profession had to stand together, forcing exploiters from the scene. When the medical profession performed its duty to the public, the public would perform its duty to the medical profession.[50]

What was most distressing, however, was the fact that some medical teachers were the leading exploiters of medical education. In many schools, they used their positions solely to gain prestige and money. They were not devoted to medical education nor to the advancement of medical science. These were the people who had always made it difficult and often impossible for medical schools to improve because, to all of

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[50] Ibid., pp. 127, 133-135.

their other faults, laziness had to be added. Of them, Flexner said:

> The one person for whom there is no place in the medical school, the university, or the college, is precisely he who has hitherto generally usurped the medical field--the scientifically dead practitioner, whose knowledge has long since come to a standstill and whose lectures, composed when he first took his chair, like pebbles rolling in a brook get smoother and smoother as the stream of time washes over them.[51]

These people, their attitudes, and their methods of teaching had to go. If these people loved their profession as they claimed to do, Flexner argued, they would immediately resign from medical education. Ultimately, a medical school was only as good as its teachers, and teaching had to become "concrete, not abstract, clinical, not didactic."[52] All the money in the country could not make the finest lecture, although well suited to certain kinds of instruction even in the medical school, do what the laboratory and the hospital could; that is, make inarticulate boys into medical scientists by providing them with experience in the laboratory and in the hospital.[53]

Flexner called for a reconstruction of medical education that would "at once reduce the number and improve the output of medical schools . . . ."[54] Although he hoped his

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[51] Ibid., p. 151.

[52] Ibid., p. 124.

[53] Ibid.

[54] Ibid., p. 143.

theoretical plan would serve as a reference point for legislators and medical educators who had to solve the problems, he was never so egotistical as to believe that it would be taken over exactly as he outlined it. Flexner believed that time was of the essence, however, and intentionally made his program short range. In fact, he hoped medical education could be reformed from top to bottom in no more than a generation.[55]

The basic principle behind his theoretical plan was the idea that fewer schools, properly financed and organized, could supply the nation with better doctors. He emphasized that the medical school could function effectively only if it were a department of a university. In fact, with few exceptions, the cost of medical education made it mandatory that medical schools become departments of state universities. Moreover, the medical school could obtain patients with a wide variety of illnesses best if it were located in or near a large city. Since many state universities were located in smaller towns, this posed a problem. Flexner deplored the common practice of having several schools in the same city and advocated that no more than one medical school be organized in any state. Finally, since medical schools could not possibly offer specialized training in every field of medicine, he encouraged them to work at developing programs

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[55]Ibid.

that concentrated on diseases unique to their locality. Tulane, for example, should concentrate on tropical diseases; while a school in Pittsburg concentrated on occupational diseases.[56]

Throughout the history of medical education in the United States, these principles had been ignored. In 1910 there were twenty-one thousand students enrolled in 155 schools.[57] "Medical schools," Flexner wrote, "have been established regardless of need, regardless of the proximity of competent universities, regardless of favoring local conditions."[58] His theoretical plan aimed at remedying the situation with one swift blow.

He calculated that thirty schools with an average enrollment of three hundred could produce annually the two thousand graduates the nation needed. Two thousand doctors added annually to the number of physicians already practicing would be enough to care for the health of the nation for at least two generations. In order to locate medical schools equitably over the entire nation, Flexner divided the United States into seven geographical regions, calculated the number of doctors each would need based upon population, and selected the number of schools each region would need to

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[56]Ibid., pp. 143-145.

[57]Ibid., p. 140; Commission on Medical Education, Final Report, Appendix, Table 104.

[58]Flexner, The Flexner Report, p. 145.

educate its quota. Each school he selected was a department of a university and each was engaged in medical research. About 120 schools would have to be closed, and twenty states were left without medical schools. Of the schools that had to be closed, sixty-six were so small--some had less than fifty students and none had more than one hundred--that their existence was precarious anyway. Flexner insisted that no section deserving a medical school would be without one and that such a drastic reduction in the number of schools would not threaten the nation with a shortage of doctors. He maintained that nothing of value would be lost; indeed, education and research would abound, insuring better health while at the same time replacing morbid stagnation in the medical profession.[59]

Flexner was aware that medical education developed along the lines he forecast would be expensive. Indeed, his theoretical budget for one laboratory department was higher than the budgets most medical schools operated on in 1910. According to the theoretical budget, a four-year medical course for 250 students would cost between $100,000 and $250,000 annually above the cost of building and equipping the school plant which included laboratories, classrooms, dispensaries, and hospitals. He calculated that the annual deficit for a properly conducted school of that size would

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[59]Ibid., pp. 143-155.

be somewhere between $62,000 and $120,000. Obviously, medical schools had to be supported through taxation or endowment.[60]

Flexner anticipated complaints that his theoretical budget was too high. Comparing it with the expenditures of the best schools, however, he found that student fees could be expected to pay only about one-third, certainly not more than one-half, of a school's operating costs. Student fees definitely could not pay for both operating costs and the building of plants. Johns Hopkins had 297 students and operated on a $100,000 budget. Student fees paid half, but clinical teachers were paid out of the hospital and not the medical school budget. Harvard had a budget of $251,389 for 285 students whose fees paid much less than half. Cornell, one of the wealthiest schools, collected fees of $24,410 from 207 students and operated on a $242,728 budget. In these schools, administrators had found that fee income increased much less rapidly than did operating costs and Flexner informed others that they could plan on ever dwindling returns from student fees.[61]

Flexner knew that fee income would become less and less valuable because even the best schools were not fully developed in all departments. Most of them had insufficient departments

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[60] Ibid., pp. 128-133.

[61] Ibid., pp. 132-134.

of pharmacology and preventive medicine, while makeshifts were practically universal in all clinical departments. Where departments had been cared for properly, expenses were always more than Flexner's theoretical budget allowed for. For example, at Johns Hopkins, $16,750 was spent annually by the department of anatomy; Columbia spent almost $30,000 on its department of anatomy, while its department of pathology and physiology cost more than $36,000 every year. Cornell spent $37,000 on pathology, histology, and bacteriology. Flexner's theoretical budget averaged only $15,000 for each department.[62]

Flexner concluded that as schools moved closer and closer to offering acceptable training, costs would rise. The high cost of medical education made it mandatory that schools be assisted by taxation and philanthropy. But neither of these was going to be given to medical schools until they became integral parts of established universities operated on a high plane of intelligence, thrift, and honesty. He did not contend that the best education was the most expensive one; he did maintain, however, that a minimum outlay was required to build, equip, and operate a good medical school.[63]

Flexner's theoretical plan thus called for a complete reorganization of medical education. Essentially, reorganization was complete reform. Reform demanded building

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[62] Ibid.

[63] Ibid., pp. 127, 135.

scientific laboratories, dispensaries, and hospitals where students could be transformed into inquisitive seekers of facts. Flexner insisted many times that the modern doctor had to have experience with the raw material of his profession. That meant he had to learn medicine by practicing medicine on sick people. Most schools were not and had not been giving experience to their students. And before many of them would be able to, the number of schools had to be cut, their standards raised, and money brought to their aid. Professors devoted to medical science had to be trained and exploiters had to be dismissed. A new idea of what medicine was and who it was intended to serve had to be developed.[64]

No one deplored the conditions in which he found medical education more than did Flexner. But like Barker and Billings, he refused to lay all the blame on the medical schools, the medical profession, or the medical teachers. The university and the public were in part to blame. The university had refused to make a place for medical education. The public had failed to support medical schools financially. Thus Flexner called upon the universities to elevate medical education to a university discipline and upon the public to enact laws which would bring an end to the deplorable conditions.[65]

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[64] Ibid., p. 127.

[65] Ibid., pp. 140-143.

CHAPTER IV

CONFUSION AT THE CROSSROADS

In 1913 Isadore Dyer said:

> We are standing at the crossroads in medical education, turning to each new way with no decision, and uncertain as to the choice of direction for future effort. No analysis so far afforded is sufficient to determine an exact course, and as yet only individual opinion has obtained as the result of investigation. More than one educator has proclaimed his views, and various conferences have accumulated a variety of material which, digested, points to no conclusion.[1]

Dyer's observation was as much prophetic as it was historical. Indecision coupled with literally hundreds of ideas for reforming medical education, all minor deviations considered, resulted in confusion which lasted for more than two decades. Moreover, confusion and indecision culminated in controversies among medical educators and other members of the profession and often involved men like Flexner who were associated with private educational agencies. While some people demanded immediate, radical change, others were irately demanding that stability and continuity accompany reform. The First World War served only to intensify the disagreements. Before the war, medical educators believed they were producing good physicians and, naturally, were

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[1]Isadore Dyer, "Medical Education: An Unsolved Problem," New York Medical Journal, XCVII (February 1, 1913), 224.

supremely disappointed when war illuminated the fact that most of the recent graduates were in several basic respects unfit to practice medicine.

Although the demands of war found medical education wanting, between 1910 and 1920 medical educators had accomplished much reform for which they were justifiably proud. In 1920 N. P. Colwell, Secretary of the Council on Medical Education, while admitting that medical education was not as good as it could be, said that American medical schools were as good as those of any other nation. It is significant that he felt confident enough to say so after only one decade of real reform. In defense of the reform movement, Colwell went on to emphasize that pre-war improvements had kept the ravages of war from being as serious as they would have been had the campaign for improvements not been made.[2]

In 1910 reformers felt compelled to attack medical education from many sides at the same time. State Boards of Medical Examiners had to be reorganized and their attitudes changed. The number of schools had to be reduced drastically. Millions of dollars had to be acquired so schools could build classrooms, laboratories, dispensaries, and hospitals as well as raise salaries to attract better teachers and to improve

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[2]U. S. Bureau of Education, Medical Education, 1918-1920 by N. P. Colwell, (Bulletin No. 15) Washington: Government Printing Office, 1921, pp. 1-5.

teaching methods. Curriculums that would fit into the limited time of the medical course had to be developed. Better students had to be won away from more attractive and respectable fields of study. All of these things were interwoven, and working on any one of them necessarily affected the others. When one problem approached solution, more complicated ones took its place; and in 1920 there remained a great deal to be done.

Basically, however, improving medical education rested on raising entrance requirements. By 1912 Bevan and Barker were praising medical schools for having made much progress in that area;[3] yet, there were still forty-five schools whose entrance requirements were less than a four year high school education.[4] Nevertheless, the unfavorable publicity The Flexner Report had given medical education was beginning to bear fruit. Public agitation for improvements in many states had precipitated government action to raise standards. New York and Virginia, for example, passed laws in 1912 which required schools to enroll only those students who had

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[3]Lewellys F. Barker, "Tendencies in Medical Education in the United States," Journal of the American Medical Association, LVII (August 19, 1911), 613; Council on Medical Education, "Report of the Council on Medical Education," Journal of the American Medical Association, LVIII (June 8, 1912), 1795.

[4]Ibid.

high school educations.[5] At the same time, the Council on Medical Education recommended that schools work toward requiring at least one year of university training in the fundamental sciences; and by 1912 about fifty schools and ten State Boards required a minimum of one year of college. By 1913 the ideal standard set in 1905--one year of college--had become the essential requirement for entrance into an acceptable American medical school. The Council immediately set to work at raising the minimum to two years of college. Medical schools and State Boards cooperated with the Council, and by 1918 the two year minimum was generally required throughout American medical education.[6]

The Council's attempts to raise entrance requirements were resisted by college and university administrators whose schools were not engaged in medical education. Some stated frankly that they did not want one- and two-year premedical

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[5]U. S. Bureau of Education, Report of the Commissioner of Education (1912), Vol. I (Washington: Government Printing Office, 1913), p. 81.

[6]U. S. Bureau of Education, Report of the Commissioner of Education (1910), Vol. I (Washington: Government Printing Office, 1911), pp. 264-265; U. S. Bureau of Education, Report of the Commissioner of Education (1913), Vol. I (Washington: Government Printing Office, 1914), pp. 26-27; U. S. Bureau of Education, "Progress in Medical Education," by N. P. Colwell, in Report of the Commissioner of Education (1913), Vol. I (Washington: Government Printing Office, 1914), pp. 36-42; U. S. Bureau of Education, Medical Education, 1916-1918, by N. P. Colwell (Bulletin No. 46) Washington: Government Printing Office, 1919, pp. 4-15; William Henry Welch, "Medical Education in the United States," New York Medical Journal, CIII (May 6, 1916), 891.

students. They resented their institutions being used for preparatory schools and objected to requests from medical educators that they alter their curriculums to satisfy the needs of medical education.[7] Medical educators pointed out that without a sound knowledge of the basic sciences the practice of medicine became "an affair of memory instead of being one of reason . . ." and that medical schools had to depend upon the liberal arts schools to provide premedical education.[8] Reluctantly, university administrators gave in; it was only a short time, however, before medical educators were aware that many of the colleges and universities were performing less than satisfactorily. Lefevre complained as early as 1913 that until improvements were made, premedical education was nothing but a "quack remedy."[9] He insisted that since medical schools required the college work, it was their duty to demand that universities and colleges reorganize their courses and improve their teaching so that the time spent would not be wasted.[10]

Lefevre had discovered that some college trained men entered medical school possessing what he called a

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[7]Lefevre, "Some Problems of Medical Education," 848.

[8]Paul G. Woolley, "Premedical Education," Science, New Series, XXXIX (May 22, 1914), 743-744.

[9]Lefevre, "Some Problems of Medical Education," 851.

[10]Ibid.

"psuedo-philosophical and not a scientific frame of mind."[11] He thought this attitude had developed because college science teachers dealt too much in generalities while they ignored basic laws and principles. In short, they had not taught students to be inquisitive. By 1918 the Council on Medical Education was calling for an investigation of liberal arts schools so it could develop a list of acceptable schools for premedical students.[12] Throughout the decade of the twenties, the Council made and revised lists of acceptable colleges and encouraged medical schools to accept only those students who had attended acceptable schools. In this way, the Council helped bring about higher standards in colleges and universities.

As inferior as premedical education was in some schools, in 1915 the editor of the Medical Record said that the United States led the world in medicine and surgery.[13] Although this comment was an exaggeration, most American medical schools conceded to the world standard of medical education by requiring college preparation, a four-year graded course divided into laboratory and clinical instruction, and a one

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[11] Ibid., pp. 850-851; Woolley, "Premedical Education," 744-751.

[12] Colwell, Medical Education, 1916-1918, Bulletin No. 46, pp. 22-23.

[13] The New York Times, April 4, 1915, pp. 11-13.

year clinical internship.[14] Even at that, however, the final standard for American medical schools was not established. Commenting on the extent of the reforms that had been made by 1916, J. M. Baldy said, "the revolution has progressed so far as to assure the future absolutely and that within a comparatively short time."[15]

But Baldy, like many others, was not happy. He argued that medical reform could progress no farther because the AMA tolerated the existence of several inferior schools that ignored entrance requirements. Baldy demanded "that all subterfuges and all evasions be done away . . . ."[16] He wanted all of the inferior schools closed immediately and insisted that unequal enforcement of standards injured those schools that enforced them. In Pennsylvania, for example, unacceptable students often left the state and obtained licenses to practice somewhere else.[17] By 1918 Baldy's demands had been generally met, and more than ninety-two percent of the medical schools were enforcing premedical

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[14] U. S. Bureau of Education, "Medical Education," by N. P. Colwell in Report of the Commissioner of Education (1915), Vol. I (Washington: Government Printing Office, 1915), p. 194.

[15] J. M. Baldy, "Medical Education in the United States," Journal of the American Medical Association, LXVI (February 19, 1916), 548.

[16] Ibid.

[17] Ibid., pp. 548-549.

education requirements.[18] By 1919 William J. Means, President of the Association of American Medical Colleges, could say that "a minimum premedical standard so long sought has been established . . . I feel that it will be maintained and honestly enforced."[19] Not even the urgency of war could undermine high standards; indeed, the war strengthened them by permitting the federal government through the Surgeon General of the Army to demand that standards be enforced.[20]

As reformers had anticipated, raising and enforcing entrance requirements precipitated the demise of many schools. Even before Flexner completed his investigation, several inferior schools closed down.[21] While Flexner's investigation was not solely responsible for the closures, it did make it emphatically clear to those who operated inferior schools that the Council on Medical Education, representing the medical profession, was determined to reform

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[18]Colwell, Medical Education, 1916-1918, Bulletin No. 46, pp. 3-4; Council on Medical Education, "Medical Education in the United States: Annual Presentation of Educational Data for 1920 by the Council on Medical Education and Hospitals," Journal of the American Medical Association, LXXV (August 7, 1920), 393; Johnson, "The Council on Medical Education and Hospitals," 899; William J. Means, "The History, Aims and Objects of the Association of American Medical Colleges," Association of American Medical Colleges: Proceeding of the Twenty-ninth Annual Meeting, XXIX (March 4, 1919), 8.

[19]Ibid., p. 11.

[20]Horace D. Arnold, "Effect of the War on Medical Education," Journal of the American Medical Association, LXXIII (August 16, 1919), 466.

[21]Flexner, The Flexner Report, Pritchett's Introduction, p. xv.

medical education.[22] Apparently, between 1908 and 1910, many of those who were offending the medical profession were assured that the primary goal of medical education was "the extension of medical knowledge and the advancement of medical science . . . ."[23] At any rate, by June of 1910 the number of schools had been reduced from a high of 166 in 1906 to 135. By 1920 only eighty-five schools survived while the number was reduced even further to seventy-six in 1929. Thus in a comparatively short period of time--twenty-three years--ninety schools were closed.[24] Almost all of the closures affected inferior schools; and, as Barker said in 1911, they actually had no other choice, because "The nation has set itself resolutely to the task of reconstruction and it will not rest satisfied until its medical schools . . . bear favorable comparison with similar institutions anywhere in the world."[25]

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[22]Richmond, Currents in American Medicine, p. 5.

[23]Blackburn, "The Course of Postgraduate Study of the American Medical Association," 188.

[24]Colwell, Report of the Commissioner of Education (1914), p. 196; Colwell, Medical Education, 1916-1918, Bulletin No. 46, p. 4; Council on Medical Education, "Report of the Council on Medical Education," (1912), 1793; Commission on Medical Education, Final Report, Appendix, Table 104. Comparison of the figures given in several sources leaves some doubt as to just how many schools there actually were at any time. These discrepancies in numbers are probably the result of variations in the times when the schools were counted or in the exclusion or inclusion of schools of various medical cults.

[25]Barker, "Tendencies in Medical Education," 614.

Fewer schools and higher entrance requirements made for fewer and better students. In 1904 there were over twenty-eight thousand medical students of which almost six thousand graduated. In 1911 the number of students had shrunk by almost ten thousand and the number of graduates had been reduced proportionately. By 1915 there were forty percent fewer students and almost forty percent fewer graduates than there had been a decade earlier. In 1920 there were well under fourteen thousand students and the number of graduates had steadily declined to just over three thousand. The Council on Medical Education considered this a more desirable number of students and graduates for the nation. After 1920, however, the number of students and graduates steadily increased until in 1932 there were over twenty-two thousand students and nearly five thousand graduates. By then, however, few men would deny that these were better trained physicians than were those of 1910 and previous years. Moreover, after 1911 the majority of students preferred to attend the best schools and the number attending inferior schools constantly dwindled.[26]

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[26]Commission on Medical Education, Final Report, Appendix, Table 104; Johnson, "The Council on Medical Education and Hospitals," 901-902; Colwell, Report of the Commissioner of Education (1915), pp. 186-195; Colwell, Medical Education, 1916-1918, Bulletin No. 46, pp. 3-10; Colwell, Medical Education, 1918-1920, Bulletin No. 15, pp. 6-11.

But closing inferior schools did more than eliminate inferior students; it also eliminated many inferior teachers. This phenomenon was far enough advanced in 1912 that the Council on Medical Education made the hiring of good teachers one of the essential requirements for an acceptable medical school. No longer could men be hired because they had political influence or because they controlled hospital services. The primary consideration after 1912 had to be their ability as teachers and their devotion to the highest ideals of medical science and education. In 1912 the Council knew that good medical teachers were scarce if not rare, but it insisted that school administrators hire only the best men. While hiring only those men who had medical educations as laboratory instructors was an impossibility in 1912, the Council encouraged administrators to work toward that goal. It did so because it believed the pure scientist at his best was still inadequate to teach medical students unless he had worked and studied to develop a medical point of view. Essentially, that meant acquiring a medical education. At the same time, the Council was beginning to insist that clinical teachers be researchers as well as physicians--an impossible combination of three things (teacher, researcher, physician) to find in one man.[27] Thereafter, many writers demanded that clinical teachers be hired full-time, required

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[27]Council on Medical Education, "Report of the Council on Medical Education," (1912), 1795-1796.

to resign from practice, and encouraged to engage in research. The Council hoped that shortly all medical teachers would be men with medical educations devoted to the advancement of medical science. Without this kind of teacher, medical science and medical education could not advance. Those who supported this position knew they were correct all along, and the war demonstrated it to almost everyone else.[28]

Even though the war demonstrated that medical schools were producing inferior physicians and that full-time clinical teaching would rectify many of the errors being made, medical teachers had been divided over the issue for years. By 1920 division crystallized, and laboratory and clinical teachers were at odds with each other. When the war revealed that young doctors had not been taught how to apply their scientific knowledge in diagnosing and curing illness, demands for full-time clinical teaching became more insistent.[29] For years, laboratory instructors had insisted that the weaknesses of students in diagnosing illness was not their fault. They insisted that they had done their job; that students knew their science, and teaching its application

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[28]Lefevre, "Some Problems of Medical Education," 852-854; Lewellys F. Barker, "The Teaching of Clinical Medicine," Science, New Series, XLIII (June 9, 1916), 800; C. R. Bardeen, "Aims, Methods and Results in Medical Education," Science, New Series, XLIII (March 17, 1916), 379.

[29]Arnold, "Effect of the War on Medical Education," 466-469.

was the province of clinical teachers. On the surface, this assertion appeared reasonable enough, but it was actually an unrealistic attempt by laboratory instructors to avoid their responsibilities. The purpose of the laboratory sciences was the preparation of students for their clinical studies. That preparation included learning how to apply the laboratory sciences in discovering and curing disease. Clinical studies were intended to teach the clinical sciences which were based upon a thorough understanding of the laboratory sciences and their application. Besides, the failure to relate laboratory science to its application hampered students in remembering their science. Reinforcement was missing. Thus by 1920 laboratory and clinical teachers, who had been drawing apart for years, had managed to erect between themselves intellectual and academic barriers which threatened medical progress.[30]

However, much of their division was due to the development of the curriculum. In 1910 Flexner's insistence on dividing the medical course into two distinct two year

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[30]Nellis B. Foster, "Medical Education as Revealed by the War," Journal of the American Medical Association, LXXII (May 24, 1919), 1540-1542; Robert W. Lovett, "A Plea for a More Fundamental Method in Medical Teaching," Journal of the American Medical Association, LXX (April 13, 1918), 1070-1072; Edward L. Munson, "The Needs of Medical Education as Revealed by the War," Journal of the American Medical Association, LXXII (August 12, 1919), 1050-1055; Lefevre, "Some Problems of Medical Education," 853-854; Bardeen, "Aims, Methods and Results in Medical Education," 379; Barker, "The Teaching of Clinical Medicine," 800.

branches contributed to the maladjustment of the curriculum as did his insistence on more time in the laboratory and less time in the lecture hall.[31] No doubt medical school administrators and teachers over-reacted to his criticism, but the fact remained that the laboratory sciences came to be taught as pure sciences rather than as applied sciences. By 1913 laboratory teachers had lost sight of the abilities of their students and planned their courses as if they were educating research workers. Coupled with this, laboratory teachers resented clinical teachers against whom they had had to wage a long and bitter struggle for recognition and respect. Laboratory teachers naturally objected to any encroachment of clinical medicine into what they considered their sphere of influence, and correlation of the two branches became even more difficult. Apparently, teaching the application of the laboratory sciences was considered an encroachment of clinical medicine into the time allotted for laboratory studies.[32] In most schools, by 1920 the correlation of laboratory and clinical medicine was as serious a problem as it had been when Flexner wrote his report. The medical curriculum continued to be arbitrarily divided into distinct units of study which began and ended as if they had

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[31]Flexner, The Flexner Report, pp. 57-95.

[32]Lefevre, "Some Problems of Medical Education," 847-855; E. P. Lyon, "Principles of Curriculum Making," Science, New Series, XXXIX (May 8, 1914), 664.

nothing whatsoever to do with each other. While more courses were added, more hours were demanded; and in some schools students had no choice whatsoever in the courses they took.[33]

Flexner warned medical educators that the prescribed curriculum, overloaded as it was, served only to injure good schools. "The prescribed curriculum," he said, "is a staff upon which those lean who have not strength enough to walk alone."[34] Some time had to be left for electives if students were to develop into responsible people. The overloaded curriculum developed before entrance requirements were raised, and most students had probably needed to be spoon fed. But better students with better minds deserved and needed more freedom. Yet better students encouraged a tendency among teachers to go into more and more detail. There was, teachers argued, so much to teach and so little time in which to teach it. Every possible minute of the student's day was demanded. Time to read, time to think, time to assimilate the mass of information they were given was nowhere to be found.[35] By 1913 the curriculum was stuffed with an indigestible amount of subject matter. Lefevre described

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[33]Foster, "Medical Education as Revealed by the War," 1540-1542; Munson, "The Needs of Medical Education as Revealed by the War," 1050-1055.

[34]Flexner, The Flexner Report, p. 76.

[35]Ibid.; Lefevre, "Some Problems of Medical Education," 847-855.

the effect that this had on the students:

> The effect of the overloaded curriculum on the student is most harmful. He gets a smattering of many things, instead of a thorough grounding in principles. He forms faulty mental habits, early becomes surfeited and loses interest in the work; everything is gauged by examination value; he has no sense of proportion; small details and facts loom large; basic principles are unimportant.[36]

By the time the reform movement had gotten underway, many medical teachers themselves had formed faulty habits, faulty methods, and faulty purposes. They had apparently lost sight of what education was. They were trying to teach their students everything they would ever need to know about medicine in four short years. While individual teachers concentrated on the obscure details of their particular specialties, they failed to instill in their students basic principles they had to have if they were ever to become effective general practitioners. Indirectly, medical teachers influenced their students to take up medical specialties too early in their educational career, and early concentration in specialties necessarily gave students a narrow view of medical science.[37] By 1914 E. P. Lyon, in his presidential address before the Association of American Medical Colleges, was calling for a new philosophy of education among medical teachers.

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[36] Ibid., p. 851.

[37] Ibid., pp. 847-851; Lyon, "Principles of Curriculum Making," 671.

> Our aim should not be to turn out a finished doctor, but a man who will continue to work and learn as long as he lives--a man who will consider that his student life has just begun on the day when he takes his diploma. Our aim should be not to produce a walking encyclopedia, but to inculcate the scientific spirit . . .
> . . . . . .
> Let us broaden our conception of medical education by broadening our conception of education itself. Education is primarily the bringing out of something from within, not the forcing of something in from without. It is the discovery of the individual to himself. It is a process of training, not a process of fattening.[38]

Lyon went on to suggest some principles upon which reasonable curriculums could be built. Basic to all the others was the acceptance of the obvious fact that students were not equal, that they were in few respects alike at all. Since it was impossible to teach everything medical science knew, Lyon called upon teachers to employ restraint and intelligence, supplying the students only those facts and principles and examples that they would find most useful. He told school administrators that they had to reverse their direction in developing their curriculums by requiring as little as possible instead of as much as possible. The bare minimum of information students needed to learn in every course had to be determined, taught intensively, and related to the whole body of medical knowledge. Anything more had to be relegated to the graduate school. Fewer subjects demanding fewer hours would offer the students much more than they were obtaining. Repetition has to be avoided, responsibility

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[38] Ibid., pp. 664-672.

through electives had to be instilled, student research had to be encouraged. In short, students and faculties had to be freed from the tyranny of the overloaded curriculum if medical education was to progress.[39]

Proposals for relieving the curriculum were made year after year. Generally they called for the same kind of revamping that Flexner, Lefevre, and Lyon had--better correlation of the laboratory and clinical branches, the four-quarter system, and stripping courses of excessive detail. Experiments were made, but improvements were slow in coming. By 1920 the situation had grown little, if any, better than it was in 1913 and 1914; and educators began to look suspiciously at the high degree of standardization with its rules and regulations. It was not until after 1925 that any tangible progress was made. But intensified by an ever growing abundance of medical knowledge, the overloaded curriculum was only partially improved by 1932.[40]

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[39] Ibid., pp. 661-672.

[40] Foster, "Medical Education as Revealed by the War," 1540-1542; Munson, "The Needs of Medical Education as Revealed by the War," 1050-1055; Arthur Dean Bevan, "Revision of the Medical Curriculum," Journal of the American Medical Association, LXXX (April 28, 1923), 1187-1191; Samuel P. Capen, "Results of the Work of the Commission on Medical Education," Journal of the American Medical Association, C (April 22, 1933), 1217-1219; Colwell, Report of the Commissioner of Education (1915), pp. 202-205; A. G. Ellis, "The Teaching of Medicine," Journal of the American Medical Association, LXXV (August 7, 1920), 367-369; Frederic S. Lee, Richard M. Pierce, and W. B. Cannon, "Medical Research in its Relation to Medical Schools," Journal of the American Medical Association, LXVIII (April 14, 1917), 1079; Colwell, Medical Education, 1916-1918, Bulletin No. 46, pp. 9-10.

Inseparably bound up with the curriculum problem was the conflict over full-time clinical teaching which implied research and meant resignation from practice. Agitation for the full-time plan had emerged because scientific research often went undone in the clinical branches. Advocates for the full-time plan also believed that its implementation would help relieve the curriculum. The seemingly strange thing about the altercation was the support laboratory teachers gave the plan while clinical teachers objected to it. Perhaps laboratory instructors were better aware from their own experience that full-time teaching and research held great rewards for medical science, education, and practice. By 1914 practically everyone had recognized and accepted full-time positions for laboratory teachers; and they were much more deeply involved in research than were clinical teacher-practitioners. Clinical teacher-practitioners objected to the full-time plan for a number of reasons, but primarily because they did not want to make financial and professional sacrifices full-time teaching demanded.[41]

The conflict arose in 1913 when Flexner, who was then director of the General Education Board, gave the Johns

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[41]U. S. Bureau of Education, "Progress of the Year in Medical Education," by N. P. Colwell in Report of the Commissioner of Education (1914), Vol. 1 (Washington: Government Printing Office, 1915), pp. 213-215; Major G. Seelig, "Some Falacies in the Arguments Against Full-Time Clinical Instruction," Science, New Series, XLI (April 23, 1915), 5940595.

Hopkins Medical School one and a half million dollars to employ full-time directors for its clinical departments. Flexner stipulated that the men hired could engage in private practice as much as they pleased so long as they surrendered all proceeds from such practice to the university. Obviously, Flexner's intention was that the directors engage in a minimum of practice. He hoped they would devote themselves to medical research. Clinical teachers, believing the AMA would ultimately make full-time teaching a requirement, formulated a number of reasons why the plan was dangerous to medical education.[42]

Generally, clinical teachers based their objectives on three conclusions. First, they believed that they would have to choose between teaching or practice. Although one writer said no one wanted that, Flexner and others probably did. Clinical teachers also contended that there was a different principle behind clinical and laboratory science and that a good clinical teacher had to be a practicing physician, implying that practice was their contribution to medical research. This, too, was denied. Since both sides of the medical course necessitated the teaching of fundamental truths, both sides necessitated searching for those truths. In other words, the medical course had to be permeated with

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[42]The New York Times, October 25, 1913, p. 12; Colwell, "Progress of the Year in Medical Education," p. 213.

the scientific spirit and based upon medical research. Advocates for research and the full-time plan accused clinical instructors of teaching their students to know rather than to think, primarily because the teachers themselves were more concerned with knowing than they were with thinking. Maintaining such a position was considered dangerous to the students and to medical science because it led to the conclusion that all a physician had to have were the facts of medicine. This meant that medicine should remain static, content to live with things as they were, and that medical research was hardly more than an expensive luxury which had little relative value. Finally, teacher-practitioners argued that advocates for full-time teaching were trying to make everyone think that teaching and research were in some way superior to practice. This, of course, was approaching the ridiculous. There was no ethical difference between the two. The difference rested in what offered the best education; the demands of teaching and the demands of practice were such that one man could not do both adequately at the same time. Good teaching depended on research and demanded all the time anyone could give.[43] Those who argued for more research knew that it was, as Colwell put it in

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[43]Seelig, "Some Fallacies in the Arguments Against Full-Time Clinical Instruction," 595-596; Lee, et. al., "Medical Research in Its Relation to Medical Schools," 1078-1079.

1913, "the very soul of medical education . . . ."[44] They believed that medical schools should be the supreme leaders in medical science, and that the medical school, like the university, had a larger function than just education. For them, medical schools existed for the purpose of extending medical science into new realms just as much as it existed for teaching what was already known. They believed that the medical profession was morally obligated to find new ways to combat disease and to relieve suffering. Without research, that obligation could never be satisfied. By 1920, however, the movement for full-time teaching had advanced but slowly except in those schools where the General Education Board had financed it.[45]

While the conflict over full-time teaching and research was going on, most medical educators cooperated in trying to develop clinical internships that would contribute to proficiency in medical practice. By 1911 school administrators were aware that clinical instruction was not sufficient to train students thoroughly in the practical aspects of medicine.[46] They did not have ample opportunity to work with

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[44]Colwell, "Progress in Medical Education," p. 144.

[45]Lee, Pierce, and Cannon, "Medical Research in Its Relation to Medical Schools," 1076-1079; Colwell, Medical Education, 1918-1920, Bulletin No. 15, pp. 7-8.

[46]Samuel W. Lambert, "Development of a Fifth Year in Medical Education in the United States," Journal of the American Medical Association, LXVI (February 19, 1916), 545.

patients. Moreover, students had obviously recognized this weakness themselves because many of them were already competing eagerly for internships all over the country. By 1914 almost eighty percent of the students were volunteering for internships, while only five schools and the State Board of Medical Examiners in Pennsylvania had made interning a requirement.[47]

Yet the Council on Medical Education hesitated to give credit for internships or to establish a requirement for them because they were known to be less than satisfactory in most cases.[48] Generally, before 1920 the interns' duties were hardly more than those of a good janitor. They were not given advanced studies; supervision was lacking or disorganized; guidance and instruction, if any, were unsystematic. But most condemning of all was the fact that hospital authorities and not medical school administrators controlled most of the internships. Their educational value was, therefore, subject

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[47]U. S. Bureau of Education, Report of the Commissioner of Education (1911), Vol. II (Washington: Government Printing Office, 1912), p. 1051; Colwell, "Progress of the Year in Medical Education," p. 216; Lefevre, "Some Problems of Medical Education," 856.

[48]Council on Medical Education, "Medical Colleges of the United States: Annual Presentation of Educational Data by the Council on Medical Education," Journal of the American Medical Association, LXIII (August 22, 1914), 675; Johnson, "The Council on Medical Education and Hospitals," 899; Lambert, "Development of a Fifth Year in Medical Education in the United States," 545; James Ewing, "The Hospital Intern Year as a Requirement for Medical Licensure," Journal of the American Medical Association, LXV (August 21, 1915), 671.

to enormous doubt, especially when the Council considered the deplorable conditions that existed in most of the hospitals. They were not organized for educational purposes; laboratories, maternity wards, children's clinics--the whole hospital was deficient; and many hospital authorities resisted overtures to raise money with which to improve their institutions.[49] By 1920 hospitals had improved in few respects, but the war had demonstrated the immediate necessity for developing constructive internships. The AMA recognized its responsibility and decided to take aggressive action. It expanded the duties of the Council on Medical Education to include investigating hospitals not only to determine which ones were acceptable for interning students, but also to suggest ways and means whereby all of them might be improved. The Council's name was changed to the Council on Medical Education and Hospitals to signify its expanded responsibilities.[50] Thus the reform movement moved into a whole new area of providing better medical services through improved hospital facilities.

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[49] Ibid.; Lambert, "Development of a Fifth Year in Medical Education in the United States," 546; Baldy, "Medical Education in the United States," 550.

[50] Colwell, Medical Education, 1918-1920, Bulletin No. 15, p. 10; Foster, "Medical Education as Revealed by the War," 1541; John Milton Dodson, "The Fifth, or Intern, Year," Journal of the American Medical Association, LXXIII (August 16, 1919), 469-472; Horace D. Arnold, "Medical Education, Interns, and War," Journal of the American Medical Association, LXX (February 16, 1918), 452-453.

When the Council on Medical Education was given the responsibility to reform hospitals, it was well aware of the enormous sums of money that had already been given to reform medical education. By 1920 philanthropists had donated and state legislatures had appropriated millions of dollars to improve medical schools.[51] Between 1910 and 1921 John D. Rockefeller alone gave forty-five million dollars to medical schools.[52] By 1916 the public averaged paying three hundred dollars each year toward the education of one physician.[53] Medical research received its fair share also. That year alone medical research received almost four million dollars.[54] The financial needs of medical education, publicized by The Flexner Report, were being met by the people; and it was obvious that they were as anxious to reform medical education as were members of the medical profession. After 1910, while Flexner worked through the Carnegie Foundation and later the General Education Board to obtain money for medical education,

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[51]Council on Medical Education, "Medical Colleges of the United States: Annual Presentation of Educational Data by the Council on Medical Education," Journal of the American Medical Association, LXI (August 23, 1913), 569-597; Council on Medical Education, "Medical Colleges of the United States," (1914), 682; U. S. Bureau of Education, Report of the Commissioner of Education (1911), p. 1052.

[52]Flexner, Funds and Foundations, pp. 55-56.

[53]Bardeen, "Aims, Methods and Results in Medical Education," 367.

[54]U. S. Bureau of Education, "Medical Education," by N. P. Colwell in Report of the Commissioner of Education (1916), Vol. I (Washington: Government Printing Office, 1916), p. 189.

newspapers and periodicals stimulated the public with their advertisements of the needs of medical schools. In 1911, for example, World's Work said that a million dollars given to medical education would do more good to make a better world than anything else.[55] The Nation encouraged benefactions by saying that elevating medical schools depended on large sums of money.[56] The New York Times supported individual schools when they embarked on fund raising campaigns.[57]

Donations from the Carnegie Foundation and the General Education Board often produced cries from school administrators whose schools were passed over that the rich and the powerful were trying to destroy sectarianism in American education. Flexner was accused of favoritism, and there were accusations that the huge sums of money were systematically placed with the intention of destroying the poorer schools.[58] Although the demise of impoverished schools was in effect the result, those schools were ignored because they were

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[55]"Do You Know Where Your Doctor Was Trained?" The World's Work, XXII (June, 1911), 14441-14442.

[56]"Medical Progress," The Nation, XCVII (November 20, 1913), 474-475.

[57]The New York Times, July 17, 1919, p. 3; March 1, 1920, p. 15; March 6, 1920, p. 19; April 4, 1920, p. 7; July 20, 1919, p. III-2.

[58]"$20,000,000 to Improve Our Doctors," Literary Digest, LXVIII (October 18, 1919), 15; The New York Times, June 4, 1913, p. 10.

scientifically, administratively, and academically impoverished, not because they had little money.

Yet it took more than money to elevate medical education and to force inferior schools from the field. When The Flexner Report was published, public agitation for improvements precipitated state action for better control of medical education and practice. State medical organizations insisted on legal protection for the medical profession and for the health of the people. Thus in 1911 state legislatures all over the country considered legislation related to the practice and to the teaching of medicine. At the same time, State Boards of Medical Examiners moved to clean their own house, for Flexner had been none too kind to them.[59]

Flexner thought that State Boards were the instruments through which reform in medical education had to be effected. State Boards, being the licensing bodies for the profession, possessed the only legal power that was needed. State Boards sat as judge over the medical schools and, ultimately, over the medical profession. They had the power to enforce preliminary education; they could determine the fitness of schools to teach medicine; they could refuse licenses to practice. State Boards could enforce entrance requirements

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[59]Borden, "The Trend of Medical Education in the United States," 2-4; U. S. Bureau of Education, Report of the Commissioner of Education (1911), p. 1050; Baldy, "Medical Education in the United States," 548; John Howland, "Medical Education," Science, New Series, XXXII (August 12, 1910), 206; Woolley, "Premedical Education," 744.

simply by refusing to accept credits for medical courses taken before the requirements were satisfied. A proper examination would reveal not only the abilities of students but also the proficiency of schools in teaching medicine.[60] Flexner's point was that "an enforced entrance requirement at one end and a proper examination at the other will of themselves limit the survival of schools to those that are financially and educationally competent."[61]

Flexner thought the licensing examination was the best tool for ridding the country of inferior schools and incompetent doctors. The "power to examine," he wrote, "is the power to destroy."[62] In 1909 and years thereafter, however, examinations left much to be desired. Being written examinations, they demanded little more than memory. Some teachers were not above helping their students cheat. Flexner and many others were convinced that practical examinations would serve much better. Indeed, Flexner was so sure they would that he said, "if thorough practical examinations were instituted, all the other perplexing details we have discussed would become relatively immaterial."[63]

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[60]Flexner, The Flexner Report, p. 167.

[61]Ibid., p. 169.

[62]Ibid.

[63]Ibid.

Flexner discovered several causes for the ineffective condition in which he found most State Boards. In some states, more than one Board existed and the various medical sects determined their own licensing qualifications. In others, state laws were written so the Boards could not enforce their decisions if bad schools disliked them. Where laws were good, State Boards excused themselves by pointing to public apathy or to the political influence of medical schools. Still in other states, positions on State Boards were considered the spoils of politics. Obviously, to be of any value, State Boards had to be independent and in command of enough money and power to enforce their decisions.[64]

Reforming the State Boards, however, proved to be little easier than reforming medical education. State legislators tried to cooperate, but they found themselves caught in a dilemma. On the one hand, the medical profession represented by the AMA wanted only one State Board in each state empowered to license healers regardless of what they called themselves. This simply meant that the AMA wanted the state governments to endorse the educational standards it had set for itself; that is, all healers should possess a fundamental knowledge of medical science. The AMA contended that anyone who attempted to cure disease had to know how to diagnose illness. Without a scientific education, attempting to cure disease

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[64] Ibid., pp. 169-172.

was ridiculous, impossible, and deadly. On the other hand, sectarian medical cults disclaimed the assertion that they were healers in the usual sense because they did not employ drugs. Thus they demanded and usually got their own State Boards. Multiple State Boards continued to exist after 1910, and the AMA claimed that their existence retarded the elevation of standards in the states that permitted them.[65] In 1910 forty-nine states and territories had eighty-two different boards.[66] In 1918 the number had grown to ninety-four. Only twenty states had a single board, while Arkansas had six and several states had two or three.[67]

Although multiple State Boards made it more difficult to raise education standards, between 1910 and 1920 states worked toward guaranteeing that those who practiced medicine had adequate educations. State Boards associated with the AMA supported the Council on Medical Education in elevating standards and in some cases went ahead of the Council, particularly in the matter of requiring internships.[68] With

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[65] Ibid., p. 172; Colwell, Medical Education, 1916-1918, Bulletin No. 46, p. 16.

[66] Flexner, The Flexner Report, p. 172.

[67] Colwell, Medical Education, 1916-1918, Bulletin No. 46, p. 16.

[68] Ibid., pp. 14-18; Colwell, "Progress of the Year in Medical Education," p. 206; Colwell, Medical Education, 1918-1920, Bulletin No. 15, pp. 13-14; "State Support of Medical Education," Science, New Series, XXXIV (August 11, 1911), 183-184.

the establishment of the National Board of Medical Examiners in 1915, the feasibility of practical licensing examinations was demonstrated to the Boards. Between 1916 and 1918, the National Board examined ninety-three applicants from the best schools. Seventy-two passed and twenty-one failed. These examinations, made at bedside, demanded that the student demonstrate his knowledge of medical science by applying it in diagnosing disease and suggesting methods for its cure. These examinations demonstrated beyond any doubt which examinees were proficient medical scientists and which were not. The high percentage of failures--thirty-three--was an indication that medical education was not all it should have been, but few people could agree on what was actually wrong with the schools.[69]

Medical educators, busy at reform and proud of their accomplishments in 1917, failed sufficiently to consider the weaknesses that still existed in most medical schools and how far from the ideal of medical practice most graduates really were. Thus was their disappointment when the war came. During the war twenty-eight hundred physicians had to be sent to medical training camps because they were unable to perform their duties effectively. In 1919 Nellis B. Foster of the Army Medical Corps denied that physicians licensed after 1909

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[69]Johnson, "The Council on Medical Education and Hospitals," p. 915; Colwell, Medical Education, 1916-1918, Bulletin No. 46, pp. 17-18.

were any better than earlier doctors. Foster found that young doctors were incapable of directing hospital departments.[70] Throughout the war, the average physician demonstrated that he knew very little about "preventive medicine, hygiene and sanitation . . . ."[71] He did not know how to give a good physical examination and was, therefore, unable to make an accurate diagnosis. Incompetence in these fundamental areas simply pointed out what pre-war medical examinations had hinted; namely, that both sides of the medical course were still a long way from giving the student the fundamental principles and the general information he had to have to become a good physician. Students needed better instruction in the medical sciences and more practice with patients in the clinical departments. At the same time, they needed time of their own in which to think about their studies and to assimilate their learning.[72]

Nevertheless, by 1920 medical educators had solved a number of massive physical problems. The number of schools and students had been reduced substantially; educational

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[70]Arnold, "Effect of the War on Medical Education," 466; The New York Times, April 6, 1920, p. 11; Foster, "Medical Education as Revealed by the War," 1540.

[71]Munson, "The Needs of Medical Education as Revealed by the War," p. 1055.

[72]Ibid.; Colwell, Medical Education, 1918-1920, Bulletin No. 15, p. 5; Arnold, "Effect of the War on Medical Education," 466; Foster, "Medical Education as Revealed by the War," 1541.

standards had been raised; enormous sums of money had been attracted; classrooms, laboratories, dispensaries, and a few hospitals had been built; the education offered was scientifically and academically superior to what had obtained before because all of the medical schools were integral parts of established universities. None of the schools were as good as they would be, but none were as bad as they had been.

Yet medical educators faced new and, in some ways, more perplexing problems because they dealt with time, content, and method. Since they were more complex, they proved to be more difficult to solve. Proper clinical internships required reforming the hospitals. Full-time teaching in clinical departments demanded the training of a new breed of teacher, while much of value in the old breed would be lost because many of them were unwilling to sacrifice in order to teach. Revising the curriculum entailed determining how much time to give each area of medical science, sifting through all of medical knowledge to determine the bare minimum the general practitioner had to have. The organization of the medical school had to be refined so that the two branches of medical study could be correlated into one smoothly working organism. Teaching methods had to become much less detailed and less specialized, because the medical schools were not producing good general practitioners.

All of this led medical educators to look suspiciously at the high degree of standardization they had achieved.

Although they understood better than anyone else the necessity for high standards, they were beginning to feel imprisoned by the wall of protection they had themselves devised. While they groped for ways to relieve their plight, their fear that something could happen to destroy their good works made them cautious. Tampering with what they had achieved came slowly. They were unhappy with the kind of doctor they were producing, and they were their own most severe critics. They knew they could do better; and they knew, basically, what changes had to be made. Their biggest problem was determining priorities and devising methods which would achieve the results they sought without jeopardizing the successes they had already made.

As discouraging and as perplexing as their problems were, medical educators faced them squarely. It was impossible to obtain a consensus of opinion on any matter before 1932, and disagreements abounded. But in 1920 most medical educators seem to have felt as John Howland felt in 1910. "Imperfectly and unevenly as usual, with imperceptible gradations between the apparent stages, and against sincere and insincere opposition, progress will come."[73]

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[72]Howland, "Medical Education," 208.

CHAPTER V

TOWARD MORE EFFECTIVE MEDICAL EDUCATION

The problems that emerged as the reform movement progressed after 1910 continued in the main unabated between 1920 and 1932. While some argued that American medical practitioners were generally incompetent,[1] Colwell contended that the advances medical schools had made in the two decades preceding 1922 had "been so extensive as to be almost sensational."[2] However, as true as Colwell's statement was, Flexner hesitated to compliment medical education in 1924. He said, "America has accomplished what at first sight looks like a transformation."[3] Yet Flexner and others saw that the problems medical educators faced after 1920 had proven to be extremely obstinate and that medical schools were not producing the kind of physicians modern medical science demanded. Discovering workable solutions before 1925 seemed

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[1]Edward H. Oschner, "The Need of More Well-Trained Practitioners of Medicine," Science, New Series, LXII (December 25, 1925), 574; J. A. Witherspoon, "Medical Education: Past, Present, and Future," Journal of the American Medical Association, LXXX (April 28, 1923), 1191.

[2]U. S. Bureau of Education, Medical Education, 1920-1922, by N. P. Colwell, Bulletin No. 18, Washington: Government Printing Office, 1923, p. 4.

[3]Abraham Flexner, "Medical Education, 1909-1924," Journal of the American Medical Association, LXXXII (March 15, 1924), 834.

an impossibility. While the curriculum remained rigid, teaching methods continued to be unsatisfactory. Teachers persisted in emphasizing minute details at the expense of general principles. Teacher-practitioners dominated the clinical faculties, and the conflict over full-time clinical teaching grew more bitter. While correlation between the laboratory and clinical subjects became even more difficult, students continued to rush pell-mell into specialties until by 1925 it appeared that the general practitioner, the old-time family doctor, was slowly but surely becoming a relic of the past.[4]

By the middle of the decade, the closing of schools, the education of fewer physicians, the growth of specializing, and the refusal of young doctors to locate in rural communities created an acute maldistribution of medical care. Many rural communities found themselves with either an old,

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[4]Ibid., p. 837; Oschner, "The Need of More Well-Trained Practitioners of Medicine," 573-574; Witherspoon, "Medical Education: Past, Present, and Future," 1192; Colwell, Medical Education, 1920-1922, Bulletin No. 18, pp. 4-8; Harvey Cushing, "Clinical Teachers and the Curriculum," School Life, IX (April, 1924), 169; Council on Medical Education and Hospitals, "Medical Education in the United States," Journal of the American Medical Association, LXXXIX (August 20, 1927), 623; Council on Medical Education and Hospitals, "Report of the Committee on Medical Education," Journal of the American Medical Association, LXVI (August 11, 1921), 1672; William C. Clarke, "Analysis of Methods in Modern Medical Education," Journal of the American Medical Association, LXXX (April 28, 1923), 1195-1196; Arthur Dean Bevan, "Revision of the Medical Curriculum," Journal of the American Medical Association, LXXX (April 28, 1923), 1187-1191; R. Lyman Wilbur, "Saving Time in Medical School," Journal of the American Medical Association, LXXXIII (May 15, 1926), 1498.

ill-trained doctor or none at all. The people who lived in those communities naturally blamed their suffering on what they thought had caused it, the reform movement itself. They believed that the constant demands for fewer schools and fewer students had caused a shortage of physicians in the United States and that they suffered while the cities did not.[5] Bevan's insistence in 1921 that more schools be closed and Colwell's contention that the ratio of physicians to the population was still grossly out of proportion helped matters not at all. When it was pointed out to the people who lived in rural communities that the war and new positions of responsibility in hospitals, medical schools, and public health departments required many physicians, they were not pacified. It mattered little to them what the causes were or whether the problem was called a shortage of doctors or a maldistribution of medical care, the fact remained that many of them were without physicians. The people living in the countryside struck out at medical education and demanded that more schools be opened and that more students be admitted. By 1925 their demands for more and better doctors threatened to undermine the advances medical schools had made in several states. While one state legislature had already lowered its

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[5]U. S. Bureau of Education, Medical Education, 1922-1924, by N. P. Colwell, Bulletin No. 31, Washington: Government Printing Office, 1925, pp. 12-14; Henry S. Pritchett, "The Relation of Medical Education to Medical Progress," New York Medical Journal, CXV (January 4, 1922), 5; Johnson, "The Council on Medical Education," pp. 901-902.

state's standards of medical education, several others considered doing the same thing in the hope of luring even inferior physicians into the countryside.[6]

The threat to educational standards and the obstinancy of the problems already existing made it obvious to medical educators that something had to be done. In 1924 the Association of American Medical Colleges, supported by the AMA and the Federation of State Boards, organized the Commission on Medical Education and instructed it to determine, first, the general principles upon which medical education should be conducted and, second, how medical care might be fairly distributed throughout American society.[7]

In 1932 when the Commission completed its work, although it had spent many hours of its time and several pages of its report explaining how in the distant future medical care might be afforded fairly to all, the maldistribution of medical care remained the most serious problem with which the medical profession had to contend. The Commission pointed out

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[6]Council on Medical Education and Hospitals, "Report of the Council on Medical Education and Hospitals," (1921), 1674; U. S. Bureau of Education, Medical Education, 1924-1926, by N. P. Colwell, Bulletin No. 9, Washington: Government Printing Office, 1927, p. 4; Colwell, Medical Education, 1916-1918, Bulletin No. 46, p. 10; Colwell, Medical Education, 1918-1920, Bulletin No. 15, pp. 10-11; "Medical Education and the Supply of Rural Physicians," School and Society, XXI (February 7, 1925), 168-169.

[7]U. S. Bureau of Education, Medical Education, 1926-1928, by N. P. Colwell, Bulletin No. 10, Washington: Government Printing Office, 1929, p. 14; Commission on Medical Education, Final Report, pp. 1-3.

that a solution to the problem was aggravated by economic, social, educational, and professional considerations that free doctors had the right to live by. The salient point was that rural communities offered what young physicians considered an inferior and unsatisfying way of life.[8] "All recent studies of the question," the Commission wrote, "agree that the greater opportunities in the cities for financial rewards and better opportunities for practice are the outstanding causes of the tendency of physicians to locate in the cities."[9] Medical schools added to the problem because their training tended to make physicians overly dependent on laboratories and hospitals. The solution to the problem depended in part upon training physicians to be confident of their own abilities and on sound organization of everyone who worked in the field of health so that county or district medical centers could be developed. The solution was obviously neither easy nor close at hand, particularly when the economic condition of the nation in 1932 was considered. Nevertheless, the Commission argued that destroying the independent medical profession or lowering educational standards would aggravate rather than alleviate any of the difficulties. Where those things had been tried, particularly in Austria, they had failed. Ultimately, the people in the rural

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[8] Ibid., pp. 107-108, 114-116.

[9] Ibid., p. 113.

communities would have to continue to do what they had been doing for years; namely, go to the city for medical care. Improvements in communications tended to make such travel less and less difficult.[10]

While there appeared to be no immediate solution to the maldistribution of medical care, the Commission emphasized that there was an excess of 25,000 physicians in the United States. The Commission calculated that good medical care, properly distributed, could be given by one physician to every 1,200 people. In the United States, the ratio was one to less than eight hundred. The Commission contended, as many had before, that too many physicians, even when there was maldistribution, endangered the quality of medical care everyone received and threatened to raise the cost through duplication of services.[11]

Thus by 1932 medical educators were made aware that they were again caught in a dilemma. On the one hand, they needed to reduce the number of students while rural communities clamored for more doctors and, on the other, they had to improve their educational programs so that physicians would feel confident enough to locate where there was little or none of the paraphernalia they had learned to depend on. The Commission admitted that it was beyond the duty of the

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[10] Ibid., pp. 18-19, 104-112.

[11] Ibid., pp. 64-65, 89-103.

medical schools to force young doctors into rural areas, but there was much teachers could do to alter their courses and their methods so that they could instill self-reliance in their students. The Commission had pointed them in this direction in 1925.[12]

Between its creation in 1924 and its first meeting in October, 1925, the Commission discovered that medical schools were unable to make any improvements in their educational programs because they were burdened with excessive external control over the details of the medical course. The AMA, the Association of American Medical Colleges, and the various state licensing bodies had, in the process of eliminating commercialism from medical education, developed such strict regulations that the program of medical education in all of the schools was dictated. Rigid regulation enslaved medical school administrators and only the associations and the State Boards could free them. While they had to abide by the dictates of the regulating agencies, they were at the same time responsible to stay abreast of new developments in medical science. They could neither remove useless subject matter from the curriculum nor ignore new medical knowledge. Thus the continuance of strict regulation after it was unnecessary contributed directly to the rigidity of the

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[12]Ibid., p. 177.

curriculum and to the subsequent failure of medical schools to perform satisfactorily.[13]

In order to relieve the situation, the Commission suggested that the Association of American Medical Colleges and the Federation of State Boards permit "any member of the Association . . . [to] experiment with medical education without penalty to its graduates."[14] In effect, this freed the medical schools from the regulations under which they suffered. Revision of the curriculum began immediately in some schools. The more technical courses were transferred to graduate departments; instruction improved; and students were afforded more time to read, to think, and to assimilate what they were learning. Students were offered more opportunities to develop their own diagnoses, while the laboratory and clinical branches were able to correlate some of their instruction. By 1929 the value of freeing medical schools from rigid control so that they could develop their own programs was recognized, and in 1930 the Federation of State Boards made the Association of American Medical Colleges the sole standardizing agency for medical schools. Thereafter, medical schools, through their own association, could determine the character and the content of the medical course.[15]

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[13] Ibid., pp. 1-6, 165-166.

[14] Ibid., p. 4.

[15] Colwell, Medical Education, 1924-1926, Bulletin No. 9, pp. 5-9; Commission on Medical Education, Final Report, pp. 166-167.

This did not mean, of course, that State Boards divorced themselves from medical education. It did mean that medical schools were given greater responsibility in providing medical education that could attempt to keep pace with medical science and in determining who was capable of practicing medicine. The State Boards retained their power to determine the fitness of medical schools to teach medicine and to live up to their new responsibility of having the primary voice in the licensing of physicians. At the same time, State Boards held the ultimate power over medical practitioners. They could discipline those who failed to live up to their expectations by revoking their licenses to practice.[16]

Had the Commission done nothing but free medical schools from excessive regulation, its work would have been a success. But it went further and elaborated the principles upon which sound medical education had to be based. While the Commission discussed research, clinical facilities, administration, staff organization, and finance only incidentally and only to the extent that they affected the education of medical students, it dealt primarily with the principles involved in the education the students received. Fundamentally, the principles involved changing the point of view medical educators had toward their profession. At the same time, the principles aimed at making medical education into a responsible and

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[16] Ibid., pp. 167-170.

competent university discipline worthy of its new freedom. Since most of the principles the Commission enumerated had been discussed from the beginning of the reform movement by various medical educators in articles and speeches, the Commission's work was essentially a matter of sifting, organizing, and assimilating ideas, discussing them in detail and putting them in their proper perspective.[17]

All of this necessitated another evaluation of the defects in medical education. Basically the Commission discovered what had been enumerated by many others. From premedical education through internship, teachers tended to emphasize minute details at the expense of general principles. Throughout the medical course, the underlying philosophy of the scientific method, the most important aspect of the physician's training, was ignored. The result was that students became mentally dependent on what they could remember rather than intellectually independent so that they could make accurate diagnoses, confident that they were correct.[18]

The Commission emphasized throughout the report that the only purpose of the undergraduate medical course was the training of confident, competent general practitioners. For the doctor to be competent and confident meant that the

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[17] Ibid., p. 6.

[18] Ibid., pp. 174-177.

medical course had to teach him the basic medical sciences, not to the saturation point, but generally, so that he could learn the structure, function, and behavior of the human body in health and sickness. He had to know the causes and the cures of a wide variety of diseases which he would meet in practice, not those which were rare and exotic. Finally, the undergraduate medical student had to be taught what his responsibilities were to the community he served. Since it was impossible for the medical school to teach everything medical science knew in four years and since it was even less likely that any student could memorize it all, the medical school had to teach the student how to think scientifically and how to learn on his own from books and experience. When medical schools did that, the Commission argued, they would produce good general practitioners with the ability to enter actively into practice or to go on to more specialized instruction in the graduate school. Anything that did not contribute directly to a general course in medicine dedicated to the production of general practitioners was superfluous, a waste of time and money, and had to be relegated to graduate courses in medicine.[19]

All of this meant that in the future the emphasis on medical education had to change from completing course requirements to the acquisition of knowledge and the ability to think.

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[19] Ibid., pp. 141-149, 177-277.

Even though a student might complete a course having acquired the minimum information needed to pass, if he remained weak in that area, further work had to be required of him.[20] "There is less confidence now than formerly," the Commission said, "in the sequential significance of subjects and more in the ability and attitude of the individual student . . . ."[21] The point was that medical education had to be directed at the student's weakest areas and that involved much more than his completion of a specific series of courses.[22]

While freeing the medical schools from excessive control was the most important step toward achieving good, general medical education, teachers had to learn to correlate their courses. Without correlation of the laboratory and clinical branches, students would never learn the essential relationships that existed between the medical sciences and their application. Correlation meant inter-departmental cooperation of the highest order. It involved conferences, examinations, and instruction which demonstrated the interdependence of all the medical sciences. Correlation would insure that the students learned that the human body with all of its parts and all of its diseases and cures was one unique whole. Correlation thus became essential, because

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[20] Ibid., pp. 229-230.

[21] Ibid., p. 230.

[22] Ibid., pp. 229-230.

only through it could students learn that they were responsible for the health of a man, a woman, or a child and not just for the bladder, the heart, or the lung. In the end, teachers would have to teach themselves that principle before they could properly teach medicine.[23]

While the Commission repeated much that had been said previously about teachers and teaching methods, it assumed a neutral position regarding the conflict over full-time teaching in clinical departments. It did emphasize, however, that certain practices in the hiring of teachers needed to be altered. Many medical administrators based their selection of teachers too much on the latter's desire to engage in research and not enough on their abilities and aspirations to become experts in the art of teaching. Teachers who knew their subjects, who could inspire their students to learn them well, were considered the most valuable assets medical schools could obtain whether those teachers engaged in research or not.[24] Also, the practice of employing teachers who knew nothing about the daily practice of medicine was criticized. The reason for this criticism was because it made it difficult to alter the tendency of schools to emphasize rare diseases. Teachers who were concerned with teaching

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[23]Ibid., pp. 189-213.

[24]Ibid., pp. 244-245.

the daily coughs and headaches most patients had were necessary, if general practitioners were ever to be produced.[25]

By 1932 many of the problems medical educators had to contend with were approaching solutions. The Commission had contributed to a change of view among medical educators and had created a new atmosphere in which they could work out their remaining difficulties. Many schools still operated under serious handicaps in regard to teachers, finances, and teaching plants; but at least they were free to develop along university lines. A new program of medical education could be developed, a program based primarily upon personal contact between student, patient, and teacher. The new program was stimulated to perfection by conferences, reading periods, independent study, and more time for electives. The reform of medical education thus entered its final stage, a stage in which it was destined to become a scientifically based, intellectually responsive university discipline.[26]

When medical educators, like other Americans at the turn of the century, looked at their institutions and found them wanting, they worked long and hard to set them aright. By 1933 they had done their work so well that Capen could say, "No other phase of American education has ever been so drastically reformed in so short a time as was medical

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[25] Ibid., p. 114.

[26] Ibid., pp. 1-2, 246.

education."[27] He gave the Council on Medical Education and Hospitals most of the credit. Yet he lamented that all the Council had precipitated was not good. While the standards it established became law in some states, they became inviolable rules and regulations everywhere and schools dared not ignore them. By 1920 medical schools were imprisoned by detailed, obsolete requirements which made it impossible for them to change with developments in medical science and in educational techniques.[28] At the same time, the Council led the American university system "into the wilderness of standardization and regulation . . ."[29] out of which the universities, like the medical schools, found it extremely difficult to extricate themselves.

Even so, few could deny that in some respects universities were better for the experience. As medical schools demanded and received more and more money and made more and more improvements, other departments of the universities were compelled to do the same thing so that they would not suffer in comparison to medical schools. The progressive spirit swelled up in the medical profession and overflowed into

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[27]Samuel P. Capen, "Results of the Work of the Commission on Medical Education," Journal of the American Medical Association, C (April 22, 1933), 1217.

[28]Ibid., pp. 1217-1219.

[29]Ibid., p. 1219.

general education, perhaps hampering the universities for a time, but resulting in basic improvements.[30]

Many men, most of them members of the medical profession, were responsible for the changes; and, like other progressives, they depended completely upon the power of the public will. They believed in progress or, as Richard Hofstadter put it, activism. They believed that the evils of medical education would not remedy themselves, that "it was wrong to sit by passively and wait for time to take care of them."[31] If anything were ever to be done about medical education, they believed they had to make it happen and that state governments were duty bound to help them. They were optimistic always and never faltered in their conviction that what they were doing was right and good and aimed at building a better tomorrow. They were neither afraid of making mistakes nor of criticizing their own ideas when they proved unworkable.[32]

Flexner played the most dramatic role in the reform movement. Although his corrective principles were in some respects fallacious, his report aroused public indignation over the despicable conditions that existed in medical schools in particular and in the medical profession in general.[33]

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[30] Ibid., p. 1218.

[31] Richard Hofstadter, editor, The Progressive Movement, 1900-1915 (Englewood Cliffs, N. J., 1963), p. 4.

[32] Ibid., pp. 4-6.

[33] Colwell, Medical Education, 1916-1918, Bulletin No.

More than one medical educator gave The Flexner Report credit for instituting massive reforms.[34] In 1916 Baldy said that the report stimulated such rapid improvements in medical education that had they been predicted they "would have been considered the fancies of a madman."[35] In some respects, then, the report may be considered muckraking because it did make people angry and it did make them demand that something be done. The tone of the report was pious, and Flexner appeared to be insulted and embarrassed by the fact that American medical education was in such a deplorable condition. In other respects, however, the report may be considered valid criticism of the highest order. Many of the schools were academic garbage heaps which in effect sold licenses to practice medicine. Moreover, throughout the report, inferior schools were encouraged to emulate the best schools. There was more to the report than just a sordid description of sorry medical schools; it incorporated ways and means whereby the public and the profession might improve the schools.

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[34]Ibid.; Lambert, "Development of a Fifth Year in Medical Education in the United States," 545; Welch, "Medical Education in the United States," 891; Norman Walker, "Some Comments on Medical Education, Legislation and Practice in the United States," Edinburg Medical Journal, New Series, XXVI (January, 1921), 23; Commission on Medical Education, Final Report, p. 11; "Medical Education: Progress of Twenty-Four Years," Journal of the American Medical Association, LXXXIII (August 16, 1924), 533; Baldy, "Medical Education in the United States," 548.

[35]Ibid.

Yet while the report was or was not muckraking literature is open to debate, it would be difficult indeed to classify any of the medical school reformers--Bevan, Barker, Colwell, Flexner, Pritchett, and many others--muckrakers. None of them can be easily made a part of the "lunatic fringe" which muckraking implies.[36] Most of them spent several years working for improved medical schools and for better trained physicians. They were not here today and gone tomorrow. In 1910 Pritchett said that although men without honor had invaded the medical schools and the medical profession, no group of men deserved the admiration and support of the public more than did conscientious medical educators and practitioners. They worked for the benefit of the public and not for the benefit of their own ambitions. The Commission on Medical Education, composed primarily of non-medical men, said much the same thing.[37]

However, like other progressives, when the First World War ended and the new decade began, the reformers of medical education were tired and frustrated. New ideas were more difficult to implement. Reform waned for a time. By 1932 the depression had struck as hard at medical education as it had at other fields of endeavor. Medical school appropriations

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[36]George E. Mowry, The Era of Theodore Roosevelt and the Birth of Modern America, 1900-1912, (New York, 1958), p. 207.

[37]Flexner, The Flexner Report, Pritchett's Introduction, p. xiv; Commission on Medical Education, Final Report, p. 152.

were cut and several medical educators were dismissed, while many others had their salaries reduced. Still, 1932 was in at least one respect a better year for them than for many others. The Commission on Medical Education had opened new avenues for reform, thus giving them at least some hope for a brighter future. The Commission had taken the position that the development of medical education was ever changing and innovative and that its improvement could never end, at least not until scientists ceased to probe for the answers to the mysteries of man's being.[38]

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[38]Hofstadter, The Progressive Movement, pp. 4-6; Capen, "Results of the Work of the Commission on Medical Education," 1219; Council on Medical Education and Hospitals, "Medical Education in the United States and Canada: Annual Presentation of Educational Data for 1932-1933 by the Council on Medical Education and Hospitals," Journal of the American Medical Association, CI (August 26, 1933), 678; Hans Zinsser, "Relationship of the Fundamental Laboratories to Clinical Teaching," Journal of the American Medical Association, XCII (April 27, 1929), 1399.

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