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Throughout Volume One continued support for biomedical research is never at issue; but it is quite otherwise with more-or-less traditional problems concerning medical education. Hopkins spokesmen never claimed to have originated the basics for the early twentieth-century reform of medical education in America in which the Hopkins institutions nonetheless played a vital role. It may be worth noting, however, that some of the most pertinent portions of Abraham Flexner's Report of 1910 were virtual quotations from Hopkins's William H. Welch. There have, as the authors point out, been many experiments in medical education at Hopkins, beginning with Gilman's *Course Antecedent to the Study of Medicine* and extending to the current FlexMex device.

Yet serious problems remain. There is no doubt some truth in the assertion that, of all the activities within our academic health centres, the complex educational sequence that leads to the MD degree is the most resistant to change. But one key to the problem rests in the Hopkins archives, directly and by implication citing the will of the Founder. In a letter to Francis King dated 11 October 1889, President Gilman said that "All that belongs to medical instruction should be under the control of the University; all that belongs to the care of the sick and suffering, and all that concerns admission to clinical opportunities . . . belongs to the Hospital. A joint committee can easily adjust all questionable points if the fundamental principle is agreed upon."

No doubt Gilman oversimplified the problem at hand and was overly optimistic concerning the solution he proposed. But his comment is another, and very striking, example of the underestimated effect that history's long arm and often lively hand may have on current settings. Past performance warrants the great hope that the tripartite Hopkins presence at Baltimore will draw on its great academic talent, non-medical and medical, to identify the ideal in baccalaureate and medical education.

Volume Two, A pictorial history of medicine at Hopkins, supplements Volume One handsomely. But none of its photographs speaks more eloquently than that chosen for the dust jacket. It shows the still intact Administration Building, a structure possessing elegance, style, and dignity, which are not significantly diminished by the functional but architecturally undistinguished multi-storied box-like structures that now surround it. Belatedly named for John Shaw Billings, it serves equally in the minds of many as an enduring monument to Francis T. King. Volume Two, in any case, stands firmly on its own solid merits.

A model of its kind may be said by some critics to overemphasize the positives and understate the negatives of the first century of medicine at Hopkins. A more valid criticism is that it is sometimes bewildering in its detail, especially that relating to individuals who have come and gone since the early twentieth century. It is, in any event, a welcome addition to the growing literature on medical education and research in America since the Civil War and, especially, since the end of World War II.

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LEONARD G. WILSON, Medical revolution in Minnesota: a history of the University of Minnesota Medical School, St Paul, Midewiwan Press, (797 Goodrich Ave., St. Paul, MN 55105-3344), 1989, 8vo, pp. xi, 612, illus., \$55.00 + \$2.50 p&p (US), \$3.50 p&p (elsewhere).

The revolution in Minnesota medical education was not much different from the transition to modern clinical and scientific training elsewhere in the United States during the past century. But the value of this long, detailed study is its local context through which the move to modernity is reconstructed as a mixture of vision and backsliding. From its founding in 1888, the University of Minnesota Medical School rose by 1910 to be among the top half-dozen medical schools in the nation. Its commitment to relatively strict entrance requirements, basic science education, and hospital clerkship made the school a regional leader in medical reform and earned it Abraham Flexner's approval in his famous Carnegie report.

Although Leonard Wilson recounts changes in Minnesota education up to the present, he clearly feels that the pivotal moment in the school's development came between 1909 and 1917.

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Following the leadership of an imaginative dean, the medical school, in Wilson's view, was prepared by 1909 to make changes in training and personnel that would have lifted the education of physicians out of the jumble of self-interest and narrow aims of nineteenthcentury schools and into a new era of university education as broad as it was deep. Two closely timed events, however, prevented this change. The first was the "brutal" (to use Wilson's term) re-organization of the medical faculty by university president George Vincent in 1913. Looking to bring the medical school up to the standards of disinterest and commitment to scholarship that he felt characterized university life, Vincent fired more than half the medical faculty. His action not only demoralized the remaining teachers, who saw valued colleagues simply cast aside, it also killed the faculty's own plan for full-time, paid positions that were a hallmark of modern medical education. This institutional insult was followed immediately by a bitter dispute over whether or not the university medical school should affiliate with the clinical empire of the Mayo brothers. The Mayo Clinic was seen by some faculty as a desirable opportunity to associate the school with the nation's foremost surgical clinic; by others, the move was seen as pandering to the commercialism of the past. This destructive debate, coupled with World War I and the economic challenges of the post-war years, put the medical school into a slump from which it did not rise until the 1930s.

The Minnesota Medical School would go on to be among the leading schools in the United States, becoming especially well known in the 1950s for innovations in open-heart surgery. At its best, Wilson's commemorative history allows a narrative of change to emerge from the texture of choices, blunders, and insights that remind us how all historical change is finally particular and local. As a commemoration of the school's first century, the study does not attempt to compare Minnesota with other institutions, and Wilson rarely ventures observations that explicitly link Minnesota history to national or even regional change. Wilson goes beyond many commemorative histories, however, in his successful integration of administrative and political history with the history of basic science and clinical medicine, thus avoiding a simple study of trustees' meetings and the like. But, as with most other such histories, he gives little sustained attention to medical students—their lives, aspirations, and points of view. It is more difficult to commemorate students than a new building. Yet historians of medical schools need to remember the individuals on whom the school had its most immediate effect and who came to embody the school in their care for people.

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JOEL D. HOWELL (ed.), *Technology and American medical practice 1880–1930: an anthology of sources*, Medical Care in the United States: The Debate before 1940, vol. 6, New York, Garland, 1989, 4to, pp. xix, 366, illus., \$50.00.

EDWARD T. MORMAN (ed.), Efficiency, scientific management, and hospital standardization: an anthology of sources, Medical Care in the United States: The Debate before 1940, vol. 9, New York, Garland, 1989, 8vo, pp. 274, illus., \$45.00.

These two volumes, contributions to a series edited by Charles Rosenberg, reproduce in facsimile primary sources that illuminate the transformation of hospital medical practice in late nineteenth- and early twentieth-century America. Joel Howell, as he notes in his introduction, has selected articles from medical journals that reflect the place of technology (by which he means machines) in ordinary hospital practice. Accordingly, among the authors of the 30 articles he assembles are not only famous doctors but also less familiar figures who published in obscure journals. Topics include enduring successes, such as the electrocardiogram and x-ray apparatus, and ventures like the polygraph and electrotherapy devices that in the long run faded from the clinic.

Edward Morman's collection traces how the American preoccupation with efficiency during the decade before the First World War was expressed in discussions about health care. In a useful introductory essay, Morman describes in particular how the methods and ideals of Frederick W. Taylor—the creator of scientific management, who applied his gospel of