United States: Oxnard-Ventura added to the Los Angeles standard metropolitan statistical area (SMSA); Gary-Hammond-East Chicago to the Chicago; Fort Worth to the Dallas; and Tacoma to the Seattle-Everett); European figures from K. Davis (*27*, table E, pp. 163–233).
32. *Demographic Yearbook 1970* (United Nations, New York, 1970).
33. J. Welsh, *N.Y. Times Mag.* (7 January 1973), p. 14.
34. A. H. Hawley and B. G. Zimmer, *The Metropolitan Community: Its People and Government* (Sage, Beverly Hills, Calif., no date).
35. A. Bailey, *The Light in Holland* (Knopf, New York, 1970); G. A. Wissink, "Metropolitan planning problems in the Netherlands," paper No. 24, prepared for United Nations Group of Experts on Metropolitan Planning and Development (Stockholm, September 1961); P. Hall, *The World Cities* (McGraw-Hill, New York, 1966), pp. 95–122.
36. U.S. Commission on Population Growth and the American Future, *Population and the American Future* (Government Printing Office, Washington, D.C., 1972), pp. 12–16.
37. See *Demographic Yearbook 1970* (*32*, table 2, pp. 106–118).
38. Bureau of the Census, *Statistical Abstract of the United States* **1971** (Government Printing Office, Washington, D.C., 1971), table 263, p. 164.
39. ———, *Census of Population: 1970*, vol. 1, *Characteristics of the Population*, Part A, *Number of Inhabitants*, section 1, "Alabama-Mississippi" (Government Printing Office, Washington, D.C., 1971), table 41, pp. 1-206–1-212.
40. Calculated from K. Davis (*27*, table E, pp. 163–233).
41. Calculated from (*39*, table 36, pp. 1-189–1-190). To achieve closer conformity with actual conditions, certain SMSA's were combined: (i) Newark, Paterson-Clifton-Passaic, Jersey City, Stamford, and Norwalk SMSA's combined with New York SMSA; (ii) Gary–Hammond–East Chicago with Chicago; (iii) Lorain-Elyria with Cleveland; (iv) Hamilton-Middletown with Dayton; (v) New Britain and Bristol with Hartford; (vi) Petersburg-Colonial Heights with Richmond; (vii) Scranton with Wilkes-Barre–Hazelton SMSA; (viii) Lowell and Nashua with Lawrence-Haverhill SMSA.
42. Calculated as the difference between total population and the sum of the population in the other components.
43. Includes population in SMSA's of fewer than 100,000 inhabitants. Calculated as the difference between the total population and the sum of the population in the other components.
44. Calculated from K. Davis (*27*, table A, pp. 57–82).
45. Calculated from (*39*). To achieve closer conformity to actual conditions, this is defined as the rural population outside SMSA's.
46. International Labour Office, *Yearbook of Labour Statistics* (International Labour Office, Geneva, 1972) table 2, pp. 44–301; table 3, pp. 314–338. Data for Luxembourg, Denmark, and Switzerland are for 1966, 1970, and 1960, respectively, and relate to persons *economically active* in agriculture, rather than actually *employed* in agriculture.
47. Department of Agriculture, *Agricultural Statistics 1971* (Government Printing Office, Washington, D.C., 1971), table 649, p. 453. This figure maximizes farm employment by including farm operators doing 1 or more hours of farm work and members of their families working 15 or more hours during survey week without cash wages, and all persons doing farm work for pay during the survey weeks. There is one survey week in each month, and the figure given is the average.
48. *Statistical Yearbook 1971* (United Nations, New York, 1971), table 148, p. 416.
49. Department of Transportation and Federal Highway Administration, *Highway Statistics 1970* (Government Printing Office, Washington, D.C., 1971), p. 33.
50. See *Statistical Yearbook 1971* (*48*, table 146, pp. 398–401).
51. Bureau of Economics, Interstate Commerce Commission, *Transport Economics: Monthly Comment* (March-April 1972), p. 7. Data are for the Eastern District, which consists of all 17 states except Wisconsin, Kentucky, and Virginia and includes three additional ones—Vermont, New Hampshire, and Maine.
52. Economic Commission for Europe, *Annual Bulletin of Transport Statistics for Europe 1969* (United Nations, New York, 1970), table 11, pp. 43–47.
53. Calculated from Federal Highway Administration data (*49*, table SM-2, p. 157; table SM-11, p. 163; table INT-11, p. 193). The figure given is the sum of mileage on high-speed motorways in the following categories: state primary highway system, interstate and defense highways, and toll roads not part of the state or federal system.

Medical Evaluation: Design for a Comprehensive System

Most American-educated physicians win their licenses to practice medicine at the end of their internships, but continue with at least 3 more years of training before they are certified as specialists and enter independent practice. Today, the physician, in effect, is licensed about halfway through the course of his studies. This anomaly is the chief cause of a reassessment of medical training that is likely to lead to the first major overhaul in half a century of the system for evaluating, licensing, and certifying doctors in specialties. Most notably, it seems highly probable that the point at which the unrestricted license is granted will be moved from the internship period to the end of specialist training.

The near universality of specialty training is not the only factor exerting pressure for change. Growing diversity in medical school curricula, serious problems in the control of graduate medical education, and an increasing demand for public accountability are also adding to the impetus for change. The probable outlines of reform can be found in a report*, released this summer, of the committee on goals and priorities of the National Board of Medical Examiners (NBME). The committee, headed by William D. Mayer, dean of the medical school at the University of Missouri—Columbia, was given freedom by the national board to make its recommendations without review, but it is fair to say that the report's analysis and recommendations represent mainstream attitudes in the principal parishes of organized medicine.

The NBME was created in the second decade of this century during the great burst of medical school reform in the United States. The purpose of this independent agency was to provide high-quality examinations which state medical licensing boards could draw on. Over the years, the "national boards" came to replace individual state board examinations and, in effect, became a national licensing examination.

The national board examinations assumed the form of a three-part examination administered at intervals during medical school and the internship, and became a familiar if formidable part of the experience of medical training in the United States. Part I of the examination covers the basic sciences and is normally taken at the end of the second year of medical school. Part II tests the student's knowledge of clinical medicine and comes at the end of the last year of the 4-year course. Part III, usually taken in March of the internship year, also is designed to test clinical competence and stresses patient management rather than theoretical knowledge.

For some 40 years after the NBME was established in 1915, the three-part qualifying examination was really the sole business of the board. In the 1950's, however, the expansion of medical education and research and the growing complexity of medical care created new demands on the board. The board had refined its techniques of multiple-choice testing to a point where it was feasible to move away from traditional essay and oral examinations. This development made possible com-

* *Evaluation in the Continuum of Medical Education*, may be ordered from the National Board of Medical Examiners, 3930 Chestnut Street, Philadelphia, Pennsylvania 19104, for $2.50 a copy.

parative evaluations of students not only within a class but between medical schools and opened the way to a much wider range of functions for the board. The NBME, for example, was asked to develop tests for students wishing to transfer from one medical school to another, and perhaps more significantly, to come up with tests designed for foreign-trained students wishing to gain entry to American programs of graduate medical education. Specialty boards which certify medical specialists in the United States asked for aid in developing examinations, and now a majority of the score of specialty boards use the services of the NBME in developing their own exams. This proliferation of board functions was a strong motive for the creation of the goals and priorities committee, from which the board wanted, among other things, a critical examination of NBME activities.

The national boards were created to abet the licensing process, but have unquestionably influenced the content and even the structure of medical education. Medical school faculty and students are acutely aware that the three-part national boards are major hurdles on the path to licensure. Inevitably, there has been a tendency to accommodate both subject matter and schedules to the demands of the national boards. The exams became an instrument for testing knowledge—success in Part I, for example, became in many schools the real criterion for a student's moving from preclinical to clinical training.

The 1960's was a period of lively debate and experimentation in medical school curriculum, and the national boards became a matter of controversy. Critics of the boards tended to argue that the exams perpetuated a rigid and obsolete curriculum. Partisans of the national boards viewed them as a guarantor of reasonable intellectual standards that were threatened by reforms that were going too fast and too far. (The importance of the national boards in the exchanges between reformers and revisionists in medical schools is indicated in the story on page 1027.) The NBME has been aware that some schools, particularly new or academically insecure ones, have been "teaching the national boards," and board officials have obviously hoped that a new evaluation, licensure, and certification system would terminate the overt influence of the boards on undergraduate medical curriculum.

The committee on goals and priorities report does recommend very substantial changes in the existing system. The major recommendation with immediate implications is that full qualification to practice be deferred until a physician has completed his formal medical education. This would be accomplished by replacing the present system with two-stage licensing. The first exam, to be called "Qualifying A," would be taken when a student completes medical school and would be meant to establish that the student could function at graduate level. By passing the exam he would also win permission to deliver patient care under supervision. "Qualifying B" would test competence in a designated medical specialty, and success in the exam would signal that a physician was competent to assume full and independent responsibility for patient care and be fully licensed.

Institutional Supervision

The committee urges that institutional supervision of graduate medical education be strengthened. The committee supports extension of the authority of the academic medical center—usually affiliated with a university—over graduate as well as undergraduate medical education. As things stand now, many specialists are trained in hospitals not affiliated with academic medical centers, and, although such residents must pass specialty board examinations to win certification as specialists, the quality of their training is sometimes suspect.

The committee also recommends more attention to the most underdeveloped area of medical education—the continuing education of practicing physicians. Although the tone of its recommendations are more tentative here, the committee wants the NBME to "take the initiative in developing methods for evaluating continuing professional competence. . . ."

In short, the committee is arguing that medical education should be regarded as a genuine continuum, covering undergraduate, graduate, and post-certification periods, and that better methods of evaluation should be developed to cover the whole spectrum.

The committee and the national board realize that they have neither a whip nor a magic wand that will transform the system along the lines recommended. Licensing power remains with the state boards and other organizations in the medical power structure, such as the American Medical Association (AMA), the Association of American Medical Colleges (AAMC), individual specialty societies, and medical schools. But the NBME itself has accepted the main points of its committee's report and is moving to implement them. Since the board is governed by those who actually represent the major sectors of organized medicine, the report is likely to have the force of general policy.

John Hubbard, president and director of the NBME, emphasizes that none of the steps recommended can be taken unilaterally by the board and that change depends on the cooperation of state medical boards and specialty societies. Hubbard apparently expresses the views of the board when he says he sees the phasing out of the three-part exam as taking 3 to 5 years, during which period new licensing and achievement exams would be phased in.

NBME officials reject as mistaken the suggestion that the new licensing system would lengthen medical education and insist that the changes would merely recognize that medical students are not ready for independent practice at the end of the internship, a point made formally by major medical organizations and by students themselves.

Withholding full licensing until the end of graduate education, in fact, seems to be an idea whose time has come and is widely accepted. Much more controversial in the medical schools is the abolition of national boards and particularly the disappearance of Part I.

Part I is already being counted out in the medical schools, and the sharpest objections are being voiced by faculty in the basic sciences. Teachers in the preclinical disciplines are feeling threatened these days anyway. Cuts in grant funds from the National Institutes of Health have curbed research and reduced jobs. Changes in medical school curricula have often worked against basic sciences in the eternal struggle for "time" in the curriculum. Reduction from 4 to 3 years in the length of medical school has often been made at the expense of the basic sciences. Student demands for earlier contact with patients whittles away time previously devoted to basic-science teaching. And in medical schools where more time has been allocated to electives, students have tended to opt for courses in clinical subjects.

For many faculty members in the preclinical subjects, Part I of the national boards has been a rock to cling to as the tides of change have swirled about them. They do not find much consola-

tion in the assurances that the new qualifying examination at the end of medical school will include basic-science material as well as clinical questions. One pharmacologist at a Midwest medical school pointed out that, for the new qualifying exam, the basic sciences will inevitably be taught in a clinical context, and he questions whether that will make students better doctors. Furthermore, he points out that the idea of incorporating basic-science teaching, wherever relevant, throughout the 4 years of medical school, as is often espoused by reformers, is excellent in theory. But in practice, he says, to do this in pharmacology would require a major increase in faculty which, in the context of limited financial resources, is impractical.

Fears that the banishing of Part I will further reduce emphasis on basic sciences in the curriculum are also related to the use of the national boards by medical schools to measure the achievements of their students and to compare themselves with each other. NBME officials say they know that medical schools will turn to the board for help in determining how their students are doing academically in the traditional disciplines and that the board will continue to provide medical achievement exams. The problem is that such exams will not exude the double mystique of the national boards, which serve as both an academic progress report and a step toward the license. The medical schools' need for ways to carry out valid self-assessments is, if anything, greater in the present period of experimentation with the curriculum, and one vital task facing NBME is to convince the medical schools that acceptable tools for self-assessment will be offered under the new system.

The committee's recommendations, of course, are not confined to undergraduate medical education. A corollary to recommendations for change in the system is that the NBME itself be extensively reorganized. For the board, the committee prescribes a new operational structure comprised of five councils:

1) Council for Undergraduate Medical Evaluation

2) Council for Graduate Medical Evaluation

3) Council for Evaluation of Continuing Medical Competence

4) Council for Evaluation of New Health Practitioners

5) Council for Research and Development

Members of each council would be drawn from the relevant constituencies in organized medicine, and each council, except the R & D council, would be primarily concerned with the board examinations in its area. The Council for Undergraduate Medical Evaluation, for example, would be concerned mainly with the proposed Qualifying A exam.

Specialty boards would continue to be responsible for certification in medical specialties, and the Council for Graduate Medical Evaluation would have the Qualifying B examination in its bailiwick. This council would also be expected to deal with problems arising under the new system. What, for example, is to be done about the licensing of physicians who do not complete the specialty certification process? The committee recommends that state boards should determine on what grounds such physicians should be licensed, but urges that they at least complete the Qualifying A exam and a minimum of 2 years of graduate medical education. Such persons could practice under the supervision of fully qualified physicians in hospitals or group practices. General practitioners in the past have typically entered practice after internship, but there is now a specialty board of family practice, and most physicians training to deliver primary care in the future are expected to choose residencies in this specialty.

Foreign Medical Graduates

The council would also have to cope with the problems of foreign medical graduates, who now fill nearly half the junior staff posts in U.S. hospitals. The foreign medical graduates come here for graduate medical education but, because of the nature of such education, are involved directly in patient care. A serious and complex set of problems has developed as hospitals have grown dependent on foreign interns and residents for service, and the profession has yet to come to grips with the situation.

The Council for Evaluation of New Health Practitioners would be concerned with assessing the competence of nonphysicians and plans to focus its attention on physicians' assistants who engage in patient care under the direction of physicians. The first NBME exams for physicians' assistants will be given late this year.

The Council for the Evaluation of Continuing Medical Competence would have to face the question of whether it is reasonable to license a physician for unrestricted practice for life. The issue of "recertification" is currently a hot one in the profession, and most specialty societies are fostering "self-assessment" programs and in some cases requiring members to participate. The NBME is developing materials for these programs, which are still voluntary everywhere but in New Mexico. That state now requires evidence of continuing education for "relicensure." Stiffer requirements generally for "recertification" seem to be in the cards.

The obvious issue here is control by the profession and accountability to the public. As things now stand, a physician may, for example, practice any specialty without ever having been certified in that specialty. The only control is through hospital monitoring of staff appointments. There is no effective control over the nonhospital-based physician.

How far restrictions on licensing should go is not a simple question. To limit physicians to practice in some narrow subspecialty of surgery or internal medicine, for instance, could be excessively restricting. Canada seems to be moving toward licensing according to a doctor's general area of practice. Hubbard suggests that a practitioner might be evaluated in the context of what he is actually doing.

To some extent the report of the committee on goals and priorities is really an assessment of changes already occurring in medicine and a prediction of what will happen as a result. The freestanding internship is disappearing, for example, and the discontinuity between undergraduate and graduate medical education is diminishing as the academic medical center becomes the dominant agency for specialty training.

Changes of the sort the committee recommends, however, have never come easily or quickly in American medicine, and there is little reason to think that the pattern will be altered in this case. How strong opposition to the changes will prove is still unclear, as reaction to the report and the first moves to implement its recommendations have been slowed by the torpors of summer. But the consensus seems likely to hold up, and the committee's prescription should be more palatable these days because it comes from within the profession, not from outsiders.

—JOHN WALSH