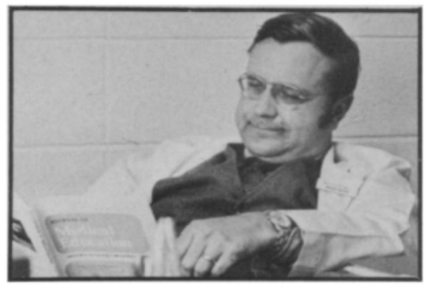
MEDICAL EDUCATION TAKES OFF

With new schools, expanded enrollments and changing curricula, the character of medical education is rapidly changing



John H. Douglas

Ayers: Some good from experiments.

In 1910, the Carnegie Foundation issued a report that revolutionized medical education. It did away with the multitude of small, haphazard private academies offering a variety of questionable medical diplomas and led to the formation of the present, university-based system of medical schools. Four years ago, the Carnegie Commission on Higher Education issued another report on medical education, which may ultimately have as profound an influence on the preparation of doctors for their profession as its predecessor issued more than a half century earlier.

Together with other studies conducted in the mid-sixties, the Carnegie report concluded that doctors were becoming over-specialized and were badly distributed relative to the population of their potential patients, resulting in a crisis of "primary care." The family doctor seemed in danger of going the way of the saddle-bag medical kit.

To meet the recommendations made in these reports, new medical schools have been formed, some existing schools have shortened their programs or greatly expanded enrollment, and a new emphasis has been placed on assigning duties once considered the exclusive province of the physician to other medical personnel, including nurses and physicians' assistants. But disenchantment regarding several of the attempted reforms has also set in.

The number of medical schools in the United States has grown from 84 in 1963—a figure that had remained stable for years—to 114 at present, with others in the planning stages. At 17 of the schools, a three-year program is now standard and at 30 others it is optional. Enrollment at some schools has doubled, and almost every institution has begun experimenting with curriculum changes designed to "humanize" medical practice—encouraging more students to enter family practice and bringing them into earlier contact with practical, clinical work.

Typical of the changing institutions is Georgetown University in Washington, which has the second largest private medical school in the country. Over the last decade, the school's expenses have tripled and applications have risen more than six-fold. Having decided to expand facilities rather than shorten curriculum to produce more doctors, Georgetown will graduate twice as many M.D.'s this year as it did five years ago. In the process of changing, the school adopted a radically altered, interdisciplinary curriculum in the basic sciences, which concentrated on body systems, such as the digestive tract, rather than on traditional disciplines, such as anatomy.

The curriculum experiment was abandoned after only two years, however, as the assistant dean for curriculum, William R. Ayers, described for SCIENCE NEWS. Skeptical students, he said, started keeping three separate notebooks, assuming that though professors might follow an interdisciplinary approach to the body system in question, when exam time came, they would test along the same strictly disciplinary lines they had followed for years past. The faculty, for their part, complained that the new, amorphous administrative structure left them without departmental identity and support for purposes of promotion, salary and tenure.

Harvard medical school is also retreating from curriculum experiments that seemed to prepare students less adequately than traditional methods of instruction. The school had reduced its basic science requirement from two to one and a half years and had adopted a pass/fail system of grading. But when students took a nationwide exam, Harvard found to its chagrin that while the last group to receive traditional preparation finished first in the nation in all catagories tested, the next class, trained under the new system, scored only one first and sank to an unprecedented 10th and 15th in two catagories.

Ayers believes that some good innovations have come from the curriculum experiments, however. An introductory clinical course at Georgetown, for example, which emphasizes newer topics in medicine, will continue to be taught along interdisciplinary lines. At Harvard, students will still be able to choose from a wide variety of new electives during their last two years, without returning to what a dean there called the "seven-semester straitjacket." Such changes never come without taking their toll of personal frustration, however. At Harvard, the curriculum committee reportedly had to be locked up in motel rooms to thrash out their differences in encounter group sessions, while the head of Georgetown's medical school once sent a whole department faculty into a couple of days' group therapy.

Innovations in medical education may come easier for the newly founded schools, where honored traditions and departmental vested interests are not yet so strong. One of the most imaginative of these new institutions is the medical school of McMaster University in Hamilton, Ontario, which graduated its first class in 1972. From architecture to course work, every element of the school is designed for flexibility and individuality in learning and treatment. The Health Science Center is a mechanical, electrical and structural "shell," whose contents—rooms, walls, equipment—can be replaced or easily shifted about to meet changing needs. The lecture method has been practically abolished in teaching, replaced by small-group tutorials, elaborate audio-visual materials and clinical patient contact.

Included in this practical training are two revolutionary new concepts: "computerized patients"—which subject students to simulated crises—and professional "programmed patients"—persons who have been trained to fake certain symptoms and are used to evaluate the would-be doctors on their bedside manners as well as their technical proficiency.

When a student sits down at the computer, he is told a list of symptoms and expected to ask a series of diagnostic questions, which are answered in ordinary language. He then prescribes a treatment and immediately gets graphic feedback on its effects: "Oh! My heart is speeding up! I can't see anymore! . . . . Doctor, your patient has just died."

Students see programmed patients mixed in with the real patients they are already tending under close faculty supervision. One such patient reportedly jogs in place, douses himself with

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cold water and then collapses for some unsuspecting students, who hopefully recognize the signs of cardiogenic shock: unconsciousness, rapid pulse and clammy skin.

Other than training more doctors, the main way of increasing primary care for patients is to assign duties once reserved for physicians to other personnel, mainly nurses and physicians' assistants.

Nurses have traditionally been responsible for monitoring patients and administering treatment under the direction of a doctor. Now hospitals and public health clinics are experimenting with two new ways of using RN's more directly and independently in patient management, after receiving more training. By taking a nine-month certificate course, a "nurse practitioner" can take over some of the initial screening and basic treatment duties that once took up so much of the general-practice physician's time—admitting patients to a hospital, working up their medical histories, running public health clinics and organizing immunization programs. By taking a master's degree in some specific area, such as treatment of cardiovascular diseases, a nurse can become a "clinical specialist," who coordinates hospital treatment of patients with these diseases. By following a patient from admission, through surgery and recovery, to outpatient status, the clinical specialist assures that the patient and all personnel involved in his treatment are aware of all factors involved and of what the other people are doing. She also acts as a nursing consultant to other RN's who may be unfamiliar with how to handle a particular case.

Physicians' assistants grew out of a somewhat narrower set of needs and manpower resources. Faced with a lack of technicians, a multitude of emergency personnel that often harmed patients more than helped them and a growing list of specialized tasks requiring intensive—but not necessarily broadly based training—medical societies have begun considering the need for a new kind of health professional. Concurrently, two long wars have produced thousands of military paramedics whose skills have heretofore largely gone to waste. By setting up special courses to channel these skills into the areas of need and arrive at standards for certification, the societies are now working with the Federal Government to formalize the status of the physicians' assistant.

As medical education changes, so does the fundamental character of American medical practice. The faces change as more women become doctors—some 20 percent of entering medical students now, compared to only 9 percent in 1969. Skills change as people with different backgrounds enter the medical profession—some 10 percent of entering medical students now were trained as engineers in college. Finally, as more physicians return to family practice and some of their duties are shared by a growing variety of other primary care personnel, the hope that adequate health care can be made available to every citizen comes nearer to reality. □

OFF *the* BEAT

Talent Search Winners

Like most other specialist journalists, science writers soon lose whatever awe they might once have held for the people they write about. Seeing a scientist as a person, rather than an impersonal symbol of technical achievement, is crucial to establishing the rapport from which lively writing can flow. For myself, I see my own training as a scientist having as much value for teaching me what is likely to make a Nobel laureate laugh as for having presented a lot of technical details. However, since coming to Science Service, I have found one great exception to my lack of awe. Nothing is more humbling than fantastic potential, and I find our yearly encounter with the high-school Science Talent Search winners humbling indeed.

A glance at this year's winners, 40 high-school seniors chosen from 1,104 entrants, illustrates the point. Besides having produced independent scientific work of significant quality, the winners include a professional juggler, a winner of the National Guild of Piano Teachers' competition and the National Federation of Music Clubs Senior Concerto Event, a karate instructor, several inventors and a parakitist (a skydiver who uses a kite).

Each year, Science Service and the Westinghouse Corp. fly the 40 students to Washington to meet various scientists, politicians and journalists, including ourselves. And each year they represent a varied cross-section of interests, personalities and ambitions—having only two things in common: a love of science and an awesome intellectual potential.

In response, I find myself full of questions. How did they get here? Who helped, or at least inspired, them? How do they see themselves and the future? What can we do to help them?

In looking over the profiles of this year's winners, the answer to one of these questions, in particular, stands out to me. Yes, they did need help, or at least inspiration. All projects must, of course, be the student's own work, but in most of the cases, getting a chance to start that work depended on knowing some older person, knowledgeable in the field, who could help define a problem, encourage the young researcher over the hard parts, and critically evaluate the results at the end.

For 16 of the students, the opportunity to meet such a person came as a result of the Student Scientist Training Program of the National Science Foundation. These summer programs usually take high-school students into university laboratories, where they work side by side with mature scientists, gaining practical skills, as well as new vistas of knowledge. Of those who did not receive SSTP grants, three conducted their work at local universities, nine worked with local scientists or at private labs (including the Mayo Clinic, the Smithsonian Institution and NASA), and three used the equipment of their high school, under a teacher's supervision. Only nine worked entirely independently, usually getting the idea for their project from reading.

Family encouragement also seems to be important. Fully half of this year's winners reported that there is a scientist in their family. One student completed his project in his father's laboratory; another continued the investigation that had brought her sister to Washington as a Science Talent Search winner.

The most popular profession among the winners is medicine, with 11 students wanting to earn an M.D. Mathematics ranked sceond, with 10. Engineering was third, having been selected by eight students. One winner wants to be a science writer.

Music is their most popular hobby, with 23 students playing a musical instrument or singing in a chorus. All but nine of the winners participate in some athletic activity, including all but one of the eight girls. About 16 participate in team sports, including some varsity track, diving, football and basketball competitors. Individual sportsmen included four scuba divers, several backpackers and mountain climbers and a couple of members of ski patrols.

Among comments solicited from teachers was the answer to the question, What is the student's principal weakness? One teacher's comment, "Drives self to the point of exhaustion," stated a theme repeated in various gentler variations for several of the students. In the eyes of their teachers, many of the winners are interested in too many things, on the one hand, and on the other, demonstrate little patience with school subjects in which they are not so interested.

Which still leaves the most personal question of all. What can we do to help them? Well, maybe I can tell the budding science writer how to make a Nobel laureate laugh. But more important, I hope we can work *with* them to offer that ounce of encouragement and help, which made so much difference for them, to other bright young people. For this special issue on education has inherent in its articles a tragic message: Amidst budget cuts, impounded funds and special programs for various pressure groups, the exceptionally gifted student is still the abandoned child of American education.

—John H. Douglas