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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 parakittist (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 second, 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