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COVER An embryonic grasshopper jumping leg imaged in a laser confocal scanning microscope, computer-enhanced, and pseudo-colored. The developing nervous system is labeled with fluorescent, neuron-selective antibodies. A major leg sensory nerve (far right) has failed to connect to the central nervous system because of the absence of a single pair of pioneer neurons. See page 982. [Photograph by Monika Klose, David Bentley, and Janet Duerr]

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AAAS Presidents

Throughout its 141-year history, AAAS has been blessed with exceptionally distinguished leadership in the office of its president. Instead of an inaugural address by the incoming president, however, AAAS has adopted the custom of having the president give a major speech during the annual meeting that concludes his or her presidency. In most cases the president's address has subsequently been published in *Science*. This issue contains the address delivered by Walter Massey in San Francisco this past January.

It is noteworthy that both Massey and his immediate predecessor, Sheila Widnall, chose as themes for their presidential addresses the combined issues of education and human resources. Widnall's address [*Science* **241**, 1740 (1988)] focused on "who will do science" and made the telling point that increased participation of women is a critical factor if the United States is to have adequate numbers of outstanding scientists and engineers in the future. In that regard, Widnall's article is worth rereading because she identified critical points in the so-called pipeline where intervention strategies would have the most leverage. She also reported data showing how our educational system works to lower the self-esteem of women compared to men as both groups move from high school through college, even when the women, by objective measures, are more academically capable. Widnall identified such "environmental issues" as constituting significant impediments to increasing the future participation of women. Unfortunately, these environmental issues have not received adequate attention from the academic community.

In his presidential address, Massey broadens the argument to include other underrepresented groups, as well as education at all levels for all students, not just those interested in careers as scientists or engineers. He also notes the sorry state of scientific literacy among U.S. adults and correctly pinpoints this as a likely handicap to the future competitiveness of the United States.

A number of programs have been established in the past to address some of these issues. For example, the National Science Foundation and the Department of Education have had activities, some in place for many years, aimed at improving both formal and informal education, boosting scientific literacy, and increasing participation of underrepresented groups. Yet the evidence shows that the scientific literacy of the U.S. adult population has not sensibly changed over a period of 30 years. Similarly, how are past efforts aimed at increasing minority participation to be judged when fields like physics produce a handful or less of black Ph.D.'s each year? In fact, the numbers are so small for a country of our size that it is arguable whether we would get the same results even without special programs. Thus, Massey calls on every school in the United States with Ph.D. programs to commit to doubling "plus one" the number of black Ph.D.'s during the next 6 years. Why the "plus one"? Because, according to Massey, in most cases "the initial number would be zero, so that doubling it would be meaningless."

It would seem that it is time for some new ideas and new approaches. Massey calls for "bold new initiatives" on the part of the scientific and technical community to demonstrate that they care enough about the education issue to get their own hands dirty. Massey argues that only then is it likely that the rest of the U.S. public will support other needs of the scientific community. Massey makes some specific recommendations, such as commitment by AAAS and Sigma Xi members to work a certain number of hours each week with local schools and museums. And he proposes that faculty members make a pledge to cut in half the attrition among students who plan technical majors.

Given the now familiar statistics—and the immutable nature of demographics—it is clear that improved education and better use of human capital are not transient issues. Recognizing this, the AAAS Board of Directors recently gave this area top priority for AAAS in the years ahead. In so doing, the board is hopeful that the scientific and technical community in this country will make a renewed commitment to effecting change. Taking on some of Walter Massey's challenges would be an excellent place to start.

—RICHARD S. NICHOLSON