

In the inflammatory letter by Nicoll and Russell, I was used as an example of a "moderate" animal rights advocate" who had supposedly made the statement that "it is pointless to use animals for AIDS research." I made no such statement. There is a great difference between writing off an area of research as "pointless" and a reasoned discussion of its limitations.

The authors went on to describe as "anti-scientific and anti-intellectual" my statements that "there is no good animal model for AIDS. There are monkeys which have a disease similar to AIDS but it is caused by a different virus." In fact, this is supported by many others. Note, for example, the *Report of the Presidential Commission on the Human Immunodeficiency Virus Epidemic* (1).

To date, adequate animal models have not been developed for human HIV-related research. An appropriate model is one in which the animal can be infected with HIV and can develop disease similar to that produced by HIV infection in humans. . . Difficulties with animal models persist. Chimpanzees, for example can be infected with HIV, but, to date, have not developed AIDS. . . The lack of appropriate animal models for HIV research makes the application of animal research to humans uncertain. . . There is also a lack of adequate animal models for vaccine development.

This is not to say that animal research is pointless. But it is to say that the inadequacies of animal models, combined with the extraordinary stresses of isolation, confinement, and manipulation, which are routine in infectious disease research, should encourage a shift toward other methods. Or should the Presidential Commission also be labeled "anti-scientific and anti-intellectual"?

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REFERENCES

1. *Report of the Presidential Commission on the Human Immunodeficiency Virus Epidemic* (Government Printing Office, Washington, DC, 24 June 1988), pp. 39-47.

Shortage of Scientists

The article by Constance Holden, "Wanted: 675,000 future scientists and engineers" (News & Comment, 30 June, p. 1536), deals with an issue of vital importance to the nation. Holden's discussion of the topic is concise and thoughtful, but misleading in

one respect. In the article she states: "White men now make up 47% of the total workforce and about 80% of the science and engineering workforce of 4.6 million. But they will constitute only 15% of the net number of 25 million people entering the workforce in the last 15 years of the century. By 2010, they will make up less than one-third of the college-age population." This statement and the accompanying pie-chart with the caption "The decline of the white male" can be misinterpreted unless they are examined carefully.

The figure of 25 million people is the estimated increase, from 115.5 million to 140.5 million, in the workforce between 1985 and 2000 and takes into account not only the number entering but also those who leave. White males, far from disappearing, increase their numbers by almost 4 million. Although their proportion falls from 47% to 41%, they remain the largest group (58 million in 2000). Despite a 10.5 million absolute increase by white women, their representation only rises from 36% to 37% (52 million in 2000). The total of all other groups, increasing by 10.7 million, rises in representation from 17% to 22% (30 million in 2000). The change in makeup of the workforce, while not insignificant, is not as startling as implied by Holden's article.

White males already constitute less than 50% of the workforce. Using the rates of percentage change (-0.4% per year for white males, +0.07% per year for white females), it would take until 2009 for the white male number to be equalled by white females, at which time each group would constitute about 38% of the workforce.

Although white males' dominance of the labor market is declining, it is a slow process and their numbers will remain significant for many generations. It is critical, for a variety of reasons, to increase the number of women and minorities entering the scientific workforce. But no matter how successful we may be in that regard, such efforts will not meet the nation's needs for technically trained people. Graduate fellowships and other incentive programs targeted only at women and minorities will miss the largest pool of potential recruits. The subtitle of Holden's article is "A shortage of technically trained workers is looming, unless more women and minorities can be attracted to science." That recommendation will not suffice. We need to attract more young people to science from all segments of the population.

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