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that endangers innovative thinking and a health care system that ignores individual needs. There is obsession with technology in both areas, with amalgamation into large laboratories or hospital networks. There is under-appreciation of clinical perspective. Scarcity of true clinicians as grant reviewers or recipients at the National Institutes of Health (E. Marshall, News & Comment, 1 July, p. 20) is paralleled by managed care systems that allow medical triage by bureaucrats. Other parallels include increasing corruption, sacrifice of scholarship for monetary concerns, and low priorities for teaching in high-volume research institutes or care systems.

While most agree that research and development deserve a greater share of health care resources, research reforms should be considered in a nation that engages in heart-lung transplants while its unvaccinated citizens die of measles. Why are some investigators allowed to garner multiple grants with additional perquisites through center and program project awards? Would limits on the number of grants per investigator restore a focus on ideas and integrity rather than money, papers, and technology? What is the optimal balance between basic and applied biomedical research? Perhaps the hyperbole of gene therapy should receive less emphasis and delivery of existing treatments should receive more (1).

The view from my clinic includes many shortcomings in health care that transcend deficiencies in knowledge. I see a growing repertoire of preventive tests or treatments that patients have no means to pay for. I see parents forced to misrepresent diagnoses and even to revoke guardianship in order to retain benefits for their children. I see research benefits diverted toward procedures such as cosmetic surgery that enrich physicians and reward the privileged. I see lawyers parasitizing care for unscrupulous rewards and the erosion of science by "experts" who endorse their chicanery. And, unlike Kirschner *et al.*, I see a biomedical research industry that is enthralled by technology, infatuated with profits, disconnected from its clinical roots, and as needy of reform as the medical care system it is supposed to enlighten.

**Golder N. Wilson**

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## References

1. W. A. Orenstein and R. H. Bernier, *J. Am. Med. Assoc.* 272, 1138 (1994).

## Career Issues

I was disturbed by Constance Holden's recent article "A quick guide to job-hunting," which appeared in the Careers issue of *Science* (23 Sept., p. 1932) and featured my picture with a quote attributed to me that had been taken out of context.

In March 1994, I was contacted by Holden, who was doing research for an article to appear in the Careers issue. Holden initially contacted me because of my role as the administrator of the Young Scientists' Network (YSN). We discussed YSN at length and its role in addressing issues facing scientists and engineers who are trying to begin their careers.

This brought Holden to ask about my career. I related to Holden how and why I decided to leave physics and how I had managed to make the transition to molecular genetics. I told her about the Special Emphasis Research Career Award I received from the National Center for Human Genome Research of the National Institutes of Health, an award designed to attract people from engineering and the physical sciences to work on the Human Genome Project. During the 2 years that I had been working in the Human Genome Center at the Salk Institute, I published two papers and submitted a number of others.

Holden asked me if I would ever consider a return to physics. I told her, "I've been doing biology for the past 2 years, and everything I've published has been in biology. Who's going to offer me a job in physics? As far as physics is concerned, I haven't published anything in 2 years."

Unfortunately, what appeared was only one and one-half of the last two sentences, "Who's going to offer me a job in physics? I haven't published anything in 2 years." This is simply not a true statement and not at all representative of the conversation I had with Holden.

I am proud of my publication record both in physics and biology. I am happy to describe my experiences as a way of illustrating the difficult job market that today's young scientists face. I am, however, embarrassed by the manner in which I was portrayed in *Science*.

**John Quackenbush**

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I am concerned about the way career realities facing our nation's young scientists were presented in the Careers issue of *Science*. It appears that there was an attempt to minimize the bleak situation with regard to the prospects of obtaining long-term employment as a scientist after the Ph.D. is earned.



I worked hard and spent considerable time with Constance Holden providing information about the realities of *all* areas of science and engineering. I provided documentation for my statements. All of that was distilled into two sentences ("Science careers: Playing to win," p. 1905):

To hear about these travails you need only tune in to the Young Scientists Network [ysnadm@crow-t-robot.stanford.edu], set up by physicists who have been publicly fretting over what they see as bleak career prospects. "The reality of discovering the negative economic value of a Ph.D. is absolutely startling," says one networker, biophysicist Gene Nelson, who calls himself a severely underemployed computer programmer in Texas.

The underlying attitude appears to be the all-too-familiar "Just work 80+ hour work weeks during graduate school and your string of postdocs, get a good 'pedigree' and publications history, and you might have a chance at a 'good' job."

There is no addressing of the government's role in promulgating misleading statistics about career prospects in science (and then exacerbating the situation for both immigrants and nonimmigrants by increasing the ceiling on the immigration of scientists and engineers in 1990 during a period when record numbers of scientists and engineers were either unemployed or underemployed).

There is no discussion of the fact that most of the educational and industrial research and development establishment continues to deceive graduates about career prospects and salary levels as a means to recruit "fresh young (inexpensive) blood." The impact of the recent tidal wave of student loans as a distorting career influence is ignored. Nothing is said about the chronic underfunding of both science and engineering in the public and private sectors. Nothing is said about how funding shortages in higher education have led to heavy use of fixed-term temporary educators and researchers who have few fringe benefits and almost nonexistent career security, among other problems.

The whole story should be told and told promptly in a forthright manner, so that young people will have accurate information on which to base their career decisions.

**Gene A. Nelson**

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**Response:** When I showed a draft of the article to Quackenbush, he had no problem with the quote he refers to. The article that the quote appeared in was shortened considerably, but the context was not changed. That context was the difficulty of re-entering a field once out of it for a time. The

quote appeared after I noted that Quackenbush had changed fields from physics to biology. Because the quote actually mentions getting a job in physics, it is reasonable to assume the rest of the quote—the part referring to publications—also refers to physics.

Quackenbush and Nelson are both concerned that the 1994 Careers special issue did not focus to a greater extent on the Young Scientist's Network and the employment prospects facing many young scientists. The stated purpose of this issue was to focus on what the individual can do to optimize her or his chances in the job market; it is hard to understand how this is tantamount to blaming the individual for being in difficult circumstances.

In addition, in past issues we have devoted considerable attention to many of the topics Nelson raises. To be specific, News articles have appeared about the desperation of young physicists (18 Sept. 1992, p. 1726); the difficulties encountered during a postdoc, including "multiple postdocing" (18 Sept. 1992, p. 1738); the influx of foreign-born scientists (24 Sept. 1993, p. 1769); getting rejected on the academic job market (23 Sept. 1994, p. 1931); and, most recently, job prospects facing physicists who were working on the now defunct Superconducting Super Collider (28 Oct. 1994, p. 532). Other themes, such as decreased job security, run through many articles. But in some cases, the best available data do not always back up widespread perceptions—this year's article about tenure, for example, indicates that the institution is far sturdier than some have suspected (23 Sept., p. 1923).

—**Constance Holden**

Daniel E. Koshland Jr.'s editorial in the Careers issue (23 Sept., p. 1787) paints a painful and, for a former scientist, all-too-accurate picture of the issues facing young scientists today. Yet, as in last year's Careers issue, the bulk of the articles in the special section do not reflect that picture. Koshland writes of the would-be role of mentors in advising students about the realities of life, yet the deficiencies of our institutions are not fully addressed in the main text. Many academic departments actively delude their students and seek to discourage an examination of the externalities that attend a career in science. They also discourage consideration of alternative careers.

The real irony is that, even as Koshland writes about job shortages and disappointments, many spokesmen in science and government, and even last year's Careers issue of *Science*, bemoan the lack of interest in science shown by American youth. We hear about dropping percentages of U.S. citizens in Ph.D. programs, risks to America's future

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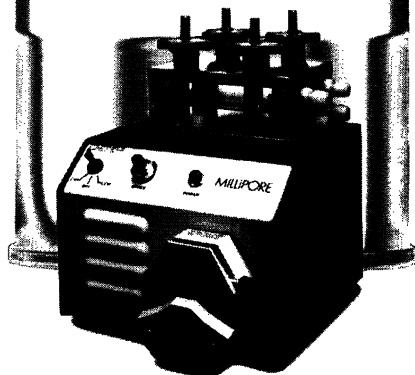
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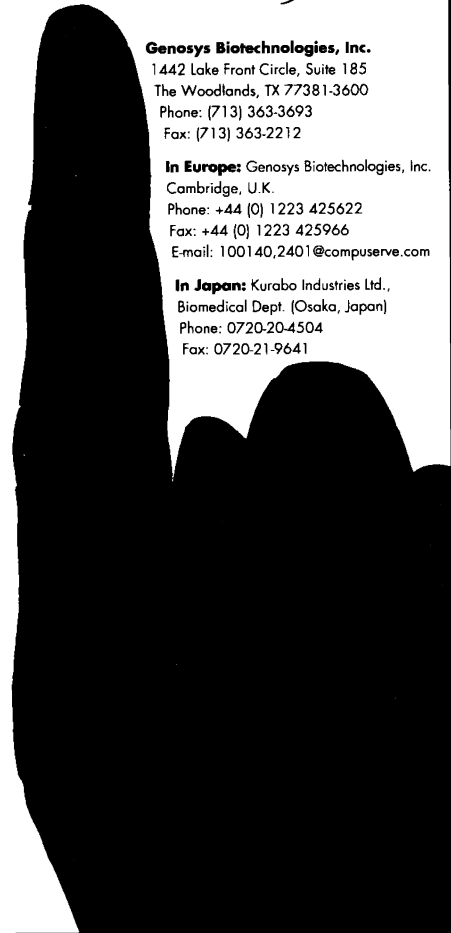
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competitiveness, and so forth. These two sets of circumstances seem at odds, but they are not. Put simply, many smart young people see science as a ridiculous career choice. For them, better alternatives abound.

Koshland rightly dismisses "birth control" as a solution. But there is a simpler, kinder, and more accurate method: Eliminate wholesale training grants. If all Ph.D. students faced exactly the same financial aid choices as medical or law students, the "C" students, and even the "A" students, would take a much harder look at their future prospects. Eventually, those prospects would improve as fewer graduates emerged from the pipeline. The market (dare I use the term in this context?) would reach a natural equilibrium, based on self-selection.

Koshland has argued forcefully in other editorials for a more "free market" vision of the management of science and technology and less government meddling. I submit that there is no more compelling case for a free market than in the production of scientists themselves.

**Charles Hsu**

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## Corrections and Clarifications

The caption for the figure in the article by Marcia Barinaga "Possible new test found for Alzheimer's disease" (Research News, 11 Nov., p. 973) was in error. The upper eye was not that of a normal subject, as stated, but was the eye of the Alzheimer's patient before administration of the eye-dilating drug.

In the Policy Forum by Brian Frost-Smith "European Union: Fresh tracks for academic exchanges" (4 Nov., p. 743), in the first paragraph on line 14 of page 744, the term "European Community Unit" should have been "European Currency Unit."

In Philip H. Abelson's editorial "Supplies of oil and natural gas" (21 Oct., p. 347), reference is made in the second sentence of the third paragraph to 4.6 "Tm<sup>3</sup>" of natural gas. The unit "Tm<sup>3</sup>" represents "trillion cubic meters," not "terameters."

In the report "Direct determination of grain boundary atomic structure in SrTiO<sub>3</sub>" by M. M. McGibbon *et al.* (7 Oct., p. 102), on line 10 of the third column on page 103, the term "three-dimensional" should have been "3d." In reference 17 of the same report (p. 104), "IEEE" should have been "JEE."

In note 6 (p. 54), of the Policy Forum "The paradox of critical mass for women in science" by H. Etzkowitz *et al.* (7 Oct., p. 51), the author of *Fair Science: Women in the Scientific Community* should have read, "J. Cole."