Letters

NIH Budget and Better Health

I should like to respond to Daniel E. Koshland, Jr.'s Editorial, "Health, wealth, and unhappiness" (22 Mar., p. 1419). I am not opposed to research or to good health; I endorse both. I do question, however, Koshland's implication that more research creates more health. The evidence quite conclusively shows that health, although associated with wealth, is not the result of wealth. Nor is there any reasonable basis for assuming that greater expenditures by the National Institutes of Health will increase the health of the U.S. population. The United States now spends $1359 per year on health care and research for each man, woman, and child—the second highest per capita expenditure in the world (after Sweden)—and yet the longevity of U.S. males ranks 19th in the world and that of U.S. females ranks 14th. As a percentage of gross national product (10.6 percent in 1982), we spend more on health than any other country. The nation with the greatest longevity, Japan, spends less than half the amount per capita spent in the United States. Among others, Greeks and Italians also have lower mortality rates and greater longevity than individuals in the United States. There are many reasons for these differences, but one of them is not the differences in direct health care or in funding for research.

Koshland gives as a reason for justifying a greater NIH budget the social judgment that poor people would benefit more than rich people. This seems unlikely. Social class differences in health, whether measured as mortality rates or as disability rates, have remained constant for at least the past 50 years. These differences in health among social classes have largely been the justification for the implementation of the British National Health Plan and for Medicare. That is, the differences were thought to be due to economic barriers to medical care. Experience shows that, in spite of the removal of those barriers, the social class gradient in health has been extremely resistant to change.

I do not mean to suggest a nihilistic view of medical research or of its benefits. Perhaps there are sound reasons for increasing the NIH research budget. The justification for doing so, however, should be something other than promises of improved health.

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One of the great values of research on health is that its benefits cross national and economic boundaries. Does anyone who reads the daily newspapers really doubt that our lives have been and are being extended by discoveries basic research unfolded, however financed? Each day's news gives some account of new methods of prevention or cure, to say nothing of the great contributions of the past in antibiotics, polio vaccine, and so forth. Foreigners do, of course, benefit from these discoveries, and some foreign countries may have more equitable systems than ours of health care delivery, but the life expectancy of these populations should not be expected to show a correlation with research expenditures. If Sagan is arguing that we must improve delivery of the applications of research discoveries to our own less privileged citizens, I agree wholeheartedly. But unless we discover the cures, we can only offer words of sympathy to rich and poor alike.

—DANIEL E. KOSHLAND, JR.

Textbooks and Profits

"[T]he fact that textbooks almost never make money" (26 Apr., p. 442) must come as a shock to publishing companies such as Addison-Wesley, Harper & Row, Houghton Mifflin, Macmillan, McGraw-Hill, Prentice-Hall, Wiley, and many others who depend on sales of their textbooks to produce a large percentage of their profits each year. The profitability of such publishers decade after decade has been based on the fact that most textbooks published do make money, and some of them make substantial amounts of it. Large numbers of individual authors have significantly increased their personal incomes by writing successful textbooks, and a few of them have even managed to earn royalties that total more than $1 million over several editions of their books. Authors with promising manuscripts for basic textbooks can count on intense competition among publishers for their manuscripts. New book-publishing companies are launched each year with the primary aim of publishing textbooks, and—no matter what changes the electronic revolutions of our time may bring to the educational scene over the next decade or two—it is highly probable that textbooks (and textbook publishers) will be with us, making good money, for the foreseeable future.

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Inyo Dike Rotation

In his article describing the Inyo Scientific Drilling Program (Research News, 1 Feb., p. 504), Richard A. Kerr does not mention one of the more significant results of the drilling to date, the successful prediction of the *rotation* of the buried silicic dike, as well as its location. The north-northwest alignment of the 550-year-old Inyo Domes is apparent to anyone who glances at a map of the area, and is indicative of a magmatic dike at depth with this same orientation. However, before the drilling and on the basis of detailed analysis of structures on and around the Inyo Domes, we suggested (*1*) that during emplacement the main Inyo dike broke up into at least three segments that underwent 10 to 20 degrees of clockwise rotation as they approached the surface. Such "fingering" behavior has been well documented for dikes of basaltic composition (*2*) and results when a rising dike encounters a vertically varying stress field.

The position of the dike in drill hole RDO-3A was 200 meters west of the line connecting the vent areas of the three large domes, as we had predicted on the basis of mapping and modeling. The inferred segmentation and clockwise rotation of the Inyo dike indicates that the local stress field 550 years ago changed with depth, resulting from a depth-dependent increase in shear stresses along

the Hartley Springs Fault, decreasing influence of lithostatic pressure near the surface, or some other structural control.

An additional slanted drill hole aimed to hit the dike above or below the successful intersection of 1984 could help define the vertical gradient in the 550-year-old paleo–stress field in this currently seismic area. Such information might be used to help predict the location and migration of any future magmatic vents in the Mammoth Lakes area.

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References

1. J. H. Fink and D. D. Pollard, *Trans. Am. Geophys. Union* **64**, 904 (1983); J. H. Fink, *Abstr. Prog. Geol. Soc. Am.*, **16**, 509 (1984); *J. Geophys. Res.*, in press.
2. D. D. Pollard and P. T. Delaney, *USGS Prof. Paper 1202* (1982).

Nuclear Reactor Safety

Susan J. Niemczyk (Letters, 3 May, p. 530) asks that her views on nuclear reactor safety not be misconstrued. But regrettably, in her gratuitous final sentence, she misrepresents my position.

My concern with regard to the study of the radiological consequences of nuclear accidents (known as "source terms") has simply been to ensure that public safety margins are not eroded, particularly on the basis of incomplete and contradictory data.

Although the assessment of nuclear accident consequences is still at a preliminary stage, some within the nuclear power industry have attempted to use this work to lobby the Nuclear Regulatory Commission to relax important safety regulations. In particular, industry lobbyists have sought reduction or elimination of requirements involving emergency planning, equipment qualification (intended to ensure that vital safety equipment functions properly during accidents which it is designed to mitigate), and backfitting (intended to correct design flaws in operating plants).

In reviewing the basis for this lobbying effort, I and my colleagues at the Committee to Bridge the Gap found numerous fundamental inadequacies in the source term research that make broad generalizations about accident consequences and drastic regulatory reductions impossible (*1*). These include unvalidated computer models that have been known to produce widely varying predictions of radioactive releases for the same accident sequence; quality assurance problems that make containment performance uncertain; and important accident sequences, such as those resulting from earthquakes or sabotage, that have been inadequately addressed.

While accident consequences may indeed have been overestimated for some accident sequences and for some radionuclides, we found that consequence estimates for others appear likely to remain the same or even to increase.

Many other technical criticisms have been offered by the American Physical Society (APS) Study Group on source terms and by Niemczyk, among others. The APS found that "the source term research cannot yet be regarded as adequate" (*2*, p. 216) and also pointed to some factors that could raise accident consequence estimates (*2*, p. 212), not lower them.

Because of these inadequacies, we concluded that emergency preparedness and other safety requirements should not be reduced.

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References

1. S. Aftergood, "Nuclear accident source terms: No basis for eliminating safety regulations" (Committee to Bridge the Gap, Los Angeles, February 1985).
2. *Radionuclide Release from Severe Accidents at Nuclear Power Plants* (American Physical Society, New York, February 1985).

CIBA-GEIGY Origins

David Dickson states (News and Comment, 29 Mar., p. 1560) that "CIBA was established by then Trinity Fellow Norman de Bruyne in the 1930's." I established Aero Research Ltd. in 1934. CIBA (of Basel) bought a majority shareholding in 1947, when the company became CIBA (A.R.L.) Ltd. Subsequently CIBA and GEIGY (both companies with worldwide ramifications) joined forces to form CIBA-GEIGY.

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Erratum: In the Research News article by Jean L. Marx, "The polyphosphoinositides revisited" (19 Apr., p. 312), the discovery of inositol 1,3,4-trisphosphate was erroneously attributed to Michael Berridge of Cambridge University. Although Berridge presented some of the data at the Smith Kline & French symposium, the work was actually done by his Cambridge colleagues Robin Irvine and Peter Downes.