

SCIENCE

Published by the **American Association for the Advancement of Science (AAAS)**, *Science* serves its readers as a forum for the presentation and discussion of important issues related to the advancement of science, including the presentation of minority or conflicting points of view, rather than by publishing only material on which a consensus has been reached. Accordingly, all articles published in *Science*—including editorials, news and comment, and book reviews—are signed and reflect the individual views of the authors and not official points of view adopted by the AAAS or the institutions with which the authors are affiliated.

The American Association for the Advancement of Science was founded in 1848 and incorporated in 1874. Its objectives are to further the work of scientists, to facilitate cooperation among them, to foster scientific freedom and responsibility, to improve the effectiveness of science in the promotion of human welfare, to advance education in science, and to increase public understanding and appreciation of the importance and promise of the methods of science in human progress.

Membership/Circulation

Director: Michael Spinella
Deputy Director: Marlene Zendell
Member Services: Rebecca Dickerson, *Manager*; Mary Curry, *Supervisor*; Pat Butler, Helen Williams, Laurie Baker, *Representatives*
Promotions: Dee Valencia, *Manager*; Hilary Baar, Angela Mumeka, *Coordinators*
Research: Kathleen Markey, *Manager*; Robert Smariga, *Assistant*
Financial Analyst: Jacquelyn Roberts
Administrative Assistant: Nina Araujo de Kobes
Science Member Services
Marion, Ohio: 800-347-6969;
Washington, DC: 202-326-6417
Other AAAS Programs: 202-326-6400

Advertising and Finance

Associate Publisher: Beth Rosner
Advertising Sales Manager: Susan A. Meredith
Recruitment Advertising Manager: Janis Crowley
Advertising Business Manager: Deborah Rivera-Wienhold
Traffic Manager: Tina Turano
Recruitment: Michele Pearl, *Operations Manager*; Dan Moran, *Traffic Manager*; Debbie Cummings, Celeste Wakefield, Angela Wheeler, *Sales*
Marketing Associate: Allison Pritchard
Reprints Manager: Corrine Harris
Permissions Manager: Arlene Ennis
Sales Associate: Carol Maddox

ADVERTISING SALES: East Coast/E. Canada: Richard Teeling, 201-904-9774, FAX 201-904-9701 • Southeast: Mark Anderson, 305-856-8567, FAX 305-856-1056 • Midwest: Donald Holbrook, 708-516-8882, FAX 708-516-8883 • West Coast/W. Canada: Neil Boylan, 415-673-9265, FAX 415-673-9267 • UK, Scandinavia, France, Italy, Belgium, the Netherlands: Andrew Davies, (44) 457-838-519, FAX (44) 457-838-898 • Germany/Switzerland/Austria: Tracey Peers, (44) 270-760-108, FAX (44) 270-759-597 • Japan: Mashy Yoshikawa, (3) 3235-5961, FAX (3) 3235-5852
Recruitment: 202-326-6555, FAX 202-682-0816
European Recruitment: AnneMarie Vis, (44) 0223-302067, FAX (44) 0223-302068
Australia/New Zealand Recruitment: Keith Sandell, (61) 02-922-2977, FAX (61) 02-922-1100
Send materials to *Science* Advertising, 1333 H Street, NW, Washington, DC 20005.

Information for Contributors appears on pages 37–39 of the 7 January 1994 issue. Editorial correspondence, including requests for permission to reprint and reprint orders, should be sent to 1333 H Street, NW, Washington, DC 20005.

LETTERS

Health Care Costs

Those of us in Colorado who have been exposed regularly to Richard D. Lamm's public persona over the past 20 years cannot be surprised by his rantings against academic health centers (Letters, 3 Dec., p. 1497). Few would argue with his position that worldwide increases in life expectancy have more to do with sanitation and diet than with biomedical research. His jump from that position to one of blaming the "fiscal black holes" of academic health centers for our current health care delivery costs and for lack of action on community problems such as poverty and alcohol abuse, is another matter.

It should be pointed out that during his 12 years as governor of Colorado, Lamm himself did little or nothing to mount antismoking campaigns, institute alcohol abuse programs, improve the diet of the poor, or undertake serious remedies for the other ills he catalogs. He merely complained (then as now) that it was someone else's responsibility. His current contention that our academic health center "did little or nothing about . . . violence" illustrates the point.

Contrary to Lamm's assertions, the University of Colorado Health Sciences Center delivers health care to urban poor and has outreach programs for primary health care in rural areas and a nationally recognized alcohol abuse program. As far as not "expanding [health care] coverage to the uninsured" is concerned, the Center was, and is, fully responsible for the care of state residents who are indigent. When Lamm was governor, the state of Colorado consistently refused to include any adequate reimbursement for this service when setting the institutional budget.

Lamm indicates that supporting academic health centers (and hence biomedical research) may actually *reduce* the overall health of the community, quoting a truism by Robert Evans, namely, that if you spend so much on health care that other "health-enhancing activities" are shortchanged, then the health of the community may decline. This argument has two obvious problems. First, no one has shown that any significant fraction of the excess monies spent on health care goes to academic health centers (try overpaid specialists, hospital corporations, insurance companies, and consortiums of physicians owning their own magnetic resonance imagers). Second,

if health-enhancing activities are indeed shortchanged, then one must look for a remedy by assessing not just health care expenditures but rather the overall expenditures of our society, including such items as repairing telescopes in space, building nuclear submarines, sending a billion dollars in "recovery funds" to sheiks in Kuwait, or paying off on savings-and-loan swindles.

Finally, if one wishes to know why health care costs in the United States are 50% higher than those of our leading competitors, it might be well to look at the health care delivery systems used by those countries and learn from them, rather than pass the buck to our academic health centers.

A. R. Martin*

277 South Dexter Street,
Denver, CO 80222

*Professor of physiology, University of Colorado School of Medicine, 1970–1993 (Department Chair, 1970–1985 and 1989–1993).

Lamm's letter describing his views of the lack of contribution of medical research to improved health status contains a sideswipe at the University of Colorado Health Sciences Center that cannot go unchallenged. Certainly there have been advances in immunology, virology, and microbial genetics that have led to the development of several vaccines that have significantly affected the morbidity and mortality of the American population. Those for poliovirus, hepatitis B (and soon A), and *Hemophilus influenza B* are but a few examples.

During the time that Lamm was governor of Colorado, there was a great deal of applied research and development going on at the University of Colorado Health Sciences Center in addition to the large amount of basic science research he alludes to. At that time, C. Henry Kempe and his colleagues were developing methods of treatment and prevention of child abuse and neglect. Kempe also pioneered the development of a variety of vaccines, all of which resulted in the near elimination of childhood infectious diseases and the worldwide total elimination of smallpox. Henry Silver and his colleagues were testing alternative methods of health care delivery by evaluating the clinical competence of nurse practitioners and child health associates—allied health programs pioneered in Colorado that have led to substantial improvements in health care delivery. These



ONE-STOP SHOPPING FOR NON-ISOTOPIC DESIGNER LABELS.

Fluorescein, biotin, alkaline phosphatase, digoxigenin*, ABI dyes and ABI primer kits (M13, T7, T3, SP6.) Genosys offers a complete selection of custom-labelled oligos for PCR, DNA sequencing, gene mapping and chemiluminescent detection. We'll attach the label to your primer or probe, purify it, and deliver exactly what you need, on time and research-ready.

In North America, call
(800) 2345-DNA

GENOSYS

Genosys Biotechnologies, Inc. The Woodlands, TX 77380-3600
Phone: (713) 363-3693 Fax: (713) 363-2212
In U.K., France, Germany & Eire: Genosys Biotechnologies, Inc.
Phone: (+44) 223 425622 Fax: (+44) 223 425966
In Other W. European Countries: MedProbe A.S. (Oslo, Norway)
Phone: (+47) 22 20 01 37 Fax: (+47) 22 20 01 89
In Japan: Kurabo Industries Ltd., Biomedical Dept. (Osaka, Japan)
Phone: 0720-20-4504 Fax: 0720-21-9641

* Chemistry licensed from Boehringer-Mannheim
The PCR process is covered by patents owned by Hoffman-La Roche Inc.

are but three of the many programs that were part of a research effort at the Health Sciences Center. In addition, Colorado also developed a statewide Area Health Education Center program which brought continuing education and student contact to hundreds of physicians, nurses, dentists, and other health care professionals throughout the state.

Our ex-governor has fired broad generalizations that are not based on fact, and in the process has grossly overstated his case and cast aspersions on a health sciences center that has an extraordinarily balanced research program—now funded at \$120 million annually, representing a nearly \$4-billion boost to the Colorado economy. This continuous research effort has resulted in improved health for all citizens. To deny these facts is pure demagoguery.

Richard D. Krugman

Dean, School of Medicine,
University of Colorado,
Health Sciences Center,
Denver, CO 80262

Vincent A. Fulginiti

Chancellor,
University of Colorado,
Health Sciences Center, Denver

Like other *arrivistes* to the health care scene, Lamm has clearly never served a single day or night at the research bench or in the medical trenches; yet such self-appointed "experts" all seem to have magic bullets for "health reform." His ad hominem accusation of "hubris" rightfully rebounds to himself. It is not clear, indeed, what credentials the ex-governor has for an objective assessment of the value of medical research.

To state that academic health centers "have done little to deal with" smoking, alcohol, and diet because there is "no glamour" there is disingenuous at best and incorrect at worst. As early as 1939, Alton Ochsner and I, on the basis of our clinical investigations (1), implicated smoking as a causative factor in cancer of the lung, and the vigorous research in this field has since provided clear scientific evidence of this link, resulting in a broad public education campaign that effectively reduced the incidence of smoking in this country. Similarly, it is research that yielded evidence of faulty diet as a risk factor in heart disease and other disorders, again leading to public education in this field (2). And if not research, what does he think is the source of preventive medicine (sanitation, pasteurization, chlorination, refrigeration, diet), whose salutary effects on health he acknowledges?

Lamm cites a 1979 article by V. R. Fuchs (3), but does not include the following passage, which supports the benefits of research.

In recent years . . . U.S. death rates, especially from heart disease, have decreased rapidly. . . . Analysts who are technologically inclined attribute most of this large decrease to better control of hypertension, special coronary care units in hospitals, open-heart surgery, and similar medical innovations.

Lamm does a serious disservice not only to the many dedicated professionals in our medical schools and research centers, but to the American public as well when he refers to these institutions as "fiscal black holes" usurping "endless resources." T. McKeown, to whom Philippe Grandjean refers in his letter (3 Dec., p. 1497), wrote (4, p. 222):

The knowledge on which . . . treatment is based must come mainly from biomedical research. Indeed nothing in the analysis of disease origins suggests that we can dispense with empirical investigations.

As Daniel E. Koshland Jr. eloquently points out in his editorial of 3 December (p. 1495), "lowering health costs at the expense of future new cures and preventions is shortsightedness of the extreme sort." His catalog of medical advances attributable to research documents the practical utility of our past investment in these endeavors. Many of these advances derived from extramural National Institutes of Health research, that is, investigations carried out in the nation's medical centers of excellence. In Koshland's apt words, "Improved health care for all should be based on the twin pillars of new cures and better access to those cures."

Michael E. DeBakey

Baylor College of Medicine,
One Baylor Plaza,
Houston, TX 77030

References

1. A. Ochsner and M. DeBakey, *Surg. Gynecol. Obstet.* **68**, 435 (1939).
2. M. E. DeBakey, A. M. Gotto Jr., L. W. Scott, J. P. Foreyt, *The Living Heart Diet* (Simon & Schuster, New York, 1984); *The Living Heart Brand Name Shopper's Guide* (Mastermedia, New York, 1993); M. E. DeBakey, A. M. Gotto Jr., L. W. Scott, *The Living Heart Guide to Eating Out* (Mastermedia, New York, 1993).
3. V. R. Fuchs, *Milbank Mem. Fund Q.* **57**, 153 (spring 1979).
4. T. McKeown, *The Origins of Human Disease* (Blackwell, Oxford, United Kingdom, 1988).

Lamm is right on target. Indeed, the evidence is compelling that increased life expectancy has occurred mainly through public health measures. Paradoxically, the success of public health measures has probably contributed to the spiraling cost of health care, especially in countries such as ours that are so committed to the application of advances in biomedical technology. The reason is simple. As a larger percentage of the population grows older, more and more

persons with chronic illnesses are available for such intervention. In fact, one can conclude that prevention does not necessarily reduce health care costs if one assesses costs from the perspective of the whole life span. As individuals live longer, the total cost of their health care increases.

Two prevention measures, however, would truly reduce total health care costs. The first would be a significant reduction in the number of children born who are unwanted or unintended. The second would be a clear increase in the number of persons having living wills, especially if they spent their last days in a hospice setting rather than in a hospital intensive care unit or even in a nursing home.

Gordon H. Deckert

*Department of Psychiatry and
Behavioral Sciences,*

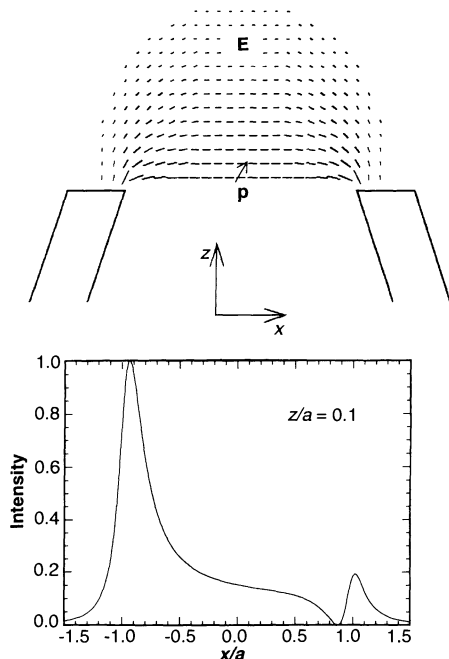
*University of Oklahoma
Health Sciences Center,*

*Oklahoma City, OK 73190-3048, and
Chairman, Public Health Policy Committee
Oklahoma State Board of Health*

Corrections and Clarifications

In Christopher Anderson's article "Hearing process proves a challenge for ORI" (News & Comment, 18 June, p. 1714), "judge" Celia Ford was incorrectly described as a "Public Health Service attorney." She is, rather, an attorney on the staff of the Deputy Secretary of Health and Human Services.

In the report "Single molecules observed by near-field scanning optical microscopy" by E. Betzig and R. J. Chichester (26 Nov., p. 1422), figure 2 on page 1423 was incorrectly printed. The arrow representing the molecular dipole \mathbf{p} was missing in the top part of the figure. The correct figure appears below.



NEMMERS PRIZES

NORTHWESTERN UNIVERSITY

THE ERWIN PLEIN NEMMERS PRIZE IN ECONOMICS

THE FREDERIC ESSER NEMMERS PRIZE IN MATHEMATICS

\$100,000 AWARDS PRESENTED BY

NORTHWESTERN UNIVERSITY

Northwestern University announces the establishment of a series of prizes for distinguished achievement in the arts and sciences. Northwestern anticipates conferring the awards, which are made possible by generous gifts from the late Erwin Esser Nemmers and the late Frederic Esser Nemmers, every other year, with specific fields designated for each cycle of awards.

Nominations are now invited for the Erwin Plein Nemmers Prize in Economics and the Frederic Esser Nemmers Prize in Mathematics, to be awarded during the 1994-95 academic year. Each award includes a \$100,000 payment to the recipient.

Candidacy for the Nemmers Prize in Economics and the Nemmers Prize in Mathematics is open to individuals of outstanding achievement in their discipline, as demonstrated by major contributions to new knowledge or the development of significant new modes of analysis. Individuals of all nationalities and institutional affiliations are eligible, except current or former members of the Northwestern University faculty and recipients of the Nobel Prize.

The recipient of either Nemmers Prize will deliver a public lecture and participate in other scholarly activities at Northwestern University for 10 weeks. Nominations for both prizes will be accepted until March 1, 1994. Nominating letters of no more than three pages should describe the nominee's professional experience, accomplishments, and qualifications for the award. Direct applications for the Nemmers Prize will not be accepted.

Send nominations to:
Secretary
Selection Committee for the
Nemmers Prizes
Office of the Provost
Northwestern University
633 Clark Street
Evanston, Illinois 60208-1101
U.S.A.

Northwestern University is an equal opportunity employer and educator.