

Analogies with Meaning

The Vignette entitled "Editing" (5 Sept., p. 1445) features an example of a rewritten text for a museum exhibit taken from *A Field Guide for Science Writers: The Official Guide of the National Association of Science Writers* that I think captures the worst of current science writing. The edited example conveys little about the scientific content of the exhibit being described. There is nothing wrong with a familiar analogy, but "TRESPASSING IN THE BLOOD-STREAM" gives the impression that early atherosclerosis is an invasion from outside. A good analogy adds meaning; using the analogy of a slowing of traffic in an otherwise smooth conduit might have been more informative. The scientist could have been depicted as a helicopter traffic reporter, finding the source of congestion by observing at a distance (not as the scientist-as-detective, a well-worn cliché). I hope that the National Association of Science Writers put this in their book as a negative example.

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NASA Funding for Earth Science

The National Aeronautics and Space Administration's (NASA's) Mission to Planet Earth (MTPE) may not have given Andrew Lawler the entire story on the funding of grants to analyze data from the "flotilla of Earth-observation satellites" that will be launched in the next few years (News & Comment, 29 Aug., p. 1198). MTPE is certainly not "boosting" funding for science at the rate that they are increasing observations and data. Support for the MTPE grants program has, in fact, been cut significantly in recent years, from approximately \$178 million in 1994 to \$125 million in 1997. Program managers have been forced to sacrifice highly regarded and productive research programs. The modest restoration of funds to the research and analysis budget being proposed by MTPE leadership is, at best, a Band-aid when intensive care is needed.

Every external and internal review panel over the past 3 years has been concerned that MTPE does not have a proper program balance. With an expected spending profile of more than \$1 billion a year for the foreseeable future, MTPE is one of the largest civilian science programs in the world today. Yet the grants program engages less than 2000 investigators each year, a small

fraction of the U.S. community with skills and interest in Earth system science and practical applications of remote sensing. More than 80% of the MTPE budget is dedicated to building and launching satellites, developing algorithms to generate data, and data management. The restoration of grants funding to \$165 million by the year 2000 is totally inadequate to make productive use of MTPE data. A "bottoms up" analysis by science program managers at NASA indicated that at least \$220 million would be required by 1998 to take advantage of highly rated research proposals using both existing and new data.

NASA Administrator Daniel Goldin has determined that NASA programs will be science-driven. MTPE is responding very slowly to Goldin's challenge, with program investments continuing to be focused on a massive monitoring and data collection effort. The problems of understanding and adapting to climate change and moving toward sustainable development are so critical to this nation's future that it is unacceptable to let bureaucratic momentum continue to dominate budget strategy. The science community has spoken and MTPE is not listening. The productivity of the nation's premier global change research program is at risk.



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Clean Air Skepticism

Polio Vaccine Production

In the debate between Alan W. Dove and Vincent R. Racaniello (Policy Forum, 8 Aug., p. 779) and Harry F. Hull and R. Bruce Aylward (Policy Forum, 8 Aug., p. 780) about whether or not to convert polio vaccination from oral to inactivated vaccine during the last stages of eradication, the supply of enhanced-potency inactivated vaccine is an important consideration. Currently, Pasteur Mérieux Connaught supplies most of the inactivated polio vaccine (IPV) used in the world. In our opinion, expanded production to 500 million doses per year would be feasible if enough advance notice were given, particularly in view of the likelihood that other manufacturers would enter into production of IPV.

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The article by Jocelyn Kaiser about the debate over tightened ambient air quality standards (News & Comment, 25 July, p. 466) does a good job of presenting the U.S. Environmental Protection Agency's (EPA's) side of the story, but does not mention several of the scientific issues that make up the basis for widespread skepticism. Most of the new epidemiological studies have examined short-term (daily) responses, including mortality. However, because of temporal colinearity among pollutants and uncertain exposures of the putative victims, it is not possible to apportion blame among potential environmental agents with certainty (1, 2). The effects of carbon monoxide have often been neglected, and the effect of particle size (if any) remains unclear (3). As Kaiser points out, there are also questions about the degree of prematurity of death.

Two recent mortality studies considered long-term survival rates of defined cohorts in relation to the average air pollution con-

centrations, as measured during periods of follow-up. Kaiser describes the first of these studies (4) as "convincing"; it reported that about 26% of all deaths in six U.S. cities were attributable to air pollution, thus putting air pollution on a par with smoking and implying that eliminating air pollution could have about the same health benefit as eliminating all human cancers, for example. Kaiser quotes me as allowing that a systematic gradient in lifestyle across the six cities "might" account for the mortality gradient that was attributed to air pollution. Such a regional gradient in physical activity exists (5), and its implied effect on longevity is almost exactly the same as that shown in an independent study of individuals in California (6). Accounting for this confounding variable would leave a mortality excess of only about 5% (in the most polluted city), and this excess could well be a result of the much higher historic exposures that were present in that city (6). My concern is thus much more than a hypothetical "what if."

Studies that conclude that current air pollution is as lethal as smoking or cancer have omitted known confounders such as diet, physical exercise, income, and employment status, and treat nonlinear factors (for example, body mass and education) as if they were linear. The second cohort study

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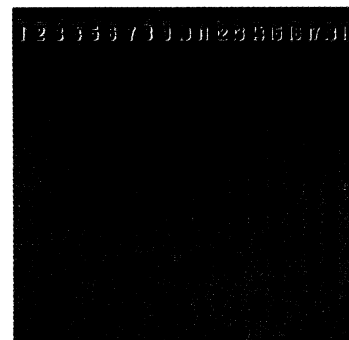
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