I agree with DeVault that the difficulty of selling the metric system to nontechnical people is semantic rather than technical, but I disagree with his approach.

We can sell the metric system by pointing out its advantages in computation (addition, subtraction, multiplication, and division for nontechnical persons) and resulting standardization [to both nontechnical and technical persons; for example, the garage mechanic must now sort out different sizes—SAE (Society of Automotive Engineers), English, and metric].

Yet, we cannot teach the metric system simply by teaching equivalents (for example, DeVault's new inch). Experienced teachers of foreign languages know that students learn a language by using it, not simply by learning vocabulary. By analogy, we can best learn the metric system by using it. Many readers of *Science*, including myself, teach; I suggest *we* (not the amorphous they) use the metric system exclusively in our courses. Quickly we would learn to think metric and live metric.

WILLIAM H. CALHOUN
Department of Psychology,
University of Tennessee,
Knoxville 37916

Pollution Taxation

Richard Wilson's suggestion of a tax based on the product of air pollution concentration and the affected population density would appear to have limitations not covered in his report (13 Oct. 1972, p. 182). With his scheme in effect, areas of low population concentration would suddenly become economically desirable locations for heavily polluting industries. Wilderness areas would then suffer; the rights of minorities (homeowners, scientific investigators, and appreciative visitors) in these areas would then be subject to gross abuse ("I moved to the city because I couldn't stand the pollution in the country").

There is more to the pollution problem than just its effect upon the health of the people. We must be concerned with our paucity of knowledge of perhaps irreversible trip points in nature (just what are the factors initiating an ice age?). From a worldwide viewpoint, any advantages accrued by limiting pollution in heavily populated areas would be speedily nullified by the relatively uncontrolled emissions in remote areas.

Wilson's final statements, ". . . the tax should be related to people because smog where there are no people is unimportant" and "there are mountain valleys filled with smog from natural NO_x, but no one is worried about this natural smog," at best indicate an unnecessary pessimism concerning the interests of the environmental community.

ERIK GOTTSCHALK
Bachtelstrasse 56,
CH-8810 Horgen, Switzerland

I believe my proposed tax will safeguard the rights of those in the countryside much better than current procedures. Present air quality standards specify a definite limit below which air quality is considered adequate (although there is some litigation in progress on this).

A common way of meeting such standards is to disperse the pollutant. Great Britain, for example, already has many tall stacks from power stations located in the countryside. Complaints have been reported from Sweden and Norway.

My proposed tax would continue to encourage this dispersal, but a simple computation of the tax based on the numbers I propose shows that there are very few areas in the world where there would not be an economic incentive to install good air pollution control equipment. At the moment there is almost no incentive.

Of course, there are limitations in any simple formula, and it is possible that my formula will not suffice to keep global, man-made sulfur dioxide and nitrogen oxide emissions to a small fraction of natural emissions (the present U.S. figure is about 20 percent). If so, I agree that other measures will be necessary.

RICHARD WILSON
Department of Physics,
Harvard University,
Cambridge, Massachusetts 02138

Artifacts or Geofacts?

Charles Dawson, presumed architect of one of the greatest scientific hoaxes—Piltdown man—devised in the early part of this century a simple experiment that now could be used to support one facet of the argument Vance Haynes advances (27 July, p. 305) about the ori-

gin of the chipped flints at the Calico site.

A lawyer, Dawson belonged to a local society of science hobbyists and antiquarians in Lewes, East Sussex, England. He was annoyingly insistent that the stone artifacts proudly displayed by fellow members could have been the result of geologic processes. One day, Dawson arrived at a meeting of the society, a sackful of flint in hand. He placed the sack on the floor and then proceeded to jump up and down on the rocks, crunching them to fragments. In a little while, he removed the stones and, with a triumphant smile on his face, showed them to his incredulous colleagues. Many of the newly splintered rocks exactly resembled the so-called hand tools.

Thereafter, Dawson was snubbed by the society. A few years later, in 1912, he made an amazing discovery that propelled him to fame—the skull and jaw fragments of the Piltdown man.

It is curious, and refreshing, to note that K. P. Oakley—mentioned in Haynes's article as having examined the Calico specimens—defrocked the spurious *Eoanthropus dawsoni*, using a fluorine dating technique, in 1949.

FREDRIC BREWER
Department of Radio and Television,
Indiana University,
Bloomington 47401

Health and Technology

In his article, "Health care delivery and advanced technology" (29 June, p. 1339), Charles D. Scott argues that the development and application of advanced technology is "exactly the kind of effort that will be necessary to help solve our 'health care crisis.'" He dismisses the notion "that sufficient biomedical technology is now available for health care delivery," but supports this dismissal with no evidence. This is surprising in light of (i) the growing realization that the health status of a population is more dependent on environmental, ecological, or social factors than it is on the delivery of medical care (*1*) and (ii) the persistence of inequities in health status among subgroups of a population, despite available technology. It is not clear to us, for example, that the development and application of advanced technology would remove social gradients in morbidity and mortality. Advanced technology may indeed have a place in the solution of problems in the health care system, but intermediate or low-level technology may be the major strategy of choice (*2*).

More fundamentally, Scott fails to make clear the exact nature of the "health care crisis" he is considering. He makes no distinction between health care and medical or disease care. When referring to "detection and treatment of incipient disease," he uses the term "preventive health care," which he seems to find interchangeable with "preventive medical care." True "health care" should be the promotion of positive health and the prevention of disease before it occurs. In this context, we submit that personal action, social organization, and environmental control will be more potent problem-solvers than advanced biomedical technology.

MICHAEL G. MARMOT
WARREN WINKELSTEIN, JR.
Epidemiology Group,
School of Public Health,
University of California,
Berkeley 94720

References

1. W. Winkelstein, Jr., *Int. J. Epidemiol.* **1**, 69 (1972); T. McKeown, *Medicine in Modern Society* (Allen & Unwin, London, 1965).
2. J. Powles, *Ecologist* **2**, 24 (1972).

The remarks of C. D. Scott regarding applications to health care delivery of the technology of the engineering sciences also hold for the technology of the applied social sciences. In fact, the responsiveness of the health care system and the cost of health care can probably be affected more, in the short term, by changes in the organization of the delivery of services than by applications of advanced biomedical engineering. The response of medicine to additional funds for biomedical engineering research might be similar to the response to the recent increase in funds for health services research—social scientists have not been brought in as experts to work on the problems.

The employment of the applied social scientist in the exploration and evaluation of alternative ways or organizing the delivery of health care frequently involves the same restriction on effectiveness as does the employment of the engineer, that is, both are contracted to add the details to a preconceived concept. In addition, the application of social science methodology to health care delivery is being incorporated by a medical subspecialty (epidemiology and community medi-