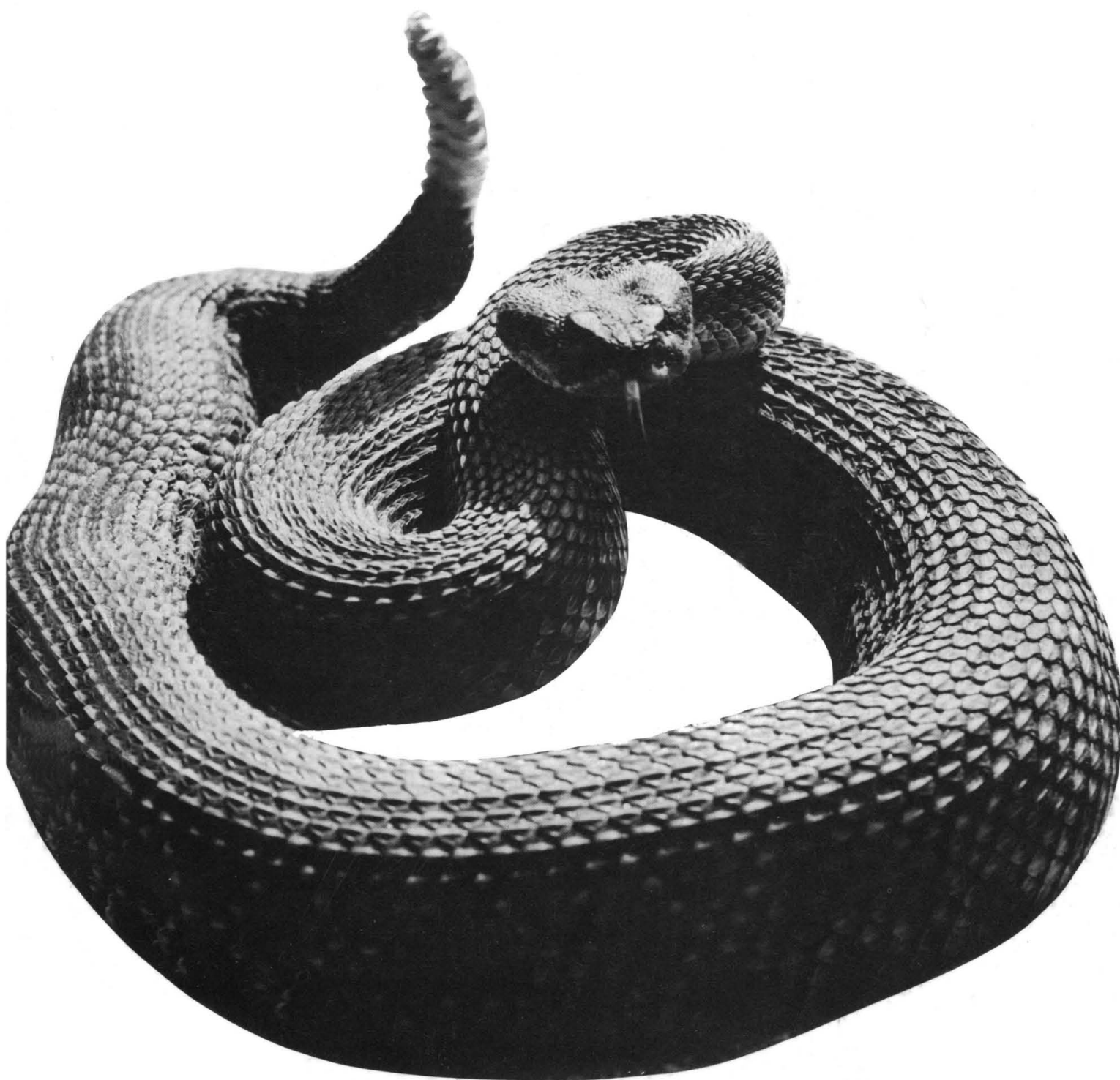


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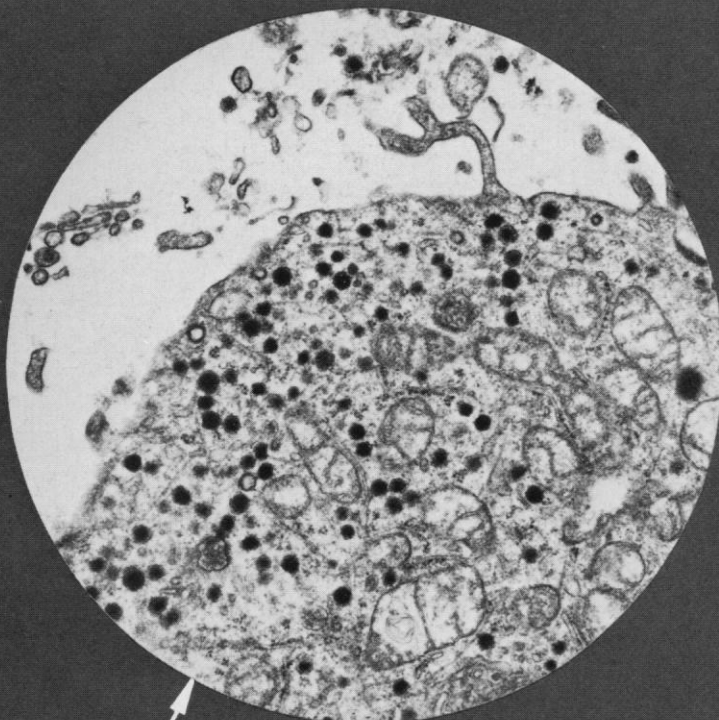
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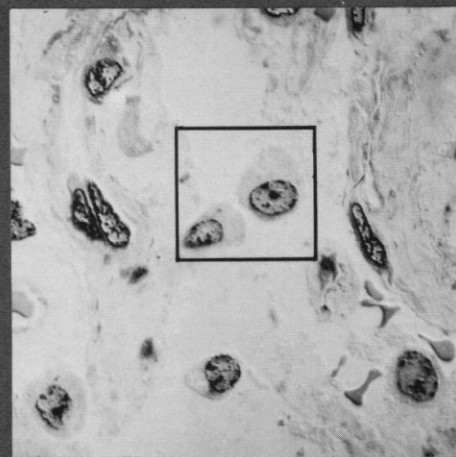
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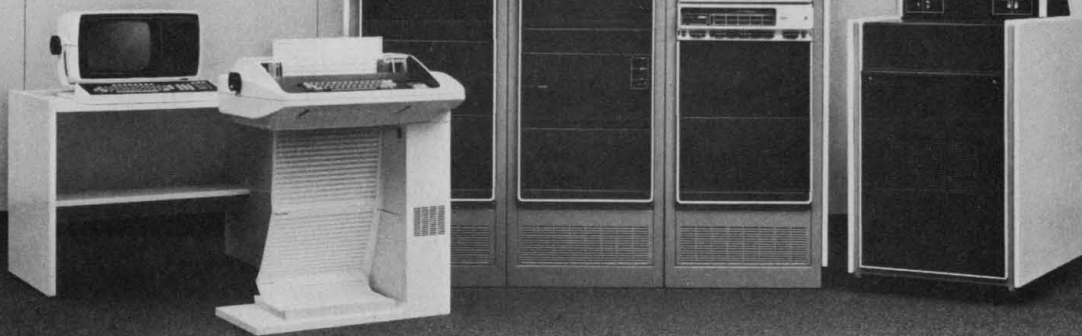
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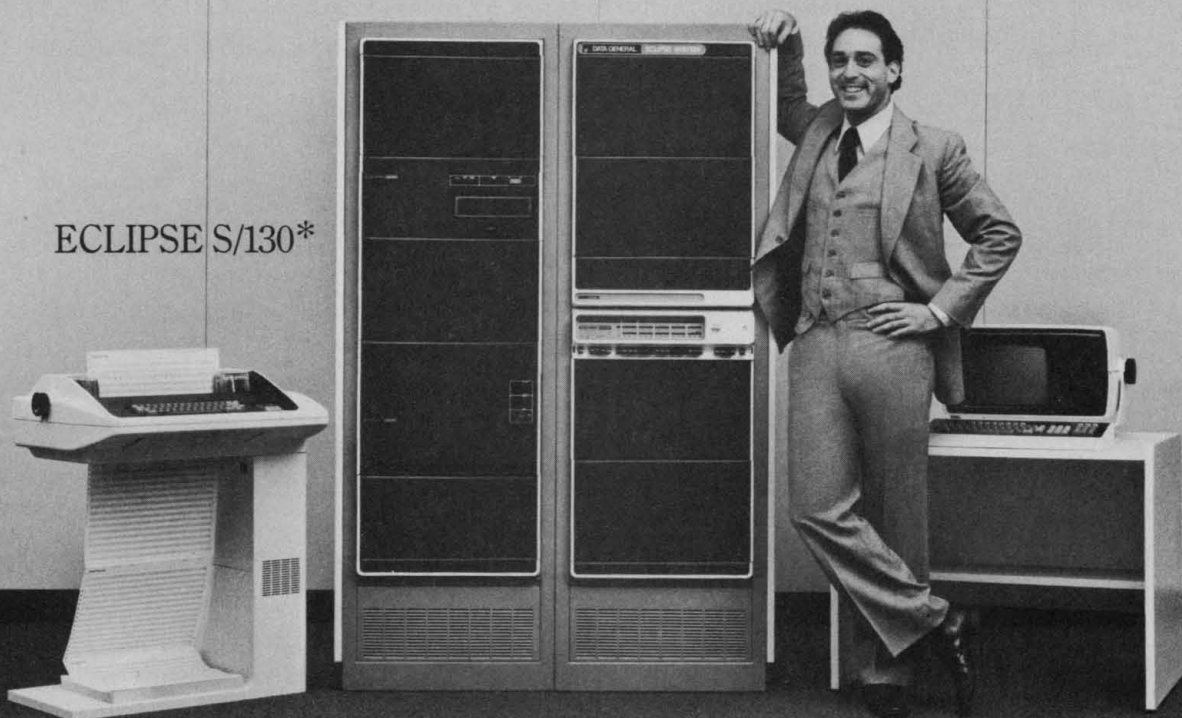
COVER

Rattlesnake, *Crotalus viridis*, sees the world in visible light through the eyes, and in infrared through the facial pit organs (dark spot below and anterior to the eye). Neurons of optic tectum combine sensor information from these modalities. The tectum's representation of space is similar but not identical for vision and infrared. See page 1225 [Ron Garrison, San Diego Zoo, San Diego, California]

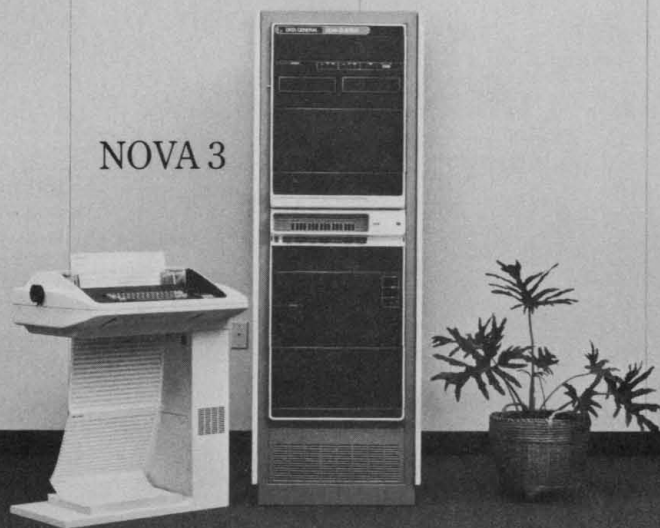
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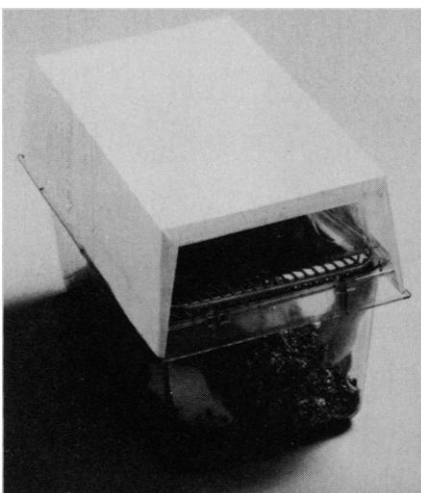
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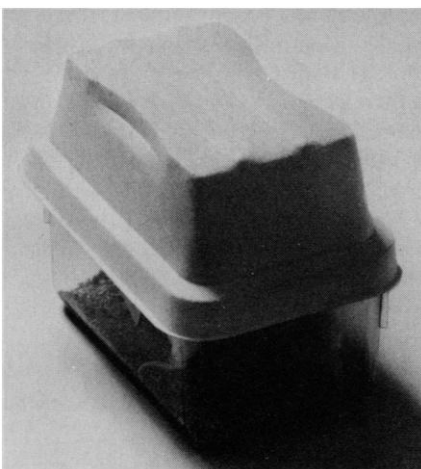
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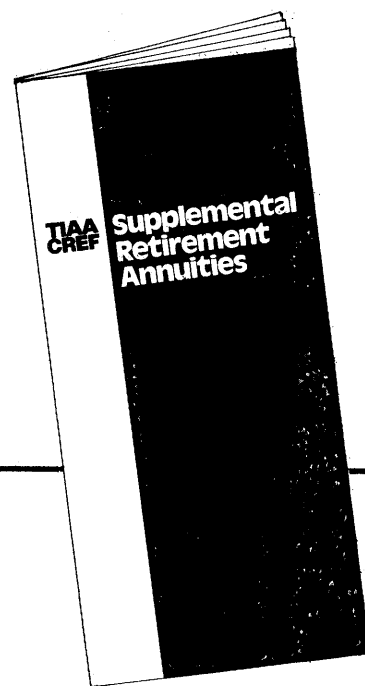
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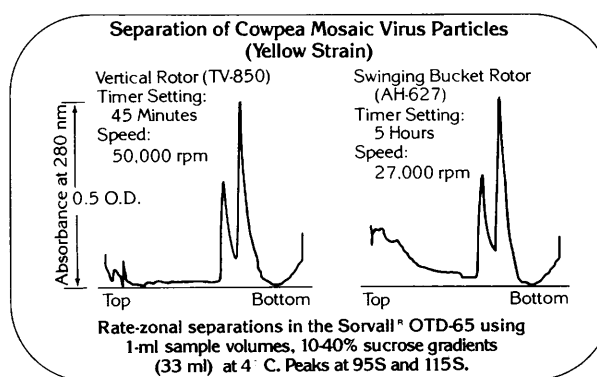
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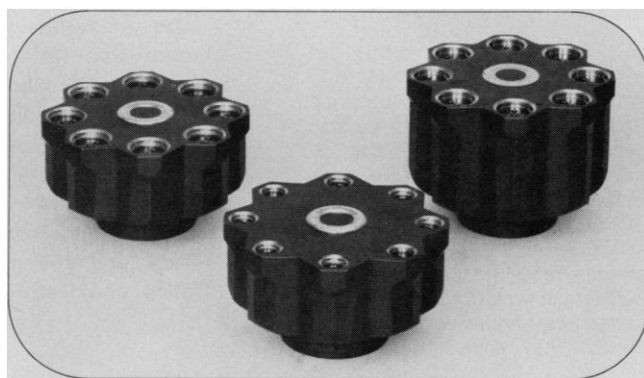
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LETTERS

ERA and the AAAS

I was surprised to read that the AAAS is moving its 1979 annual meeting from Chicago to Houston to protest the refusal of the state of Illinois to support the Equal Rights Amendment (ERA) (News and Comment, 3 Mar., p. 954). The surprising feature is that a group of scientists, who have traditionally demanded the right of dissent, have agreed to use their economic power to coerce those with whom they disagree. But while the inconsistency of a scientific group might be considered to be harmless to society, the action of using economic power to influence political opponents is not harmless. The concept of the loyal opposition is fundamental to our political system and, essential to the effective functioning of this opposition, is the freedom to speak and act without fear of retaliation.

JOHN A. MCINTYRE
2316 Bristol Street, Bryan, Texas 77801

As a fellow of the AAAS and a female, I was encouraged by the board of directors' decision to convene in states that have ratified the Equal Rights Amendment. It is an important decision that positively reinforces the will of the Congress of the United States and the substantial majority of states that have ratified ERA. The AAAS joins the American Psychological Association and other organizations and reveals heightened sensitivity toward female colleagues by affirming the desire to end the sexual inequality that affects over one-half of the nation's people. The symbolic and economic results will not be lost on those states that fail to formally recognize equality under the law.

Recent accredited polls reveal that a majority of the American people, male and female, favor ERA. With the scientific community in the forefront, perhaps the well-funded media and the local political and commercial opposition will follow and destroy the barriers to equality.

ALBERTA S. GILINSKY
University of Bridgeport,
Bridgeport, Connecticut 06602

Energy Policy and the Quality of Life

Intercountry energy comparisons are an extremely important part of energy policy research. Nothing impresses like an example, and the examples from Scandinavia and other parts of Europe

(Editorial, 10 Feb., p. 605) certainly show great potential for conservation in the United States. On the other hand, workers in this field have not given enough attention to the quality of life (QOL) in the countries studied. The standard argument goes like this: "The per capita GNP's (gross national products) are nearly the same in, say, Sweden and the United States. Of course GNP is a poor indicator of QOL, but it's the best we have. Further, attention to some details of Swedish life will help." Then, anecdotal evidence is invoked: higher life expectancy, lower crime rate, more second homes, more book publishing per capita, more public transport.

My opinion is that currently, in spite of all this, the great majority of Americans feel that this is nonsense—they believe deep down that the QOL is highest in the United States. I base this on a nonscientific analysis of discussions with Americans after I returned recently from a 2-year stay in Norway. The most-discussed points are these: (i) What is the price of gasoline? (United States, \$0.65 per gallon; Norway, \$1.65 per gallon.) (ii) What does a car cost? (Because of taxes, the price is about 90 percent higher in Norway.) (iii) What about income and sales taxes? (They average about 20 percent in the United States, 45 percent in Norway—and in Norway they are remarkably loophole-free. Median before-tax income is about \$10,000 in Norway versus \$13,000 in the United States.) (iv) Food prices? (Norway averages 70 percent higher; only fish and a few subsidized items like milk and flour are lower.) (v) Housing? (Rents in Norway are higher, and the average nonfarm dweller does not own a detached dwelling. A 1200-square-foot apartment is considered large for a family of four. People live closer together in Norway.)

After these questions the discussion often branches out to things which are more available or cheaper in Norway—medical care, public transport, access to nearby natural beauty, slower pace of life, low crime rate, lack of disruptive forced mobility—but I almost always get the impression that the decision has already been made (one discussion ended after the gasoline price question).

If Americans feel this way, they are by definition correct, for QOL is a subjective measure. The problem then is to determine which of the good elements of European energy policy are necessarily coupled to those effects considered undesirable by Americans; for example, high gasoline taxes. (In fact, one could ask if use of—and reliance on—more public transport is really considered a

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benefit by Americans.) This is subtle stuff, but it is necessary to remove barriers to implementation of the lessons learned from Europe.

ROBERT A. HERENDEEN
Center for Advanced Computation,
University of Illinois, Urbana 61801

Carcinogens by Fiat?

R. Jeffrey Smith, in the briefing related to preliminary findings on the carcinogenicity of xylitol (News and Comment, 10 Feb., p. 670), appears—as do several governmental agencies—to interpret the Delaney Clause as one without reasonable modifiers. The clause in its entirety is, “No additive shall be deemed to be safe if it is found to induce cancer when ingested by man or animal, or if it is found, after tests which are *appropriate* for the *evaluation* of the safety of food additives, to induce cancer in man or animal [italics added].”

The italicized words could and should be used to establish the appropriateness of the evidence used to ban varied substances. The farcical nature of decisions to ban substances given to animals, usually rodents, by stomach tube in horrendous amounts, or in other ways inappropriate to human exposure, should be apparent. On the other hand, the need of pharmacological studies for the inherent evaluation of the biological activity of such substances is evident, but their applicability to human practices should be judged by separate criteria.

The interpretation of the first part of the clause as requiring instant action even if one animal is known to have developed a malignancy surely should be interpreted as meaning a *valid* observation of the causal relationship of the additive to cancer. Under such circumstances, both parts of the clause are congruent.

Last, in contrast to the few, if any, identifiable deaths from additives covered by the Delaney Clause, there have been more than 2 million premature cancer deaths since 1950 from tobacco products, which are excluded from regulation by the Delaney Clause. In addition to tobacco, the “natural” additives, such as aflatoxins and various radioactive elements in food plants, are also not covered by the Delaney Clause.

Carcinogen should be a biological appellation, not a legislative term.

GEORGE E. MOORE
Department of Surgery,
Denver General Hospital,
Denver, Colorado 80204



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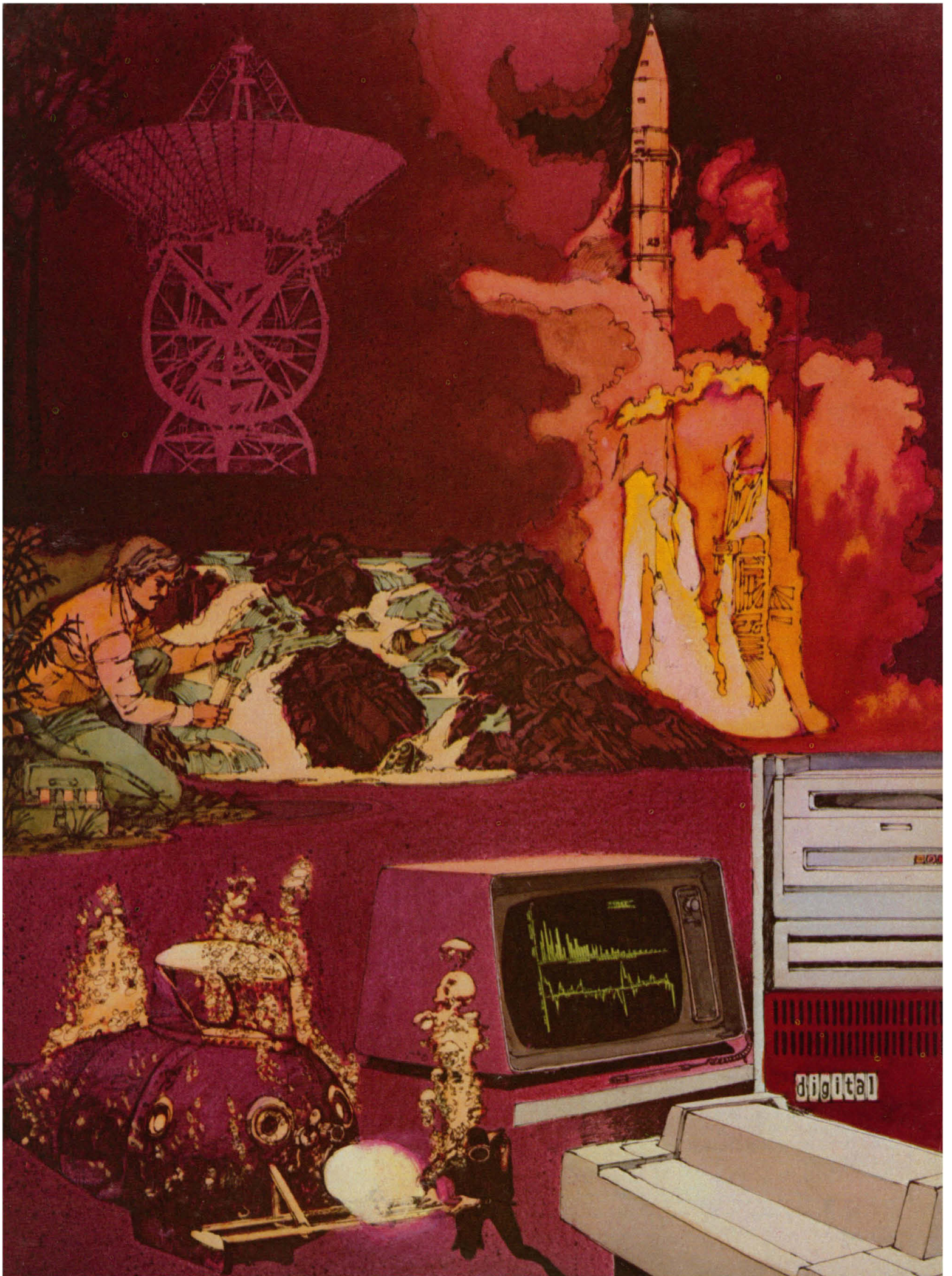
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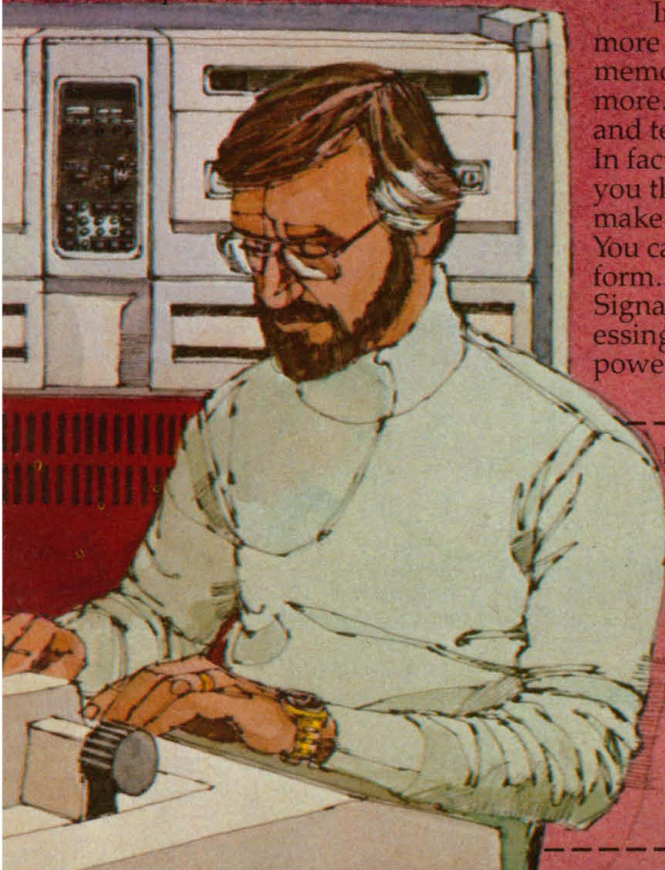
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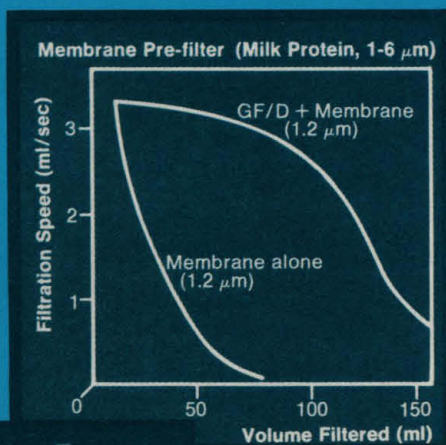
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A Very Human Business

In the kinetic behavior of AAAS over the past decade, not excluding the present, social controversy has troubled the waters and provoked questions about what is science's proper business and what is not. While the prevailing wisdom is that the fires of American discontent are burnt out, the evidence is that it does not take much to rekindle them. Science may yearn to be seen as impartial, a sanctuary of reconciliation whose members hear no evil, see none, and above all speak none. If scientists were saints, it might be so.

At the recent AAAS Annual Meeting the principal eruption was one of information and communication, with nearly 140 symposia and almost 1000 speakers shoehorned into five days and nights. But there were other eruptions too, more impassioned and divisive, whose echoes still resound. The questions will not be quieted. What pushes scientists, whatever their fields and credentials, to plunge into social and political controversies which are not central to the search for and application of knowledge? What is politics doing in the house of science?

There is no way, in a dynamic society, that a strict line can be drawn between science and the tides of social change. They overlap, and if it is argued that science is value-free the same cannot be said of scientists. If scientific freedom is half the operative equation, responsibility is the other half. Where trouble comes is in divining the issues on which scientists should take a stand, and in attesting the legitimacy of their interventions. There are no glib rules, no magisterial fiats, to go by. Conscience and conviction are among the valuables rescued from the debris of the recent American experience, and they will have to do.

The scientific community has seldom complained when politics has used science for its various purposes, and it is curious that so much anguish is expressed when it is the scientists' turn to make use of politics. The glorious Apollo program, for all its benefits, was more the child of politics than of the craving for exploration. The war on cancer had similar origins. The sweep-stake staged for siting the solar energy laboratories was more of the same. Like it or not, political motives have been largely responsible for driving American science and technology for three decades, and under the banner of energy they are likely to do so for the next three. It is outright myth to imagine that science and politics exist in separate spheres.

It is not a matter of indifference that in police states the human rights of fellow scientists are violated. Nor is it beneath scientists to borrow textbook political methods in the defense of basic research against statutory regulation. When state governments dictate what is to be taught in the schools about the origins of life, we have little hesitation in taking up the fight. If these responses are legitimate, it is not clear why scientists should not also go to the mat for the physically handicapped in science, for the rights of other minority groups, or on behalf of an equal chance for women in science. The advancement of science will not be measured entirely by the growth of research budgets or the per capita share of Nobel Prizes.

If there is a hitch in the argument, it concerns the public's grasp of what the scientists are up to. Will a public which listens when scientists speak on saccharin or laetrile care to hear their views on social morality? The reaction is likely to be that the scientists have left their domain. Where the public will finally lose patience is at the appearance of arrogance, no matter what may be the moral strength of the scientists' position. It is here that a line surely can be drawn.

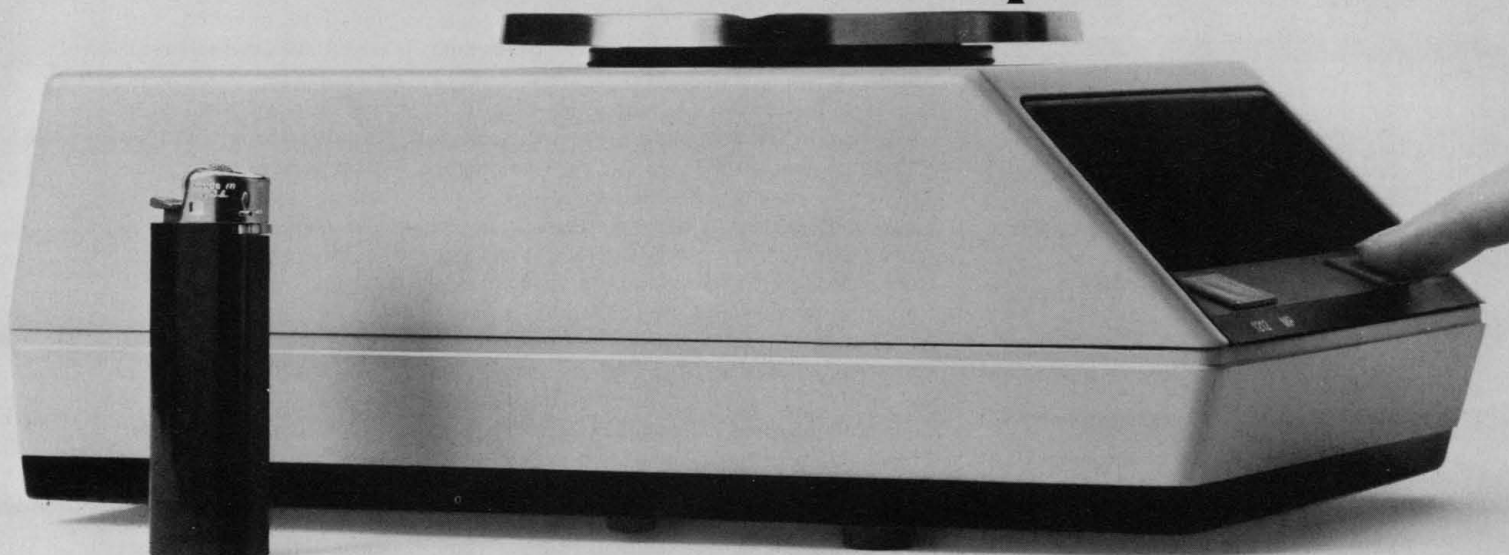
Science and social controversy will touch each other more often than not, and usually with good reason. AAAS will get its share. But when the sparks fly again, as they are bound to, there is a lot to be said for the view of our colleagues in London,* that science is "a very human business."

—WILLIAM D. CAREY

*"The vulnerable side of science," *Nature*, 15 December 1977, page 549 (editorial).

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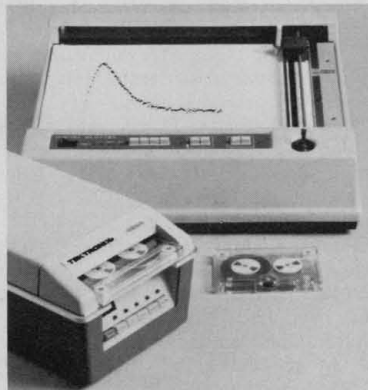
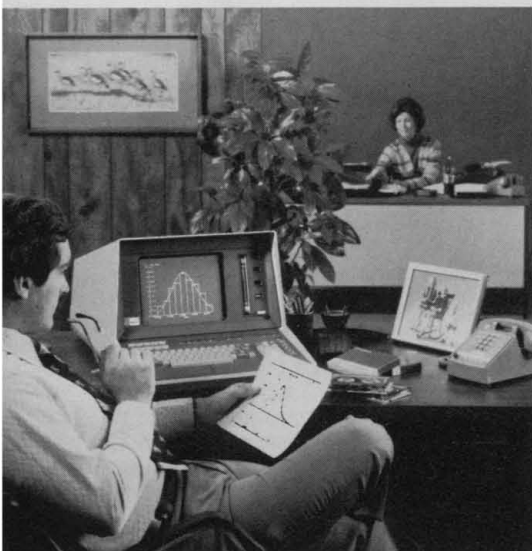
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(Continued from page 1198)

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