Laboratory Decontamination

I read with great interest the article "Prudent practices for disposal of chemicals from laboratories" by Robert M. Joyce (4 May, p. 449). I fully agree that the first step in reducing the problems of disposal is sound planning of every experiment, including minimizing the amount of chemicals ordered to conform with the quantities required. I also agree that the second step is planning of laboratory destruction of the wastes. The problem of disposal is especially acute in the field of cancer research. At the International Agency for Research on Cancer (IARC), we are acutely aware of this and organized a meeting of experts in 1978, at which the participants reached the same conclusions (*1*).

On the recommendation of this group, to conduct "research into methods for the destruction and disposal of chemical carcinogens," the IARC in 1979 initiated, with the support of the Office of Safety of the National Institutes of Health of the United States, a project to test published methods and to elaborate methods for those compounds for which no published method was available (*2*).

The following criteria were established for a method to be considered acceptable.

1) A degradation technique should lead to disappearance of the carcinogen, as analyzed by conventional analytical techniques.

2) The products of degradation should have no adverse biological effect. Although it was recognized that long-term animal experiments are the ideal method for testing such effects, short-term testing using the Ames *Salmonella typhimurium* mutagenicity assay was selected in order not to impede research.

3) The method should be reproducible and applicable in all laboratories. It was decided, therefore, to organize collaborative studies for the validation of all the proposed methods. The groups taking part in these collaborative studies were convened in small meetings with the task of discarding or amending, as required, all the methods they had tested and ranking them with respect to ease of utilization, danger of the reagents used, efficiency, and manpower involved.

So far, seven classes of chemical carcinogens have been investigated, and five volumes have been published on, respectively, aflatoxins, nitrosamines, polycyclic aromatic hydrocarbons, hydrazines, and nitrosamides (*3*); two volumes, on haloethers and aromatic amines, are in press.

Pooling efforts in this field will help solve the problem of waste disposal in small-scale laboratory investigations, as well as the acute problem of the treatment of spills, which has also been looked into in these publications. These monographs can be obtained through the Oxford University Press in New York or Oxford, United Kingdom.

M. CASTEGNARO
Unit of Environmental Carcinogens and Host Factors, International Agency for Research on Cancer, 150 Cours Albert-Thomas, 69372 Lyon Cédex 08, France

References

1. R. Montesano *et al.*, Eds., *Handling Chemical Carcinogens in the Laboratory: Problems of Safety* (Scientific Publ. 33, International Agency for Research on Cancer, Lyon, France, 1979).
2. E. A. Walker and M. Castegnaro, *Nature (London)* **284**, 210 (1980).
3. M. Castegnaro *et al.*, Eds., *Laboratory Decontamination and Destruction of Aflatoxins B_1, B_2, G_1, G_2 in Laboratory Wastes* (Scientific Publ. 37, International Agency for Research on Cancer, Lyon, France, 1980); *Laboratory Decontamination and Destruction of Carcinogens in Laboratory Wastes: Some* N-*Nitrosamines* (Scientific Publ. 43, International Agency for Research on Cancer, Lyon, France, 1982); *Laboratory Decontamination and Destruction of Carcinogens in Laboratory Wastes: Some Polycyclic Aromatic Hydrocarbons* (Scientific Publ. 49, International Agency for Research on Cancer, Lyon, France, 1983); *Laboratory Decontamination and Destruction of Carcinogens in Laboratory Wastes: Some Hydrazines* (Scientific Publ. 54, International Agency for Research on Cancer, Lyon, France, 1983); *Laboratory Decontamination and Destruction of Carcinogens in Laboratory Wastes: Some* N-*Nitrosamides* (Scientific Publ. 55, International Agency for Research on Cancer, Lyon, France, 1983).

Science and Technology Awareness Month

During the past 3 years I have been director of the Office of Energy Research, I have testified before several congressional committees on various aspects of some of the Department of Energy's (DOE's) science and technology programs. A recurrent theme of the questions asked by the members of these committees has been, "What are we getting for our money by supporting basic research?" In reply, I have used what I now call the "standard argument." I usually cite some of the federally supported basic and applied research conducted 10 or 20 years ago. I then point out how many of our present goods, services, products, health care benefits, and so forth can be traced to that support. For DOE it is an impressive list that includes nuclear power, nuclear medicine, and radiation processing. It is clear that some substantial portion of our gross national product comes from this kind of activity. Unfortunately, this ex-

planation is not particularly useful to a representative or senator seeking ways to explain to the nonscientist constituent why the present levels of government support for basic and applied research are essential for the *future* economic growth in certain technical areas where the United States must remain among the leaders. Without such support, we could easily lose our ability to compete internationally in these areas.

The importance of having members of Congress informed on this issue cannot be underestimated. Those of us who testify help in the process of keeping them informed. But they are busy, and science and technology are not always their highest priority. For this reason, I believe that in the final analysis it may be more important for a substantial number of our citizens to have a better appreciation of the fact that virtually everything that they eat, drive, fly, view, take, wear, and so forth exists in its present form in part due to past government support of basic and applied research. Industrial support of applied research and development is also essential to this process and needs to be encouraged. However, at the moment, I am more concerned with the government role in the basic end of the activities.

I have a suggestion on how to improve this situation of public understanding of the role of science and technology in our lives. I believe that it is time for scientists and engineers to take more responsibility for explaining science and technology in ways the rest of our citizens can understand and appreciate. That is, we need to convince *them* that science and technology are important to our nation's future. How to accomplish this? Pamphlets, television, radio, and other media events help. Traveling lecturers who give excellent views of technical subjects in entertaining ways help. However, in my opinion there is no substitute for person-to-person contact between scientists and engineers and members of the rest of the community in which they live.

Therefore, I propose that October be designated "Science and Technology Awareness Month." What this means is that members of the AAAS, the American Institute of Aeronautics and Astronautics, the Society for Industrial and Applied Mathematics, the Institute of Electrical and Electronics Engineers, the American Physical Society, the American Nuclear Society, the American Chemical Society, and so forth volunteer to give a simple, jargon-free talk on what they do and why they believe it is important to our nation. They should give these talks to their local chapter of the Lions, Kiwanis, or Rotary clubs; Chamber of Commerce; or any other appropriate civic or service organization. Far from being put off, the public I come in contact with is fascinated by science and technology and is willing to learn about them and the benefits they produce. It helps if things are put in terms that they understand and the explanation comes from a friend or neighbor.

My objective is to cause the greatest possible mixing of those who earn a living as scientists or engineers with those who do not. If this kind of interaction is to occur, it needs to be stimulated but need not be too highly organized. In my attempt to try to stimulate this activity, I am sending this same letter to several civic service clubs and booster organizations in the hope that they will contact the various local or national technical professional societies to make arrangements to have volunteers talk to them. Those who believe that a better informed public is important for the health of U.S. science and technology should volunteer to help make conditions better by giving such talks to their local service club, high school PTA, or civic clubs. Mayors, councilmen, representatives, and senators should also be invited. They might enjoy the talk and add some thoughts of their own. Since this is being suggested in the spirit of volunteerism, I will give a talk on DOE's basic research programs to the first service or civic club that invites me.

ALVIN W. TRIVELPIECE
Office of Energy Research,
Department of Energy,
Washington, D.C. 20585

Animal Rights Movement

Sharon Lynn Campbell's recent letter (8 June, p. 1043) clearly demonstrates that few lessons have been learned from the challenges of the animal rights movement. Campbell rejects Jeffrey L. Fox's wise counsel that "scientists should not use dramatic testimony from patients who have benefited from animal research" and criticizes the animal rights movement with the comment that "they are not often open to reason." Campbell does not acknowledge that there are now large and growing professional associations of lawyers, veterinarians, psychologists, scientists, physicians, and others, all based on and supporting the animal rights philosophy. These are reasonable, articulate, intelligent individuals who share a common perception that (i) animals have rights independent of humans and that (ii) our traditional homocentric