"Environmentally" Caused Cancers

Barbara J. Culliton's recent Research News article on toxic substances legislation (29 Sept., p. 1198) contains the statement, " '60–90 percent' of human cancers are 'environmentally' caused." Because this statement is sometimes (not in the present case) misused and misunderstood, its genesis and subsequent transmogrification invite inspection.

The sense of the statement appears to have originated in two World Health Organization reports which stated, first (*1*), that environmental or extrinsic factors directly or indirectly account for more than three-quarters of human cancers and "that the majority of human cancer is potentially preventable." The second report (*2*), referencing the first, stated that "More than 75% of human cancers are, at least potentially, preventable." Five years later, Boyland (*3*) classified the causes of human cancers as chemical, physical, and biological and concluded that "Some 90% of cancer in man is . . . due to chemicals."

One, two, or all three of these papers are frequently cited to support statements such as, "There is now growing recognition that the majority of human cancers are due to chemical carcinogens in the environment" (*4*).

At times, the sense of the statement is more carefully used, as in (*5*): "The evidence that 80% of human neoplasms directly or indirectly depend on environmental factors carries important implications . . ." or (*6*): "Most cancers today appear to be induced by elements originating in man's environment . . . ."

The problem with all these variations on the same theme is the confusion sometimes seen among the general public (and others who should know better) about the intended meaning of the word *environmental*; that is, the word is sometimes loosely taken to refer to air, water, and food and not, more correctly, as a classification term meaning extrinsic or exogenous. As environmental problems are commonly considered to be caused by *pollutants*, and pollution is commonly regarded as the intrusive contamination of otherwise pure entities by industrial *chemicals*, the inference for some is that chemicals (that is, some or most of the substances originating in industry) in the environment (air, water, and food) cause most cancers.

Unfortunately, the simplistic gloss given above ignores the fact that "life-style factors" which are difficult to identify and change—such as sunshine, diet, and cigarettes (*6*, *7*)—are also environmental factors which, like the more easily documented "chemical factors," should be targets for cancer prevention strategies.

GERTRUDE BARNA-LLOYD
Texas Biomedical Research, Dow Chemical U.S.A., B-1222, Freeport 77541

References

1. World Health Organization Expert Committee on the Prevention of Cancer, *WHO Tech. Rep. Ser. No. 276* (1964).
2. *WHO Chron.* **18**, 323 (1964).
3. E. Boyland, *Prog. Exp. Tumor Res.* **11**, 222 (1969).
4. S. S. Epstein, *Cancer Res.* **34**, 2425 (1974).
5. J. Higginson, in *Persons at High Risk of Cancer, An Approach to Cancer Etiology and Control*, J. F. Fraumeni, Jr., Ed. (Academic Press, New York, 1975), pp. 385–398.
6. E. L. Wynder, and G. B. Gori, *J. Natl. Cancer Inst.* **58**, 825 (1977).
7. J. F. Fraumeni, Jr., Ed., *Persons at High Risk of Cancer, An Approach to Cancer Etiology and Control* (Academic Press, New York, 1975).

NSF and NASA Budgets

An article published in the 1 September issue of *Science* (News and Comment, p. 796) has been interpreted by some in the scientific community to mean that Senator Charles McC. Mathias, Jr. (R-Md.), did not strongly support the National Science Foundation (NSF) and the National Aeronautics and Space Administration (NASA) during the Senate's consideration of their budgets for fiscal year 1979. The article mentions "complex parliamentary maneuvers" on the Senate floor, and that is an accurate characterization. However, these maneuvers resulted in the least harmful and smallest acceptable cut in the NSF and NASA budgets by the Senate. This result was largely due to Senator Mathias' leadership.

The bill, as reported to the Senate by the Appropriations Committee, contained nearly the full amounts requested by NSF and NASA. Senator Mathias, in committee, successfully led the fight to restore cuts made by the House and to oppose cuts proposed in the Senate appropriations subcommittee and full committee.

The day before floor action on the appropriations bill, I joined Senator Mathias and six other senators in a letter to our colleagues opposing a prospective 2 percent across-the-board cut on all agencies covered by the bill, including NASA and NSF. Senator Proxmire (D-Wis.) had indicated he would propose such a cut. This would have meant a reduction of $87.4 million in NASA's budget and $17 million in NSF's budget. Another amendment, of even greater impact, also was to be proposed by Senator Roth (R-Del.).

As the bill was being considered on 4 August, it became apparent that action could not be completed that day and that the vote on the amendments would occur on Monday, 7 August. At that time it was generally believed the 2 percent across-the-board amendment would pass. This reduction would total $810,205,000. Over the weekend, however, Senator Mathias worked to reconfigure the 2 percent cut amendment and eventually reached agreement with Senator Proxmire and other senators on a substitute amendment. This Proxmire-Mathias substitute, which passed, called for cuts in the NASA and NSF budgets of only $5 million and $10 million, respectively, and increased cuts in other parts of the bill in order to keep the total reduction at $810,205,000.

I hope this helps clarify Senator Mathias' constructive role during congressional consideration of these two major budgets for scientific research and technology.

ADLAI E. STEVENSON
Subcommittee on Science, Technology, and Space, U.S. Senate, Washington, D.C. 20510

National Synchrotron Light Source Project

Two electron storage rings which are to be dedicated exclusively to production of photons for use in experimentation are under construction at Brookhaven National Laboratory (BNL). A 0.7-billion-electron-volt ring, to provide radiation in the wavelength interval between the infrared and ~ 10 angstroms, is scheduled for experimental use by mid-1981; and a 2.5-billion-electron-volt ring, whose spectrum, with beam wiggler magnets, will extend to ~ 0.1 angstrom, should be available for experimental use by the end of 1981 or early 1982, depending on apportionment of project funding by year. The National Synchrotron Light Source (NSLS) project will provide a number of equipped beam lines for general use by researchers from universities and from industrial and government laboratories; in addition, research will be carried on by BNL staff scientists. It is clear, however, that the needs of those who require specialized and unusually complex apparatus will be best met if they, either individually or in collaboration, can take a primary role in the design, construction, and maintenance of such a line. An individual or

group so acting, a Participating Research Team (PRT), will be allotted exclusive use for an agreed-upon period of a certain fraction, as much as three-quarters, of the scheduled beam time. The remaining fraction will be available for general users.

We are asking for expression of interest or intent from members of the scientific community who wish to take advantage of the capabilities of the NSLS either as general users or as members of a PRT, which in some cases could be formed by our bringing together researchers having common interests. Responses should be addressed to Dr. Martin Blume, Department of Physics, Brookhaven National Laboratory, Upton, New York 11973. A reply is desired by 31 December 1978.

A description of the facility, outline specifications of beam lines being planned, and a statement of the Policy for the Instrumentation and Utilization of the NSLS are available on request from the project secretary, Mrs. C. Albert, NSLS Project, Building 911C, Brookhaven National Laboratory.

MORRIS L. PERLMAN
Department of Chemistry,
Brookhaven National Laboratory,
Upton, New York 11973

Preventing Blackouts

The article in the 15 September issue (News and Comment, p. 994) on the New York City blackout of 13 July 1977 omits what I feel was one important aspect that might have, relatively easily, prevented the extended blackout.

On 12 July 1978 I wrote a short letter on this to the *New York Times* after they had published articles on the blackout. My letter was published on 20 July. This has led to an interesting correspondence file. My point was as follows: The night in question was a hot, muggy evening when millions of Con Ed's customers, including my family, had air-conditioners operating and were watching television. I have been involved for about 30 years with nuclear particle accelerator installations which use a few megawatts. I am all too aware of the possibility of operational failure of high-power equipment. A logical response when imminent system failure seemed possible because of overloading would have been to send messages to all local radio and television stations to request that they broadcast the message to their viewing-listening public that the system was temporarily endangered because of accidental causes. They could then have requested that air-conditioners, and other heavy power drains, be turned off temporarily until a message was broadcast that initially limited use (higher-temperature thermostat settings) could be resumed. In all that I had read about the blackout, there was no mention of that option. I believe that enough customers would have heard the message then, and enough would have cooperated, to give a large reduction in power usage without massive load-shedding or the system failure that actually occurred. I suggested that the New York State Power Commission, the New York City mayor, Con Ed, and the radio and television stations establish effective procedures for this purpose. Subsequent correspondence indicated that such machinery had not been set up, but that it may by now have been done. The other features mentioned in the article are, of course, also very important.

JAMES RAINWATER
Department of Physics,
Columbia University,
New York 10027

"Released Time"

Those of us who are part of academia applauded Brewster C. Denny's editorial (25 Aug., p. 677) on "renegotiating the society-academy contract." I suggest, however, that the university's stance vis-à-vis the government in particular could be immeasurably strengthened if the universities were to speak more convincingly of their own commitment to research than they do at present. I am referring to the nefarious practice of charging time spent in research by academic personnel to a grant as "released time." This practice, which was not permitted by federal agencies until comparatively recently, essentially denies any stake on the university's part in a scientist's research; indeed, it raises the question whether authors should even identify themselves with their institution in publications reporting their work, since it was in effect carried out on their "own" time.

The practice has not only served to undermine the university's traditional position as an institution devoted to the encouragement of research, and the creation of an atmosphere conducive to it, but has had some all too familiar tail-wags-the-dog side effects. For the institution now has a financial vested interest in the research of its faculty and tends to give support or rewards for it, not in relation to the intrinsic worth of the work, but rather in terms of the amount of money brought into it in the form of released salary, along with indirect costs. Indeed, in some institutions released-time moneys are counted on for the operating expenses of a department, putting the faculty under intense pressures to apply for large grants that permit such released-time payments. This is not true of many smaller grants administered by foundations and other private agencies.

It is unrealistic to expect university administrators to push for this much-needed reform. But it is surely in the interest of the researcher to do so, if only to make the ever-shrinking total pie of available research support stretch further—that is, distribute the limited resources among a greater number of investigators. Particularly in the social sciences, where salaries frequently constitute a major portion of research grant budgets, this reform could result in a significant increase in research support. It would, furthermore, greatly improve the climate for the conduct of research and the researcher's motivation for seeking out grant support. But first and foremost, it would reaffirm the university's primary commitment to scholarly activity for its own sake. Clearly, until such a step is taken, we who are part of academia are in a very weak position to complain about external control or interference in the affairs of the university.

JOACHIM F. WOHLWILL
Man-Environment Relations,
Pennsylvania State University,
University Park 16802

Houston Transportation System

On page 1216 of the 29 September issue of *Science*, the reader is directed to page 1213 for a map indicating the locations and distances between the hotels used by AAAS for program activities and housing during the next annual meeting in Houston (3–8 January 1979). I was surprised to find on page 1213 only a map of the United States, which also provides information on airlines serving Houston. I wish to assure those readers of *Science* who plan to attend the AAAS meeting that most of the hotels mentioned on page 1216 are within walking distance from each other and that plane reservations are not required to get from one hotel to another.

KURT RANDERATH
Department of Pharmacology,
Baylor College of Medicine,
Houston, Texas 77030