Letters

Communications and National Security

In an article (News and Comment, 28 Aug., p. 990) concerning the government's antitrust case against the American Telephone and Telegraph Company (AT&T), reporter William J. Broad distorts and misconstrues numerous points. The article mentions the oral legal arguments held on 13 August on the question of admissibility of a Department of Defense document and the judicial weight which it should be given. Neither in the 28 August article nor in any subsequent article is it mentioned that on 20 August the federal judge hearing the case ruled that the document would be admitted into evidence but that, because the Department of Defense had obtained some of its information from the Bell System, the court would not attach so much weight to the document as it might otherwise have done. The judge also said that neither the Bell System nor any of its employees had done anything wrong in providing information which had been requested.

Contrary to what Broad says, it was not AT&T but rather the Department of Defense study which stated that breaking up the Bell System would be "lethal to national security." While we agree with that position, even the most casual reading of the document of the court transcripts would have turned up the origin of the statement.

The charge that AT&T introduced this document in "hopes of ending the massive case" is totally false. There was no intent or expectation that this or any other single piece of evidence would terminate the case.

Despite Broad's characterization, it is not at all "unusual" for any party to a lawsuit to use admissions from the opposing side. In fact, most of the government's case is admissions from AT&T in the form of documents, employee memos, minutes of meetings, tariffs, and so forth. The judge ruled many months ago that this case is the U.S. government versus AT&T and that the government includes cabinet departments, including the Department of Defense. The document in no way represented, as Broad says, "the entry of the Pentagon" into the case. It has been in it ever since the case was filed in November 1974.

Finally, without commenting on a number of other colorful but misleading statements in the *Science* article, we do want to correct an error concerning communication satellites which has now appeared at least twice in *Science*, in the 28 August article and in an earlier article on electromagnetic pulse (News and Comment, 5 June, p. 1116).

The Bell System, which pioneered in communication satellites, currently utilizes the three Comstar satellites and has announced plans to replace those with three Telstar-III communication satellites when the current ones reach the end of their useful life. In addition, without getting into the Department of Defense's specific mix of services, Broad is totally incorrect when he states that the "Pentagon now relies on satellites for 70 percent of its long-haul communications needs."

I have read *Science* regularly for many years and generally believed its news reporting to be as fair and objective as its scientific section and in the tradition of the AAAS. It is disappointing to find such misleading reporting in this case.

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I regret that the headline attributing the "lethal" charge to AT&T was misleading. The text accurately attributes that opinion to the Department of Defense (DOD) and notes that it was the Bell System, not the Pentagon, that brought the charge into the courtroom. Because *Science* is dated a week ahead of actual publication, the article was in print before the judge handed down his ruling. An AT&T attorney at the hearing said that if the court were to rule that the DOD document represented the position of the entire government, AT&T would then move to have the suit dropped. Also, the hearing was unusual in that it took place so the judge could consider the "weight" that should be accorded the DOD document, rather than just hearing testimony.

Finally, an unclassified 1979 DOD report (*1*) says the Pentagon relies on satellites for more than 66 percent of its total long-haul communications. Pentagon officials estimate that, since the report was written, use of satellites has increased to 70 percent.—WILLIAM J. BROAD

Reference

1. "Distributed, survivable direction and control systems for civil preparedness—concepts and initial designs" (Defense Civil Preparedness Agency, AO-AO72388, Department of Defense, 19 May 1979), pp. 4–11.

Sulfur Dioxide Emissions

In the 2 October issue (News and Comment, p. 38), an article by R. Jeffrey Smith about the National Research Council's report *Atmosphere-Biosphere Interactions: Toward a Better Understanding of the Ecological Consequences of Fossil Fuel Combustion* incorrectly attributes to the Committee on Atmosphere and Biosphere a quantitative statement on sulfur dioxide emissions. The *Science* article states: "Emissions of sulfur dioxide, one of the precursors of acid rain, should be cut by at least 50 percent, the panel says, while emissions of nitrogen oxides, another precursor, must also be sharply cut." This misstatement appears to be based on a comment in the committee's report (page 181) that points to a need for a reduction of 50 percent in deposited hydrogen ions to protect sensitive freshwater ecosystems.

While there is insufficient evidence to make a quantitative one-to-one linkage between emissions of sulfur and nitrogen oxides and the hydrogen ion concentration of rain, there is extremely strong circumstantial evidence to support the conclusion that acid rain is largely a problem of anthropogenic origin and that its solution will involve substantial reductions in emissions of oxides of sulfur and nitrogen to the atmosphere.

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Germplasm Conservation

It is heartening to see that the problems of conservation of germplasm resources are somewhat belatedly receiving scientific press coverage and federal government attention. John Walsh (News and Comment, 23 Oct., p. 421) gives a good account of current activities of a number of governmental and private

agencies relating to conservation of land races of crop plants. He also indicates that current funding is not enough to guarantee continued availability of badly needed resources and tells of a most praiseworthy effort by the Department of State and the Agency for International Development (AID), who sponsored, in Washington, on 16–18 November, a U.S. Strategy Conference on Biological Diversity. This was a very important undertaking, and both the Department of State and AID should be praised and thanked for their sponsorship.

In addition, as a mammalian geneticist deeply concerned with advances in biomedical research, I would like to urge that similar attention be given to the preservation of biological diversity for a different purpose: to make possible biomedical research on experimental animal mutants of medical interest. Although John Walsh cites "genetic engineering applications" as part of the agenda of the strategy conference, I am not sure this means animals for biomedical research.

Back in 1977, when our National Academy of Sciences committee was preparing *Conservation of Germplasm Resources: An Imperative* [Introduction in (*1*)], we pointed out that in experimental animals, as in land races of plants, "the main issue has to do with preservation of the basic genetic material, DNA." As long as we have one copy of a particular gene, we have the capacity to make more.

Mutants of medical interest in experimental mammals, some of them homologs of human constitutional diseases, others valuable tools for analysis of metabolic pathways, form the basis for much current biomedical research. Future availability of the germplasm of these animals is really almost as important as is the scientific literature resulting from study of their characteristics and responses. Research support has usually been available for experiments on these animals, but it is much harder, particularly in the present "tight budget" situation, to get adequate funding for long-term maintenance to guarantee future availability. The problem is "specialness": only a few researchers at any one time need to work with mice with pituitary dwarfism (*2*), hemolytic anemias due to defects in the red cell membrane (*3*), vitamin D–resistant rickets (*4*), or testicular feminization (*5*); but these investigators "need it bad."

There are hundreds of other important mouse mutants (*6*) that must be saved, plus smaller numbers causing constitutional diseases in rats (*7*), rabbits (*8*, p. 575), and even cats and dogs. To cite the most obvious example of critical need for particular mutants of medical interest, many promising experimental therapies for human constitutional diseases cannot legally be tried on human subjects until their effects have been tested on pertinent mutant animals.

Maintenance of animal colonies of so many diverse kinds of mutants becomes very expensive and hard to support under current funding conditions. It is hoped that cryobiological preservation, usually of embryos, will be less expensive over the long haul (*1*, pp. 79–91). As worldwide biomedical research and improvement of public health continue to reduce the incidence of infectious diseases, study and therapy of constitutional diseases will become more and more important. The need for many diverse experimental animal mutant research tools will continue and increase. Truly, the conservation of germplasm resources *is* an imperative.

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3. S. E. Lux *et al.*, in *Mammalian Genetics and Cancer, The Jackson Laboratory, 50th Anniversary Symposium*, E. S. Russell, Ed. (Liss, New York, 1981), pp. 159–168.
4. E. M. Eicher *et al.*, *Proc. Natl. Acad. Sci. U.S.A.* **73**, 4667 (1976).
5. M. F. Lyon and S. G. Hawkes, *Nature (London)* **227**, 1217 (1970).
6. M. C. Green, *Genetic Variants and Strains of the Laboratory Mouse* (Fisher-Verlag, New York, in press).
7. M. F. W. Festing, *Inbred Strains in Biomedical Research* (Oxford Univ. Press, New York, 1979).
8. R. R. Fox *et al.*, in *Inbred and Genetically Defined Strains of Laboratory Animals*, P. L. Altman and D. D. Katz, Eds. (Federation of American Societies for Experimental Biology, Bethesda, Md., 1979), part 2, pp. 570–606.

Documenting Science and Technology

Eliot Marshall's article about the U.S. House of Representatives' investigation into radiation treatments at the Institute of Nuclear Studies (INS) clinic in the late 1960's (News and Comment, 23 Oct., p. 423) attributes the inconclusive findings of the House science and technology subcommittee on investigations in part to "gaps in the record." He notes, somewhat ominously, that "Andrew Stofan, a NASA official, disclosed that all of NASA's documents on the INS research, which ran from 1964 to 1974, had been thrown out in the course of routine housecleaning."

This situation comes as no surprise to members of a joint committee of the History of Science Society, the Society for History of Technology, the Society of American Archivists, and the Association of Records Managers and Administrators. This committee has been examining the state of documentation of post–World War II science and technology in America for the past several years. Similar passing notices in *Science* and other journals have alerted us to endangered Manhattan Project records, lost radiation waste disposal records, proprietary records concerning science and technology at important corporations that may well be destroyed, and conflicting regulations concerning retention of government-funded research grant and contract records.

It is extremely helpful to the joint committee to have examples of such unmet documentary needs as we attempt to identify the systemic failures of our national archival systems. We would greatly appreciate hearing from scientists, scholars, and administrators, including records managers and archivists.

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Pleistocene Climate

I read with interest Richard Kerr's exciting article about orbital variations and their effect on the earth's climate (Research News, 4 Sept., p. 1095). I should like, however, to draw the reader's attention to one point of reference in need of clarification.

In 1975, Briskin and Berggren (*1*) found that the Pleistocene was divided into two major climatic regimes with the shift taking place approximately 1 million years ago. Comparison between winter temperatures and oxygen isotopic ratios of planktonic foraminifera led to the conclusion that two types of cold regimes characterized the Pleistocene. On the average, the first million years' winters were colder, and shifts in winter temperatures were associated with minimal ice volume changes. In the last million years, the average winters were warmer, but shifts in winter temperatures were associated with greater ice volume changes.

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Reference

1. M. Briskin and W. A. Berggren, in *Late Neogene Epoch Boundaries*, T. Saito and L. Burckle, Eds. (Micropaleology Press, Museum of Natural History, New York, 1975), pp. 167–198.