Letters

Anonymous Charges

M. B. Mittleman (Letters, 8 Jan., p. 127) states that a "proposed guideline of the National Conference of Lawyers and Scientists (NCLS) for 'bringing charges anonymously' " of scientific fraud is disturbing and contrary to basic legal principles. As the American Bar Association liaison to the NCLS and one who has attended all recent meetings of the NCLS as well as the Workshop on Fraud in Science, let me assure Mittleman and others that no such guideline has been proposed by the NCLS.

The report in *Science* (AAAS News, 6 Nov., p. 813) stated that one individual indicated his experience as a whistleblower had extremely unpleasant consequences and that "NCLS workshop participants agreed that establishing guidelines, including the provision for bringing charges anonymously, is critical to protecting the whistleblower. . . ." Some workshop participants did favor such a guideline, but the workshop did not agree or attempt to agree upon any guideline. It was a wide open discussion exploring many facets of the problem in which the participants attempted to establish some basis for further consideration. It is hoped that there will be two more workshops considering the same matter, and whether guidelines will be proposed or approved by NCLS has not yet been determined.

As a lawyer with many years of experience, I agree that there are grave dangers in acting upon anonymous charges. However, I would not presume to predict what the NCLS may ultimately decide to do with respect to this problem, if anything. Expressions of viewpoints such as that of Mittleman are useful, but alarm about the content of prospective guidelines is unwarranted at this time.

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Stratospheric Ozone

The Upper Atmosphere Research Program of NASA recognizes the importance of both measuring and interpreting trends in stratospheric ozone. Kenneth Bowman, one of many researchers supported by this program, reports (1 Jan., p. 48) a trend in global ozone based on TOMS (Total Ozone Mapping Spectrometer) data from the Nimbus-7 satellite. Donald Heath of Goddard Space Flight Center has publicized, but not yet published, similar trends in ozone derived from satellite observations. Unfortunately, the TOMS and SBUV (Solar Backscattered Ultraviolet) instruments used in both Bowman's and Heath's analyses are known to suffer from a drift in the absolute calibration, as noted in Bowman's report. The slow degradation of the instrument in space, the magnitude of which is uncertain, leads to the apparent measurement of a downward trend in total ozone that may or may not coincide with true atmospheric change.

A major review of trends in ozone as observed by different satellites and ground-based programs is currently under way and will be presented to Congress and the Environmental Protection Agency on 15 March 1988. This study will assess not only the magnitude of recent trends in global ozone but also the uncertainty of any such trends. An important part of this assessment involves analysis and modeling of the possible causes of perturbations to ozone over the past few decades, including both natural cycles and human activity.

At present, the TOMS data set can be used to discern large changes in ozone, such as a 30% decrease in Antarctic ozone, but it cannot be used to detect smaller trends on the order of 1 to 2% per year, without cross-calibration involving other satellite and ground-based instruments.

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Response: I learned of the NASA review of the various satellite and ground-based ozone data sets shortly before my report appeared. Had I known of the forthcoming trends panel review, I would have awaited their results, instead of using NASA's older estimates of the instrumental drift cited in my report. A new comparison of SBUV data with the Dobson network (*1*) has yielded estimates of recent changes in global total ozone that are slightly smaller than mine. Reinsel *et al.* found that during the period from November 1978 through September

1985 global total ozone decreased $-0.20 \pm 0.13\%$ per year as a result of variations in solar output and $-0.35 \pm 0.28\%$ per year due to other (possibly natural) processes. My analysis did not attempt to separate changes caused by solar flux variations from other causes.

Naturally, I am pleased that the calibration of the satellite instruments is being reevaluated, since the issues involved are important. I hope that the trends panel's work will improve the calibration of the satellite instruments and lead to more accurate estimates of recent ozone fluctuations and a better understanding of the processes involved.

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1. G. C. Reinsel *et al.*, *J. Geophys. Res.*, in press.

Breast Cancer Study

The article "Debate rages over breast cancer study" by Marjorie Sun (News & Comment, 2 Jan., p. 17) describes the unfortunate status of an important clinical trial. Most of the human studies relating diet and breast cancer are nonexperimental (*1*). Many are case-control studies of diet and breast cancer. Unfortunately, the criticism about the lack of relation between fat in diet and breast cancer in homogenous populations is similar to the controversy regarding diet and heart disease. A paper published in the *New England Journal of Medicine* in 1977, "Diet-heart: End of an era," was based on the analysis of the dietary data from the Framingham Study and reported that dietary fat and cholesterol were not related to atherosclerotic heart disease (*2*). Fortunately, investigators realized the problems with the nonexperimental nutrition studies (*3*) and the difficulties of evaluating nutrition in a homogenous population and moved forward with successful clinical trials that demonstrated a decrease in heart disease morbidity and mortality associated with reduction of dietary intake of saturated fat and cholesterol and a reduction of blood cholesterol levels. These findings resulted in the important National Cholesterol Education Program (*4*). Are we about to repeat the errors of the 1970s with regard to prevention of breast cancer?

Most of the traditional methods of breast cancer etiology and prevention research have clearly been unsuccessful. The best results to date have come from the clinical trials of surgery, chemotherapy, and early detection. Certainly, the trial cannot do any worse. We might even learn something useful and reduce the breast cancer death rates.

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4. National Cholesterol Education Program Expert Panel, *Arch. Intern. Med.* **148**, 36 (1988).

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A Larger Question?

Although some scientists may continue to bewail *Science*'s publication policy, and many will question whether science has a right to be regarded as a profession in the same sense as, say, medicine, law, and the ministry, none will quarrel with Daniel E. Koshland, Jr.'s, description of it as low-paying (Editorial, 15 Jan., p. 241). If, as he suggests, we scientists ("who are a fairly intelligent group") put up with this largely for altruistic reasons, that is just as well, for at present we are in no position to improve our status by initiatives we might take on our own behalf.

Abundant annual production of fresh scientific talent, and absence of any professional organization to defend the interests of veteran scientific workers in the marketplace, will ensure that scientific employment not only remains low paid, but also continues to carry substantial risk of frustration, stagnation, and early loss of occupation—all at the whim of nonscientist patrons on whom we can exert no influence whatever. It seems true for scientists, just as for Thurber's fly (*1*), that being fairly intelligent is no guarantee of survival. Beside this somber fact, arguments over proper allocation of journal space among competing scientific specialties appear almost frivolous.

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1. J. Thurber, *Fables for Our Time* (Harper, New York, 1940), p. 13.

Erratum: In the report "Spacelab-2 plasma depletion experiments for ionospheric and radio astronomical studies" by M. Mendillo *et al.* (27 Nov., p. 1260), figure 5A (p. 1263) was misplaced with respect to figure 5B so that the scale of figure 5A was incorrectly represented. A correct figure 5 is printed below.

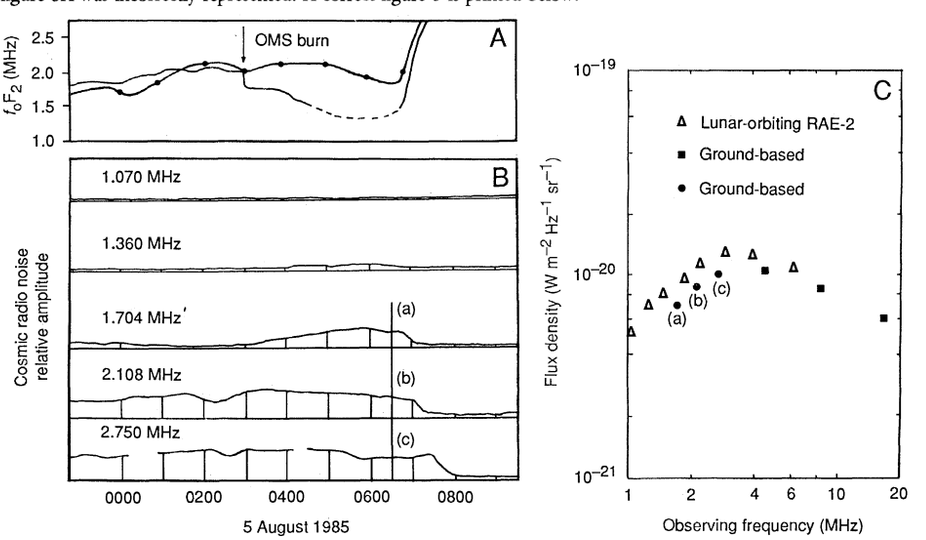

Fig. 5. (**A**) The behavior of the ionospheric penetration frequency (f_oF_2) recorded by an ionosonde in Hobart (solid and dashed line) and a control curve of hourly f_oF_2 values (filled circles) recorded in Melbourne (more than 500 km from the Hobart site). The dashed portion of the Hobart f_oF_2 curve from 0500 to 0700 UT expresses uncertainties in the very low f_oF_2 values. (**B**) Cosmic radio noise levels at various frequencies observed on the night of 5 August 1985 at the University of Tasmania Radio Observatory in Hobart. Times are in local time (LT), corresponding to UT plus 10 hours. (**C**) Galactic radio spectrum on a log frequency scale observed at 0630 LT (filled circles) by means of the observations at (a) 1.704 MHz, (b) 2.108 MHz, and (c) 2.750 MHz from (B). Additional ground-based observations (filled squares) at 4.7, 8.3, and 16.5 MHz are also shown (*19*). For comparison, the low-resolution spectrum observed by the lunar-orbiting spacecraft RAE-2 for the south galactic pole region is also shown (open triangles) (*18*).