practiced it usually exists in combination with an authoritarian constitution under which the department chairman is appointed for life and already holds a veto over pay raises and promotions. If he alone also controls the department budget, makes assignments of office and laboratory space, and decides on teaching assignments, it is understandable that his remarks on manuscripts carry a lot of weight. Under these circumstances I have known of instances in which a department head (i) insisted on changing the title and thus minimized the article's legitimate claim to consideration; (ii) sat on the article; (iii) penciled his name on the title page and thus became co-author.

RICHARD F. SHAW

Department of Preventive Medicine, University of Virginia School of Medicine, Charlottesville

Radiation from Solar Flares

We have read with some interest the article in *Science* [**133**, 312 (3 Feb. 1961)] entitled, "Limitations on space flights due to cosmic radiations," by Howard J. Curtis. The work discussed reported on the effect of concentrated doses, and the results represent an important finding, for they completely remove any doubt which may have remained about the ability of the galactic cosmic rays to cause radiation problems in space.

However, we are somewhat disturbed that an article on an important topic which is in a journal widely read by biologists should have omitted a discussion of the potentially most troublesome source of radiation. We refer to the frequent storms of solar cosmic rays originating in large flares.

These storms have been widely discussed at meetings of the American Physical Society and the American Geophysical Union. The literature abounds with papers on the subject, many of which point out the very serious radiation hazard to space flight outside the earth's magnetic field or in the polar regions. We are quite certain that every technical group considering space flight is well aware of this problem and has gone to considerable effort to examine the difficult problem of shielding against the solar cosmic rays. We have in our files many reports on the subject of shielding, as well as records of conferences with the space agency, the Radiation Research Society, the Air Force medical groups, and other organizations. All of the authors quoted in Curtis's article, we are sure, are also familiar with the solar cosmic rays and their potentially dangerous effect from the standpoint of radiation.

Great flares on 23 February 1956, in May 1959, and in July 1959 produced dangerous radiation levels and have been widely studied. The recent solar-flare eruptions in November of 1960 produced exposures, due to protons in the energy range 50 to 500 Mev, of 1 rad/hr in balloon instruments in the atmosphere. The free space radiation probably approached 100 rad/hr. This dosage represents a very large event, but the other strong events mentioned probably produced similar radiation levels. The total number of such events, of all sizes, was more than 35 during the last 3 years. For programs such as the Apollo program and others involving extended trips away from the earth, this radiation is a matter of serious concern and, at solar maximum, is difficult, if not impossible, to deal with.

JOHN R. WINCKLER
EDWARD P. NEY
School of Physics, University of Minnesota Institute of Technology, Minneapolis

Winckler and Ney are quite correct in indicating that the solar-flare radiation is an important aspect of the radiation hazards of space flight. At the time my article was written, nearly a year ago, there had not been enough measurements in space for us to be able to assess the biological hazard, so I discussed the flares as a perturbation on the radiation belts. Now we know, largely through the excellent work of Winckler and Ney, that they constitute an additional hazard which will be very troublesome for some types of space travel. In such an active field, a review article may be out of date by the time it is published.

HOWARD J. CURTIS
Department of Biology, Brookhaven National Laboratory, Upton, New York

Meeting of Zoologists

A most unfortunate impression of the recent annual meeting of the American Society of Zoologists is created by your story [*Science* **133**, 89 (13 Jan. 1961)]. Although few in number, those present did devote much of the meeting to matters of professional concern to the members of the society, and it was only when adjournment appeared imminent that there was introduced the statement featured in your story. The subsequent discussion was hurried, and the action of the society on the many amendments and modifications of the statement you quote [recommending government implementation of programs for research and training in the