

## letters

growing technology to science. Surely if financial support for research is not linked to economic history, we would expect little permanence to this mutually beneficial interaction.

Granted that cost-effectiveness would be desirable in research funding, Zernik then states, however, that laymen are persuaded by "superficial arguments" and most physicists are "utterly incapable of assessing the importance of their daily work." Who is left to pass judgment on all the vast trivial research, Mr Zernik? I think the physics profession has an elaborate system (probably it could be improved) to referee the quality and significance of research and judge publication or funding. It is always easy to shout "Trivial!" after the fact.

Concerning cost-effectiveness, I'd rather trust the profession's judgment than the machinery that gives millions toward developing university and industry research capabilities, graduate student and faculty fellowships, and national laboratories, then only to waste these very resources it has spent tax money to produce. I think the "job crisis" will exist until the output of physicists becomes commensurate with their use.

Lloyd A. Case

Indiana University Southeast  
Jeffersonville, Indiana

## Boston workshop

*physics today* (February, page 64) reported that physicists are welcome to attend the AIAA employment workshop programs. Telephone numbers for 14 cities were listed, for use in making reservations.

The program is also operating in Boston, with the cooperation of IEEE Boston Section. For reservations or further information, call (617) 862-3880.

Paul Penfield, Jr  
Boston Section IEEE

## Women in physics

I sent a letter to my congressman and to my two senators that reads as follows:

"I have recently read Congresswoman Green's Hearings on Discrimination Against Women. I urge you to support Section 805 of HR 16098 (or the Senate version of this bill) barring discrimination against women. (This bill was re-introduced in the 92nd Congress as HJ 208 and SJ 8 and 9.)

"In the meantime I hope that you will press HEW to enforce Executive Orders 11246 and 11375, which prohibit discrimination against women in federally assisted programs."

I recently chaired a panel on

'Women in Physics' at the annual American Physical Society meeting. In physics, as in all the professions, we find that there is severe discrimination—at all levels—against women. It is foolish and a waste, and it should not be permitted when federal funds are involved."

I urge the readers of *physics today* to obtain copies of the Hearings from their congressmen and to communicate their views on this matter to their representatives and to their senators.

Fay Ajzenberg-Selove  
University of Pennsylvania  
Philadelphia

## More far infrared

I must express my disappointment at the article by W. G. Rothschild and K. D. Möller in September (page 44) on far infrared spectroscopy.

Some of the points that I feel deserve inclusion pertain to the whole development of interferometric spectroscopy. Michelson saw the general possibilities in the 1890's; in Strong's laboratory at the John Hopkins University early attempts by Gebbie and Vanasse (1956) were followed by the effective instrumentation developed by Gebbie and his group at the National Physical Laboratory, Teddington, England. The September article omits the significant virtue of the refractive-index dispersion being available simultaneously with the absorption; the production of continuous spectra down to two wave numbers by 1967, which is more than two octaves below the ten wave numbers mentioned in the article; the production for the first time of the total rotational absorption spectrum of gaseous molecules at resolutions of 0.01 wave number; the observation of the Poley-predicted absorption seen in all polar liquids between 20 and 100 wave numbers; and the delineation of the quasi-resonant broad absorption in nonpolar liquids arising from collisional interactions of their molecules.

These features, to mention no others, provide essentially new formation on molecular behavior. The fact that the British-designed interferometric system is now being largely and very effectively sold by a well-known US corporation will surprise few people who are familiar with both British and US instrument manufacturers.

Mansel Davies  
The University College of Wales  
Aberystwyth, UK

**The author comments:** While it is true that the specific topics of far-infrared research mentioned by Mansel Davies had not been included in our article, it should be realized that our article,

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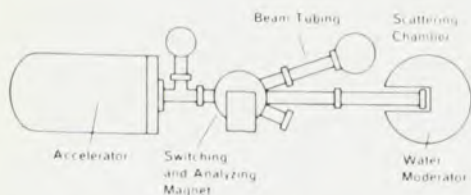
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restricted as it had to be to a certain number of pages, could not possibly include all existing significant references. It was necessary to be selective as to the subjects included, an important criterion being their interest to an audience as general as that of *physics today*. The article therefore did not purport to be a comprehensive review. Finally, we would like to reassure Davies that we are aware of the contributions on far-infrared research being pursued by interferometric techniques in the UK and that we have discussed certain aspects of them and tabulated many references in our forthcoming book, *Far-Infrared Spectroscopy* (J. Wiley, New York, 1971), in chapter 11.

W. G. Rothschild, K. D. Möller  
Ford Motor Company  
Dearborn, Mich.



## Ecology movements defended

I find it difficult to understand the quite violent reaction of John Boardman (February, page 9) to the December issue of *physics today*. It seems apparent that Boardman is not so much opposed to the ecology movement as he is to his own personal (mis)conception of what it is.

Whatever the ecology movement is, and it is many things, it is not anti-science. In fact its impetus comes mainly from within the scientific community. The difficulty here is that Boardman confuses for the mainstream of the movement the mouthings of a lunatic fringe—a seemingly inevitable by-product of any social movement. When he characterizes a social movement he is obliged to ascribe to it the goals of its leaders, not its fringe. I notice that nowhere in his letter does he quote Commoner, Ehrlich, or Udall—the recognized leaders of the ecology movement. Instead he quotes articles from the *Los Angeles Free Press*, an underground paper, which I'm sure would be repudiated as nonsense by

the nation's representative ecologists.

The ecology movement is simply a manifestation of Man's rediscovery of the simple fact that he is only a part of Nature, and that he must arrange his behavior so as to ensure the continued existence of the Earth as a viable ecosystem. It is a recognition that three billion human beings have a significant impact on the life support systems of this planet, and that this impact must be studied, understood, and controlled. The Earth is a finite, closed system and our behavior within it must be analyzed in that light. This does not lead to an inevitable rejection of science and technology, but only to the injunction to use it and its byproducts wisely.

I hope that Boardman can exorcise his personal demon and convince himself that he is tilting at windmills. Just as "college students" are not bent on the destruction of our society, "ecologists" are not neo-Luddites. It's not necessary to manufacture pseudo-problems, we have enough real ones already.

David Workman  
Kent State University  
Kent, Ohio

John Boardman characterizing the current concern for ecology as a fad is the most incredible example of misrepresentation ever to appear in *physics today*. Aside from Boardman's simplistic interpretation of the articles referred to in the *Environmental Handbook*, one example will suffice: anyone who had read the article by H. Bert Frank, "The Electron Crisis," in which it is claimed that continued use of electronics in technology is rubbing off some of their charge, producing among other dire consequences a disease called "Locatelli's Syndrome," cannot possibly misunderstand the fact that the article is a masterfully written, jargon-ridden put-on. Boardman is either as incompetent in grasping the meaning of English prose as he claims H. Bert Frank to be in the area of science, or he is hoping the *Los Angeles Free Press* is so obscure a periodical that nobody will read it to dispute his claims.

Francis Michael  
South Windsor, Conn.

Since it is inevitable that any mass movement—and the growing concern for the environment must surely amount to that—attract a number of cranks, it is a little difficult to understand why Boardman attaches so much importance to them. In fact it is not even clear whether he believes there is an ecological crisis or not.

In the first place, it seems unlikely that he should refute a certain belief