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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 electrons 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

simply on the grounds that, among the many people who hold that belief, some happen to be nuts. If he were told by a person of somewhat dubious character that his house were on fire, would he immediately conclude that it could not be? Surely he would at least investigate the matter a little further, for example, by taking a look for himself. His subsequent statements as to whether or not his house was on fire would then contain little, if any, reference, to his original informant. Since Boardman does not offer any other argument against the existence of an ecological crisis one is tempted to conclude that he is not trying to deny there is one. But then if he thinks there is, in fact, an ecological crisis, why does he go to the trouble of telling us that his point of view is shared by crackpots?

This is not the end of my perplexity. Boardman refers to the 19th century concern for the environment, as though the present movement is to be discredited through the antiquity of its origins. But then what is one to conclude when one realizes that our technological society has its roots in the 18th century, if not the 15th? One possibility that comes to mind is simply that the Luddites were ahead of their time.

J. M. Pearson

University of Montreal

Concerning the "threat" posed by the ecology movement that John Boardman considered in his letter in the February issue of *physics today*, the following three points are worth bearing in mind. First, good solutions to environmental problems may be supported by people who are not knowledgeable in science. Secondly it is extremely glib to condemn the reduction of energy consumption on the ground that it diminishes the "standard of living." For just one example, consider the change in the standard of living and in the level of power consumption that results from transforming a population of healthy pedestrians into a population of motorists who suffer from heart disease for want of exercise. Finally, scientific research has a crucial role to play in detecting subtle forms of environmental damage that may have visible effects in future decades. One should not, however, assume that the solutions of environmental problems will all be related to such research. The proper long-term solution to the automobile-produced component of the air pollution problem may be the changing of housing patterns to reintroduce the prewar notion that people should live close to where they work. The solutions of the problems of air pollution and radiation hazard that accompany the production of electric power, on the other hand, will probably have impor-

tant scientific and technological components including how to transport power produced far from concentrations of population to where it is used.

Peter D. DeCicco

Massachusetts Institute of Technology

The author comments: The foregoing letters seem to take the position that the ecology pamphleteers I mentioned are a lunatic fringe. I would like to assure them and other readers who may accept this point of view that I only mentioned a few samples of "ecology" propaganda.

I could have included the ecology pamphlet in comic-book format, in which a mad scientist stereotype creates a monster called "Technology," which gulps down large chunks of the earth and reaches for the moon as its creator looks proudly on. I could have cited Paul Ehrlich's frenetic "Eco-Catastrophe" from *The Environmental Handbook*, in which, finding existing insecticides not toxic enough for his purposes, he invents an imaginary "thanodrin" that fulfills his prediction of an end of all ocean life. I could refer to the Earth Day coordinator, Denis Allen Hayes, whose organization won't print bumper stickers because "they go on automobiles"—which he is presumably out to eradicate (*New York Times*, 23 April 1970). I could cite the students who buried a car at San Jose State, or the students who "beat a car to death" at Syracuse University (*ibid*). I could refer to Jack Bloomfield, education columnist for the *New York Column*, who in the 3 April 1970 issue of that weekly claimed that the "greenhouse effect" of increased atmospheric CO₂ will melt the ice caps and flood coastal cities while at the same time air pollution will block off enough sunlight to cause a new Ice Age. I could refer to the Long Island residents who claim that since the building of Brookhaven Laboratory their breakfast coffee doesn't taste as good. I could cite the demand that the oil industry be totally shut down, together with the claim that "a rise in the mean temperature of the air of as little as two degrees could totally destroy most of the life on this planet." (Rober Lovin, *Los Angeles Free Press*, 11 Sept. 1970). I could quote John B. Cobb of Claremont College "who is regarded as a major American theologian" that the ecology crisis has been produced by Western society going too far in asserting "the absolute value of every human individual" (*New York Times*, 1 May 1970). I could refer to the 18.2 tons of litter left behind at Earth Day observances in New York City in 1970 (*New York Post*, 23 April 1970). I could quote Jerry Pournelle of Pepperdine College that flush toilets are ruining the fertility of our soil. I could cite a leaflet distributed at the Pace College Envi-

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ronmental Teach-In that demanded a total ban on *all* pesticides. Or I could quote Pearson's own statement that "the Luddites were ahead of their time"—which agrees with the ecology movement leader Kenneth Watt that 1800 was a year in which industrialization had proceeded about as far as it ought to.

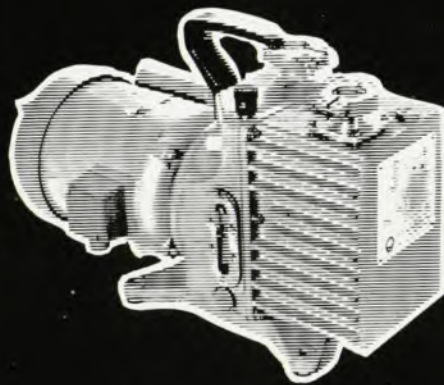
"Do I believe that there is an ecology crisis?" On the basis of such "evidence" as the ecology movement cites, I do not. In this belief I find myself in agreement with Lee A. DuBridge (*US News and World Report*, 19 Jan. 1970) and with Robert S. Hanson, Director of the Ames Laboratory at Iowa State University (*News of Iowa State*, Nov.-Dec. 1970).

Physicists might consider whether there is any relation between the anti-scientific propaganda of the "ecology" movement and the sharp reduction in governmental and public support for scientific research in recent years. Science is being depicted in "ecology" literature as part of the problem, not as part of the solution. As John Leonard said in a review of Rene Dubos's *Reason Awake* (*New York Times*, 27 May 1970): "We can no longer afford the luxury of a scientific establishment operating on the assumption that any old pursuit of any old truth deserves subsidizing. . . . If the scientist doesn't worry about [morality], the society sponsoring his work should chop down the money tree."

John Boardman
Brooklyn College

Refereeing or thought control?

I wish to second J. G. Bellak's statement (November, page 15) that "professional journals exist to allow workers . . . to be heard . . . regardless of the opinions of others Hence the question of refereeing is inane, except as a limiting monitoring function against writers who are obviously incompetent." Therefore, although journals need editorial guidelines to protect readers from irrelevant papers (such as one discrediting quantum jumps for religious reasons, say), it is inadmissible censorship when one or even three referees try to block an article as incompetent when their own private but precious standpoint differs from that of the author, or when they are incapable of seeing the point at issue. Imagine now that the rejected article, printed eventually after much delay, evokes great interest among its readers, as shown by its drawing scores of requests for reprints, dozens of letters of acclaim from all over the world, plus numerous invitations to give lectures on the forbidden subject, and so forth. Does this not raise the question of who is incompetent, the author, or the editor



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