

## letters

if we clean up and use conventional fuels.

Instead, our government and industry seem determined to forge ahead with nuclear power plants.

Yet the failure of nuclear proponents to "see" the point: of several-thousand-fold concentrations of man-made radiation in certain foods, or large numbers of *different* sources—each of which are legally allowed to yield their "maximum permissible dose"—will not prevent the cancer, leukemia, and other injuries predicted from materializing.

ELIZABETH HOGAN  
New York, N. Y.

**THE AUTHOR COMMENTS:** For Miss Hogan, of all people, to complain that another's writing is not objective is truly incredible. She is coauthor of "Perils of the Peaceful Atom," which is surely one of the most biased books ever published. It was reviewed by James Beckerly and Norman Hilberry who pointed out that the book was filled with errors of fact and quotations that are deliberately misleading. They summarize the review by stating: "The reviewers conclude that this book is not a balanced account of the safety aspects of present and future nuclear-power production. It is strictly a biased, misleading, sensational political tract. It constitutes a public disservice. We are sorry to see it published, not just because it is a bad book, but because we sincerely feel that a factual, balanced, honest discussion of the problems of nuclear power, as they really are, is badly needed by the public. It could be written."

I see no point in debating the eco-

nomics of nuclear power with Miss Hogan; let the utilities beware when next they choose to build a nuclear plant. As for the "Brookhaven Report," my statement is borne out by the two sentences that Miss Hogan quotes. Since it was "assumed that, because of a breach in the container . . . all volatile fission products would be discharged to the atmosphere . . .," then it must surely be apparent that the authors "gave no credit for containment" even though there was a containment vessel. It is indeed the possibility that somehow the containment vessel will be breached or left open that is of greatest concern to all nuclear-power-plant designers and licensing officials. Nuclear accidents may be a possibility, however remote, but so long as the containment vessel is intact no one will be injured. I agree that locating a nuclear power plant at Indian Point would be too great a risk if it were not contained. I am sure that Miss Hogan does not speak for the majority of the 155 510 residents living within 10 miles, who prefer the small risk of a nuclear incident to the certain atmospheric pollution that would result from a fossil-fueled plant.

As she was in her book, Miss Hogan is again caught up in her misunderstanding of the radiation protection guides. The maximum permissible concentration of radioisotopes in gaseous and liquid effluents from a nuclear power plant is based on the restriction that the people living near the plant will receive no more than 170 millirem per year (mr/yr) under any circumstance. It is true that the limits given in Title 10, Part 20, of the Code of Federal Regulations are based on breathing the air and drinking the water at the boundary of the plant. However

if there should be a fishing community nearby that subsists largely on the fish they catch, and if these fish contain concentrations of certain radioisotopes, then these concentrations must, by controlling the effluent, be kept low enough that the residents of this community will receive no more than 170 mr/yr when all the pathways of all the radioisotopes are added together. As another example, the effluent limits for radioactive iodine are usually much less than that specified in 10 CFR 20 because of the possible concentration of iodine in milk. There has been and continues to be a conscientious effort to understand and identify all the possible food pathways to man; Miss Hogan does a great disservice in continuing to raise the spectre of an irresponsible nuclear industry and Federal Radiation Council who conspire to expose the population to damaging radioactivity. Recent surveys have shown that people now living near operating reactors are receiving less than 5 mr/yr above background; much below what they receive in x rays, less than the residents of Denver or Albuquerque receive in additional cosmic rays.

Finally, as to Miss Hogan's solution to the energy crisis, I recommended to her and to others a study of Chapter 8 of the recent report of the Committee on Resources and Man, National Academy of Sciences—National Research Council. The author, M. King Hubbert, points out that we are facing an energy crisis, that fossil-fuel resources are indeed limited, and that alternative sources, such as those suggested by Miss Hogan, are not feasible.

WALTER H. JORDAN  
Oak Ridge National Laboratory

## What interests nonscientists?

I read with interest the letter (July, page 17) by P. L. Walker, Jr concerning the role that applied-science departments are and should be playing in teaching science to nonscience majors. Walker seems to assume, as do so many "pure" researchers, that the only way to justify science to the nonscientists is to emphasize the practical applications, both actual and proposed, that result from basic research. Certainly there is a need to have students (both science and nonscience majors) understand

some of these applications as well as to have them better understand the role of science and technology in our society. Yet there is another aspect to this relationship between science and the layman that is often overlooked.

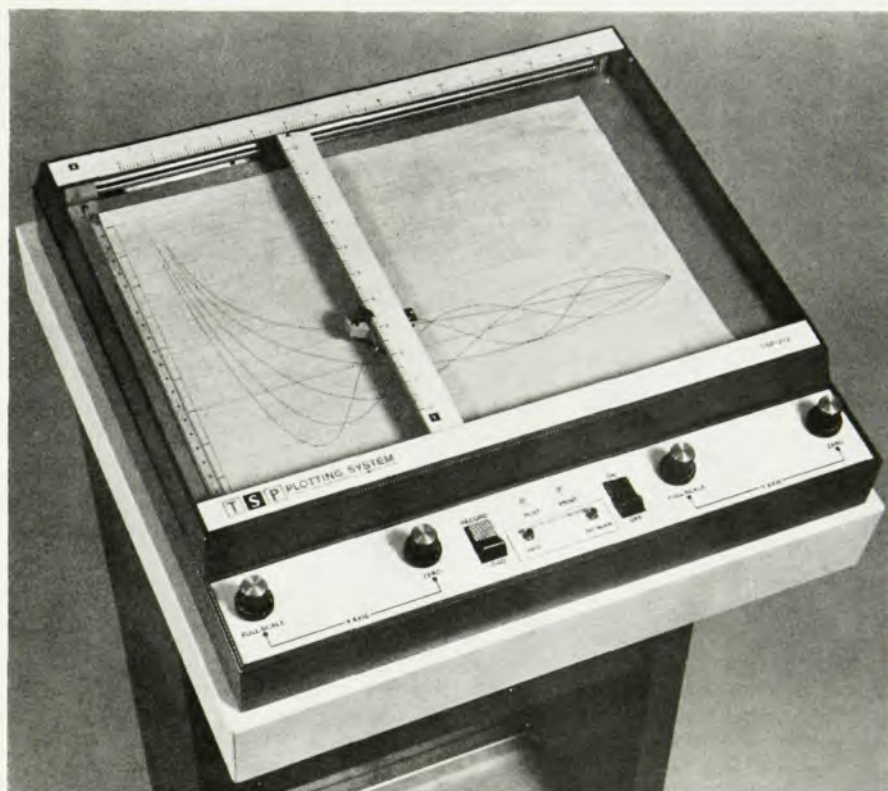
Why is it that the most popular science course for nonscience majors in many colleges is still "general astronomy," a subject with very few practical applications? Could it be that even nonscience majors are interested in such things as the origin of the solar

system, neutron stars, quasars, the age of the universe, the notion of hyperspace and so forth? I submit that they are. And that many are also interested in antimatter particles, what happens to matter at very low temperatures, the origin of life, how information is stored in the brain and many other areas of investigation now at the frontiers of science. I suggest that they also have some interest in how these investigations are carried on, what it is in the nature of science that makes such investigation valid, what are the limitations of the methods employed by scientists and what are the characteristics of the scientists who conduct such research. Of course they do not care to go into these subjects in the same depth and detail as science students do, but they are interested in knowing what these discoveries are and how they

PHYSICS TODAY, a publication of the American Institute of Physics, Incorporated, is published at Mack Printing Company, Easton, Pa., USA. Editorial, circulation and advertising offices are at 335 East 45th Street, New York, N.Y. 10017, USA. Subscription rates: United States and possessions, Canada and Mexico: \$7.00 a year; airfreight countries (Europe, Middle East, North Africa): \$10.50; elsewhere: \$8.50. Copyright © 1970 by the American Institute of Physics. All rights reserved. Change of address: Provide at least six weeks advance notice. Send old and new addresses to Circulation Department. Please include address label from one of your recent issues.



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come about.

For many years scientists have been saying "While we as scientists find the study of these fields fascinating, you as nonscience students are not able to appreciate or understand them. You as laymen are only interested in the practical applications that can be derived from what we are doing." Are scientists really the only ones interested in understanding nature, or in resolving discrepant events? Are scientists the only ones curious about science? Certainly not! Yet this somewhat snobbish attitude of scientists annoys the layman and serves to broaden the gap between the scientists and the nonscientists.

What we need, I believe, are courses for nonscience students that provide a carefully planned, intellectually honest treatment of a few of the current research areas in science emphasizing not only possible applications, but the methods and aims of science, and the possible relationship that new knowledge may have on man's view of nature and of his place in space and time. These courses should deal with what is happening now in science and what we think might be happening in the next 20 to 30 years—the years in which these students will be living and working. To develop such courses requires innovation, creative people with an understanding of the nature of science, the current research efforts in science, and the nonscience student's interests and abilities.

RICHARD REIS  
Stanford University

## Time-sharing addendum

Congratulations to PHYSICS TODAY on the July special issue featuring computers. Now that about 90% of your readers use computers in their work, the informative surveys are well timed to help physicists get a wider view of computer capabilities and trends.

If we had not missed the deadline for responding to the time-sharing questionnaire, the table in Hussein Elkholy's survey would have carried the following added information: Telcomp Corporation of America, a subsidiary of Bolt Beranek and Newman Inc. of Cambridge, Mass., offers services in regions 1, 2, and 3 on two kinds of systems. The first uses PDP-10 central processors; fast memory space of 32 K 36-bit words; cycle time of 1 microsec; user languages TELCOMP III, BASIC, FORTRAN IV; simultaneous users, 64 per system; no minimum charge; terminal connect \$10/hr; CPU charge, \$0.05/sec per 4000 words of core memory; storage charge, \$0.40/month/640-char-