by improved technology and by utilization of more nearly reversible—and hence more expensive—recovery processes. Although we can define *resources* in terms of the energy requirements for recovering fuels from mineral deposits, the situation is quite different for *reserves*. Reserves are created by the economically motivated activities of developing mineral deposits for profitable recovery, and they include only the deposits actually so developed.

JOHN C. FISHER
General Electric Co.
New York, N.Y.

Wigner replies

I am very glad that Stephen Shafroth expressed, in the April issue (page 11), his disagreement with my (and many other people's) conception about a future role of physics. Only if both sides of an unquestionably debatable issue are voiced can one hope for a rational view to prevail in the end.

The first question on which we do disagree concerns the physical possibility, at least in the US, for everyone to have a materially carefree life. I maintain that this possibility is present in the sense in which the term "materially carefree" was used in my discussion, that is, to denote the absence of worry for food and shelter. And I do believe that if these are assured life can be, esentially, carefree. It may be of interest to recall that when Shafroth was contradicted by his African students, he referred, in rebuttal, to the famine in their land. It is true that we expect many other material comforts—I mentioned the availability of running hot water—the absence of which is now regarded as a sufficient condition for poverty, whereas many of our grandfathers had no running cold water either. The availability of electric and automotive power is a similar convenience, and Shafroth is entirely correct when drawing attention to it. I also agree that there was a danger of a real shortage of these—not only a threat conjured up by oil companies. However, I doubt that further research in physics is necessary to assure adequate supplies of these. One obvious solution would be to get along with a little less power than we now use—perhaps with only 75 percent more per person than Sweden, the second largest power consumer, uses. Or, we could build more nuclear reactors. Neither of these solutions requires fundamental extensions of our science, and the lack they would cure is not a cause of human unhappiness comparable with the lack of food and shelter.

To conclude, it is my conviction that our present technical skills could already provide, at least for the foreseeable future in our society, the basic material requirements for all. Hence, our natural sciences have accomplished the original objectives set for them by society. It is for this reason that I emphasized the significance of the more spiritual studies, in particular of psychology, and Shafroth apparently agrees with this. I also tried, however, to find new vocations for *our* science. These should integrate the various disciplines more thoroughly. But, and this is the controversial issue, I consider it the main future function of science in societies that have already the affluence of ours, to become for a larger number of people the challenge and the source of pleasure which they now are for us scientists. Even if the old objectives continue to play a greater role than I envisage, these new objectives appear to me highly desirable.

EUGENE P. WIGNER
Princeton University
Princeton, N.J.

Reprint service

I would like to suggest a partial solution to some of the problems caused by the photocopying of AIP journals discussed in the recent article by H. William Koch (February, page 23).

My suggestion is that AIP should set up a fast, reliable, and *economic* reprint service for its members.

Most individual subscribers to AIP journals may find only a few articles in each issue of the journals they receive, and several in journals that they don't receive, which are of special interest. AIP should therefore provide a subscription service whereby individuals and small industrial labs with specific interests should be able to receive reprints of articles in all AIP journals that fall into their special-interest area as given in the CPT and SPIN classification scheme. Also, issues of CPT, CPAA, and receivers of SPIN profiles should be provided with "Reader Service" cards on which they can order reprints of articles that interest them.

Since more copies of articles in AIP journals would be printed it would result in a smaller "per-copy" publishing cost. If the cost and speed of receiving reprints can be made competitive with the cost and inconvenience of looking up individual articles and photocopying them or sending to authors for reprints, then the loss to AIP because of photocopying could be minimized or eliminated.

In addition, reciprocal arrangements with other physics and engineering so-

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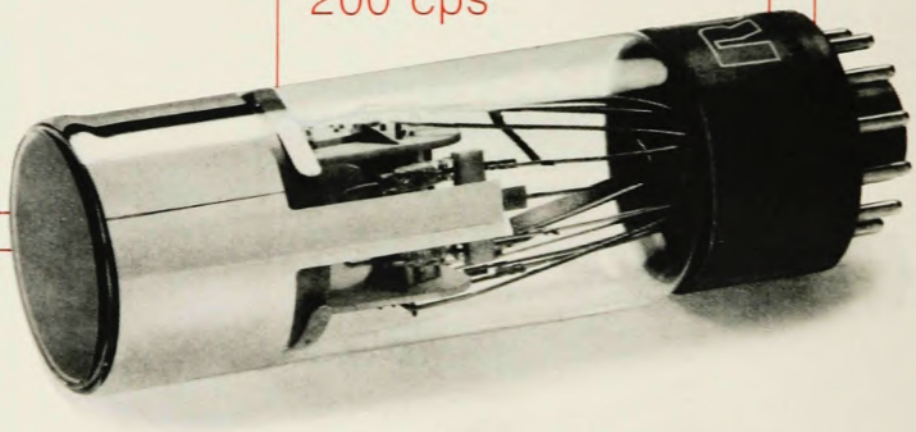

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cieties and journal publishers to provide each other's readers and members with reprint services would provide decreased cost and increased income to publishers, and wider dissemination of physics information.

Also identification of specific interests of members and subscribers could provide increased interest to advertisers, which would decrease the cost of specialized reprint services.

JEHUDA ZIEGLER
New York University
New York, N.Y.

COMMENT FROM AIP: *The Journal of Physical and Chemical Reference Data* published jointly by AIP and ACS for the National Bureau of Standards inaugurated a reprint program with the start of publication of this journal in 1972. These reprints are produced at the same time as the journal. Each article is separately bound in individual orders. The same technique is about to be implemented for *Reviews of Modern Physics* published for the American Physical Society by AIP.

In addition, an advertisement in the March issue of PHYSICS TODAY (page 91) announced the start of AIP's new reprint service for all of the journals published by AIP. All an individual has to do is to send us the article title, author, journal and date, and we will mail a reprint of the article. Orders are filled on the same day they are received. The price is 25¢ per article page, plus postage.

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ROBERT H. MARKS
Associate Director of Publishing
American Institute of Physics

Disability insurance

Disability resulting from accident or disease is one of the most serious hazards of life. The deficiency most frequently found in personal insurance programs is a lack of balance between disability insurance and life insurance. Even when a person carries disability insurance, the particular policy may not be suitable or adequate. In taking leave from the University of Maryland for a year, I was faced with acquiring my own fringe-benefit package because the University Research Foundation I went to had no package.

Most of the APS membership know that life insurance is available through the society and elsewhere at competitive costs. I have always thought that the Society fell down on its responsibility when it endorsed the present life-insurance program without at the same time requiring the presence of a disability insurance. I have found that a good disability policy is expensive. By good, I mean a *professional* disability policy, not the typical policies without the professional coverage or the University policy with a two-year clause. I believe that here is a chance for the APS to do something worthwhile for its membership. Now, when the APS Plan Administrator will be getting proposals for such a program of protection, I urge all members to make known their interest in a program of *professional* Disability Income Protection.

SHERMAN K. POULTNEY
Newport News, Virginia

COMMENT FROM APS: Our society has moved a long way in its professional concerns responsibilities since the establishment of its Life Insurance Program in 1969. When the Life Insurance Program was first suggested, our attorney and many members of the Council did not think it proper for the APS to endorse this life-insurance program. However, the Tax Reform Bill of 1969 enabled the Society to do something that previously would have been unacceptable. If the Professional Disability Insurance had been proposed to the Council at the time the Life Insurance Program was instituted, I'm sure that it would not have been accepted. The Life Insurance Program of the APS has been very successful, and more than 3500 members of our Society are now covered under this insurance program. Because of the success of this program, the accident and dismemberment insurance program has also been made available, and we are now looking into a Professional Disability Insurance Program. We do not, as yet, have a proposal for a Professional Disability Insurance Program that is acceptable to the APS insurance administrator and the officers of the Society. When we do, the members will be given the opportunity to participate in this new insurance program as soon as possible.

W. W. HAVENS, JR
Executive Secretary, APS

Disagrees on math

It was interesting to read Robert Hermann's letter (December 1972, page 9) regarding physicists and their lack of mathematical training.

As one whose basic training was in physics and who hires physicists for various jobs, I could not disagree more with Hermann's contention that physi-

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