letters

search programs at a university was small and funding levels were measured in tens of thousands of dollars. Now, a typical research university has a large number of scientists and a large number of research programs and sometimes an institute devoted to national goals and the funding levels are measured in tens of millions of dollars. A small fraction of a large number of dollars may still be a large number of dollars and may represent a significant demand on the resources of the university.

In the event that the federal government and others desirous of the fruits of university research do not respond to this serious situation, what will the universities do? It appears to me that the dollar shortfalls can be made up from university funds only for a finite period of time. Then the deficits will be (are being) eliminated by reducing that which causes them—scientists and their research programs. The private universities will be hit first (and presently are) including those with large resources such as Zirin's California Institute of Technology. The public universities can tolerate this situation a little longer, because they have access to state treasuries. However, I doubt that the various state legislatures will continue to subsidize non-state research programs once they find out what is going on.

I urge every university scientist and every science program director to make some attempt to understand this problem. The financial health of our profession and our universities depend on it.

D. H. DOUGLASS
University of Rochester

THE AUTHOR COMMENTS: D. H. Douglass misunderstands the point of my letter, as do university administrators. I was simply trying to point out that a decrease in overhead charges would not hurt university research programs, because most overhead charges come right out of a fixed grant amount; in fact, the decrease would help by putting the money directly into science.

One can argue back and forth over whether overhead rates are fair. Donors give buildings, and the capital cost of these is depreciated and charged to overhead. I could (but won't) give examples of how overhead can be exaggerated by pooling sponsored and non-sponsored activities. But one cannot argue the fact that overhead comes out of a fixed grant budget in most cases. There may be some universities that have a high-overhead rate because they really track the costs. But I feel that in many cases high overhead means just that—they are spending too much money on wasteful indirect charges that should go into science.

I am not familiar with the Rochester situation, but logic tells us that continuously increasing overhead rates mean money is dissipated in ways which do not contribute directly to research. Big, unnecessary computing centers, overstaffed purchasing and building and grounds staffs, are typical items in this drain. As Douglass correctly points out, the university administration will itself gain if these costs are reduced. Such efforts can be successful. In response to vigorous faculty protests and its own budget difficulties, the Caltech administration made great economies and succeeded in keeping the overhead rate nearly constant for the last ten years. Each time they cut the staff of a department, it became more productive. Every functionary they laid off made life that much easier for the principal investigators. Hopefully Harold Brown is doing the same thing to the Pentagon.

If one examines the budgets of the national centers, one finds the same result: Despite the relatively lavish way they are run, the overhead costs appear to be lower than at universities. Because they don't need to exaggerate it.

Moral: If we scream and holler, the universities can and will set their house in order and we will get more science for a buck. Such increased productivity will lead to more grants, increased overhead, and more science.

HAROLD ZIRIN
California Institute of Technology
Pasadena, Calif.

Three-Mile Island complaint

I found your explanation of "What went wrong with the Three Mile Island reactor?" (June, page 77) to be very obscure, primarily because reactor components are mentioned which are never explained or identified in the accompanying diagram. The article failed to take into account that your ordinary PhD physicist is not familiar with steam-heat technical jargon or plumbing diagrams. For example, the diagram should have especially identified the *primary loop*, the *secondary loop*, the *primary circulation pumps* (are these the reactor coolant pumps?), and the *decay-heat removal system*. The demineralizer, its *secondary flow*, and the ruptured *seal* location might also have been shown.

How can we physicists educate the general public about technical matters when our own publications do not explain these matters to us? I think my local newspaper gave a better technical explanation of the accident.

The article should also have told us the ultimate fate of this reactor. Can it ever again generate electricity?

VICTOR J. SLABINSKI
8/1/79 *Arlington, Virginia*

We regret that our article did not help this reader arrive at a better understanding of

the Three Mile Island nuclear reactor accident. Selecting the appropriate technical level is always a difficult matter. In this instance, we intentionally geared the level a bit high to supply the type of details that had not been given in the general newspaper accounts. The story attempted to answer many of the questions we heard raised by physicists of varied backgrounds. We had hoped that, although space prevented anything but a cursory definition of terms, the diagram would help indicate the relations among the reactor components. We do agree that the diagram could have been altered to highlight key components, to indicate explicitly the primary and secondary loops and to make the terminology more consistent with the text. (Yes, the primary coolant pumps are the reactor coolant pumps).

As for ultimate fate of the reactor, that was still an open question as the story went to press. The containment building is still closed at this writing, so the extent of damage remains unknown. Metropolitan Edison has requested and received some preliminary estimates for the reconstruction of the reactor.

The Editors

Helping science libraries

More and more, libraries cannot afford to buy scientific books and periodicals, and are forced even to cancel some subscriptions. As a result fewer books are sold and they become more expensive, hence the vicious circle. Clearly this situation is detrimental to research and scholarships. A remedy would be if the funding agencies would adopt a method that would force the universities to give a certain percentage of the considerable overhead to science libraries for books and periodicals. After all, the availability of all publications is a very important ingredient of research, a relatively inexpensive, yet neglected part that would also benefit future projects and future generations. The agencies and foundations should not just encourage but stipulate such a procedure in their grants.

A. O. BARUT
University of Colorado
Boulder, Colorado

10/30/79

Hall-effect omission

The article on the ferromagnetic Hall effect by G. Bergmann in August (page 25) ably reviews developments in the field in the last two decades. We feel, however, that it is most appropriate for any review of the Hall effect in ferromagnetic materials to make reference to the unique and pioneering work of Emerson Pugh, and this the article fails to do.

For over a third of a century Pugh's work on the Hall effect in ferromagnetic