

References

1. R. P. Feynman, R. B. Leighton, M. Sands, *The Feynman Lectures on Physics*, vol. III, Addison-Wesley, Reading, Mass. (1965).
2. R. P. Feynman, "Surely You're Joking, Mr. Feynman!" Norton, New York (1985).

SUDIP CHAKRAVARTY

University of California, Los Angeles

Give Schoolteachers a Hand

In the ongoing discussions on science policy, the topic of education in physics is usually restricted to the education of PhD students. Unfortunately that process too often consists merely of university scholars cloning themselves. Any nation needs more than that.

The frontline troops in public acceptance of science are the overlooked, overworked schoolteachers. And this fact implies the necessity of universities' producing bachelor's degree students who go out with missionary zeal: "Boy, I enjoyed physics. I could recommend it to anyone." In reality, physics is usually regarded as too hard, too mathematical and not relevant to everyday life.

The physics profession should make every effort to stimulate bachelor's degree students, to ensure that the bachelor's courses are appropriate to someone going into the community with a first degree and to support physics teachers.

Now for the self-test. Ask yourself, "When did I last help a schoolteacher?" Anyone having trouble recalling when has no right ever to complain, as too many do, about the standard of physics teachers or the incoming students.

There are many excellent teachers in classrooms and many more whose enthusiasm can be boosted with a little encouragement and support. Any support and help we give them is magnified in the classroom and for years to come. It is one of the best investments a professional physicist can make.

JOHN CAMPBELL

*University of Canterbury
Christchurch, New Zealand*

Remembering Willie Fowler

Some people are ageless. Willie Fowler was one. [See the obituary on page 116.] His creative mind, wit and exuberant personality never dimmed or clouded. That is why it

seems so incredible that he is no longer with us. Years ago, I had the great fortune to participate in a series of measurements of cross sections for neutron capture by selected stable isotopes of heavy elements at energies corresponding to the interiors of red giant stars. Fowler and others suspected that red giants were the breeding ground of s-process (slow process) nucleosynthesis, which created a large proportion of the elements lighter than bismuth. He also was partly responsible for identifying the source of the very-neutron-rich heaviest elements as being supernovae.

Willie was a kind of bright star—a supernova—himself. He was particularly pleased when we included a quote from Walt Whitman in one of our papers: "I believe that a leaf of grass is no less the journey-work of the stars." Now he belongs to the stars again. Another poet said it this way: "All things come and go. A star melts as surely as a snowflake . . . only to come again in some other time and place."

JOHN H. GIBBONS

*The White House
Washington, DC*

*(The author is assistant to the
President for science and technology.)*

A Review of Peer Review

This column frequently prints letters about peer review. Many are angry letters from authors. This letter gives my opinions, reflecting my experiences as editor of the *Journal of Applied Physics*.

The number of submissions to the journal increases every year, so some system of quality control is essential to keep the journal from becoming too large. Peer review, to paraphrase Winston Churchill on democracy, is the worst system for this, except all those other systems that are proposed from time to time. The system works superbly when reviewers send fair reviews promptly; their reward is, in principle, fair and prompt reviews on their own manuscripts. The system fails when the reviews are late, biased or just plain useless.

The increase in the number of submitted manuscripts has led to a work overload for reviewers. The best remedy would be self-restraint on the part of authors: Does every crumb of scientific information have to be written up as a letter, followed by a paper? A more realistic suggestion for easing the load is that senior people,

whose names are likely to be the ones in a journal's reviewer files, parcel the work out to their junior colleagues, even advanced graduate students. As long as the mentor checks the first few reports, this tactic should provide valuable training. The first good report will put the young reviewer into the journal's files and save work in the long run for the mentor.

From a journal editor's point of view, the purpose of a review is twofold. The first purpose is to advise the editor on what action to take on the paper. The word "advise" is important here; the review is but one factor on which the editor bases the decision to accept the paper, ask for revisions or reject it. The reviewer's advice must be supported by a brief discussion of the reasons for it. The second purpose of the review is to help the author to improve the paper. A substantial improvement in a paper owing to the reviewer's suggestions is one of the biggest benefits of peer review.

The chosen reviewer should be an expert on the subject of the manuscript but not so close to the subject that self-interest rears its ugly head. The expertise is particularly necessary for applying the following criteria:

▷ *Correctness.* This is the *sine qua non*.

▷ *Interest and novelty.* Is this paper interesting? Is it new or is it the 45th paper on the subject in the last year? Is the new information in this manuscript important or is it incremental?

▷ *Completeness of references.* Is the literature cited complete or are important references (not necessarily only to the reviewer's papers) left out?

Serious shortcomings on correctness, novelty or importance suggest rejection. In that case, the report should not contain suggestions for minor improvements, lest the author be encouraged to resubmit.

If acceptance or revision is recommended, the quality of the presentation should be evaluated. Is the manuscript too long or too short for the information contained? If the former, where can it be cut? Most journals are short of space, so an expert's recommendations on editing are welcomed by the editor, if not the author. How about the quality and quantity of figures and tables? Most important, is the paper comprehensible? Are major changes in organization needed?

The quality of the English—grammar, word use, style, spelling and so on—is a big problem for some