

LETTERS

crystals, x rays, electrons and neutrons). Whether the majority of your readers dieted differently or are ordered to do so in the future by some international clinic, I would not be able to say, but I know the crystallographers would have no interest in changing to nanometers. Not that they are not interested in unit changes! How they worked on kx units vs angstroms vs J. A. Bearden's proposed "A* unit"!

CHARLES S. BARRETT
University of Chicago

Let students write problems

H. Richard Crane's guest editorial, "Better Teaching with Better Problems and Exams," in the March PHYSICS TODAY has stimulated some ideas about problems in a nonscience major's physics course. Although such students are disenchanted with present courses because they lack contact with pressing social problems, perhaps their interest can be stimulated by challenging them to invent problems. The effort might train them to think as scientists do and, at the same time, equip them better to attempt solutions to social ills.

At the end of the first week of class each student could turn in two or three problems that he thinks the course should enable him to solve by the end of the year. They will tell the instructor what the students think the course should be and force the student to define his own involvement. The procedure can be repeated several times during the year to show whether each student has changed his goals or defined them better or made progress toward solving his chosen problems. The instructor can change his course, and the situation might change from static to dynamic. The students might give some clues to what would make the course relevant to current problems.

MARIO E. SCHILLACI
Los Alamos Scientific Laboratory

Unpublished works

In recent scientific papers I have noted that some authors tend to refer to their own unpublished work and to work they hope to publish later in an unspecified journal. Since several of the papers were in journals published by the American Institute of

Physics or member societies, I thought to draw the matter to your attention. Allow me to give a few recent examples from a flourishing field (I apologize to those authors whose contributions I have overlooked).

1. In a paper by H. Träuble and U. Essmann (*J. Appl. Phys.* **39**, 4052, 1968), they state, "It is shown in ¹². . . ." Reference 12 reads "U. Essmann and H. Träuble (unpublished)."

2. A paper by L. R. Saravia and D. Brust (*Phys. Rev.* **170**, 683, 1968) reads in part, "a method described elsewhere (see ref. 17)." Reference 17 reads, "L. R. Saravia and D. Brust (to be published)," and reference 21 further reads, "D. Brust and E. O. Kane (to be published)."

3. In a letter by D. L. Mills, A. A. Maradudin and E. Burstein (*Phys. Rev. Lett.* **21**, 1178, 1968) they state, "A microscopic theory of these mechanisms is published elsewhere²." Reference 2 reads, "D. L. Mills, A. A. Maradudin and E. Burstein (to be published)."

Surely such references only waste the readers' time and should read something like "We have also observed. . ." without citing a reference.

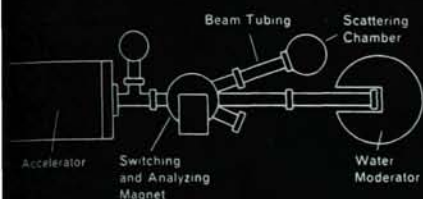
PETER H. BORCHERS
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An overly homogeneous group

The underlying problem behind the controversy on the Schwartz amendment and the American Physical Society Chicago meeting, in my opinion is that the APS Council has taken on the aspect of "the Establishment."

The APS Council is a group of dedicated, hard-working, honest and conscientious individuals. The question, however, is whether they represent the present APS constituency in approach, attitude and sympathy. Instead, I believe they have many of the characteristics of an inbred, self-perpetuating, overly homogeneous group. The manner of election helps assure this since they are selected from the scientifically elite. Note also that in the present election all of the officers are from universities, and all of the nominating group are also from universities.

Unfortunately APS officers have already acted as the Establishment. The most astonishing act of the council was to include propaganda for their side alone in the ballot for the Schwartz amendment. I am sure it



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was done with the best intentions, but it was still done.

It is noteworthy that Princeton University recently elected two members of the graduating class to their board of trustees. Before this the average age of the board exceeded 60 years. Perhaps we can learn from their experience. Should the councilors be a more heterogeneous, more youthful and broader based group? Should it include one or more recent graduates? Should it include people from industry?

Improved representation might help us out of our present dilemma. An amendment changing the nature of the council might well be in order.

LEONARD R. WEISBERG
RCA Laboratories, Princeton

Suggestion: the minireview

The need for an improved system of reviews has been stressed in recent articles, particularly in the physics literature. The suggestions are equally applicable to chemistry.

The primary need is for timely substantive reviews—in which topics are analyzed exhaustively. These should indicate what data and concepts are still valid and why others should be discarded. The synthesis of "best values" for molecular properties and parameters of systems, that is, the most reliable values the reviewer can derive from the data at hand, and recommendations for future work should be included where applicable.

Such reviews are research and information filters, not reporting. They are new source documents that will replace, for most readers, the research reports that are analyzed. Conyers Herring's phrase "Distill or Drown" (PHYSICS TODAY, September 1968, page 27) is apt.

Much of the discussion to date has been aimed at the improvement of the invited review, the large-scale review that is the staple of the review journals and the *Progress in X* series. Examples of large substantive reviews are: L. J. Kieffer and Gordon H. Dunn (*Rev. Mod. Phys.* 38, 1, 1966) on electron-impact-ionization cross sections and H. S. Johnston (*NBS-Nat. Std. Ref. Data Series No. 20*, 1968) on the kinetics of oxygen reactions.

Unfortunately, most large reviews are straight reporting. The time and

effort required for the preparation of a large critical review usually are greater than the author is willing to devote to the subject. In contrast this detailed coverage is feasible in finite time and space if the topic is limited in scope.

I suggest that the review literature can be expanded rapidly by encouraging the *contribution* of small-scale reviews on restricted topics. The suggested incentive is a special publication medium.

For these small reviews the research community is the pool of talent. The reviews would be evaluations of topics that a research scientist masters in the course of planning or writing up his own work. At its very simplest the proposal is: Capitalize on the evaluation effort that goes into a first-rate research paper.

This does not mean that the typical discussions in papers are suitable. They rarely are scholarly. They are often partisan justifications for publication. Even the best are viewed in this light by the jaundiced reader.

The short evaluation is not easy to prepare. It must meet the goals listed earlier. It is important that the review be definitive and present well documented conclusions and recommendations. This program will not appeal to all scientists, but, for those who are attracted, the time required for preparation will be reasonable because they will be drawing on experience gained in their own work.

If the scope is kept small, five pages of text should be a generous limit. An example of a review having the scope envisaged is the discussion by Eugene S. Domalski and George T. Armstrong of the heat of formation of tetrafluoromethane in section 10 of their paper (*J. Res. Nat. Bur. Stds.* 71A, 105, 1967).

These short evaluations should be given high visibility. They should be published in special sections in the journals that normally cover the pertinent field.

This proposal has several implications:

- Prepublication refereeing must be thorough, because a "best value" (a vital part of these papers) is often taken as gospel by the nonspecialist. If the evaluation stands alone it will get close scrutiny by the specialist.

- Since in most cases critical evaluation involves subjective judgments, one can expect that many of these reviews will arouse strong differences



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