

LETTERS

College teaching

I am somewhat surprised at the replies (*Physics Today*, May 1965, p. 92-4) to my original letter in the March 1965 issue (p. 60). There appears to be some controversy over my statement that small-college teachers work 8 months per year, 25 hours per week during these 8 months, are not required to do any research, and make enough money for a living. I sincerely believe (and personally know) that there are many hardworking small-college teachers. Often, the budget is so tight that there is not even enough personnel to do the teaching. However, at least in some cases, there is a reasonable opportunity to do research. Let us compare the chemistry departments of the University of Chicago vs. seven state universities not well known for their research (averaging 0.5 publication per faculty member per year vs. 3 at Chicago). The average state university has 60% of the staff and 80% of the enrollment of Chicago. If we use the teaching load of 0.5 course per quarter per person at Chicago as standard (and most people will agree that Chicago is at least adequate in teaching), the teaching load at these state universities should be one course per quarter per person. It may be argued that these universities must fulfill teaching requirements different from those of Chicago. Even allowing such discrepancies, it seems fair to say that there is something wrong somewhere. Let us face a problem, and not merely by-pass it by catch-all statements like "survey indicates small-college professors work more than 50 hours per week" (the 25 hr/wk. professors will usually either skip the survey or not tell the truth). In some cases, the effort of the hard-working professors may be more than counterbalanced by their lazy colleagues. More often, however, the problem is more complicated and should be studied more carefully. I have not made any detailed studies, but certain possible

improvements are fairly obvious. Sometimes the curriculum needs to be streamlined; haphazard departmental expansion can lead to a proliferation of courses neither well taught nor sufficiently different from one another (Parkinson's law: courses are expanded to fill the teacher's time.) Whereas Oberlin, Reed, and a few others should concentrate on statesmanship in science as J. H. Millen [*Am. J. Phys.* 29, 272 (1961)] suggested, an active research program at most colleges would keep the faculty from becoming stagnant and also help to train the students. Expensive equipment is not always necessary for good research. For example, Mössbauer, semiconductor, and molecular band-spectra experiments often require only modest investments, some theoretical problems even less. At many colleges, mass production is a dirty word. Whereas Oberlin and Reed can afford not to mass produce, I believe a compromise should be reached at most institutions. The average age of a typical set of first-year graduate texts, Condon-Shortley, Kittel, Schiff, Morse-Feshbach, Goldstein, and Eyring-Walter-Kimball, is 17 years. The half-life of undergraduate lecture notes should be even longer, and the necessity of yearly revisions could be questioned. Without yearly revisions, time required for lecture preparations can be drastically reduced after the first year or two. Advanced students should also be used to some extent as teaching and laboratory assistants. (Given the best materials, the highly skilled craftsmen and the utmost abundance in time, a Rolls-Royce is better than a mass-produced Chevrolet. Lacking any one of the three, a Rolls-Royce may not be as good. Let us not frown on mass production blindly!)

With certain compromises, working 25 hrs./week excluding research may not be completely ludicrous. If a genius like Einstein can be highly efficient and spend 25 hrs./week to do an adequate job in teaching and the rest of his time on relativity, he should be encouraged, not fired.

The lack of interest among creative scientists to teach in small colleges has often been mentioned. This is a positive feedback problem. (The

creative scientists are attracted to the better institutions because of the institution reputations, and their creativity further enhances the reputation of these better institutions.) The supply-demand picture is, however, favorable for the small colleges at present. Although the supply and training of creative scientists have increased greatly in the past several years, the demand has actually decreased. Neither the large universities nor the large research centers are expanding. In addition, a properly administered small college can be an ideal compromise between Einstein's patent office and the large-university rat race. At least the faculties are under no worse handicap than Einstein in his patent office days, and we shall expect to find National Academy members, if not Einsteins, among their faculties. With vigorous recruiting and careful screening of creative scholars, an active research program to prevent the stagnation of creative scholars, and a streamlined curriculum to reduce teaching loads, the potential to do research in many small colleges can be very good indeed. Sometimes the present theme that small colleges should be interested first and foremost in good teaching deserves more careful study; occasionally the complete exclusion of research in the name of good teaching can lead to stagnancy of both faculties and students.

Tung Tsang

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Scions, fermions, un-ions

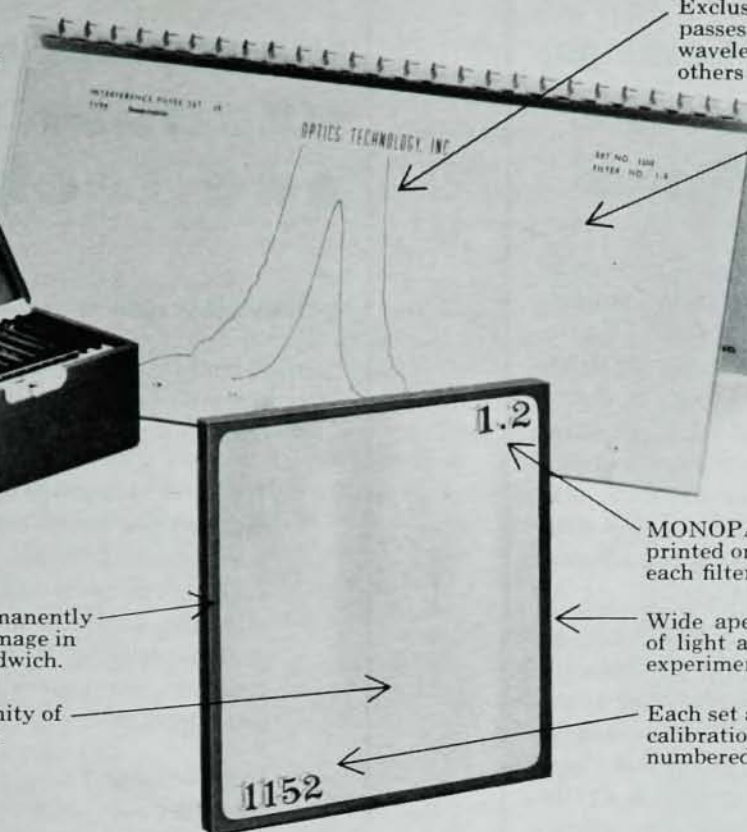
Professor Green is to be complimented on his analysis of scientists' salaries ("Scions Are Fermions", *Physics Today*, June 1965, p. 32). This is the first new attack on the problem in many years, so far as I am aware. It displays an imaginative and creative approach which all practitioners in the field of salary administration would be well advised to emulate. Professor Green uses LASL data as representative of salaries of scions, who are identified as scientists in industry involved in two-body interactions and defined as "industrial scientists compensated at levels dictated by the open market place". As he

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demonstrates, the data suggest that scions are fermions.

However, there is one minor weakness in the study, which should perhaps be noted for the benefit of future workers in the field. This detail, which has so far been overlooked, is the fact that some of the scions in the LASL data are involved in interactions more complicated than those of just two bodies. To be specific, some scions manifest associative properties which in certain cases lead to their joining into subsets. The presence of subsets, themselves, results in special forces in the market place. For purposes of analysis it is convenient to designate such subsets as un-ions. (In popular parlance they are commonly referred to as professional unions, but this is an obvious contradiction in terms.) It seems improbable that allowing for the influence of un-ions would significantly alter Professor Green's broad conclusion. However, their effects may be quite important in more refined studies such as the hyper-surface explorations which Professor Green suggests. In particular, forces related to un-ions will quite possibly prove to be of major significance when the time-dependence of the hypersurface (bow-wave phenomenon) is rigorously evaluated.

Robert A. Steel
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Taxation threat

Dr. Sawyer, in opposing modification of the present tax treatment of tax-exempt scientific and education organizations ("Taxation Threat to the Progress of American Physics," *Physics Today*, May 1965, p. 23) seems to offer an appropriate immediate response to an immediate threat. But omitting consideration of the motives of the Internal Revenue Service in proposing changes leaves one wondering what is happening.

Included under the present umbrella of tax exemption for scientific and educational organizations are some which would probably be regarded questioningly by many a scientist who might write to his congressman at Dr. Sawyer's instigation. For example, there are organizations which make a "member" of anyone for a fee, which

offer "members" nothing but magazine subscription "privileges", which are governed by tiny, self-perpetuating bodies which include few if any scientists of repute, which offer no public accounting of funds or of policies, which may hand on their top leadership on a hereditary basis, and may even exert detrimental influence in shaping public attitudes while operating in a tax-free shelter in competition with private enterprise. A more stringent definition of "scientific and educational" organizations would increase public revenue, would tend to preserve the tax privileges of bona-fide scientific organizations, and would encourage favorable development of organizations whose present claim to the designation "scientific and educational" is questionable.

Lawrence Cranberg
University of Virginia

Abstracts

I wish to comment on the very interesting article by Michael Moravcsik considering private and public communications in physics (*Physics Today*, March 1965, p. 23).

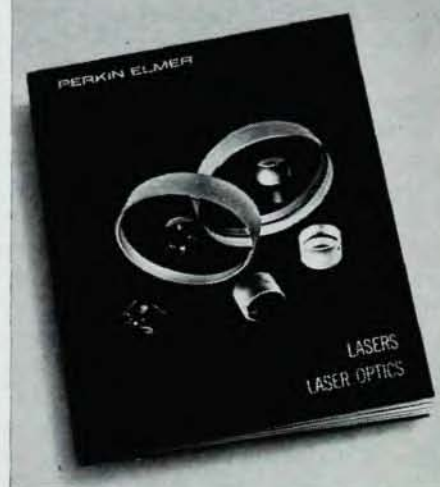
I for one find that the abstracts presented in the *Bulletin of the American Physical Society* are extremely valuable not only in supplying additional detail, but also in deciding on whether to attend the meeting in question. Another very valuable aspect of the *Bulletin of the American Physical Society* is that the addresses of the authors are given. I would like to urge that *Physics Abstracts* eventually consider printing addresses of the authors. I have written this suggestion directly to the publishers.

I would like to call attention to a letter to the editor of another journal.* F. H. Attix speaks about references to unpublished reports and urges that more journals allow reference to laboratory reports. I am in hearty agreement with this letter and with any plan which would make company reports more available to the scientific community.

Ray Hefferlin
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Collegedale, Tennessee

*F. H. Attix, *J. Opt. Soc. Am.* 55, 200 (1965).

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