

# Letters

## International Comparisons

In his review (3 Jan., p. 60) of Klaw's book *The New Brahmins*, R. E. Marshak suggests that young European scientists' beliefs that in the United States there is great freedom to move from institution to institution and an absence of academic hierarchism are incompatible with Klaw's claim that the academic origins of scientists in the United States are important determinants of their professional fates. The Europeans judge the U.S. scientific community in comparison with their own; but it is clear that mobility and hierarchism are matters of degree, and that even where, as in the United States, mobility is high, tendencies toward hierarchism may be present and origins may be important determinants of fates.

We are presently investigating the careers and productivity of U.S. academic scientists in four disciplines (physics, chemistry, mathematics, and experimental biology) and have found that there are in fact significant relations between prestige rankings of scientists' institutions of origin and those of their institutions of destination (and it should be noted that such prestige rankings are highly correlated with other rewards such as salaries). For example, from analyses of probability samples of each of these four disciplines, we find that correlations between the prestige of a scientist's doctorate institution and the prestige of the institution where he obtains his first position range from .36 to .42 for the four disciplines. Correlation coefficients between the prestige of the institution where a scientist obtains his first position and the prestige of his present academic affiliation range from .66 to .73. We have also carried out multivariate analyses which include various measures of scientists' levels of ability and contributions to their disciplines, and have found that, even after these measures are taken into account, scientists' institutional origins continue

to have significant correlations with their later rewards. For example, the zero order correlations noted above are not a result of greater research productivity of scientists who receive their doctorates from high-prestige institutions; in fact, the correlations between the prestige of a scientist's doctorate institution and the number of citations his research received in 1966 range from only .12 to .19 for the four disciplines. Of course these relationships account for only a small proportion of the variation in scientists' fates and certainly do not support claims that institutional origins are the primary determinants of later rewards.

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Marshak's review points up a number of instructive differences among systems of scientific education and training in the industrial nations. Such comparisons are not only useful but also essential to the improvement and perfection of this aspect of our culture. Generally speaking, however, our sources of information on comparative systems of science education are still too imprecise and fragmentary . . . .

While both the book and the review are welcome additions to this literature, I wish on one point to clarify what Marshak says concerning advanced training of young scientists in the U.S.S.R. He implies that the universities and higher schools do little or no research and that the research institutes do little or no "teaching." As a matter of fact, the some 25 or more groups of scientific research institutes (*nauchno-issledovatel'skie instituty*) conduct graduate programs (*aspirantury*) in all the major scientific and social-humanistic fields. In the form of seminars, tutorials, and individual relationships with specialists on research projects a great deal of instruction occurs over the 3-year period. Also, some of the large departments in universities conduct research with

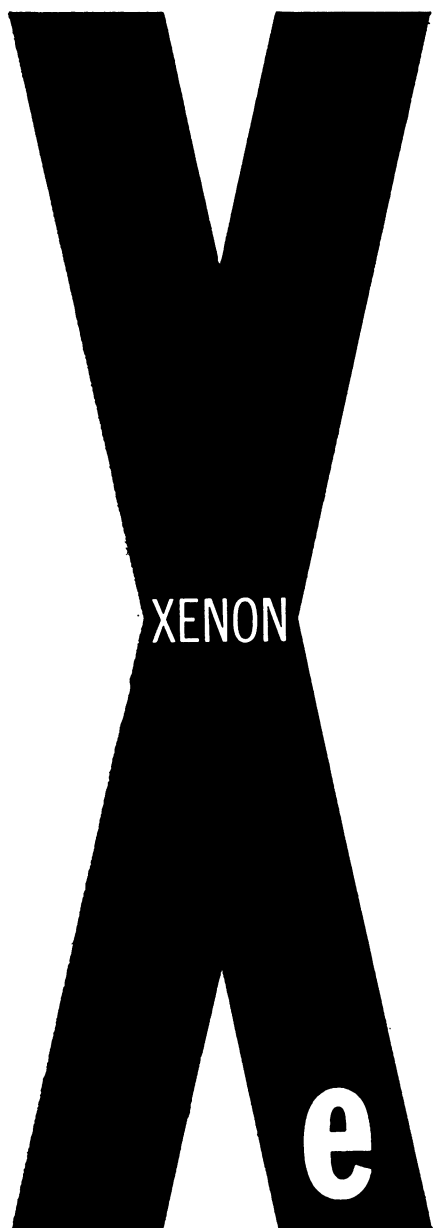
government funds and provide opportunities for both graduates and undergraduates to come into contact with enterprising teacher-scholars.

I would agree that U.S. higher institutions provide more interactions between research-minded instructors and students than is the case either in the U.S.S.R. or in Europe. On the other hand (having received both my advanced degrees in Europe), I would note too that in Europe and Russia the research specialist per se enjoys a more genuine and protected role in his chosen path of scientific endeavor than does generally his more harassed U.S. counterpart. We do not yet have enough data on these variables to weigh the significance of each system in terms of real scientific creativity. It may be possible to provide a valid answer by using a systems analysis in selected, measurable fields. It seems worth doing.

WILLIAM K. MEDLIN

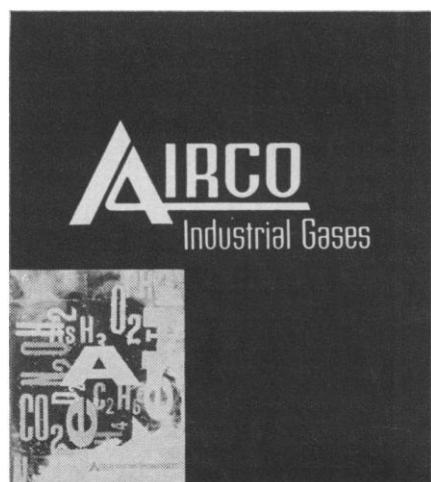
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Both the foregoing letters are in partial agreement with my views (necessarily abbreviated in a review) but do raise interesting points of difference. Hagstrom and Hargens submit some of their own evidence on the prevalence of academic hierarchism in the United States by citing correlations between scientists' institutional origins and their later institutional affiliations. I would suggest that these correlations could be explained in large measure by the much greater number of superior graduate students attracted to the prestigious schools (the statistics provided by the predoctoral NSF fellowships are startling in this respect). The prestigious institutions then find it easier to appoint superior Ph.D.'s, and the process tends to become "self-sustaining." In order to establish that there is widespread academic hierarchism in a "derogatory" sense (artificially induced immobility, snobbishness, and so on), it would be necessary to demonstrate that equally talented Ph.D.'s from the low-prestige schools suffer the consequences of their academic origins (and conversely, that excellent Ph.D.'s from the high-prestige schools will try to avoid a reduction of status!). Such additional constraints complicate the analysis, but it is evident that Hagstrom and Hargens are aware of these problems and are engaged in a serious study to learn the full extent to which academic hierarchism determines scientific



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careers in the United States. In any case, I believe that they would agree with me that the creation of so many excellent science departments in the "non-Ivy League" universities of the United States since World War II is not compatible with the argument that "institutional origins are the primary determinants of later rewards."

With regard to Medlin's letter: I am, of course, aware that research is carried on in Soviet universities (having paid six visits to the Soviet Union since 1956). However, in the natural sciences (to which I was limiting my remarks), the contrast in the quality of research (and facilities) of the universities and the academy institutes is striking. This is especially true in places like Moscow and Leningrad; in the new academic town of Novosibirsk, the liaison between the university and the academy institutes has been patterned on the American model. I am convinced that one of the chief reasons for the outstanding American performance in basic science is our system of graduate education (and I think the Russians are now recognizing this fact) and, in these days of student rebellion, I used the Soviet comparison to underline this point. I do not believe that the Soviet dichotomy exists in Western Europe.

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#### **Australia's Appeal to Ph.D.'s**

Rodney Willix (Letters, 22 Nov.), commenting on the lack of opportunities for Ph.D.'s in Australia, has stated only one aspect of a complex situation relating to the employment of scientists here. A presumed glut in the physical sciences is said to be confirmed by the number of Ph.D.'s "who continue to live in the United States for longer periods than they originally intended."

While it is probably true that Ph.D.'s do not return because of the comparatively poor level of research support provided both by government and industry, it is also very relevant to point out that, unless an individual has pressing personal reasons, he may be reluctant to return to a country where professional salaries and hence real purchasing power are close to half those pertaining to appointees of equivalent status in the United States. Also it comes as a shock to experience the

substantially higher taxation rate levied on individual incomes in Australia.

Australians as a whole are barely aware of the importance of research and its effect both directly and indirectly on the economy. It is significant that many research projects both large and small are relying heavily on funds from U.S. sponsors. While it should be possible to reduce this component over the next decade, it would be catastrophic to have it cut off overnight. I, for one, am grateful for the amount of continuing U.S. research support for nuclear physics which we have received over the past few years; I am proud of the calibre of Ph.D.'s that have been produced; and am agreeably surprised that employment in industry has been found in the last year for those seeking it.

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#### **Fluoride: Nature's Own**

A. R. Miller's criticism (Letters, 3 Jan.) of Sopolsky's comparison of fluoridation to chlorination and pasteurization is right but for the wrong reasons. Chlorination and pasteurization—valuable though they are—are nevertheless actions in which man surmounts the threats of nature. Fluoridation, on the other hand, is an action in which man restores the benefits of nature. Fluoride is an essential trace element, found in many local water supplies but deficient in others. If government authorities assume the responsibility of supplying water—as the public would have them do—then they would be culpable if they did not supply the essential trace elements which under optimum circumstances are furnished by nature. At any rate, we can be sure that nature never intended them to be supplied in toothpaste!

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#### **The Pill Doesn't Poison**

The comment on "Oral contraceptives: Government supported programs are questioned" (7 Feb., p. 553) contains a statement which to my knowledge is absolutely untrue. Mueller states that the accidental ingestion of oral