research productivity, particularly as manifested in article counts, is strongly affected by characteristics of the employing institution. In particular, there is strong evidence that physicists employed in top PhD-granting departments and Federally funded R&D centers are more likely to publish than their colleagues in places where resources are scarcer and the environment is less conducive to research.[8] It is clear that not all generations of physicists have had equal access to the most productive sector. Indeed, one need only look at the pages of PHYSICS TODAY to see how job opportunities for physicists have changed over time. A cohort particularly hurt was that of the late 1960s and early 1970s—the cohort from which the "young" in our study are drawn.

Finally, some have expressed concern that the average ability of new science PhDs has declined in recent years as the best and brightest in our society have been drawn into the lucrative professions of law, business and medicine.[9]

Because our data allowed us to observe physicists as they aged over a six-year period, we were able to draw inferences concerning the presence of cohort effects and to see whether true aging effects exist once we controlled for these cohort effects. Using an econometric technique that controls for both cohort and aging effects, we found evidence that except for particle physicists employed in PhD-granting departments, true aging effects exist. Furthermore, when we held the aging effects constant, we found evidence that for the period of our study the latest PhD cohorts were not the most productive in any of the subfields of physics we studied.

References

1. P. E. Stephan, S. G. Levin, "Demographic and Economic Determinants of Scientific Productivity," Georgia State U., Atlanta (1987).
2. R. Evenson, Y. Kislev, *Agricultural Research and Productivity*, Yale U. P., New Haven (1975).
3. E. Garfield, ed., *SCI Journal Citation Reports*, Institute for Scientific Information, Philadelphia (1975).
4. National Research Council, *Science, Engineering, and Humanities Doctorates in the United States, 1979 Profile*, Natl. Acad. Sci., Washington, D. C. (1980).
5. S. Cole, Am. Sociol. Rev. **84**(4), 958 (1979).
6. A. E. Bayer, J. E. Dutton, J. Higher Ed. **48**(3), 259 (1977).
7. D. C. Pelz, F. M. Andrews, *Scientists in Organizations*, revised edition, U. Michigan P., Ann Arbor (1976).
8. J. S. Long, Am. Sociol. Rev. **43**, 889 (1978).
9. H. R. Bowen, J. Schuster, *American Professors: A National Resource Imperiled*, Oxford U. P., New York (1986).

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Bread Shortage in the Nation's Breadbasket?

In the December 1987 issue (page 9), George E. Pake writes: "Through its extensive nationwide system of research universities, centers of basic research are ubiquitous in the US.

Nearly every citizen lives relatively near a laboratory doing research somewhere along the frontier of basic knowledge." These statements simply are not true.

In the heartland of our country, high-grade basic research proceeds at only a few locations. Throughout most of the area, the citizens reside far from such facilities. As a result, they are familiar with only the descriptive aspects of science, as presented in television broadcasts.

Furthermore, the people in power do not reasonably support most of the research facilities that do exist. It is not just a matter of lack of funds; the organizational structure is quite often deficient.

At South Dakota State University, the basic sciences are divided up among the various deans, so the plight of fundamental researchers is of little concern to the hierarchy. Relatedly, the instruction here neglects the foundations students need for a research career.

If our country's leaders felt that Pake's statements constituted an ideal, they would distribute research funds accordingly. This they do *not* do. Instead, the funds are concentrated on a few, already well-heeled institutions.

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PAKE REPLIES: It seems that George H. Duffey and I would disagree only in matters of extent or of degree. My statement is, I believe, suitably qualified to be valid. I had in mind that every state has at least one state university, which in turn sustains graduate programs in the sciences that award the PhD, a research degree at the frontier of current knowledge. Admittedly, in the larger states west of the Mississippi, some citizens do not live very near to the state university, although they may readily on an autumn Saturday commute to the campus for a football game—which I grant is not a research interest.

All universities I know allocate or distribute the basic science departments among several deans.

The implication that funding for basic science research ought perhaps to be distributed geographically or more uniformly does not take into account that in addition to state universities there are a number of academically strong private universities in a few states. These pinnacles of privately established science strength are not uniformly distributed throughout the nation, yet they represent a major component in US basic research competence. Looking at things this way, it is only logical that, for example, Massachusetts, with Harvard and MIT as well as the University of Massachusetts, receives larger amounts of Federal basic research funds than most other states, but probably less funding for agricultural research (both basic and applied) than the larger Western states.

Both Duffey and I would like to see the "people in power" support more aggressively the research facilities that do exist in the US.

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Correction

August, page 56—STI should have been identified as Superconductor Technologies Inc. ■