# Letters

## NSF Materials Funding

As current chairman of the DEPTH committee (*1*), I feel impelled to express at least my personal opinions concerning the 29 July testimony before a subcommittee of the House Science and Technology Committee by Doris Kuhlmann-Wilsdorf on the funding patterns of the National Science Foundation's (NSF) Division of Materials Research, as reported by Deborah Shapley (News and Comment, 22 Aug., p. 622).

The validity of the conclusions drawn by Kuhlmann-Wilsdorf from her statistical study of the funding patterns is open to serious doubt for two major reasons. The first is her highly questionable use of the first-name citation index as a measure of the quality of university materials departments. That such a measure gives a distorted view of department quality is attested to by, among other things, the list of the ten best materials departments to which Kuhlmann-Wilsdorf's measure leads, as presented in Shapley's article. I am convinced from some 30 years of close contact with the materials community that at least four, and possibly six, of these departments would not come close to being rated among the top ten if the opinions of the members of the materials community were polled. Two of the ten—Harvard and the University of Maryland—do not even have such departments.

The first-name citation index may be expected to be a poor indicator of department quality because there is a wide disparity in practice among faculty members in the determining of whose name goes first on a multiauthor paper. Most often it is the custom to place the names of graduate students and postdoctoral students first. As a result, the first-name citation index is probably meaningless as a measure of the research effectiveness of the faculty members concerned. Also, many departments in which excellent research is done, but in which undergraduate programs are nevertheless emphasized, cannot compete in quantity of research with those that do not undertake undergraduate training. To deny research funds to the former on the citation-index basis would be to cut off the vital supply of B.S. graduates. The trend toward using the first-name citation index as a measure of quality is entirely deplorable. If encouraged, it will inevitably lead to the almost uniform appearance as the first name on papers of the name of the investigator with the most "clout" in a given local group. This in turn will militate against the development of new, young researchers; it will also tend to seriously reduce the number of joint research efforts and, thus, the very important synergistic effect of such efforts on the amount and quality of research done.

The second major reason why Kuhlmann-Wilsdorf's conclusions are doubtful is her assumption that science will serve the United States best by moving toward an elitist national scientific effort. Leaving aside the complicated political and philosophical questions that such a policy raises for a democratic society, it is not at all obvious that an elitist state of affairs produces the best science and technology. The history of science is replete with instances where an established elite has delayed for long periods the introduction of important new ideas and developments. Further, irrespective of the truth of the arguments presented in the Kuhlmann-Wilsdorf testimony and the Shapley article in *Science*, concerning NSF's alleged "populist" distribution of materials research funds, NSF's research support of the Materials Research Laboratories (MRL's) at some 15 universities is not "populist." These 15 universities receive a large proportion of the research funds distributed by the NSF's Division of Materials Research, and much of this is effectively funds for which the MRL's do not have to compete directly "on the open market." This policy (inherited by the National Science Foundation from the Advanced Research Projects Agency) has created an elite in the materials community in that the MRL universities, tend to be able to more easily buy the best equipment and facilities, attract the best faculty and, in turn, the best research students, followed by a big advantage in attracting more funds, and so on. A good case can be made for NSF support of such institutions, partially on the basis of the elitist ideas of Kuhlmann-Wilsdorf, but the optimum proportion of such support in the overall NSF materials research funding may or may not coincide with NSF's established ratio. At any rate, its existence clearly demonstrates NSF's recognition that special support of excellence in science is desirable. The difficulty, of course, is that, as in all areas of human endeavor, there is the inevitable disagreement on what and whom should rate that special support.

PAUL GORDON
*Department of Metallurgical and Materials Engineering, Illinois Institute of Technology, Chicago 60616*

**Notes**

1. The DEPTH committee is a group made up of all the department heads of university materials departments (metallurgy, ceramics, and polymers) throughout the United States.

## Stimulating Technological Innovation

Jordan Lewis (Letters, 22 Aug., p. 593) indicates that ETIP (Experimental Technology Incentives Program) at the National Bureau of Standards is the *only* federally sponsored technology incentives program now operating. However, the National Science Foundation's ERDIP (Experimental R & D Incentives Program) is still in operation, contrary to Lewis's allegation. The Innovation Center at the Massachusetts Institute of Technology (MIT), established in 1973 under a cooperative agreement with ERDIP, performs the function of "demand-pull" in a teaching atmosphere. Several projects have already resulted in marketable products, and quite a few young entrepreneurs and innovators have begun to take their first steps. In addition to the MIT Innovation Center, ERDIP also has centers at Carnegie-Mellon University and at the University of Oregon.

Lewis's ETIP appears to be a most interesting program with considerable potential. Since this kind of program is still in the infant stage, we can all benefit from learning from one another.

YAO TZU LI
*Innovation Center, Massachusetts Institute of Technology, Cambridge 02139*

## Population Control

The relevance of previous European experience for Third World policy concerning population growth and development is correctly questioned by Michael Teitelbaum in his critique of the "demographic transition theory" (2 May, p. 420). But he does not consider contemporary experience in the Third World itself and is puzzlingly inconclusive about what policies are most appropriate at present. By implication, in his rejection of the theory of transition, Teitelbaum endorses population control measures as an alternative