LETTERS

University Research Funding: More than Supporting the Best to Do the Best

Howard Birnbaum argues that research funding needs reform at both the university and funding-agency levels (PHYSICS TODAY, March 2002, page 49). He suggests rather strongly that the decline in dollar amount (in constant dollars) of a typical academic research award is due to the diluting effects of such things as multi-investigator awards and the requirement that research proposals incorporate outreach programs.

I offer an alternative explanation of the same data: What has led to this decrease in funding is not new attitudes, new programs, and new requirements, but rather a great mismatch between the methods used in the recent past to secure congressional funding and those required today. In fact, the reform that Birnbaum is suggesting is exactly what the new programs and requirements are all about, and the attitude he exemplifies in his article is exactly the reason that funding for research at universities has been decreasing.

Although I agree that research at universities is funded to educate, create new knowledge, and provide service, I disagree on how best to accomplish these goals. How will the US produce the researcher pool needed now and in the future? How can we best nurture and harvest creative ideas and talent? How do we maintain our country's strong contribution to science and a robust economy? And very important, and perhaps more to his point, how do we ensure that we will have the dollars to make these goals possible? In answer to these questions, reform is now taking place via the very programs questioned in his article.

Over the past 40 years, the US culture has changed significantly. It no longer supports national goals based on authoritative arguments without compelling logic or decisive evidence. As a result, to say that research at universities needs to be supported because exploration is what we humans do or because it is the approach that has previously delivered so many good things, though still true, is no longer sufficient. We are now compelled to educate and convince our entire population of the crucial role that research at universities will play in the continued prosperity and defense of our way of life. It is, therefore, simply good strategy to engage every state in this endeavor. Both funding agencies and university administrators recognize the need and have adopted an attitude to develop and support experimental programs accordingly.

For example, to provide our nation with the needed labor pool in science and engineering, funding agencies have begun to reach out to at-risk youths and provide opportunities for talented individuals to choose and pursue careers in science and engineering. In the long run, this approach will build a stronger national infrastructure and a more competitive nation than would be true with an approach that supports the best to do the best. Funding agency outreach programs, like all experiments, must be critically evaluated. However, a crucial part of the evaluation of NSF outreach programs is the independent assessment that the research team must provide to reviewers. As a panel reviewer, I have seen proposals rejected due to an inadequate assessment plan or poor track record based on assessment of previous work. Although it has taken some time, accountability for outreach is now firmly built into the peer review system.

Of course, as Birnbaum says, all of this effort takes valuable time away from research. However, we have an obligation to find a research approach that will produce the talented labor pool needed by our country and will uncover new knowledge to fill our spirit, drive our economy, and improve our quality of life. The approach that is now taking shape requires that we engage talented science students and that we educate our nation on the value of research as a means to attain a higher quality of life. Although outreach and education will continue to take time away from research, all scientists must play a role and not expect others to do the job. I hold that science outreach and education programs can better engage all talented individuals while developing a public appreciation of the importance of research when they are led by each of us. I believe that this effort will lead to a more skilled, diverse workforce that will, in turn, generate and contribute the knowledge needed to meet the challenges ahead and win greater public and congressional support for university research.

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According to Howard Birnbaum, the " 'margarine method' of spreading research funds equally thin among all possible recipients is a waste of resources."

Quite the contrary. Despite the insulting sound, "margarine funding" is the best way to encourage serendipity, creativity, and originality in research. All university professors are expected to be efficient teachers and researchers. The highly competitive system of faculty appointments assures that, with rare exceptions, all university professors have the ability and training for both of those roles. Although equal grants for all are indeed impractical, there are viable and fiscally responsible alternatives to the present all-or-nothing funding model.

If we keep in mind the known rule of economics that the first dollars are the most cost-efficient, the funding model under which all active university researchers receive a

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