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# How Fares Basic Science?

When the elders gather to assess the spirit and substance of science, apprehension is invariably expressed about the state of basic research. Thus, it was only normal for the recent summer meeting of the Committee of Scientific Society Presidents to vote that "basic science is in trouble."

This is a useful, and suitably gloomy, battle cry to raise on the eve of the annual jousting exercise of budget-making. Unfortunately, the quality of the supporting evidence leaves much to be desired. Is basic science in grave trouble, in significant trouble, or in *some* trouble? Is it equally in trouble in government and in industry—or is there a great difference: a tale of two cities? What are the properties of the trouble—financial, political, institutional, attitudinal, or managerial? How much of the trouble is self-inflicted? It would be helpful to have answers. Lamentation is not enough, and basic science is not homogeneous.

As has been said before on this page, basic science long ago drifted amiably into the arms of government at the price of those checks and balances which go with pluralistic support. It should not come as a surprise to learn that the marginal industrial and foundation dollar has been driven out of the picture. It has also been noted that although government has been a very good friend of basic science, everything considered, it provides an erratic and uncertain environment for long-term research because it has not yet come round to treating basic science as *investment*, in contrast to year-to-year expense. This library of familiar music is likely to play for some time.

What becomes important now is the question of productivity in basic science. Instead of measuring "trouble" strictly in terms of rising, falling, or steady-state budgets, we need to ask different questions and apply different tests. It may very well be that built-in inefficiencies and distractions are sapping the vitality of the research process and that the dollars allocated to basic science no longer tell us much about the true levels of research effort.

Which factors operate to devalue the basic science dollar? The indirect cost surcharge on research grants is a familiar kind of burden, but not the only one. Countless man-months are subtracted from research effort in order to satisfy the routines of renewal application, accounting, reporting, and compliance with the rising tide of governmental and institutional regulations. Obsolescence of instruments and equipment, together with queuing delays, works to drop the blood count of research. The torrent of what passes for scientific and technical information presents obstacles through which investigators must blast or tunnel their way. This is the enervating dimension of basic science as it must be practiced now, and little of it meets the unwary eye. Would it overreach by too much to say that, compared with the environment of a decade ago, the research dollar has been devalued, in terms of productivity, by one-third?

With zero-based budgeting coming on strong, and a balanced federal budget being scripted for 1981, prospects for growth of support for basic science are problematic. The normal revenue growth under present tax laws will be claimed by defense, welfare reform, energy development, and perhaps a national health insurance program. Three-quarters of the government's budget is already relatively uncontrollable, leaving a very narrow area for discretionary expenditure, and it is in this cramped and bitterly competitive corner that basic science is to be found. Given all this, there are strong incentives for isolating those influences which undercut the productivity of basic research at existing support levels.

Basic science has known lean times. But a combination of austerity, industrial disinclination, continuing inflation, and falling productivity could prove to be too much. If the science adviser, the National Science Foundation, and the scientific community would take a close look at the issue of productivity, a brighter light might be shed on the sources of "trouble" in basic science.—WILLIAM D. CAREY