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Setting Priorities in Science

The paths of Big Science and big federal deficits have finally supercollided as science expands and the discretionary part of the federal budget shrinks. We are approaching a zero sum game. It is significant, therefore, that National Academy of Sciences President Frank Press and Association of American Universities President Robert Rosenzweig have each called on scientists to set priorities among disciplines, a subject heretofore considered inappropriate for mention in polite scientific society. The question remains as to how this is to be done.

Many individuals will come forth to proclaim personal priorities, but how can we produce a list that will have credibility both inside and outside the scientific community? The first steps might be to select about 14 individuals with diverse backgrounds who would form a Panel for Science Priorities, operating like such panels at the National Science Foundation and the National Institutes of Health. The members should represent the physical, biological, and social sciences. To achieve credibility, the representatives of the various disciplines should be selected by the appropriate societies—for example, physicists by the American Physical Society, chemists by the American Chemical Society, and so forth. In that way, the criticism that the outcome was predetermined by selection of lions from some disciplines and lambs from others should be avoided. The societies should show the good judgment to appoint wise enthusiasts rather than provincial chauvinists, because willingness to see other points of view would be essential to the success of the panel.

The panel should then give priority ratings to the proposals of Big Science in precisely the same way that panels now consider proposals for Little Science. Each proposal should contain an appropriate budget and arguments about feasibility and significance of projects, both to science and to society. To put these proposals in perspective, each discipline should be charged with putting together a document outlining the effects of a 10% increase and a 10% decrease in funding for the Little Science of that discipline. The priorities panel would then be charged with ranking the order of the proposals for the space shuttle, the genome project, the NSF centers, the 10% increases, the 10% decreases, and so on.

The ground rules of such a system would have to be similar to those of the present granting committees for Little Science—that is, it would be known in advance that subsequent supplemental budget appropriations would have essentially zero chance of being approved. In that way, program proponents would have to present realistic budgets, or be faced with a future half-finished project. Little scientists may not incur cost overruns; neither should Big scientists.

Congress would of course not be mandated to follow the recommendations of the scientific community, because factors such as national prestige and relative values of other parts of the budget would have to be assessed. However, a priorities panel would at least provide the considered judgment of the scientific community. Moreover, it might suggest to the Legislative and Executive branches that they establish equivalent panels on federal priorities to aid them in comparing the demands of farmers, transportation experts, the military, education, the environment, et cetera. A panel composed of congressmen and Executive Branch representatives, specifically asked to rank incremental increases or decreases for science, farmers, health care, and so on in a priority order would have the virtue of introducing rationality into the budget process. Some will say this is utopian. But the automatic features of the Gramm-Rudman-Hollings Act indicate a strong desire by Congress to deflect the blame for tough budget decisions away from those who must get elected every few years. The priorities panel would allow congressmen to say to constituents, "We set up a panel to introduce reason into the budget process."

It has been said that a democracy will always come to the right decision once it has exhausted every other alternative. The two key features of scientific panels—that is, having a range of experts and the requirement to rank proposals in relation to each other, rather than ad hoc, are crucial tools that have maintained the quality of science. They are clever social devices that can be extended to the new, more difficult tasks of interdisciplinary and intercultural assessments. Such devices will not only help in setting priorities but, as anyone who has filled out a grant proposal knows, will actually improve the hard thinking on which the success of the proposal depends.—DANIEL E. KOSHLAND, JR.