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An Alternative Funding Mechanism

At a recent science policy seminar in Washington, Philip Handler described the changes in the actual meaning of "peer review" in research funding. He pointed out that in the 1950's, informal phoning around by the program manager in a funding agency to a select group of active scientists served to strengthen the judgment of the manager. Thus was born peer review. The complicated time- and creativity-consuming process that has since evolved and that we also call peer review serves a different purpose. Handler's view was that the peer review process now functions as a legitimating balance wheel between the inherent elitism of science and the egalitarianism demanded by the structure of American democracy.

The wastefulness of the present system, which takes on the average 2.5 full-time equivalent person-years just to get and manage $1 million, is admitted on all sides. Yet the question is often asked rhetorically: Is there an alternative system that can achieve the same goal of equitable funding of the best science? The answer is that there is, and it has many advantages over the present system. The system I describe below is only one example of a genre of systems that could be called productivity-based formula systems for research funding. Underlying the new system is the changing social contract between science and its patron society. The change of Administration and of the national mood is an opportune framework within which to rewrite this contract. Alternative systems based on what Philip Abelson once referred to as "performance rather than promise" will provide a much firmer basis for public accountability.

University research is unique in one important respect in reasons for commanding public support: It makes possible the education and training of research personnel principally at the graduate level. In addition, universities conduct varying percentages (depending on the field) of the total national basic research effort. Finally, universities are part of the research base drawn on by mission agencies to achieve national goals. The formula suggested here arrives at a figure of merit for support of basic research on the basis of these three benefits or services, which are the principal outputs of university research. It takes the general form:

Dollars per year to university department or similar-size research unit
= A × (number of M.S. degrees + 3 × number of Ph.D. degrees)
+ B × (number of papers published in refereed journals)
+ C × (amount of research support from U.S. and state mission agencies)
+ D × (amount of research support from industry)

All productivity bases would be on a rolling average for the preceding 3 (or 5) years. The work of the administering agency would be a once-a-year collection of the required data and negotiation of the award, and oversight of regulations concerning misuse. Approximately 15 percent of the funds could be reserved for entering (young) faculty and special initiatives at the discretion of the program manager.

The advantages of this productivity-review system over the proposal-review system are several. (i) It saves a substantial fraction of the total intellectual effort of the science community. (ii) It provides an honest, contemporary rationale for non–purpose-linked funding of both the production of scientists and engineers and the conduct of the science. (iii) It offers Congress and other policy-makers great flexibility in emphasizing or de-emphasizing aspects such as university-industry coupling by varying the coefficients of the equation. (iv) By allowing scientists to follow their own best judgments, it is more conducive to genuine innovation. (v) It is potentially a rigorous yet decentralized peer review system for the industry-university coupling component. (vi) It provides the appropriate mix of populist spreading of the wealth with recognition of excellence. (vii) It rewards performance instead of promise—a paradigm with major potential in the 1980's.—RUSTUM ROY, *Director, Materials Research Laboratory, Pennsylvania State University, University Park 16802*