Letters

NSF

Representative Daddario's views (1 April, p. 42) on revising the charter of the National Science Foundation should be of concern to all citizens, and especially those who are scientists. The Foundation is a unique federal agency: it is charged with promoting basic research and hence with providing the scientific capital, so to speak, which technological advances feed upon.

Because of the specialization of activities that complex societies impose on all men, it is unreasonable to expect the average intelligent citizen to recognize the needs of the various sciences and to demand that something be done to meet them. On the other hand, the intelligent citizen can certainly recognize technological problems, such as increase in air and water pollution; he meets these problems every day. Consequently, the demands of society that are voiced frequently and with political force almost invariably involve these kinds of problems. Daddario suggests that NSF become more responsive to the demands of society. This suggestion can only lead to a fundamental shift in the role of NSF. Instead of focusing on the development of scientific concepts and information, NSF will gradually be forced to support the application of science. These demands will find their expression in congressional hearings at which the representatives of NSF will be asked why they spent so much money in support of basic research when there are all these immediate problems to solve. Daddario says that his bill "does not direct NSF" to undertake applied research; but an appropriations subcommittee could change that without the passage of additional legislation if the Daddario bill becomes law. . . .

If Congress feels that immediate problems are not being solved fast enough, it is a relatively simple matter to strengthen the mission-oriented agencies it has established to deal with them. But no step should be taken that will diminish the rate of accumulation of scientific understanding. To change the orientation of NSF as proposed by the Daddario bill can only have this undesirable effect.

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I heartily applaud Abelson's emphasis (editorial, 18 Feb.) on the importance of considering past performance and accomplishments when basic research proposals are being selected for support, but I take issue with his assertion that NSF is following a procedure and philosophy which is substantially different from the one he advocates. All applications for NSF research grants include a section which deals with the past performance of the investigators, their bibliographies, and their specific accomplishments in the field of the proposed research. Before being reviewed by panels, research proposals are customarily sent to individual referees, who turn in confidential written reports; these evaluations usually stress the ability and record of the investigator. As far as possible, referees are chosen because of their specific knowledge of the literature and the people in the field of the research proposal, and their reports are given great weight by panelists in judging the relative merit of proposals. Furthermore, from two-thirds to three-quarters of the proposals are for renewal of previous support; in such cases the investigator must review in detail his previous accomplishments on NSF funds.

There is also a misunderstanding in the editorial about how "proposal pressure" is used as an index of need in various fields. It is measured not by the recommendations of panels but by the proposals actually received. The implication that a mere crank-turning application by bookkeepers is used is entirely false. Proposal pressure requires interpretation by staff and panels, and is used at most as a first approximation to arriving at judgments. On the whole, however, I think the criterion of proposal pressure, applied with judgment and responsibility, is about the best method that can be devised for keeping support of basic research reasonably attuned to the developing needs and opportunities. It is essential that judgments based on the summation of individual proposals be supplemented by analyses of the trends and accomplishments of individual fields of science, and this is one of the main reasons why NSF has been working with the Committee on Science and Public Policy of the National Academy of Sciences in developing such broadly based analyses of various scientific disciplines.

It is hoped that these reports will contribute towards more informed judgments in the evaluation and interpretation of proposal pressures. In effect, major reliance on proposal pressure places the initiative for the "planning" of basic science in the hands of the individual working scientist where it properly belongs, especially for that part of science which the nation supports primarily on the basis of intellectual criteria.

While I agree with the editorial that the past record of an investigator or a field should be a major factor in any judgment about research support, I cannot accept the suggestion, hinted at vaguely, that the content of the proposal is irrelevant. Poor proposals from prestigious scientists and excellent proposals from young unknowns may be rare, but they are not nonexistent. A referee or a panelist who knows the field of research can usually distinguish between glib promises and a soundly conceived research plan. Contrary to a folklore which seems to be growing up outside the research community, my experience also indicates that the most penetrating skeptics are the people in the same field as the investigator and that scientific salesmanship is much more likely to deceive the nonscientific administrator or a scientist outside the field than it is an expert panel.

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