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The Burden of Competitive Grants

In 1960, when U.S. science was beginning to depend heavily on grants and contracts for research support, Leo Szilard wrote a fanciful story.* In it he suggested that if some person or some group should ever want to bring research progress to a standstill, they could do so by establishing a competitive grants system under which all researchers would be required to prepare written proposals describing what they wished to work on. The commitment of time by the research community in writing, reviewing, and supervising such a universal grant system would effectively halt research progress. It may be that now, in the late 1970's, we should ask ourselves whether the load of the competitive grant and contract system is becoming excessive and whether it is time to seek alternatives.

The numbers of research proposals submitted to the principal federal granting agencies in 1978 were as follows: 28,000 to the National Science Foundation, 13,000 to the National Institutes of Health, 3,500 to the Department of Energy, 1,000 to the Environmental Protection Agency, and 2,000 to the Department of Agriculture. This makes a rough total of 47,500 proposals in 1 year.

Calculating the amount of time it takes to write a proposal is not easy, but 3 weeks would be a conservative estimate for the average time invested in each proposal. Thus last year, on the order of 2700 man-years were invested in proposal writing. This is probably a low estimate, since it often takes 3 months to write a proposal, and proposals by groups can take as much as 3 man-years.

Any estimate of the time investment must include those involved in the reviewing process. Allowing 3 man-days for review adds another 575 man-years, making a total estimated investment by the research community of approximately 3300 man-years during 1978. Since most research scientists are in the academic community, where perhaps half their time is available for research, the figure of 3300 man-years of research time may, in fact, represent the entire research time of 6600 academic persons during 1978.

The preparation and even the review of research proposals does have an educational effect. An essential part of the preparation of the research proposal is the examination of the literature and consideration of research directions that might be most profitable. But the cost in time to the research community is nevertheless a very heavy burden.

The problem is exacerbated by the fact that in every competitive program the majority of the proposals are rejected. The rejection rate can vary from 60 percent in some programs to 95 percent in others, but in general, it ranges between 70 percent and 85 percent. Thus roughly three of every four proposals fail to obtain funding for the researchers.

In the early days of federal support of research, when support was increasing year by year, distribution of grants on the basis of competition was an effective means of getting money to competent and productive persons. In the late 1960's, however, the amount of money (corrected for inflation) available for the support of research began to level off, and the growth period has now ended. Competition has become increasingly keen and the proportion of proposals that can be funded has declined. The investment of research time in the proposal system, however, may continue to increase.

With the investment of an estimated 6600 persons' research time in writing and reviewing proposals, perhaps it is now appropriate to ask whether Szilard's fanciful story is turning into a serious matter. Should consideration be given to ways of providing research support without adding to the heavy burden of our present grants and contracts system?—A. CARL LEOPOLD, *Boyce Thompson Institute for Plant Research, Ithaca, New York 14853*

*L. Szilard, *The Voice of the Dolphins, and Other Stories* (Simon & Schuster, New York, 1961), p. 100.