

If I Get My Grant . . .

We have talked recently with research students, teachers, information specialists and physics statisticians with a common problem. Each was waiting to see whether his grant would come through. Each was spending much effort and emotion on two basic questions: what to do to get the grant and what to do if he failed to get it. Each was developing alternative plans to move or stay, to hire or fire, depending on the outcome.

An article that *PHYSICS TODAY* will soon publish makes one feel that the atmosphere in France is quite different from the one in the United States. In France a graduate student is treated as a productive member of society. He is not at the mercy of funding agencies nor the professor who will hire or fire him as the support for the professor's projects is greater or smaller.

As we see it, the US still treats graduate study as a privilege rather than a right for those qualified to undertake it. Of course scientific study and the study of science are generally subsidized, but public sentiment in favor of doing so was originally generated by a false assumption: that if two billion dollars would buy a bomb, two more billion dollars would be likely to buy something just as exciting. Some of the methods for subsidizing appear to have grown up under the influence of the false assumption, and some of them may be subject to question.

One question is misplaced emphasis. Perhaps many of you, like me, have been told, "Yes, you can teach for us. Just come here with a research grant. We can find teaching for you to do on the side." It is

not obvious that the best teachers or even the best researchers are those who are most effective in finding research grants. Moreover, as one educational administrator has called to our attention, availability of research funds tends to decrease the teaching of faculty members. The Grant Swinger pieces and other articles that Daniel S. Greenberg has written for *Science* treat the problem so well that we need not explore it fully here.

Another question is the effect of interruptions. The step function of a new grant or discontinuance of an old one can cause quite a surge in the system. Departments grow where there were none—or disappear. New jobs are created—or eliminated. New people come aboard—or walk the plank. Even when grants are renewed in normal manner, institutions complain of the deleterious effects of interim periods between grants.

Start-and-stop grants are one way to support science and its ancillary activities, but they may not be the best way. The kind of person who can be hired suddenly to fill the needs of a grant may not be the most dedicated or the most firmly fixed in his career. The Damocles sword of a grant that may end may not inspire his most creative thoughts. The time he spends applying for his next grant may not be his most productive time.

A third question is what one is buying. In the 1940's the bigger-bang-for-a-buck philosophy was general. Each newspaper account of a scientific discovery ended with what this one meant for national defense or national prestige. Even now a proposal implies a project. Grants seem to buy science more often than they support scientists.

We feel that the way to solve the problem is to look not for the new jobs that should be supported by new grants but for the constant elements of science that always deserve support. For example one might do as the French do and support any properly qualified and enrolled graduate student. Money would be well spent if it were proportional to the number of students educated. Graduate departments competing for students who brought with them money for fees and tuition might be quite as well motivated as those in which students compete for a place on the team and expenditure is proportional to the research produced.

Another suggestion we have heard is that research support be proportional to the number of full-time teaching faculty associated with a project. It might be understood that each teacher would carry a normal teaching load, that academic-year salaries would not come from grant funds and that the grant would employ a certain number of graduate students. Such conditions might ensure that research would not steal its people from teaching.

The issue is not clearcut, and the picture is not all black. When a magnetron must be developed for a radar or a cross section measured for a nuclear reactor, you have to pay somebody to get the job done. And many government agencies have blessed some worthy projects with steady, continuing support. Nevertheless the problem exists. Science grows continuously, not with the leaps of stop-and-start funding. Continuously available support for purposes defined in advance might be as encouraging as a good supply of grants.

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