

How Long a Surplus?

THE statistics at the root of the employment crisis in physics are set forth by Wayne Gruner on page 21 in this issue. In brief, new PhD's are being produced each year at a rate equal to about 10% of the total number of PhD's (1300 new PhD's in 1969 compared to a total of 16 000 PhD's in the US). Only a fraction of this annual 10% increment in manpower (as little as one eighth) is needed to replace physicists who die or retire each year. The bulk of the new PhD's have in the past been absorbed in new jobs created each year in the two fields of research and teaching (in about equal numbers). In the several years before 1968, real dollar support in each of these two areas was expanding at something like 10% each year, so that the supply of PhD's matched the demand.

We are all painfully aware that since 1968 the increment in federal support of physics research has abruptly dropped from 10% to 0%, meaning that roughly half the PhD's currently being produced each year are surplus. The spontaneous reaction to this situation is to think about cutting in half as quickly as possible the rate at which PhD's are being pumped through the graduate-school pipeline. But to regulate graduate-student enrollments on the assumption that research support will continue indefinitely in a leveled-off condition would be suicidal from the point of view of the national welfare. We must assume that the physics community will soon be able to convince policy makers to come to their senses and realize that the future of the country requires annual increments in

federal support of physics research of some reasonable size.

It may not be possible to return to the good old days of a 10% increase every year, but we should argue that research support should at least expand no more slowly than the rate at which the Gross National Product is expanding (4.3% per year in real dollars). In a steady-state situation this rate of expansion would create jobs each year for half of the surplus PhD's now being turned out.

And in addition, this next year funds should start becoming available in the new area of interdisciplinary efforts dealing with problems of the environment, the cities, and so on. It is not too unreasonable to expect that in two or three years this third area will be expanding at a rate that will absorb the rest of the PhD surplus each year (of the order of 300 PhD's per year).

If one is willing to grant that these figures represent the minimum realistic needs of the country for physicists in two or three years, then our current rate of PhD production is not unreasonable. In fact if physics departments start cutting enrollments at this time we could end up with a serious shortage a few years from now. (The effects of the draft alone are already pushing us in this direction.)

Suppose one is further willing to grant that, with the help of determined and articulate voices from the physics community, the increments in support of physics research and interdisciplinary efforts will become available as suggested. Then the remaining problem is what the surplus physicists are

supposed to do in the meantime. Gruner foresees that this pool of surplus PhD's will, by 1973, contain at least 1000 physicists. More than one person has suggested that the government might best utilize this reservoir of highly talented individuals by beginning *now* to involve them in the interdisciplinary areas where everyone agrees help will be needed. Specifically, the National Science Foundation could be empowered to set up a special program of postdoctoral grants to support training and research in these areas. Since at first the appointments would involve more training than research, the cost would not be large by government standards. It has been estimated that a total of \$10 million would be enough to support such a program for physics PhD's through 1972.

Figures collected by Gruner indicate that employment pinches for new graduates in the other sciences (mathematics, chemistry, biology) can be expected soon. The crisis already at hand in physics employment has vividly demonstrated the need for an intelligent and coordinated policy on the part of the federal government that will foster the proper development and utilization of the extremely valuable national resource represented by the country's scientific manpower.

The interim program of postdoctoral grants for physicists, as proposed above, would be a first step in this direction and would provide an experience that could prove valuable to the other sciences as they too begin to face the problem of surpluses of highly trained and talented individuals.

—Harold L. Davis