Letters

Ph.D. Projections

The article by Gina Bari Kolata, "Projecting the Ph.D. labor market: NSF and BLS disagree" (News and Comment, 30 Jan., p. 363), highlights the differences in projections of science and engineering Ph.D. supply and utilization in two recent reports, one by the Bureau of Labor Statistics (BLS) (*1*) and the other by the National Science Foundation (NSF) (*2*). While there were variations, it seems significant that both projections, though based on completely different methodologies, indicate the strong possibility of a future supply of science and engineering doctorates in excess of that required for traditional activities.

NSF and BLS engaged in a series of discussions shortly after the BLS projections were published. These and joint analyses showed that most of the major variations between the two sets of estimates were in the supply side of the equation and were caused by the use of different enrollment and degree projections. NSF developed its own higher education flow model in 1974. However, BLS, which had started to prepare its analyses much earlier, used degree and enrollment projections developed in 1973 by the Office of Education (OE). The OE Ph.D. projections are based heavily on trends in advanced degree enrollments. Subsequent revisions made by OE reflect the slowing of enrollment growth during the early 1970's, and bring their Ph.D. projections closer to those prepared by NSF. If timing had allowed BLS to use these later OE projections, the BLS and NSF Ph.D. supply projections would have been very similar.

The BLS and NSF utilization projections were more similar, with only an 11 percent difference. This difference is due to a number of factors, including variations in R & D funding projections and assumptions about the proportion of new faculty who will possess doctorates. Furthermore, the BLS use of the higher OE enrollment projections also had an effect in that it translated into a greater demand for Ph.D. faculty.

The differences between these two sets of projections are thus explainable and reemphasize the fact that projections depend on both the methodologies and assumptions that are used. Users of projections should not be dismayed by different forecasts. Rather they should study them to ascertain the effects of different assumptions and to note those parameters to which projections are especially sensitive. As in many other analytical efforts, a diversity in approach is desirable in order to produce the best understanding of the dynamics of the system under study.

Analyses of the projections also point out the need to periodically update them as new data become available. BLS plans to release an update of its Ph.D. supply-demand analyses in the early summer of 1976 based on the latest degree projections and revised 1985 economic, industrial, and total occupational employment projections. The NSF cycle for Ph.D. supply-utilization projections is biennial, and thus new NSF projections will not be available until 1977.

CHARLES E. FALK
Division of Science Resources Studies, National Science Foundation, Washington, D.C. 20550

NEAL ROSENTHAL
Division of Occupational Outlook, Bureau of Labor Statistics, Washington, D.C. 20210

References

1. *Projections of Science and Engineering Doctorate Supply and Utilization, 1980 and 1985* (NSF 75-301, National Science Foundation, Washington, D.C., 1975).
2. *Ph.D. Manpower: Employment, Demand, and Supply, 1972–1985* (Bulletin 1860, Bureau of Labor Statistics, Department of Labor, Washington, D.C., 1975).

Of Bergy Bits and Growlers

Luther J. Carter notes (News and Comment, 14 Nov. 1975, p. 641) that the losses of ships because of collisions with icebergs are rather rare, the last one being in 1959 off Greenland. However, the loss of a ship is not the only concern, especially with a tanker and a lethal load of crude oil. A ship that is not fully ice-strengthened can take a fearful beating from regular sea ice, and there have been several ice-related mishaps in Canadian waters since 1960. One vivid example is that of a large freighter which was proceeding through the Gulf of St. Lawrence toward the Strait of Belle Isle in June 1974 when it struck a bergy bit or a growler. The ship didn't sink; but had it been a tanker, a nasty spill would have resulted, and crude oil in ice-laden waters is virtually impossible to deal with.

Bergy bits and growlers cannot be followed on radar in rough seas and are rather difficult to spot even by a forward lookout with a light. Fog and snow compound the problem, and a tanker has a very long response time. Even large icebergs can disappear from radar screens in certain instances as they rotate and present a different aspect. Radar transponders can be mounted on bergs and work well until the bergs melt or "founder down" and ultimately roll. A growler cannot be marked in such a way. Small bergs (up to, say, 1,000,000 tons) can be towed, but the rounded, low-lying growler is extremely difficult to harness and tow.

A growler frozen into a new coat of winter ice and drifted over with snow presents another possible hazard for those ice-breaking vessels which would venture into the port of Valdez, Alaska, during winter months. Old pressure-ridge keels present the same problem in areas such as the Arctic islands or the Beaufort Sea.

It would be interesting to examine the surface of the Columbia Glacier's moraine shoal with side-scan sonar in addition to the depth sounder to look for iceberg and ice scour. I suspect that a strong, down-fiord wind running across winter ice locking bergs together might well enable even larger bergs to "scour" their way across the shoal and even lower the top of the shoal over time, as fetch increases in the future.

Ice patrols, if carefully designed, will reduce the problem considerably, but they can't operate in fog or snow and special conditions such as sea smoke reduce their effectiveness. We should perhaps remember that even the *Manhattan*, in its famous run through the Northwest Passage, completely lost a number of plates and that virtually every bottom plate from stem to stern was partly buckled.

ALAN RUFFMAN
Geomarine Associates, Ltd., Post Office Box 41, Halifax, Nova Scotia, Canada B3J 2L4