Science & Engineering Indicators. National Science Board, Washington, D.C. (U.S. Government Printing Office, Washington, D.C.). 1993. pages xxxi + 514.

The collapse of the Soviet Empire and the end of the cold war have drastically changed the world and have necessitated major changes in US policy. Science policy is no exception. Gone are the days when a very large proportion of America's spending on science was on defence R & D largely aimed to meet real and perceived threats from the Soviet Union. Defence R & D, including the Department of Energy's weapons programmes, has dropped to 59% of the 1994 federal R & D budget – down from its 1987 peak of 69%. And a substantial part of DoD's R & D budget now goes to financing for a multi-agency defence conversion effort to bolster economic competitiveness and promote dual-use technologies to ease defence conversion. Such adaptation to changing circumstances is the key to survival and success.

Today, in the changed circumstances, the US and its allies in Western Europe are keen on tapping the undoubted scientific talent languishing for financial support and infrastructural facilities in the erstwhile Eastern Block, and in fact are mounting many programmes to help the scientific enterprise in those countries keep going.

Viewing US scientific and technical capabilities in a global context, the report, eleventh of a biennial series that began in 1972, provides plenty of statistics and insights as well as ample international comparisons. The different chapters cover elementary and secondary science and mathematical education, higher education in science and engineering, science and engineering workforce, research and development: financial resources and institutional linkages, academic research and development: financial resources, personnel and outputs, technology development and competitiveness, and science and technology: public attitudes and public understanding. There are 150 figures, 53 text tables and 215 tables in the Appendix, and many sidebars.

Among the important features of the report are (i) the effective use made of bibliometric data (publications and citations by fields and countries) and patents indicators; (ii) quantitative evaluation of the complex, but all-important, public attitudes towards and understanding of science and technology; (iii) data on trends on international collaboration and regional cooperation; (iv) information on global trends in human resource development in science and engineering, as well as on the education and employment of women and minority scientists and engineers; and (v) a discussion on the increased role of universities in US R & D.

In her overview, Jennifer Sue Bond draws attention to scientific research becoming increasingly global. For example, investments on overseas research by US companies as well as investments on R & D in the US by foreign companies are increasing at a rapid pace. The number of research papers jointly authored by scientists from different countries is on the rise. Cooperation between universities and industry, and within industry, is also on the increase. More than one third of the research papers published by industrial laboratories were written in collaboration with university researchers.

Although the total available funds for R & D in the US has remained steady around 2.6% of GDP, sources of support are diversifying. The Federal Government's share of R & D funding dropped to 42% of all R & D in 1993 from 46% in 1985. Industry's share increased slightly during this period from 51% to 52%. The combined share of state governments, universities and nonprofit institutions rose from 3% to 6%. While universities have assumed a larger role in performing the nation's R & D, they now receive a smaller share of their funding from the Federal Government.

There are major differences between males and females in their participation in science and engineering at all levels. Women represented 19% of academic researchers in 1991, about half of them being life scientists. However, the participation of women in academia is fast rising. Even in engineering, women's share in the US workforce rose from 5.9% in 1983 to 8.7 in 1992. Minorities, however, are still underrepresented in science, mathematics and engineering. Asian students, however, are performing far better than the rest in the Scholastic Aptitude Test.

Performance of American school children in science and mathematics is still problematic, says the report. Males, 13- and 17-year olds, have better science scores than female students.

While the US leads the world in the manufacture of hightech products, its leadership is challenged by Japan, which has recorded a higher rate of growth of R & D, especially in the three sectors, communication equipment, motor vehicles and electrical machinery. But in most other areas US industrial R & D and technology remain competitive, especially in high-tech industries such as scientific instruments, drugs and medicines, and aircraft.

US patenting activity has improved and has been on the rise since 1983, but foreign inventors are also filing more patents in the US. American researchers have taken a substantial number of international patents in robot technology, genetic engineering, optical fibre technology and several other fields.

Americans, says the report, hold science and medicine in high regard, but do not consider themselves well-informed about science and technology, with only 15% Americans following science and technology issues in the news and trying to stay up to date.

The volume ends with an elaborate index – more than ten pages long.

On the whole, this well-produced volume of *Indicators* is an extremely useful reference source not only for the science policy specialists but also to the lay public interested in knowing the state of science and engineering research and education in the US. It establishes once again NSF's leadership role in developing 'indicators' and quantitative information on science and technology as a basis for policymaking and as a tool for research and assessment on a worldwide basis.

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