

Biotechnology manpower in the UK

from Richard Pearson

The best brains will not remain in this country unless the best jobs are here too.

BIOTECHNOLOGY is one of the fast growing new technologies. It was born as late as the 1970s and is recognized everywhere as a key technology for the future. As well as the United States and Japan, the technology superpowers, France, West Germany, Switzerland and the United Kingdom have taken initiatives to develop their biotechnology, even though the industry has barely moved out of the fundamental research stage. Being a knowledge-based industry, the availability of skilled manpower is crucial to its future success. In the United States, the Office of Technology Assessment has assessed prospects for that country and also provided an international overview, and has highlighted the strengths and weaknesses of different countries' manpower (see *Nature* 307, 399; 1984). In the United Kingdom, the Science and Engineering Research Council (SERC) has been trying to ensure adequately trained manpower to support this emerging technology and has just published two reports prepared for it by the Institute of Manpower Studies (*Enabling Manpower for Biotechnology* and *The Biotechnology Brain Drain*).

There are now almost 2,000 professional specialist personnel active in novel biotechnology in the United Kingdom in addition to those engaged in traditional areas such as brewing. While a precise definition of a "biotechnologist" is inappropriate, most individuals being regarded as, say, microbiologists, biochemists or biochemical engineers, it is clear that, on the science side at least, few people would be regarded as professional biotechnologists without three or more years postgraduate experience; on the process engineering side, however, the entry threshold is more likely

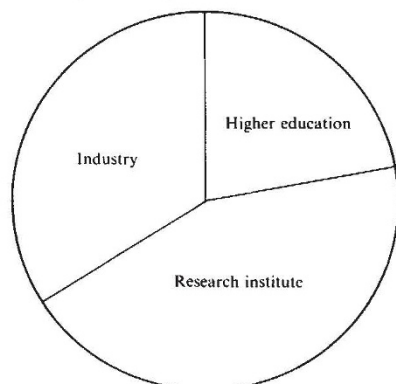


Fig. 1 Distribution of biotechnologists in UK institutions.

to be a first rather than a higher degree.

The 2,000 specialists in the United Kingdom are employed in more than 100 organizations, some with just one or two, others with more than 50. One research laboratory employed over 100. The type of organization involved did not, however, indicate the actual employment level — two major pharmaceutical companies, for example, each employed fewer than 25 specialist biotechnologists, much of their basic research being contracted out to university-based research groups.

The commercial sector accounted for nearly half the employment at professional level, with research institutions taking about a third and the balance in higher education, although in the latter it was sometimes difficult to isolate applied biotechnologists from those focusing on more fundamental aspects of science (Fig. 1). With the rapid growth of commercial companies spinning off from academic departments, consultancies and so on, the dividing line between the sectors is also becoming increasingly blurred.

With the exception of junior staff and chemical engineers, who were often recruited either after a first or possibly master's degree, most recruits to biotechnology had had some relevant postgraduate research experience and were typically in their mid to late 20s or early 30s. Apart from new companies or centres starting up, the numbers recruited rarely exceeded ten vacancies in a year in any one company. Wastage rates were also generally low. The only significant shortage of suitably experienced personnel was in fermentation technology, particularly microbial physiologists, biochemical engineers and bioscientists with research and development experience of plant and tissue cell culture. There was also a shortage, as in many other technologies, of people who could combine technical and managerial expertise.

One particular concern of the past few years has been the potential scale of the brain drain (see *Nature* 308, 572; 1984). The study estimated that about 250 UK nationals had gone abroad since the mid-1970s, representing perhaps 13 per cent of the number currently employed in the United Kingdom. The peak flow was about 30 per annum in 1981 and 1982. UK nationals were found working in 13 countries; the main destinations were the United States (46 per cent), followed by Switzerland (16 per cent) and then Canada,

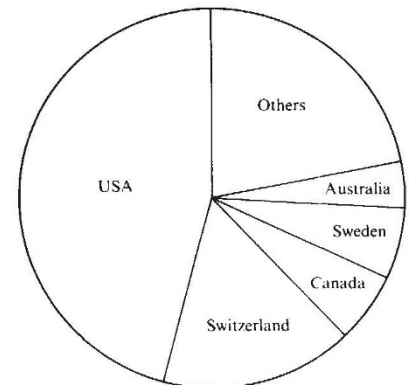


Fig. 2 UK biotechnologists taking positions overseas.

Sweden and Australia (Fig. 2). The largest loss was from higher education institutions and the main flow was to commercial organizations. More than 65 different overseas organizations were known to have recruited UK nationals. One recruited at least 16 UK nationals, four others took four or more each. One in three of those who had gone overseas had changed jobs since leaving the United Kingdom, and one in eight had also changed countries.

Typically the leavers were aged 26 to 30, although one in three was over 30. Nearly one in three went to "senior" jobs overseas, at professorial or departmental head level. They reported that the main reason for leaving was not salary but the lack of "suitable" opportunities and jobs in the United Kingdom. Most of them did not expect to return to the United Kingdom because they would be unwilling to take a reduced salary and standard of living. Thus while salary is not a motivation in leaving, it is a barrier to returning. While the flow overseas included a number of people who had left senior appointments in the United Kingdom and were unlikely to return, some were young postdocs moving overseas for experience, part of the normal international interchange of scientific personnel. While the outflow had no significant impact on individual organizations, such losses being only one part of their wastage to other employers, the flow was regarded as a lost opportunity and weakening of the United Kingdom's scientific base. The future flows, in either direction, will depend on job opportunities in the United Kingdom and salary differentials. □

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