

UK biotechnology

Fast start

Britain's "official" biotechnology company, Celltech Limited, seems not yet to have decided how to respond to Stanford University's advertisement of terms for non-exclusive licences to exploit the Boyer-Cohen patent. Part of the difficulty is that it is not yet clear how far companies outside the United States, part of whose business will come from the licensing of their own patent rights to other non-American companies, will be affected by the patent. But there is also an element of waiting and seeing. So far there have been no direct talks with Stanford.

In any case, the company is probably too busy. Since Celltech moved into its new headquarters in Slough (20 miles west of London) just after Christmas, the staff has grown more quickly than originally foreseen, to just about sixty. The company seems pleased with the eagerness of scientists to join up, mostly from industrial companies but with a substantial proportion of people from the universities.

One of the newest and most significant recruits is, however, a sales invoice clerk. Although the company's prospectus has made no bones about the time that will be needed to put biotechnology on the commercial map, it does plan to sell what it can as soon as it can. One of the first products will be an anti-interferon monoclonal antibody, principally for use by the manufacturers of interferon. A laboratory for the preparation of this and other monoclonal antibodies is being assembled. But the company is anxious that this part of its business should not be thought of as more than a kind of sideline.

Understandably, the company is reluctant to say where its chief efforts will go, but gives the impression that it will not be investing a major effort in the production of interferon of any kind. At some stage, though, it seems clear that Celltech will be in the industrial enzyme business. For the time being, the practical aim seems to be to establish itself well in the basic techniques of genetic manipulation, among which nucleic acid chemistry and the techniques of gene expression are conspicuous.

The nucleic acid chemists have built themselves an automatic nucleotide assembly machine rather than buying one off the peg, chiefly for the flexibility that results. They claim that their machine will add nucleotides (up to a score or so) at the rate of one every half an hour, which means the production of one full-length oligonucleotide during each overnight run.

Celltech's fast start means that its initial capital of £12 million will be used up more quickly than originally foreseen. The plan now is to recruit up to 150 people by September 1983, half of them scientists.

The shareholders in the company (among whom the National Enterprise

Board is the largest, with 44 per cent) have agreed to the accelerated investment plan, and will take a close look at its successor in just over two years time. The officers of the company say that they are heartened by the long-term view taken by the shareholders, which also include the Prudential Assurance Company, the Midland Bank, British and Commonwealth Shipping and Technical Development Capital. This, the guess is, should give Celltech a good chance when, in two or three years, there is likely to be a shakeout in the biotechnology field.

The company has no fixed ideas about the way in which it will sell its products, but plans not to enter the marketing of manufactured products nor manufacturing as such (which does not exclude the setting up of manufacturing companies in partnership with others). Enquiries from industry have been flowing in, some of which may lead to research contracts.

On the relationship between Celltech and the Medical Research Council, on whose developments the company has first refusal, Celltech says that developments not of direct interest may be licensed to others, in which respect the company will act as a kind of broker. It expects, however, to make direct use of most of the ideas suggested by the Medical Research Council, which, nevertheless, retains the right to bypass Celltech if too much time passes.

US graduate salaries

Engineers ahead

Washington

Statistics for 1980 recently released by the US Department of Education show a significant increase in the number of bachelors and first professional degrees in science and engineering awarded by US colleges and universities for the first time since the early 1970s.

The main reason for the increase is a growth of 11.5 per cent in the number of engineering graduates, continuing a trend that started in 1976. Since then, the rise has been balanced by a drop of about 4 per cent a year in the number of graduates in the social sciences and psychology — there was a drop of only 1.2 per cent in 1980.

The continued growth in engineering graduates reflects the relatively high salaries that even first-degree graduates are being offered by industry. Figures published by the College Placement

Council two weeks ago showed that 1981 graduates are entering jobs with starting salaries between 10 and 14 per cent higher than a year ago.

The average starting salary for petroleum engineers with a bachelor's level degree was \$26,652, and for chemical engineers \$24,360. This compares with starting salaries for economists with similar qualifications of \$16,440, and for other social scientists of \$13,992.

The high salaries being offered by industry also seem to be discouraging engineering graduates from staying on to complete higher degrees, leading to difficulties in higher education institutions of attracting qualified teaching and research staff. In comparison with the 11.5 per cent increase in bachelors' and first degrees awarded in engineering, the number of masters degrees in the same subjects rose by only 4.3 per cent, and the number of doctors' degrees remained virtually constant.

Concern about the implications of these figures has prompted Congress to oppose President Reagan's plans to eliminate the National Science Foundation's support for graduate fellowships. Committees in both the House and the Senate have agreed to restore funds for the fellowship programme, which makes about 500 new awards a year, although the precise level of funding for the foundation's overall education efforts has still to be negotiated between the two legislative bodies.

Another problem now emerging is a shortage of qualified science teachers. States have experienced a rapid decline in the number of science teachers turned out by their colleges of education; in physics, for example, the supply of new secondary school teachers has virtually dried up at a time when warnings are being voiced in Washington about the dangers of a growing "scientific illiteracy" among the general population.

According to Dr James Rutherford, who has been appointed director of a new science education programme within the American Association for the Advancement of Science, many schools are reporting that their science teachers are being approached with tempting job offers from private companies — often mathematics and physics teachers are offered jobs in computer sciences at salaries considerably higher than they receive for teaching.

David Dickson

Degrees awarded in 1980 (figures from National Centre for Education Statistics)

	<i>Bachelors' and first professional degrees</i>		<i>Masters' degrees</i>		<i>Doctors' degrees</i>	
Total	1,009,879	(+0.9%)	299,492	(-0.9%)	32,758	(—)
Science and engineering	292,271	(+1.2%)	54,463	(—)	16,495	(+0.8%)
Science and mathematics	117,906	(-1.1%)	22,023	(-1.2%)	8,559	(+1.0%)
Social sciences and psychology	114,469	(-1.2%)	15,552	(-2.7%)	5,416	(+0.8%)
Engineering	59,903	(+11.5%)	16,888	(+4.3%)	2,520	(+0.1%)

Values in parentheses are per cent changes from 1979 figures; a dash indicates no change.