British industry

Manufacturing in need of help

THE British Government should spend up to £20 million more each year on encouraging industry to make full use of advanced manufacturing techniques, according to an outspoken new report from the Advisory Council for Applied Research and Development (ACARD). The changes called for range from the establishment of an Advanced Manufacturing Development Service to the suggestion that the Department of Trade and Industry might distribute free robots. The first priority should be to ensure that existing techniques are taken up by industry, says ACARD.

The report, *New Opportunities in Manufacturing*, observes that, even in large companies, design and development frequently accounts for less than 2 per cent of turnover — half the comparable figure for many overseas competitors. Moreover, most of this is spent on product development, rather than improvements to manufacturing techniques.

ACARD believes that industry has failed to take sufficient account of recent advances in manufacturing systems, which have now reached a stage where large-scale integration of automated systems is possible. Resistance to change generally comes from middle management, and at higher levels there is often a failure to recognize advanced techniques as an important long-term investment. ACARD hopes to see suitably qualified board members taking explicit responsibility for manufacturing strategy, and wants these ideas promoted to industry through the National Economic Development Office.

ACARD confirms what many engineers have been saying for some time: traditional engineering degree courses offer inadequate preparation for modern industry. Resources should be channelled towards more training opportunities for technicians, and engineering degree and postgraduate courses should include more about manufacturing techniques. These should be associated with a few strong "centres of excellence" in manufacturing technology that ACARD wants to see established and coordinated by the Science and Engineering Research Council.

On finance, ACARD asserts that there is no shortage of money for investment in new manufacturing technologies, although the financial institutions could do more to ensure that their staff are well informed about production techniques. But the report says that the Department of Trade and Industry's multiplicity of support schemes may actually be confusing some companies, and that some schemes are not well enough supported to make a significant improvement. If programmes were rationalized, more companies might take advantage of them. A principal recommendation is that the department should establish a comprehensive Advanced Manufacturing

Development Service to advise and assist companies. Government could also help by ensuring that public procurement policies encourage companies to use advanced techniques, an idea that has often been put forward.

Many of ACARD's previous reports

have been a significant focus for debate, for example that on links between industry and the universities. As the council reports directly to the Prime Minister, who takes an active interest in such affairs, this report is unlikely to be left to gather dust. But at a time when the government is imposing strict cash limits in other areas of public expenditure, some of ACARD's recommendations may be thought out of tune with the political music.

Tim Beardsley

Gene diagnosis

Yale bungles patent claim

Washington

YALE University may have seriously underestimated the significance of the patented work that led to the production by Enzo-Biochem, under an exclusive licence, of the "Enzo Bioprobe", a non-isotopic method for detecting gene sequences.

David Ward, the principal investigator at Yale who carried out the work, approached the Yale administration in mid-1980 seeking to have his work patented. Yale was then using a non-profit New York firm, the Research Corporation, to handle all its patent matters; the corporation paid the filing fee for patents and sought out licensees in exchange for a significant share of the royalties. The corporation did not consider Ward's work worth the expense of patenting. Ward appealed to several Yale officials, but was turned down.

Ward then began to send out feelers to diagnostic companies. Enzo heard of this and made Yale an offer: Enzo would pay the costs of filing for a patent in exchange for an exclusive licence. Yale agreed.

"After that fact", Ward said, "virtually every major diagnostic company came and

asked for a license." It was, of course, too late, and Enzo has declined to sublicense.

Yale officials defend their action at the time by pointing to the uncertainty that any company would be interested in Ward's work. Robert Bickerton, who now handles patent matters for the university, said that with the sensitivity of the technique at the time — roughly 1,000 times poorer than the standard isotopic methods — the doubt was understandable. The sensitivity has since then improved to the point where it is comparable with the isotopic methods.

In July this year, Yale established its own office to handle patents and has appointed a university committee to review potentially patentable research. It no longer employs the Research Corporation.

Ward does not blame the university for its handling of the affair. "I came along at a time when the university was in a state of flux in how to handle it", he said. And given the university's experience with other patents, he said, their action was understandable. "The return from those was minimal. Why should they assume this was going to be any different?"

Stephen Budiansky

Nature index of biotechnology stocks

12-Month high	12-Month low	Company	Close previous month	Close 30 Sept.	Change
23 1/4	13	Biogen (Switzerland)	14 1/2	14 1/4	-1/4
6 1/4	2 1/2	Bio-Logicals (Canada)	3 1/4	2 1/2	-3/4
16 1/4	7 1/4	Bio-Response (USA)	14	14 7/8	+7/8
19	11 1/8	Cetus (USA)	13 3/4	12 7/8	-7/8
15 1/2	8 7/8	Collaborative Research (USA)	10 1/2	11 1/8	+7/8
39 7/8	15	Damon (USA)	22 1/2	25 1/2	+3
34 1/4	16 1/8	Enzo-Biochem (USA)	25	25 1/2	+ 1/2
18 7/8	8 7/8	Flow General (USA)	11 1/8	8 3/4	-2 7/8
49 3/4	26 1/8	Genentech (USA)	43 1/2	35 1/2	-8
17 3/4	8 3/4	Genetic Systems (USA)	12 7/8	11 1/2	-1 1/8
23 1/4	12 7/8	Genex (USA)	19 1/2	18 3/4	-3/4
31	19 3/4	Hybritech (USA)	22 3/4	19 3/4	-3
22 1/4	13 3/4	Molecular Genetics (USA)	15 3/4	17	+ 1 1/4
23 1/4	13 1/2	Monoclonal Antibodies (USA)	15 1/2	14	-1 1/2
73 1/2	42	Novo Industri A/S (Denmark)	61	67	+6
30 1/8	13 1/2	Pharmacia (Sweden)*	29	26 1/2	-2 1/2

Closing prices are for the last Friday of the month. For over-the-counter stocks, bid price is quoted; for stocks on the American and New York exchanges, the transaction price. *Nature's* weighted index of biotechnology stocks stood at 221 on 30 September, compared with 232 a month earlier. Data from E.F. Hutton, Inc.

*Pharmacia underwent a 2:1 stock split recently; prices have been adjusted to reflect this.