British innovation

Research corporation relaunched

BRITAIN'S own academic entrepreneur, the National Research Development Corporation (NRDC), emerged more or less unscathed last week from the marriage into which it was forced in 1981 with the body called the National Enterprise Board, itself a relic of the 1964 Wilson government's decision to use large amounts of public money to reshape the pattern of British industry.

During the past year, the merged partnership, called the British Technology Group (BTG) since 1981, has been selling off its investments in large companies, and BTG's chairman, Mr Colin Barker, explained last week that disposal of equity stakes would continue, and that the outstanding interest in outside companies was already less than £50 million.

For the future, the group plans to spend up to £15 million a year in the next five years in support of technology transfer between British researchers in the public sector and general industry. Mr Barker insists that the group will function as a broker, not as a venture capitalist, for innovations arising in universities and government-supported laboratories.

BTG has already held a meeting with more that 30 vice-chancellors of British universities at which its new range of services was described. As well as the patenting and protection of innovations at its own expense, the group now promises to share its net revenue on all newly arising projects with those responsible for them, and will also collaborate in development projects on a fifty–fifty basis.

One curious aspect of what is in effect the re-launch of NRDC is that the government seems not yet to have decided when BTG will lose its exclusive right to the exploitation of inventions arising in the British public sector. This change was first announced by Mrs Margaret Thatcher a year ago. Nor, according to Mr Barker, has it been decided when there will be legislation to formalize the *de facto* merger, four years ago, of the two parts of BTG.

As a business, BTG itself is an enterprise of modest scale. NRDC, in the financial year to 31 March last, earned a surplus of £5.18 million (before tax) on an income of £16.87 million, mostly from income from licensed innovations. Income last year had fallen sharply from that in 1982–83 (from £27.38 million) but profit increased, from £2.33 million to £5.18 million.

Revenues from synthetic pyrethrin pesticides (developed at the Rothamsted Experimental Station) are now rising steadily, and BTG has a handful of other potential money-spinners on its books. Mr Barker argues that BTG will be both profitable and self-financing during the five years ahead, the span of time for which the government has approved its business plan.

The management seems also to recognize that it will in future have to compete with other sources of financial backing for innovations, and estimates that the City of London has raised rather more than £400 million for these purposes in the past five years. BTG hopes to intervene earlier in the process of technology transfer between the public sector and private industry, but said last week that participation in more mature ventures such as the biotechnology company Celltech and the Agricultural Genetics Company (AGC), while exceptional, would not be ruled out.

Whether BTG will be a more comfortable partner than NRDC for universities in the process of innovation remains to be seen. On the common academic complaint against its predecessor that many projects would be turned down only after long delay, Mr Steven Dollands, BTG marketing director, said he hoped the group would be able to improve its performance. To strengthen links with universities, it has recruited eight liaison officers who will scour the universities for ideas and also has a scheme whereby sums of up to £20,000 can be committed without formality to particularly attractive projects.

BTG's success may also be limited by the scale of its planned expenditure, now only a small part of funds flowing to universities from commercial sources. But BTG is adamant about its role. **John Maddox**

Hepatitis B

Taiwan plans mass vaccination

TAIWAN, with a population of 18 million, has embarked on a world first in vaccination: a 10-year mass vaccination campaign against hepatitis B, which is endemic in the country and in many cases results in liver cancer. The vaccine to be used is serum-derived and French — news which marks an enormous step forward for the French producers, Institut Pasteur Production (IPP), the industrial offshoot of the Institut Pasteur Fondation research laboratory in Paris, and an equal step back for IPP's competitors (notably Merck, Sharp and Dohme of New Jersey).

This year and next, Taiwan will be using the IPP vaccine to immunize, free of charge, all newborn babies who are at obvious risk from infection from their mothers. In 1986 the campaign will be extended to cover all 400,000 babies born each year in Taiwan, and will then gradually extend to older children and ultimately to adults. IPP has signed a contract to provide a million vaccine doses over two-and-a-half-years, and to transfer production know-how. Sanofi, the French drugs company which for the time being owns 51 per cent of IPP, will transfer production equipment at cost, and will also offer cost-price production training.

Moreover, Pierre Tiollais's group at the Institut Pasteur Fondation research laboratory has reached "production stage" with a genetically-engineered (second generation) vaccine produced in animal cells. Thus if the Tiollais vaccine works well, and receives health authority approval, the vast Taiwanese market for second-generation vaccines may also be tied up with France.

This French success has not been a matter of marketing or clever pricing, Sanofi claimed on Monday, but of the technical superiority of the IPP vaccine. The Merck serum-derived antigenic particles "lack some important polypeptides", according to Sanofi, and so the IPP vaccine is more effective. The missing portion is the polypeptide expressed by the "pre-S" region of the hepatitis-B viral coat gene, removed in the Merck production process when the product is treated with pepsin to remove serum proteins (once feared as they might induce autoimmunity). The IPP process does without pepsin. But now the pre-S region appears to be important in generating full immunity to hepatitis B.

Moreover, the Institut Pasteur may also have stolen a march on the next generation of hepatitis-B vaccines, which will be genetically engineered. Here there are four main choices, according to Tiollais: to produce the antigen in yeast or in animal cells and in either case to produce the main hepatitis-B surface (HBs) antigen (which the Merck vaccine is left with) or HBs plus the pre-S polypeptide as well. Early attempts (as at Biogen, now licensed to Wellcome, and also at Merck, Sharp and Dohme) used yeast and produced HBs alone. But Tiollais and IPP now claim to be at production stage with an animal (Chinese hamster ovary) cell line expressing and secreting full HBs plus pre-S antigens assembled into particles almost identical to natural (human) hepatitis-B particles. It has not yet been proved, "but it is a working principle", says Tiollais, that such a vaccine will be more effective than other less complete products.

Merck, Sharp and Dohme meanwhile have licensed their serum-based technology to a Singapore company called Singapore Biotech, and are believed also to have transferred second-generation yeast technology to Singapore. The latter product, however, lacks pre-S, though moves are being made to introduce it.

Thus it seems that the Pasteur, with a foot in the Taiwan market with the serum vaccine, may have a chance also of taking the second-generation market, particularly as a part of the new deal with Taiwan involves the Pasteur "sharing knowledge" with the Taiwanese Development Centre for Biotechnology. **Robert Walgate**