

One way ahead for British biotechnology?

BRITISH biotechnology may yet survive. A plan by three renowned molecular biology laboratories for setting up in Britain a commercial biotechnology venture is being considered by several agencies of the British government.

The laboratories concerned are the MRC Laboratory of Molecular Biology at Cambridge, the Laboratories of the Imperial Cancer Research Fund in London and the Cold Spring Harbor Laboratory on Long Island in the United States. The three principals are Dr Sydney Brenner, Dr Walter Bodmer and Dr J. D. Watson, the respective directors of the three laboratories.

The essence of the plan is to establish a small organisation in Cambridge, initially for the preparation and supply on commercial terms of monoclonal antibodies, principally for use in biomedical investigations.

This would involve exploiting a technique originally developed by Dr César Milstein of the Laboratory of Molecular Biology, Cambridge, in which lymphocytes producing antibodies of a specific kind are fused with cells of cancerous lymphoma tissue.

After suitable selection procedures, the outcome can be a line of cells with the vigour of lymphoma cells which nevertheless produce the specific antibody prolifically.

This particular plan has emerged over the past year, and thus in its origins predates the Spinks Report on biotechnology, published at the beginning of April (*Nature*, 10 April and 24 January). That urged that the research councils and the public sources of venture capital in Britain, especially the National Research Development Corporation and the National Enterprise Board, should take steps to promote a British biotechnology industry. Both organizations have announced their interest in the field (*Nature*, 29 May).

The production of monoclonal antibodies has presumably been chosen as a first objective because it could be applied immediately, thus providing a new venture company with some bread and butter. The initial need of capital would be correspondingly modest.

The next steps to be taken in the setting up of a commercial venture are by no means obvious. The Medical Research Council, the obvious sponsor of such a venture, is precluded by its terms of reference from risking the loss of money. The NRDC is used to dealing with particular products and inventions, not with backing companies as such.

On the face of things, the National Enterprise Board is constitutionally better able to provide the backing a venture like this would need. One intriguing possibility is that the two private laboratories — Cold Spring Harbor and the Imperial Cancer

Research Fund — would be able to provide some of the capital if their boards of trustees agreed.

A spokesman for the National Enterprise Board declined this week to say whether his board was considering this particular proposal, but reaffirmed the organization's concern with biotechnology. It is, however, understood that

Research councils

Disquiet over NERC succession

THE appointment of Sir Hermann Bondi as full-time chairman of the UK Natural Environment Research Council (*Nature*, 15 May), although widely welcomed, is also the cause of consternation. At its meeting last week (28 May), the Council was sore that it had not been even formally consulted and concerned that the forced resignation of Mr R J H Beverton, secretary of the council for the past sixteen years, might be misinterpreted.

Members of the council agree with the chief objective of the change at the top — that NERC should be put on the same footing as the other research councils, with the responsibilities of chief executive and official accounting officer combined in the same person. Hitherto these functions have been the responsibility respectively of the Secretary and the Chairman, for the past three years Sir James Beament, head of the department of applied biology at the University of Cambridge.

What irks the council and dismays some of the directors of NERC research establishments is that when Sir Hermann's candidacy for the job became known to the Department of Education and Science early in April, both Beverton and Beament were presented with a *fait accompli* and, in effect, invited to go quietly. This, in the event, they both agreed to do.

The urgency of the decision stemmed from Sir Hermann Bondi's impending retirement as Chief Scientific Adviser to the Department of Energy with effect from Beverton out . . .



some news of the NEB's interest in the field will be forthcoming within weeks rather than months.

Much may depend on whether biotechnology is able to avoid the Catch-22 problem which has beset micro-electronics (see page 346, this issue) — if it's not good, it's not worth backing; if it is, why doesn't the market step in?

1 October, required by Civil Service rules on age. The NERC Council was left with the impression that if the succession at NERC had not been settled quickly and to his satisfaction, Bondi would have taken his undoubted talents elsewhere.

The past few years have seen something of a change in the character of NERC's programme. Although NERC continues to spend its own funds on a programme of basic research not markedly different from in the past, funds awarded to NERC by government departments for contract research ('Rothschild money') have increasingly emphasized energy-related problems — radioactive waste disposal and physical oceanography related to the exploration of the North Sea, for example.

Although the division of the responsibil-



. . . Bondi in

ities of chief executive and accounting officer is agreed to be the long-term reason for change, the move of the NERC headquarters from London to Swindon has complicated the problems of management in the past two years. Sir James Beament, based at Cambridge, has been spending two days a week on NERC business but has been hard-pressed to divide this time between London and Swindon.

Even so, there are many who consider that some role could have been found in the new organisation for Mr Beverton, who has only two years to go to his normal retirement date.

The council was at pains to emphasise at

its meeting last week its appreciation of Beverton's service to NERC and its hope that the Civil Service would find a worthwhile job for him to do in the next few years. The council was especially at pains to emphasize that Beverton's sudden departure betokened no misconduct of NERC's affairs.

For the British research council as a whole, the incident has been a somewhat chilling reminder that their jealously guarded autonomy is, in the last resort, in the gift of the Department of Education and Science. In the week in which another government department (Energy) precipitated the resignation of the financial managing director of the British National Oil Corporation by the unwelcome appointment of a new chairman (without consultation with the board), that should not be a surprise.

Radiation

ICRP rules row

Washington

Fitting round pegs into square holes must seem child's play compared to the political difficulties of bringing US radiation exposure regulations in line with the current state of scientific knowledge.

In an unusual reversal of roles, officials of the US Nuclear Regulatory Commission have expressed reservations about new occupational exposure guidelines being prepared by the Environmental Protection Agency, claiming that they would result in an unnecessary relaxation of certain existing restrictions.

The dispute centres on recommenda-

tions for revising occupational exposure to radiation proposed three years ago by the International Commission on Radiological Protection. These have been accepted as the basis for regulation by the Commission of the European Economic Community, but remain the centre of fierce controversy in the United States.

The method for calculating maximum exposure levels proposed by the ICRP in its report known as ICRP 26 is widely accepted as a major advance and as reflecting the best 'state of the art'. For example, it allows for joint consideration of the effects of internal and external doses of radiation, previously considered separately.

Furthermore it shifts the basis for calculating maximum exposure levels from consideration of 'critical organ' doses — using the maximum acceptable exposure to organs most susceptible to a particular radionuclide — to a method which calculates a general level of risk by integrating the weighted risks posed to various parts of the body.

The advantage of this approach is that it includes the risks to organs other than those considered the most critical. The difficulty, however, comes from the need to adjust the specific figures placed on exposure limits.

Controversy has in particular focused on the ICRP's suggestion that the maximum integrated risk should be equivalent to that represented by the existing maximum whole body exposure of 5 rems a year.

The EPA, which is responsible for setting exposure guidelines to be followed by other agencies, has yet to issue formal proposals on revised exposure levels. But it has in-

formally sounded out the agencies on the use of the ICRP aggregated-risk methodology, based on a maximum organ dose of 30 rems a year.

Even this reduced exposure guide, however, has not been acceptable to some NRC officials. While supporting the ICRP methodology in principle, they argue that the result of meeting the overall risk requirement would be to permit an increase in permitted air concentrations for many radionuclides, in some cases by an order of magnitude.

The NRC officials, who say their arguments have been accepted as an interim position by the NRC commissioners, agree that such increased limits would not necessarily be harmful. But they argue that they would inevitably reduce the protection afforded to workers at licensed power plants and uranium mines — and that the nuclear industry apparently has little difficulty in meeting current standards.

EPA officials agree that adoption of these proposals would permit increased exposure to some radionuclides (as well as reducing exposure to others). But they insist that assessments should be based primarily on consideration of the overall risk, rather than merely the risks to separate organs.

"If someone gets cancer, it does not really make much difference to them which part of the body they get it in. We are trying to limit the amount of harm to people. That is not the same as limiting the dose in an abstract sense", Dr David Rosenbaum, director of EPA's Office of Radiation Programmes, said last week.

NRC officials have proposed a hybrid scheme under which exposure limits for individual radionuclides would be calculated both by the ICRP methodology and by the 'critical organ' technique using the same methodology but old dose limits, accepting whichever is the lower. But EPA is unenthusiastic about this approach.

The situation is complicated by each agency's desire to respond to outside arguments. The EPA, for example already faces challenges by nuclear companies on its proposal that public exposure outside a nuclear facility should not exceed 25 millirem.

At the same time various public interest groups are using the uncertainties in the scientific evidence to petition the NRC to reduce the present 5 rem occupational exposure limit by an order of magnitude. Several trade unions are also planning to press the EPA not to introduce the ICRP 26 scheme without major modifications.

Given all this activity, publication of the proposed guidelines is now unlikely before the autumn, with a period for public comment to be followed by a series of public hearings next year. These promise to be lively; particularly if the Administration changes to one more concerned to minimise regulatory restraints on the growth of nuclear power. **David Dickson**

Soviet heavy neutrinos

BARELY a month after a 'Science Day' speech in which Anatolii Aleksandrov, President of the Soviet Academy of Sciences, suggested that the Soviet Union should make itself as independent as possible of western scientific results, a team of physicists led by Academician Valentin Lyubimov, has repeated the claim of Dr F. W. Reines to have established that neutrinos have mass. This has now been announced by the Russian news agency Tass. Reines, from the University of California at Irvine, described to the Spring Meeting of the American Physical Society last month the latest in a series of experiments at the Savannah River reactor in which the relative importance of the charged and neutral currents in the interaction of reactor neutrinos with deuterons was measured. The neutrino mass deduced is the equivalent to a few electron-volts.

The Russian work now referred to is based on a different method. The team concerned, from the Moscow Institute of Theoretical and Experimental

Physics, is said to have analysed the spectrum of electrons in tritium decay, deducing the mass of the neutrino from the shape of the spectrum. The discovery was announced in a report delivered to the Presidium of the Soviet Academy of Sciences.

Commenting on it, Academician Yakov Zel'dovich observed that the result could produce major changes in current cosmological concepts and possibly raise once again the question of the existence of a cosmological constant, first mooted by Einstein in 1917.

Reporting the discovery, the Tass agency said that the existence of 'heavy' neutrinos solves a number of existing paradoxes, including the question of the missing mass of galaxies and the measured deficiency of solar neutrinos from the sun. Tass claimed that it also appeared to confirm the model of solar neutrino flux proposed by Academician Bruno Pontecorvo involving the inter-conversion of different neutrino types.

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