

tiveness of the insertion of human β -globin genes into mouse haematopoietic cells. A condition of this grant was that no work on human subjects should be involved.

In the case of the National Cancer Institute, two grants for which Dr Cline was the principal investigator were reviewed. The first, for research into normal and malignant haematopoietic cell replication, has been allowed to run until its expiry date at the end of next May, and a renewal application is now under consideration.

On the second grant, part of a four-year project in medical oncology with a total cost of \$3.3 million, the National Cancer Advisory Board has suggested that the grant be continued until 28 February 1982. A renewal grant application has already been submitted by UCLA, with Dr David Golde named to replace Dr Cline as the principal investigator.

Following the decision by Dr Tom Malone (acting director of NIH) to accept the recommendations of the three advisory boards, Dr Cline has pointed out that the termination of the NHLBI grant eliminates only about 20 per cent of his research support. He has also said that he has not decided whether or not to appeal against the decision. In a letter to NIH written in September, however, Dr Cline strongly criticizes the 14-month delay by the UCLA Human Subject Protection Committee in giving a definitive response to his request for permission to carry out experiments.

One sanction recommended by the NHLBI advisory council which was not endorsed by NIH was that Dr Cline be asked to provide assurances that he will not engage in human experimentation involving recombinant DNA for a three-year period. A memorandum from NIH associate director of extramural research, Dr William Raub, says that he does not believe it appropriate for NIH to impose such a sanction, "nor do I believe we have authority to do so". **David Dickson**

ARC biotechnology

Cottage industry?

The pips may squeak in British research, but biotechnology forges on. The UK Agricultural Research Council (ARC), whose budget shrank 3 per cent in real terms between 1979-80 and 1980-81, has actually been able to announce the setting up of a new research centre. Admittedly, it is in a portable home (a Portakabin), but it will house twelve researchers and provide a focus for ARC work on monoclonal antibodies.

Costing around £100,000 for the Portakabin and equipment, and £100,000 a year to run when it gets going in April next year, the centre will have two resident researchers, four technical staff, and — on average — six visitors from other ARC laboratories.

The goal is to produce a centre of expertise in the handling and creation of

hybridomas — which some ARC virologists have found to be tricky things to culture. The resident researchers at the new centre will work on their own projects (for example, suggest ARC officials, on creating hybridomas of cow, pig and sheep cell lines) and assist visitors with their own problems.

The first applications will be to the creation of specific antibodies to viral strains, such as the varieties of calf enteritis virus, to help research and — perhaps — create vaccines where these would be commercially useful. To this end the unit will also have production facilities large enough to conduct commercial trials.

Who will profit from this ARC commercialism, however, is a moot point. By law the council must pass patent rights to the National Research Development Corporation, now part of the British Technology Group which includes the National Enterprise Board. Unlike the Medical Research Council, ARC has no direct agreement with Celltech, the company created by the National Enterprise Board a year ago to exploit biotechnical developments in British research establishments and universities (and to pursue its own research); but, says Celltech, it would expect the new British Technology Group to consider them as potential developers of any ARC product. The British Technology Group, however, would be free to approach any company it wished — and that might be a new British Technology Group company specializing in agriculture.

ARC recently suggested that the British Technology Group should set up a kind of agricultural parallel to Celltech — in which, no doubt, the ARC would like to have the same exclusive rights and potential earnings as the Medical Research Council has in Celltech — and this idea is still being considered. The British Technology Group will not reveal what stage negotiations have reached, but the ARC do not seem particularly optimistic.

Celltech itself is certainly interested in veterinary applications of hybridomas, but the company does not want to be thought of as specializing only in monoclonal antibodies. Its first and so far only product is a monoclonal antibody against interferon, but Celltech's research and development is now evenly divided between monoclonals and recombinant DNA. Celltech also sees no immediate likelihood of involving itself in the genetic manipulation of plants, unlike the ARC, which has the area very much in mind.

Meanwhile ARC was last week still awaiting official confirmation of the European Council of Ministers agreement three weeks ago to go ahead with the European Commission's biotechnology research programme, which will specialize in agricultural applications. ARC has been closely involved with the definition of the programme, and might hope to win up to £100,000 a year in grants to supplement its

own £1 million annual spending in biotechnology — but only if it has the chance to appoint a strong scientific team to the Advisory Committee on Programme Management. This Brussels committee will ultimately examine research proposals within the programme and — by advising the Commission — effectively hand out the cash. Unfortunately ARC is at a far remove from the Department of Industry, which is in touch with Brussels on this matter, and there are fears that the council may not be approached in time for Britain to get strong representation on the committee.

Robert Walgate

Soviet universities

Research needed

The Soviet Union must invest more in university science, according to Academician Ivan F. Obraztsov, Minister of Higher and Secondary Specialized Education of the Russian Republic. Writing in *Pravda*, he claimed that unless academic research is given priority, it will be difficult to train "good cadres" in the new directions needed for the Soviet economy to develop.

Obraztsov said that Soviet universities and higher educational institutions at present receive no capital funds specifically earmarked for science, although they carry out research worth more than 1,200 million roubles each year. Funds for scientific equipment and research materials are not forthcoming, and computers and similar sophisticated equipment appear far later in the universities than in institutes and laboratories run by specialized ministries.

The lack of funds seems to be especially serious in the engineering faculties. Although Soviet industry is committed to a policy of extensive automation, which is made more urgent by the Soviet Union's falling birth rate, the training of future engineers needs to undergo a "major restructuring". Obraztsov implied that means of familiarizing students with automated design systems, control systems, production lines and man-machine complexes simply do not exist.

The emphasis on engineers reflects a trend in the Soviet press. After a long "press debate" last year on why Soviet public opinion gives more prestige to the pure than to the applied sciences, the weekly *Literaturnaya Gazeta* last month published a round table discussion on the role, status and career prospects of Soviet engineers.

One complaint was that since 1948, engineers' salaries had risen by an average of 20 per cent in real terms, while those of "ordinary" workers had doubled. The participants also noted that young people seem reluctant to apply to engineering colleges. Many of the most prestigious higher technical schools, such as the Leningrad Mining Institute, no longer set competitive entrance examinations, while