separate statement filed with the committee by Dr William Beisel, deputy for science at USAMRIID and the Defense Department's representative on the committee. An open question, however, is whether USAMRIID and the arms control agency are even aware of the Army's classified programme on defensive biological weapons. **Stephen Budiansky**

UK-Dutch agreement

Seeing stars

A far-reaching agreement for collaboration on major research projects was signed last week between the British Science and Engineering Research Council and its opposite number in the Netherlands, Nederlandse Organisatie voor Zuiver-Wetenschappelijk Onderzoek (ZWO). The immediate objective is to specify the rules under which the two research councils will collaborate on projects which involve expensive capital equipment.

A spokesman of the British council said last week that this development is a mark of the "steady convergence" of the policies of the two councils. Exactly a year ago, they signed an agreement on collaboration in astronomy under the terms of which ZWO will pay a fifth of the cost of the Las Palmas Observatory on Tenerife, receiving a fifth of the observing time in return.

Those administering the agreement say that the constructive benefits of the agreement are already apparent. Technical arguments by Dutch astronomers, for example, have led to the decision that the planned sub-millimetre telescope planned as part of the Las Palmas Observatory should be sited instead in Hawaii.

The intention now is that similar arrangements should be extended to other expensive projects, including the synchrotron radiation source at Daresbury, the British Starlink system for the common processing of astronomical data and possibly even the common use of major computer facilities. There is a possibility that the two councils may mount a joint project to build an improved neutron source for diffraction and other studies.

One administrative convenience in the new agreement is that it will not always be necessary for the costs of projects to be shared out one by one. Rather, when it suits the two councils, barter may replace the exchange of money.

The love affair between the two research councils has already led to the setting up of committees of which British and Dutch nationals are members. This has not yet, however, led to cross-membership of the principal policy-making committees, nor is there an immediate prospect of common grant-making procedures except where these are ancillary to some major project.

The Science and Engineering Research Council is the largest of the five in the United Kingdom, and exists to support scientific research at British universities

Cetus goes begging

Standard Oil Co. of California, an investor in Cetus Corporation, a leading California biotechnology firm, has elected not to fund the firm's plan to produce fructose commercially. Cetus hopes to find some other sponsor for the work, perhaps a sweetener manufacturer, instead.

The process would attempt to produce pure fructose at the same price as, or more cheaply than the main competitors — high fructose corn syrup (used in soft drinks) and sucrose. Although Cetus carries out research involving recombinant DNA techniques, the enzyme at the basis of the process was found using standard microbiological techniques.

Standard Oil's decision may represent a retrenchment by major oil companies in the biotechnology field generally. Investors in such firms are said to be more cautious now than they were one or two years ago, the budding recombinant DNA industry benefited from the enthusiasm — and dollars — of major firms. Standard Oil of California (Socal) owns 17 per cent of Cetus Stock. **Deborah Shapley**

and polytechnics. The terms of reference of ZWO are wider, extending to the humanities and social sciences. On the other hand, ZWO is not responsible for Dutch contributions to international projects (such as CERN), while the proposed Anglo-Dutch collaboration in the infrared satellite is similarly the direct responsibility of the Dutch government.

As a rule of thumb, the budget of ZWO in Dutch guilders is roughly equal to the budget of the Science and Engineering Research Council in pounds sterling (£1 = 4.7 guilders).

Global systems analysis

Insult or injury?

The International Institute for Applied Systems Analysis (IIASA) in Vienna is going hawking for money. Abandoned recently by the US National Academy of Sciences, IIASA has suffered another blow. Its British member, the Royal Society, quit last week. Hopes for survival now centre on the institute's friends in the United States, who are trying to raise private money. Next month the director, Canadian Professor C. S. Holling, will visit Britain to attempt to rekindle interest.

For just over a decade, the institute's chief claim on public attention has been its unique status as the paradigm of the truly East-West research centre. Its collapse, now possible, could spell the end of an era or simply mean that the project was misconceived.

IIASA is being attacked on three fronts: political, financial and academic.

Politically, the institute is a creature of detente, planned as a forum where East and West could tackle problems of global importance; but detente is dead, as is the Reagan government's interest in IIASA. And the £5 million budget (1982) is seen as an unnecessary luxury in hard times.

Academic criticism such as that which seems to have moulded the British decision has been more of a surprise. Sir Hermann Bondi, British member of the IIASA Council and also chairman of the UK National Committee for IIASA under the Royal Society, professes himself "horried" at how few friends IIASA has on the committee. But Sir Hermann is by background a theoretical physicist, not a systems analyst, and must demur to professional opinion.

The UK committee seems to have been dismayed by the draft research plan for 1983, the first produced by Professor Holling. The committee had expected to see drastic pruning of the 24 projects current in 1981 under Soviet leadership of IIASA. Holling had reduced the number to nine, but these included the biggest of last year's projects, including for example the analysis of energy policies, the impact of industrial change, environmental regulation and institutions and regional and urban development. The committee decided that resources at IIASA were still being spread too thinly.

This opinion thus left the Royal Society unable to press the British government to continue membership. The Department of the Environment, the formal channel for the annual subscription, had already decided for internal reasons that it need no longer support IIASA. The Royal Society, Britain's formal member, without any obvious means of paying the subscription, resigned.

IIASA complains that the British committee does not understand the institute's objectives, which — as Holling has put it — are to provide policy-makers with "creative options". The British attitude is more pragmatic, IIASA staff members say, while there is very little overlap between the research interests of UK National Committee members and those of IIASA.

The institute is also offended that the British decision was taken when only the draft plan for 1983 was available. With the plan approved by the IIASA Council, the proposals can now be "fleshed out". Bondi has invited Holling to present his more detailed case personally to the UK National Committee next month. Holling will travel with Professor K. S. Parik of India and A. Wierzbicki of Poland to emphasize the international interest in IIASA work. It is too late for the Royal Society to reverse its decision, but Bondi hopes it is not too late to find another sponsor, however slim the chances.

In the past, IIASA has been represented by member institutions from 17 countries including the Soviet Union and the United

States which had "Class A" membership and each paid 36 million Austrian schillings (£1.2 million). Lesser Class B members paid 5.4 million schillings. IASAs's nine projects for 1983 will now have to be found within a budget of 115 million schillings. IASAs's friends in the United States are looking for \$1–1.5 million a year from 1984.

Robert Walgate

Commercialization of research

So far. . .

Boston

Biological research progresses much more slowly than Wall Street transactions, Dr Walter Gilbert, professor of molecular biology at Harvard University reminded an audience of senior businessmen and brokers worth many millions in venture capital last week in the last lecture of his illustrious academic career. Gilbert, who in two weeks will take up full-time duties at the biotechnology firm Biogen, joined other eminent scientists in giving the executives a day-long, \$300 per head tutorial on the rudiments of biotechnology. Several speakers addressed the question of how involved a university can get in the big business of biotechnology and still retain its integrity and autonomy.

Gilbert described the 30 years of basic research that prepared the ground for the recombinant DNA boom. Only in 1978, after three decades of work, could scientists attack the problem of making particular genetically engineered commercial products; and even the applied problems are proving very slow to solve. After the meeting, Gilbert reflected at length on the issues of the conference.

In the first place, Gilbert stated that aggressive university patent and "technology transfer" programmes are in fact superfluous. In the United States there exists no real technology transfer gap. "This is evident in the plethora of small biotechnology companies, and is due wholly to the effervescence of America's venture capitalists", he said, "who are the missing link in England."

Gilbert also took issue with the public perception that applied research is the intellectually weaker sister of basic research. And in fact, Gilbert continued, although everyone sees basic research as the wellspring of new scientific ideas, this is not exclusively true. "One reason universities encourage their faculty to consult for industry is that they realize that this is an important way for teachers to learn about the problems in the world."

With a foot in both industry and academia for five or more years now, Gilbert is in a unique position to comment on the threat to a laboratory of such cases as his own. Because "the student has absolutely no notion of why a professor puts him on a scientific problem", the threat of student exploitation is real. But Gilbert thinks that any commercial exploi-

tation of a student will be exposed. In any case, the transgressor will be doomed, since commercially motivated work is often not academically meritorious and so he will not attract top-flight graduate students and government grants.

Dr Derek Bok, president of Harvard, gave the conference the clearest statement so far of the line universities will be taking on relations with biotechnology companies. Bok's "cleaner than thou line", as Gilbert later called it, was drawn up at conclaves of university presidents such as that last March in Pajaro Dunes (*Nature* 1 April, p.381). Universities are generally eager to aid in closing the putative "technology transfer gap", Bok said. He encouraged so-called "bilateral research agreements", such as the \$50 million agreement between Hoechst and Massachusetts General Hospital. He underlined as justification for his position the current shortage of public research funding, the liberty inherent in a multiplicity of research sponsors and the fact that private support demands of the investigator little of the red tape that a federal grant does. Bok stated four provisos for such agreements: (1) that the sponsor cannot stipulate what the scientist studies; (2) that bilateral agreements must be published; (3) that a firm must guarantee a discoverer's right to publish his findings; and (4) that a firm must get preferential patent rights only when it has clearly funded the work involved.

Gilbert later called the patent issue the messiest in all the debates. Patents on discoveries made by university workers should go to the discoverer himself, not to a private supporter and particularly not to the university. "The superficial rationale behind Harvard's current position of retaining patent rights on its employees' inventions is that this is in the public interest", Gilbert said, "but actually the university has only one motive: remuneration." In Gilbert's view, the university should renounce patent rights and any other procedures which would lead to its motives appearing suspect. The disinterestedness that would result is one of the university's strongest assets. In the long run, renouncing patents would actually make it richer, since over the centuries such a climate of disinterestedness is what has made universities worth endowing.

Bok overtly proscribed investment by the university in a firm in which one of its faculty members had a stake. He recounted the example of the firm in which Dr Mark Ptashne is involved, in which Harvard once considered a joint venture. Although it "takes an imaginative soul to dream up a gift a university will refuse", Bok mused, this was an offer which Harvard had to turn down to preserve good public relations, faculty morale and general academic values. Dr Ptashne later retorted that in fact Bok had got it wrong — that it was the university and not Ptashne's company that made the first overture.

Cases in which a faculty member has a stake of money or time in a biotechnology firm are the hardest to legislate. The concern of Harvard, Bok said, is with "what occupies a professor's mind when he wakes up in the morning". Since this information is inaccessible, there must be certain guidelines. For instance, at Harvard and at Massachusetts Institute of Technology no professor may be a corporate executive and retain his faculty post. Nor may he hold a "significant number of shares" in a job-related company. ("The main flaw in Bok's position," Gilbert later said, "is in his argument on shareholding. What constitutes a 'significant number of shares?' There is only one clean line and that is no shares at all.") Bok said that on the other hand the university permits its faculty members to spend up to 50 days per year away from their laboratories consulting with industry (at a going rate of \$200–\$2,000 per day). He warned that it is as important that a university should be seen to avoid the dangers in faculty or university relations with biotechnology firms as that it should actually avoid them.

James Aisenberg

British biotechnology

Imperial poised

Imperial College London has found an ingenious way of dragging itself by its bootstraps into the brave new world of biotechnology. A few weeks after the college arranged that its fermentation pilot plant should be transferred to a private company financed by TDC Developments Limited and called Imperial Biotechnology Limited, a venture capital firm, the college is in the market for three staff members — a professor (whose stipend will be provided by the Leverhulme Trust) and two lecturers, whose salaries will be met by the fees earned from contracts with outside bodies based on the use of the pilot plant.

The chairman of the Centre for Biotechnology that will result, Professor Brian Hartley, says that the development at Imperial College shows that universities can still embark on novel undertakings when general funds for universities are restricted. In these days, he says, a college that has three vacant posts on offer in such a field is in a unique position. He is undismayed that the local branch of the academics' union (the Association of University Teachers) has complained that new academic posts should not be created when the holders of other academic posts are being threatened with redundancy.

The Imperial College pilot plant, built somewhat before its time was ripe at the instance of the late Sir Ernst Chain and until quite recently considered something of a white elephant, and has turned out to be a marketable asset. Imperial College has, however, reserved 20 per cent of the time available at the pilot plant in lieu of shares that would otherwise have been available.