

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. IASA's nine projects for 1983 will now have to be found within a budget of 115 million schillings. IASA'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 ending.

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.

Exploiting genetics

Washington

Congress keeps muttering about legislation to regulate links between universities and industry on the exploitation of genetic engineering. Last week, Congressman Albert Gore's oversight committee held two days of hearings on the conflicts of interest that have arisen or may arise. The occasion gave university representatives an opportunity to parade local solutions they believe will prevent a recurrence of recent controversies.

In several well-publicized cases, university researchers pursued work in outside corporations that closely paralleled their academic research, and the financial arrangements between the parties, suggested conflicts of interest. (In the recent Calgene case, for example, a plant biologist at the University of California at Davis received a grant from Allied Chemical. The researcher was also vice-president of Calgene, a biotechnology firm in which Allied subsequently purchased a 20 per cent interest (see *Nature* 4 March, p.6).

Recent large grants by corporations to Massachusetts General Hospital and Washington University, St Louis, have heightened concern over possible conflicts with traditional freedom of academic inquiry.

Roderick Park, vice-chancellor of the University of California at Berkeley, testified — as did representatives of the University of Wisconsin, Stanford University and the University of California at Davis — that the universities are themselves concerned. Draft principles under consideration at Berkeley, for example, would prohibit

any research on campus "whose benefits to education and research are small"; would require sponsors of research to allow free publication of all results; and would "scrutinize", but not necessarily forbid any arrangement that involved sponsorship of campus research by a company in which the researcher held a financial interest.

At the hearings, critics of university-industry ties had a chance to point a finger at some of the more notorious conflict-of-interest cases and called for federal guidelines on financial disclosure. Albert Meyerhoff of the Natural Resources Defense Council (NRDC) testified that the universities have already proved incapable of confronting these issues themselves. The Pajaro Dunes conference failed to accomplish its purpose of drawing up ground rules for industry-sponsored research, he said. Meyerhoff also criticized the Stanford faculty for having rejected a proposal requiring disclosure of conflicts of interest.

NRDC called for federal legislation that would require universities receiving federal research funds to adopt financial disclosure rules for faculty. Researchers should disclose any financial interests they have in research sponsors and also any interests in companies that could benefit from their research, NRDC said.

No such legislation has been introduced. But Representative Albert Gore (Democrat, Tennessee), who conducted the hearings, has been increasingly concerned over the effects of new industry-university ties.

Stephen Budiansky

Professor Hartley says that the new research and teaching centre will have two chief lines of enquiry — the engineering of microorganisms able to digest wood and wood-like natural materials (including sugar-cane and bagasse) into usable chemicals, and the development of enzyme electrodes or sensors by which means the activity of a biochemical enzyme can be coupled directly to a semiconductor device. "We may be able to make microprocessors that can smell", Professor Hartley said.

On his own position at the centre, Professor Hartley says that there is no conflict between his chairmanship of a new academic centre and his membership of the scientific advisory board of Biogen, the Swiss-based company. He explains that his contract with Biogen allows him to keep confidential his work within Imperial College and vice versa. He considers that the centre, now that it is a going concern, will be able to apply successfully for a subvention from the fund earmarked by the University Grants Committee for the support of biotechnology in British universities (see *Nature* 20 May, p.173).

Research council visitors

No-gag gag

Allegations that foreign scientists visiting British research council laboratories are subject to serious constraints on their freedom of expression seem to be a storm in a teacup. What is at issue is whether the terms on which visiting scientists agree to work in British laboratories muzzle public criticism of council policy.

Mr Stanley Alderson, who describes himself as a writer and human rights campaigner, claims that foreign scientists visiting the Agricultural Research Council (ARC), Medical Research Council (MRC), Science and Engineering Research Council (SERC) and Social Sciences Research Council (SSRC) are asked to sign an agreement, known as Form Y, accepting the conditions of work undertaken by British employees of the councils. As well as agreeing to observe safety arrangements, patent regulations and conditions governing publication of research work, visiting scientists

are also required "during (their) visit and afterwards . . . not to mention the Council's name in any public controversy". Mr Alderson says that the last condition is inspired by Section 2 of Britain's Official Secrets Act and contravenes the human rights guidelines of several international organizations.

The issue may be taken further. Not only does Mr Alderson plan to write to the national newspapers but Lord Avebury has written to Sir James Gowans, Secretary of MRC, drawing his attention to Form Y. Lord Avebury professed himself astonished that "any self-respecting scientist would give such an undertaking which on the face of it puts a gag on visiting scientists" and prevents them from ever commenting publicly on the policy of the research councils.

The research councils are clearly surprised and bewildered to find themselves at the centre of such a maelstrom. "Form Y? Notes for the guidance of visiting scientific workers? What is it? We've never heard of it." Form Y is in fact used only by MRC; visiting scientists are asked to sign it in exchange for access to MRC facilities.

An MRC spokesman said that Form Y had nothing to do with the Official Secrets Act and merely expressed work conventions understood by employees of any establishment. The phrase which requires that MRC should not be mentioned in any public controversy conforms with the guidance given to its own employees and was inserted to avoid embarrassment — when making a public statement the individual should make it clear that he is speaking on his own behalf and not stating council policy unless he has obtained official approval in advance. MRC employees, he claimed, are not prevented from expressing their opinions as private individuals.

Visiting scientists at ARC and the National Environment Research Council (NERC) are asked to sign a form covering standard conditions — patent rights, health regulations, publication conditions — but there is no clause referring to the councils in any public controversy. NERC employees and overseas visitors who come for two or three months do have to sign Section 2 of the 1911 Official Secrets Act and Section 1(2) of the 1920 Act. SERC has no official form at all, and the only restriction on visitors is that covering patent agreements.

What seems clear is that the obligation, explicit or understood, on an employee not to speak publicly on behalf of his employing body without official approval does not limit his right to speak out on any issue whatsoever as long as he makes it clear he is expressing a private opinion. What is not so clear, however, is whether an individual, employed by or visiting a research council, can publicly criticize the policy of the council without the fear of being disciplined.

Jane Wynn