

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.