

commercial company differs from the sale and exploitation of patent rights, however profitable. The circumstances in which universities may properly set up commercial companies to exploit work of their faculty members are thus easily defined. Success must not depend on future promise, and there must be no foreseeable circumstances in which an academic will feel compelled to function as the research or even marketing director of a company if things should start going wrong. The academic freedom most at risk is that of the academics who are most directly involved.

A further difficulty, which persists even though the university has said no to its commercial venture, is that the laboratories of individual professors will continue to be sources of research with entrepreneurial potential. Even if Ptashne decides not to go ahead independently of the university, Gilbert as a member of Biogen will no doubt remain on the lookout for ideas that can be exploited commercially. No doubt he will be as anxious as his academic colleagues that he should never be open to the charge of making inequitable use of his position, and of his access to university facilities. The most immediate cause for concern must be the graduate students working in his and other people's laboratories. Graduate students are called students because the university to which they belong is responsible for their further education, and the formalities of registration for higher degrees reflect that understanding. There is, however, an obvious danger that in the present excitement about recombinant DNA, the Gilberts and Ptashnes of this world, but also their graduate students, will put commerce before education. Having said no to the university's proposal, the Harvard faculty now has no choice

but to make more explicit its corporate responsibility for graduate students.

In the long run, Harvard will find it necessary to take a further and more painful step. A university is a kind of club of academics, kept together by mutual respect. Academics' external interests are by no means always destructive of that spirit. Academics who serve their governments, who write good literature or who add to the public enlightenment in other ways, often by doing so enhance the esteem in which they are held by their colleagues and in which their university is held by the wider public. Naturally, most universities have explicit rules for making sure that academics are not so caught up in extramural activities that they have insufficient time for their students, but there are other less formal constraints to be reckoned with. The worst offence an academic can commit against his colleagues is to abuse his position as a member of his academic club.

Yet universities (like other kinds of clubs) differ in their unspoken definitions of what constitutes abuse. Even at Harvard, it seems to be accepted that within reason people should be able to advise commercial companies. The problem of the faculty member as entrepreneur in the exploitation of his own research seems not previously to have arisen as sharply as in the past few months. (At some other universities, it is commonplace.) The Harvard faculty seems to have been taken by surprise. It has only itself to blame for not having made its unspoken rules explicit long ago. What it needs now is a general understanding that people's extramural activities and the financial gains therefrom are fully disclosed within the faculty, and are proper material for faculty discussion and even decision.

How not to run a public monopoly

The British government's proposals for the reorganization of the British Post Office (see *Nature* 27 November) seem calculated to win the worst of all possible worlds for everybody concerned, but the hapless users of telecommunications systems in particular. The chief purpose of the bill soon to begin its passage through the House of Commons is to separate the postal service from the rest of this nationalized industry, and there is no argument about the wisdom of that course. Indeed, for more than a decade the Post Office has been organized internally as if it were two organizations — a loss-making postal service and a money-making telecommunications service. Three years ago, Sir Charles Carter's committee on the problem told the government that it should go the whole way along this road, and formally split the two parts of the business. Everybody agrees that this should be done. But how?

The issue is important for several reasons, but not least because of the technical importance of the telecommunications industry to the wealth (and even the health) of a modern state. For far too long, Britain has been badly served by the electronic half of the Post Office. When other countries were installing modern and increasingly versatile telephone systems, would-be British users were forced to wait, often for more than a year, for the privilege of renting an antiquated handset. From time to time, bursts of excitement would nevertheless filter out of the British government's public relations network, explaining that this or that new miracle was about to be brought into service. In the late 1950s, for example, the "world's first" electronic exchange was being praised to the skies. Unfortunately, it never worked. More recently, with the new internal arrangements at the Post Office, there has been discerned a sense of realism. The managers of the telecommunications network have plainly begun to come to grips with the nature of their business. Keeping up with the Joneses (or the Japanese) technically is much more difficult than it seemed in the old days, when the Post Office would draft a specification for some new system and farm out the development and manufacture of the equipment to a cosy cartel of manufacturers. But the technical problems are not even half the battle. Managing a complicated telecommunications network is hair-raising.

Meeting the cost of developing a modern network is an exercise in high finance.

In all the recent discussions about the British Post Office, it has been plain that the crucial question to decide is where the line should be drawn between the public monopoly and private enterprise. Again, there is no dispute about the good sense of monopoly ownership and management of the telecommunications network. Every modern state has been driven to recognize as much. The questions that arise concern the definition of the monopoly at its margins, and the arrangements for its regulation. In Britain, there has been a lot of excited talk (encouraged by Sir Keith Joseph the industry minister) about the shading of the telecommunications monopoly. There are two respects in which this might with advantage be done. There is a need that those who rent access to telephone lines or other channels of communication should be allowed to attach to them whatever terminal equipment they choose, provided it is technically compatible with the network (and also legal). For no single organization, however competent (and British Telecom has a great deal of depressing history to live down), can hope itself to supply everything that users of the network are likely to need in the decades ahead. But the network (whatever it is) should also be usable by people prepared to offer services that the monopolists themselves choose not to offer.

Sir Keith Joseph's reorganization bill fudges both these issues. British Telecom will not have an exclusive right to supply all terminal equipment, but it will be dragged in if an attachment has to be serviced, while the minister's own civil service will assume some of the responsibility for telling what attachments can be attached. And yes, there will be arrangements for letting private people use the network for providing novel services, but again the details are not worked out and the minister's civil servants will again decide. The consequences of these un-Tory compromises are potentially disastrous. Neither British Telecom, the users of the network nor manufacturers of equipment will know where they stand, but crucial decisions about the development will return from whence they came several years ago — to the civil service.