

only complaint that can be made is that the council keeps its reasoning to itself. The most immediate hazard is that in the process wrongheaded policies may go unrecognized, even by the council. But there is possibly a greater cause of loss than that. Because the council occupies a pre-eminent position in the pattern of research in Britain, it is natural to look to it not merely for the conduct of research but for a lead in the evolution of research policy. If the council is ever to shake off its reputation for gifted—or perhaps just lucky—empiricism, it will have to cultivate the skill of stating its objectives publicly.

## FUSION BY HALVES

THE decision that the scale of operations at the Culham Laboratory should be cut in half is painful for everybody concerned. Even Mr Wedgwood Benn had no relish for the task of cutting down the budget, which is plain enough from what he had to say in the House of Commons on July 26. But the sense of regret which may haunt the Minister of Technology will be nothing compared with the regret at the laboratory itself. People will start looking around for jobs elsewhere and will quite understandably ask why it is they who should be the victims of such cruel circumstances.

Unfortunately, of course, there is very little doubt that the decision now taken has been necessary. For several years now the work at Culham, as at the other thermonuclear laboratories scattered around the world, has been directed at a receding target. It is a long time since people used to make calculations about the detailed operating characteristics of thermonuclear power stations—the optimum output of electricity, for example, or the cost of the concrete shielding necessary to keep the installations safe. Instead, thermonuclear research has become a synonym for the careful study of instabilities in electrical discharges through highly ionized plasmas. Those engaged on it have been cheered up when from time to time it has become clear that their work could be useful in other fields—in astrophysics, for example. Although it would be foolish now to say that the commercial exploitation of thermonuclear power is not feasible—indeed, the opposite is probably the truth—those who work in fusion have been forced to take the long view. This is one reason why they have been quick to point out that the experiments with the large pieces of equipment which they use may bring much more immediate benefits in electrical engineering, for thermonuclear equipment is a notorious consumer of high density current. The trouble here is that it is not possible, in Britain at least, to justify the cost of research programmes by the putative value of the spin-off they may provide. In the circumstances there is no doubt that Culham has grown too big.

But if not fusion why not something else? In other words, why shouldn't Culham take a leaf out of the Harwell book and attempt to diversify its activities?

Reading between the lines of Mr Benn's statement in the House of Commons, the ministry is not keen to encourage this possibility. That, too, is also right. For one thing, there is no assurance that Culham would be any more successful at finding self-financing work to do than the other public laboratories now touting for industrial contracts. Evidently there are limits to the extent to which industrial research can be subcontracted. But it is also important to acknowledge that it would be intolerable if the long-term pattern of applied research in Britain were determined by the historical accidents of where laboratories were established in the forties and fifties. Indeed, long-term economic interests may even require that laboratories should be regarded as expendable. Certainly they are much less durable capital assets than, say, steel works. The cost of building them and equipping them is often less than the cost of running them for five or ten years. In other words, if the present scale of operations at Culham is really too lavish, there is no point in supporting it at an artificial level. To let things run down to half over five years seems sensible in the circumstances.

Whether it is wise to let Culham continue as a dependant of the Atomic Energy Authority is another matter. In previous years there seems no doubt that Culham has profited enormously from rubbing shoulders with those engaged on reactor design at Harwell and elsewhere. For some years to come, however, there will be much less profit to be derived that way. A question which needs asking is what setting will best allow a £2 million a year laboratory like Culham to keep going productively. There is a strong case for thinking that the laboratory would be better off under the Science Research Council than as a continuing dependant of the AEA. (Another less satisfactory possibility would be an autonomous laboratory within the Ministry of Technology.) For one thing, there would then be a chance that it could flourish as the magnet laboratory on which the SRC seems to have set its heart. It might also then be able to contribute more effectively than at present to the development of university interests in plasma physics. As things are, the universities do not participate in the design of the biggest pieces of equipment. And in the long run, of course, it would be possible to arrange that the scale of expenditure at Culham could be determined by a sensible matching against other demands for funds for long-term research.

There remains the question of whether the experience with the Culham laboratory will persuade scientists that working for the Government is as hazardous as working for industry. However much advantage may be taken of what is called natural wastage at the laboratory, the chances are high that many people will find themselves moving to other places against their wishes, possibly because opportunities of promotion are not easily offered. It would be sensible if the Government would recognize that this is as much a social problem as the difficulty caused in coal fields throughout the country by the running down of fuel production. In other words, the Government has a

duty to ensure that people whose jobs come to an end or whose prospects are unreasonably dimmed must be given some kind of help to find other outlets for their energies. No doubt there will be some talk of compensation payments. No doubt attempts will be made to fit people in elsewhere within government establishments. But it would be better in the long run, and a good precedent as well, if the Government were to recognize that what the circumstances require is a thorough-going programme of retraining and resettlement backed up by generous schemes for helping people move from place to place. One of the ironies of the two decades since the war is the growth of the assumption that scientists working in some narrow field cannot be expected to transfer their interests to some other. It seems to have been forgotten that during the Second World War every other biologist was trained to be a radar engineer almost overnight. If the country is really short of talent, and if the Ministry of Technology is anxious somehow to increase the effectiveness of what there is, it should put its energies into making full use of the people who will no longer be fully occupied at Culham.

## SPEAKING FOR UNIVERSITIES

THERE is something entirely appropriate about the election of the new chairman of the Committee of Vice-Chancellors and, in the same week, the announcement that the Department of Education and Science will, after all, assume direct responsibility for seeing that universities spend public money in a manner which is seemly but as yet undefined (see page 576). The universities have never been as much in need of somebody who can act on behalf of them all. With one thing and another it has been a bad year for the universities. For one thing, it is becoming ominously to seem that the first bite at the Robbins cherry may also be the last. Gone already is the heady talk of how the university system might grow and grow so as to provide a substantial part of the adult education on which such hopes as may survive for British economic prosperity must rest. The gloom which has been accentuated by the tactless handling of the equipment grants by the University Grants Committee may lift when the funds for the five years from 1968 are announced later in the year, but nobody can be cheerful at this stage. And then there is the galling incident of the Government's decision to increase fees for university students from overseas without properly consulting the universities. Yet the universities themselves have done very little to face up to the problems which confront them. Such talk as there may have been of more efficient operation seems to have been largely ineffectual. The Standing Conference on University Entrance will probably come out with more liberal rules for admission in the next few months, but the universities as a whole have done

little more than Oxford after Franks to protect themselves from criticism.

This is why the new chairman of the Committee of Vice-Chancellors can play a decisive role. It has been plain for the past five years that the UGC is less and less effective as a buffer between the universities and the Government. That this should have happened is inevitable. The growth of the scale on which the universities are supported by public funds is less important than the now open abandonment of the whole convention that universities should be protected from the knowledge that they are living on taxpayers' money. Indeed, it is no longer possible for a government to allow that universities acting for themselves should make important decisions affecting public policy. And it is, of course, entirely sensible that the Government should have the last word about questions such as the proportion of the British GNP to be consumed by higher education. A good many in the universities will agree with that. Yet the universities must be able to retain freedom over academic policy and self-respect as well. Even if the UGC can keep for itself something more than the role of being Sir Herbert Andrew's auditing department, there is now no chance that a body of civil servants like the UGC can set itself up as a means of keeping an effective dialogue with the Government on university policy and, when necessary, as over fees for overseas students, to defy the Government. For a long time it has been obvious that only the Committee of Vice-Chancellors could fill that role.

But what needs to be done? The most immediate task which Dr Christopherson should undertake is to let it be known that the Committee of Vice-Chancellors is not some kind of quasi-judicial body, a pillar of the establishment, but an institution which must be reckoned a political force. For too long the committee has sought to win respect by making itself almost inaudible on matters of public policy. The trouble, of course, is that if it is to carry university opinion, the committee must function publicly, making statements, publishing newsletters and sometimes even taking steps to improve its standing with the non-academic world. If on some occasion it finds that the Government has not consulted it on important issues of principle, it should feel free and strong enough to take unilateral action on its own account. (A public appeal for funds to make up overseas fees would have been an interesting exercise.) And then, of course, the committee must somehow capture the respect and the loyalty of the separate universities, so that it can act quickly on their collective behalf. This in turn will imply that universities must delegate some of their freedom of action to the committee and, lower down the hierarchy, that university departments must give up some of their present autonomy for the greater good. How far things can go in these directions, only time will tell. But clearly one of the most obvious needs is that the chairman of the committee should command respect. Fortunately, Dr Christopherson is the sort of man who will appreciate what needs to be done.