

Two other aspects of the department's varied research programme include an investigation into the effects on the lungs of breathing in radioactive xenon—headed by Dr H. L. Leathart—and a continued ergonomic study of industrial component inspection using a conveyor belt. This study is being conducted by Mrs Judy Lion.

Also housed in the department is the Decompression Sickness Registry, directed by Dr P. D. Griffiths. Although the Medical Research Council grant supporting the registry is made to Professor D. N. Walder, in the Department of Surgery, who is concerned with the significance of gas micronuclei in the aetiology of decompression sickness (see *Nature*, **222**, 251; 1969), the records and radiographs of thousands of men who have

worked in compressed air are kept in the department. So are the new decompression tables giving the most suitable length of time for decompression, which are being widely used in compressed air work on an experimental basis. Under these tables, a man working at 44–46 pounds per square inch—almost the limit for civil engineering work—is required to decompress for 270 minutes compared with the 127 minutes required under government tables. Working in close association with other members of the MRC Decompression Sickness Panel, Dr Griffiths and Dr McCallum periodically arrange for X-rays to be taken of the limbs of men in compressed air work in the hope of detecting, at an early stage, aseptic necrosis of the bones.

Growing Pains in British Universities

by our Education Correspondent

THE next few years could see major changes in the British system of higher education. The number of student places must double in the next ten years: that now seems to be recognized both by the government and the universities, and it is unlikely that the system will come through such expansion unchanged. But the changes will inevitably be accompanied by their fair share of arguments. Preliminary skirmishes have already been made—the Department of Education and Science, in October and December last year, discussed, with the Committee of Vice-Chancellors and with the Association of University Teachers, various ways to achieve the expansion as cheaply as possible. It seems likely, however, that both bodies will reject most of the proposals put forward, and Mr Gerald Fowler, Minister of State with responsibility for higher education, has already complained that academics are being hypersensitive to alleged threats to academic freedom.

The controversy has been brought to a head by the latest predictions of the demand for higher education in the 1970s. Using the Robbins basis of relating entry to higher education with numbers of school leavers, the ministry predicts that 437,000 students will be engaged in higher education in 1971–72, 557,000 in 1976–77 and 727,000 in 1981–82. It suggests, however, that colleges of education will only increase their intake by about 20,000 in the next ten years, and the universities and further education establishments will therefore bear the brunt of the expansion. Such an expansion will require about a 7 per cent annual increase in student numbers, and it is unlikely that expenditure on higher education will be allowed to grow at the same rate. Faced with the demand for places outstripping the available resources, Mr Fowler has been casting around for ways to reduce the costs per student, and it is this which has stirred up the rumblings in the universities.

Analysis of the Department of Education and Science's figures for 1959–60 to 1967–68 suggests, however, that the government may already be reducing the costs per student. Fig. 1 shows that expenditure on the universities rose at about the same rate as student numbers between 1959 and 1964. But after

1965, when the Colleges of Advanced Technology were given university status, costs rose less sharply than student numbers. Even if these trends were continued, it is doubtful whether it would effect the saving which Mr Fowler wants, and moreover, expenditure on new buildings will inevitably tend to push costs up. For one thing, expansion of this order would require that several new universities must be established. It is reasonable to expect that existing institutions can do no more than treble in the next decade (only Reading and Strathclyde have done this in the past ten years), and most universities believe that about 12,000 is the maximum size that they could achieve without becoming completely impersonal establishments. Even if existing universities expand as quickly and as far as possible, the expansion would therefore fall short of the target for 1980.

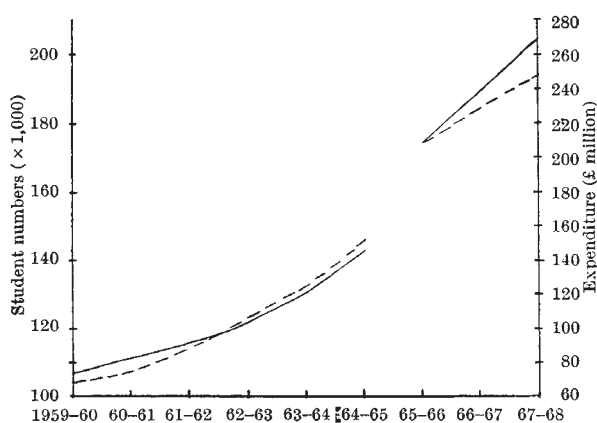


Fig. 1. Student numbers and university expenditure, 1959–68. —, Student numbers; ---, university expenditure.

Some change in the system therefore seems inevitable, and the Department of Education and Science has suggested thirteen proposals to the vice-chancellors and the AUT for their consideration. Individual vice-chancellors will submit their own views to the Vice-Chancellors Committee probably early in February, and the AUT has set up a working party to formulate a

policy for the universities in the 1970s. This policy will be presented to an extraordinary council meeting probably in March. At least twelve of the thirteen points are likely to be rejected by both bodies.

The proposals which seem to have caused the most concern are those which seek to alter the length of degree courses and the number of terms in a year. Among the points put to the vice-chancellors were proposals for replacing the present three-year courses with two-year courses of four terms a year, and for introducing a "box and cox" arrangement, in which the university timetable would be arranged in such a way that two sets of students could be taught in the same year. A similar arrangement is at present being operated by some colleges, one set of students being taught when the other is on vacation or industrial training. The vice-chancellors maintain, however, that alteration of the university year would inevitably reduce the time available for research and would place an intolerable burden on teaching staff. Sir Derman Christopherson, chairman of the Committee of Vice-Chancellors, speaking at the North of England Education Conference on January 9, also maintained that the three-year degree course and the present low drop-out rate would become more important in the future.

The Department of Education and Science also canvassed the possibility of student loans and of increasing the percentage of students living at home as measures likely to effect some reduction of cost, but both these suggestions will be bound to antagonize the National Union of Students, and it seems that the Association of University Teachers and the Vice-Chancellors would also oppose them. Sir Derman Christopherson, for example, said that students and their parents are already finding about £20 million a year towards making up their grants, and that simple commercial loans would tend to restrict higher education to those who could afford to pay for it. Professor Michael Swann, vice-chancellor of Edinburgh University, commenting on this, said that loans would not save very much money, but he suggests that neither students nor staff are as violently opposed to their introduction as is usually claimed.

Unless the number of staff increases at the same rate as the number of students in higher education, the staff/student ratio will inevitably suffer, and this is an aspect of the proposed expansion which seems to alarm many academics. The ratio in British universities, about 1 : 8 or 9, is, however, much lower than in most other countries, and Sir Derman hinted at the Northern Education Conference that he is prepared to see it raised slightly. He suggested, for example, that some departments could accept more students without parallel staff increases and without loss of quality. Professor Swann also suggests that if research facilities were expanded at the same rate as student intake, then some deterioration in research quality may be unavoidable. He therefore sees the higher education system developing more along the lines of the American system, with postgraduate schools becoming further removed from undergraduate teaching, but he indicated that he thought this to be a step in the wrong direction.

None of the proposals put to the vice-chancellors suggests that the government has altered its thinking on the binary system in higher education. One proposal did suggest, however, that there should be more sharing of resources between the universities and the polytechnics, and this is unlikely to be opposed by the

vice-chancellors or by the AUT. There are indications, however, that the universities may be prepared to see the binary system eroded away. Sir Derman told the Northern Education Conference that "the separation of the education and training of most teachers from that of other students is an unsatisfactory arrangement which ought to be brought to an end as soon as possible", and he suggested that colleges of education should open their doors to students taking general degree courses, courses in social services and possibly science courses as well.

The AUT is likely to oppose the binary system outright. Like the National Union of Students, it sees the system as wasteful of resources, and it is bound to perpetuate the elitism of the universities. The AUT working party on policy for the universities in the 1970s suggested to the AUT annual council in December that an expanded University Grants Committee should distribute capital and recurrent finance to universities, polytechnics and in due course to colleges of education. A very similar system was proposed by the Select Committee on Education and Science last year, when it suggested that a Higher Education Commission should finance all sectors of higher education. But the government has given no indication that it intends to act on the Select Committee report, and indeed, maintaining the binary system seems to be central to its thinking on higher education expansion.

In a speech to the NUS Universities Conference on January 6, Mr Jack Straw, NUS president, argued that expansion is absolutely vital, and that the NUS regards the figures for student numbers in 1980 as a low basic minimum. The NUS also believes that the binary system should go, and Mr Straw argued for comprehensive institutions of higher education to be established. These institutions, called "polyversities", should provide a variety of courses, as wide as the universities, the polytechnics and the colleges of education combined, and they should accommodate both full and part-time students.

Both the NUS and the AUT are, however, less explicit about where the necessary finance should be found. Indeed, Mr Straw throws that problem back at the government by suggesting that it is not the duty of a pressure group like the NUS to do the work of the Treasury. He maintained at the Northern Universities Conference, however, that Britain lags behind most other advanced countries in an international league table of education expenditure. Using 1962-63 figures, Mr Straw said that the USSR spends about 8 per cent of its GNP on education, Japan, Holland and Canada each spend about 7 per cent and the United States spends about 6.3 per cent. Britain, on the other hand, devotes only about 5.8 per cent of its GNP to education. Mr Straw therefore suggests that the government is throwing a "smokescreen of panic" over the whole issue, and that the proposed expansion would do no more than bring Britain into line with other countries.

Although it seems that there is to be considerable controversy about the means of achieving the proposed expansion in higher education, both the government and the universities accept that it is necessary, and that doubling the numbers of students will not necessarily cause a deterioration of standards. Sir Derman Christopherson maintains that standards have been rising during the 1960s, although student numbers increased at an unprecedented rate, and Mr Fowler said that the doctrine that "more means worse" is

patently untrue if one looks at the experience of other countries or of Britain during the past decade. If the projected figures for student intake in the 1970s are not met, competition for places in 1980 would be even stiffer than it is now, and the proportion of students undergoing some form of post-school education would

be well below that of most other advanced countries. Moreover, even if provision in higher education were made for everybody who has minimum entry requirements now, Britain still would not have a mass higher education system equivalent to that in the United States.

Signs of Change at UGC

THE shortage of funds of which British academics have been complaining in the past year seems now to be real enough to have caused an actual decline in the cost of university education. This is apparent from the latest Annual Survey (for 1968-69) of the University Grants Committee (HMSO, 4s), which shows that in terms of 1967-68 prices, the cost of educating a full-time student fell from its peak of £900 a year in 1966-67 to £877 a year in 1968-69. The cost of paying academics has decreased steadily for the past four years, and now amounts to £357 per student per year, chiefly because of the slow increase of the ratio of students to staff, which is now greater than at any time since 1962 even if the British ratio remains, as the UGC reminds its pensioners.

The UGC is now half-way through the most turbulent quinquennium for a long time. The new report is the first to be presented by the new chairman, Mr Kenneth Berrill, who succeeded Sir John Wolfenden in January 1969. The quinquennium has already seen the controversy about the report of the Prices and Incomes Board on academic pay (December 1968), a strike by university technicians, a running battle (or skirmish) between the UGC and the universities over attempts to assess the productivity of academic people, the decision that the accounts of universities should be open to inspection by the government's inspector, the Comptroller General, and the perpetual quarrel about money. The new survey looks all these issues in the face but seems to dodge altogether more important issues of public policy—the relationship between the universities and the polytechnics. Nobody will take offence.

The intervention of the Prices and Incomes Board has clearly sharpened the aim of the Association of University Teachers to participate in formal machinery for the negotiation of salaries, although it seems clear that the question has not yet been settled of whom the AUT should negotiate with. The UGC is the obvious adversary, but everybody knows that it does not have the power to summon up the money needed to settle pay increases which may be forced on it, yet negotiation directly with the Treasury, which really holds the purse-strings, would undermine the doctrine of the autonomy of the university system. In default of a solution, the Prices and Incomes Board has been retained as referee, and a pay settlement based on data soon to be available will be back-dated to the beginning of the current academic year.

The UGC continues to provide funds for schemes which foster collaboration between universities and industry—many of the 38 grants now current (which will cost £190,000 in the current year) are for training courses in subjects such as cryogenics and food

engineering, but three universities (Bath, Heriot-Watt and Dundee) have been blessed with industrial liaison officers while others have acquired lecturers in subjects such as management. These grants are only available for periods of three years, and it is laid down that the Science Research Council will often be involved in the making of decisions about new courses.

A kind of raffle among universities seems to have succeeded in increasing the number of places for teacher trainers in university departments of education by about 250—the UGC says there has been a good response to its scheme for paying to universities willing to increase their effort in teacher training sums of money which are multiples of £2,500 in each of the last two years of the quinquennium. There has been a similar success with even smaller sums of money as prizes in the provision of 150 extra places for psychiatric social workers, but management education remains a running sore—the two schools at Manchester and London are financed through the Foundation for Management Education, which is in turn dependent on subscriptions from private business and the government, but the UGC now calculates that there will be a rapid growth of its own responsibilities for management education at other universities. Outsiders will marvel that the two systems seem destined for indefinite co-existence.

If the UGC is a little too obviously anxious not to give offence in what it has to say about medical education, there is a robust if modest declaration of more support for marine biology, one of the chief features of which will be the setting up of the Scottish Marine Biology Association at Millport as a common university facility under the Natural Environment Research Council when the present staff moves into its new premises.

On the administration of university finance, the UGC is plainly (and rightly) proud of its scheme to devise a computer model of the university system so as to help with the allocation of funds, but a little nervous in its account of how it has rejected the advice of the Committee of Vice-Chancellors that at the beginning of future financial quinquennia, universities should be told all at once how much they will have to spend. The UGC argues that the first of the five years should be dealt with by means of a provisional settlement, although it does undertake to provide estimates of the likely size of the student population. The committee says that it has taken the opportunity provided by the government decision that local authorities will not in future be expected to help in financing awards to postgraduate students to set up, jointly with the research councils, a Committee on the Co-ordination of Postgraduate Awards.