

## ENERGY

## How Gas Lost

THE extent of the British Government's retreat on the use of natural gas in power stations was described last week in a paper discussed by the Institute of Actuaries. The institute, not usually a place where fuel policy is discussed, was talking about a paper by Mr C. I. K. Forster, director of statistics at the Ministry of Power. Mr Forster provided the fullest account yet published of the background to the Fuel Policy White Paper of November 1967, and also of the developments since then, which have included a Government directive to the Gas Council and the Central Electricity Generating Board that no natural gas is to be sold for electricity generation.

The Fuel Policy White Paper, Mr Forster explained, resulted principally from two statistical exercises; first, the "assumptions exercise", which was intended to produce unbiased estimates of the demand for all types of fuel until 1975, and second, the "natural gas absorption exercise", intended to define how far gas from the North Sea was likely to penetrate into the domestic fuel economy. These two operations, completed by January 1967, showed that coal was facing a sharp decline whatever policies were adopted. Greater protection for the coal industry seemed impracticable, Mr Forster said, as well as costly. By April 1967, the chances of absorbing natural gas more rapidly seemed to have improved, and new estimates were made which suggested that the electricity generating industry would by 1970 be using an amount of gas equivalent to 9 million tons of coal, and by 1975 equivalent to 14 million tons of coal. But after the Fuel Policy conference in May at Sunningdale, Lord Robens won a substantial victory with the admission that the rate of contraction envisaged for the coal industry up to 1970 was too damaging; the White Paper in November that year gave a consumption of only 2 m.t.c.e. of gas in the power station by 1970, instead of 9 m.t.c.e. Oil had also suffered a cut-back between the April assessment and the White Paper. These were substantial concessions, but they have been followed by further reductions in the potential market for gas, including, most recently, the decision that the Gas Council is to sell no gas at all for use in power stations.

All this will one day make fascinating material for the historians and students of pressure group politics. Meanwhile, the Ministry of Power has moved on to the production of its computer model of the fuel economy, which should in future make a contribution to the formulation of fuel policy. Mr Forster said that the model is now reaching its prototype stage, and that further development will certainly be necessary before the ministry and the fuel industries have real confidence in the results. In its present form, the model is not capable of determining what policy is best even on a specified set of assumptions, because not all of these have yet been quantified—the convenience of different fuels, for example, cannot easily be assessed, and the assumptions could also be upset by a successful advertising campaign by one or other of the competing fuels. But it should be able to indicate the likely consequences of a variety of decisions; as Mr Forster puts it, the sort of questions it will be able to answer will be "What would be the likely outcome of . . . ?" Or "How much difference would it make if . . . ?" When the model

can answer questions like these, it will be, said Mr Forster, "a powerful and flexible tool . . . but human judgment will remain a vital element".

## UNIVERSITIES

## Brighter Statistics

WHATEVER may be tarnished about the University Grants Committee, the committee now has a bright new format for its latest set of statistics compiled from the returns of British universities. Instead of publishing the returns as in the past as a parliamentary document, riddled with illegible six and seven point type, the latest volume, reporting the position at the end of the autumn term of the 1966-67 academic year, has appeared as *Statistics of Education, 1966*, volume 6 (HMSO, £2). Apart from simply making the returns more legible, the Department of Education and Science says the welcome change to the format of the *Statistics of Education* series has been made for the sake of uniformity.

It remains to be seen whether the change of style will be followed by a shortening of the ridiculously long time it takes to publish the returns. The latest statistics are just over two years out of date.

Much of the information deserves to be published much sooner—the costs of running different departments, for example (Table 1). The difference in cost per student between the arts and social sciences on the one hand and the natural and applied sciences on the other is no surprise—it reflects the cost of running laboratories. But why does it cost 50 per cent more to train a biological scientist than a physical scientist? The economies of scale, if not the complete answer, certainly have much to do with it. The physical sciences departments at the fifty-two universities covered by the returns house more than six hundred students each, compared with only a hundred and thirty undergraduates in the combined biological sciences departments at the average university.

Table 1. AVERAGE COST PER STUDENT BY FACULTY AT BRITISH UNIVERSITIES IN 1966

	Departmental expenditure excluding research grants in £	Undergraduate numbers	Apparent average cost per student in £
Arts	11,591,460	32,483	369
Social studies	9,345,805	28,149	330
Physical sciences	19,319,039	31,831	610
Biological sciences	6,266,675	6,690	930
Engineering	12,740,213	16,356	780
Preclinical medicine	5,791,213	7,124	810
Clinical medicine	8,564,115	6,389	1,340

Some very small biological sciences departments prove to be extremely expensive when judged by this criterion. For example the biology department at the University of Manchester Institute of Science and Technology with an undergraduate population of 13 spent £23,777. UMIST may be a special case because it had 12 postgraduates and spent only £897 from research grants. But at Dundee, the 32 biological sciences undergraduates cost £40,489, over £1,000 per head; at Surrey 41 undergraduates and 5 postgraduates cost £65,294; and at Sussex the 32 undergraduates and 11 postgraduates cost £61,810 plus £25,132 from research

grants. In other words, a department with a student population of 43 spent £87,000, just over £2,000 per head.

In the same year the physical sciences departments had 700 undergraduates costing about £550 per head, less than the national average. There could be no better ammunition for those, including the UGC, who are arguing that there should be fewer and larger biological sciences departments. It seems that small departments are not only poorly placed to do significant research but also uneconomic teaching establishments.

## EMBO

### Almost Home and Solvent

WITH luck, on February 13 the European Molecular Biology Organization will be one step nearer a permanent solution to its financial problems. At Geneva on that day the ambassadors of twelve and possibly thirteen western European countries (the only country of any consequence which is not on the list is Belgium) are to sign an inter-governmental treaty establishing the Conference of European Molecular Biology. This ceremony was originally billed for last October or November at Berne, but shilly-shallying over the official working languages for the conference and the second and third thoughts of some countries about joining have caused the delay. Once the conference treaty has been signed, it will go to the thirteen governments for ratification. Then the conference will at last get down to business as arbiter of EMBO's requests for funds, which in future are to come from the collective public purse.

Optimists, including the British Department of Education and Science, believe that ratification will take only two or three months and steps are apparently already being taken to arrange the first conference meeting. The first item on its agenda will be the EMBO request for \$630,000, the sum needed to meet the cost of EMBO's current fellowship, travel and summer school programmes. The conference will also scrutinize EMBO's administrative arrangements and its budget proposals for the next two years.

At present EMBO is living off what little it saved from the three-year grant from the Volkswagen Foundation, which expired at the end of December, together with some interim payments made by several of the signatory governments—including Britain, France, Germany, Italy, Sweden, Switzerland and Holland—as an emergency measure to tide EMBO over until some formal arrangements are made. But, as the DES is quick to point out, these interim payments in no way imply that the governments which are making them have accepted the EMBO budget. That will have to be decided by the full conference. It seems likely that once a decision is reached, the countries will contribute in proportion to their gross national products. West Germany, therefore, will foot the largest share of the bill.

Proposals for an international EMBO laboratory along the lines of the CERN laboratory in Geneva have been in the air ever since the organization was founded. Indeed, they have been discussed at inter-governmental meetings in preparation for the establishment of the conference, but ratification of the treaty will provide for the first time the machinery for formal

discussions. Once the immediate problem of a budget for 1969 has been settled, the conference probably will begin discussions on the laboratory. With surprising foresight, the British have already started an inquiry into the idea. Since Christmas a working party of the Council for Science Policy has begun to examine the general question of international laboratories with special reference to the proposed EMBO laboratory.

## UNIVERSITY PAY

### No Love for Mr Jones

No recent official report has produced a louder or more prolonged clamour of academic wrath than Mr Aubrey Jones's remarks about merit payments. The Prices and Incomes Board, rash enough to suggest that the consumers' opinion might be sought before merit payments for teaching were awarded, has suffered a severe reverse. But if the University of Edinburgh is a typical institution, it is not the merit awards themselves that are repugnant, but simply the idea that students might be asked where they thought the awards should go. Professor Michael Swann, addressing the General Council of the University on January 30, reported the results of a straw vote held at a General Assembly of staff, when about 400 of the university's teachers were present. Only about twenty-five of them, he said, were against merit awards altogether; but only another twenty-five were willing to countenance merit awards for teaching alone. The vast majority, about 350, were willing to accept the notion of merit awards if they were given for research and teaching together. "I myself believe that this is abundantly the right answer", Professor Swann said, "and I hope the Government will heed it".

Professor Swann said that the most immediate threat to the universities was the PIB's attempt to shift the balance away from research. There was, he admitted, a real problem to be faced as the cost of research increased, and he suggested that the universities would have to accept some concentration of the research effort in "centres of excellence". It must mean, he said, that few universities could hope to achieve the highest excellence on a wide front. But this evidently does not inhibit them from trying. Professor Swann went on to say that "I am determined that we aim at nothing less than the very highest international excellence in scholarship and research, in every faculty. We have gone a long way, but we are not yet there". Restraint, it seems, does not begin at home.

## ERGONOMICS

### Collect More Data

THE ergonomics information service, covering the literature on human factors in engineering, which has been dormant for a year, is to be resurrected by ergonomists and information scientists at Birmingham University with the help of an £11,000 grant over three years from the Office of Scientific and Technical Information. The service was originally run by the Warren Spring Laboratory, but when this was taken over by the Ministry of Technology it was decided that the small research team was not a viable unit and that its work should be discontinued.