RESEARCH EXPENDITURE

Government More Bountiful

CHEERFUL if somewhat ambiguous prospects for research spending in the United Kingdom in the year ahead have been provided by the annual Vote on Account, presented to the House of Commons by the Chancellor of the Exchequer a week ago. The publication of this document, intended to bridge government financing operations from one financial year to the next, also entails the publication of skeletal estimates of expenditure for the coming year. From the information available, it looks as if the research councils will be treated at least as generously as they had been hoping and probably a good deal better than they had feared.

The expenditure of the research councils predictably continues to increase, and at comparatively generous rates. In the table, all the figures are given in 1969 prices.

	1968–69 (£ million)	1969–70 (£ million)	Increase per cent
Science Research Council	42·127	45·844	8·82
Medical Research Council	15·311	17·141	11·92
Agricultural Research Council	13·483	14·663	8·75
Natural Environment Research Council	9·193	11·725	27·5
Social Science Research Council	1·728	2·380	37·7

The Ministry of Technology budget shows a slight decline in the amount to be spent under the aerospace heading; this will fall from £233·5 million this year to £230·7 million next; at the same time, the industrial services of the ministry will show a very small increase between the total net estimate for this financial year of £31·9 million, and that for the next financial year, which amounts to £32·1 million. The Ministry of Posts and Telecommunications (the new name for the GPO) will be spending £135 million, against £97·5 million last year. The amount spent on universities and colleges shows a very small increase indeed. This year it is running at £245·6 million; next year the estimate is £246·5 million. The Department of Education and Science actually shows a decline in its budget, from £70·0 million to £69·5 million.

The museums seem to have done rather well. The British Museum (Natural History) will have its grants increased by a comparatively modest £30,000 to £1·1 million, but the British Museum proper, in spite of the row between the Government and the trustees last year, will have expenditure increased by some 12 per cent to £2·86 million. Even the Science Museum will have an extra 5 per cent to spend.

The British Government has managed to keep public spending more or less within the targets it set itself. Total expenditure for 1969–70 shows only a modest increase in real terms, which came as something of a relief to the foreign exchange markets, which had feared a repetition of last year's run on the pound after the publication of the Vote on Account. This year's, presented by the Chancellor of the Exchequer last week, was prefaced by an elaborate explanation intended to prevent anybody getting the wrong idea this time.

ELDO

Going it Alone?

THE four hard core countries in ELDO (European Launcher Development Organization) seem now to have decided to turn their backs on Britain's prevarications and may even complete the Europa launcher programme on their own. The countries involved are France, Germany, Belgium and Holland.

This came out after a high level meeting of the four in Brussels last week from which Britain was excluded. At a press conference later, the Belgian Science Research Minister (and an ex-Prime Minister), Monsieur Lefèvre, declared the intention of the four to complete the European rocket without Britain and Italy and announced the formation of "a club" to do so. The only doubt was the continuing availability of the booster stage, the British Blue Streak. This has already (mid-1968) been guaranteed "at cost" by Britain to the continentals on a basis of ELDO's continuation. A "club" may be another matter.

Though not likely to improve Britain's continental image, this turn of events should be nectar to Mr Benn. His policy has succeeded in getting Britain out of the costly launcher business, directly saved £17 million (£10 million due this year and £7 million due for 1970) and wrecked the launcher organization which Britain instigated.

NUCLEAR INDUSTRY

Grand Design Falters

THE unrest in the British nuclear power industry shows little sign of abating. Mr Wedgwood Benn's "grand design" called for the formation of two new nuclear companies, taking in expertise from the Atomic Energy Authority and cash from the Industrial Reorganization Corporation. These two companies were to have taken over reactor development from the authority. It has now emerged that neither of the two companies is willing to take on the commercial development of the steam generating heavy water reactor at Winfrith, on which the AEA has spent £16 million. It had been generally assumed that British Nuclear Design and Construction, having turned down the opportunity of taking over the fast reactor at Dounreay, would be willing to take on the SGHWR. This hope has now been disappointed. At the same time, the other company, the Nuclear Power Group, is to offer employment to only a minority of the staff at AEA Risley who have been working on the development of the fast reactor. Instead of transferring the full group of 330 people to TNPG, the transfer is now only expected to involve 150 people who work in the Reactor Design Office. The other 180 people, who work either in Central Technical Services or in the Engineering Group, will remain in the AEA, and it is almost certain that the Engineering Group will be broken up. "The grand reorganization of the nuclear industry", one Risley man commented bitterly, "has now dwindled to a transfer of 2 per cent of the authority's staff."

This change of plan is clearly going to have important implications for the development of the fast reactor. The most obvious is the difficulty of coordination which is bound to arise between the staff transferred to

TNPG and those who stay with the AEA. Members of the Engineering Group face a double uncertainty, both because their group is in danger of extinction and because it is by no means certain what will happen to them after the PFR is complete. The AEA intends to place two contracts with TNPG for the development of the system; one is a management contract for the completion of the PFR, under which the AEA will reimburse TNPG for the cost of the work and pay a fee for management services provided by TNPG, and the other will cover subsequent design and development work needed to bring the fast reactor to a state for commercial exploitation.

Those members of staff who do transfer to TNPG have been told by the AEA that they cannot expect to be re-employed by the authority if anything goes wrong with the development of the commercial fast reactor. This is in contrast with the original terms of employment by the AEA, which provided for redundant staff to be re-employed somewhere in the Civil Service. Although the AEA maintains a public attitude of confidence in the ability of TNPG to develop the fast reactor, it is unwilling to back this up by offering "return tickets" into the AEA to staff who transfer.

The Institution of Professional Civil Servants, which has never approved of Mr Wedgwood Benn's plan, has now come up with an alternative programme which it believes could rescue the situation. It has suggested that Mr Benn should accelerate the formation of the Atomic Energy Board, and make it a much stronger organization than was envisaged either by the Select Committee on Science and Technology or by Mr Benn's original statement. The board would have its own fast reactor experts, who would let appropriate contracts to the two nuclear companies and to the AEA. There would be only one design team, which would be part of the board, or part of the AEA under the control of the board. The IPCS emphasizes that the board would have to be strong and technically competent, or control of the project would tend to be taken over by a proliferation of design offices in the two companies, the AEA and the Central Electricity Generating Board. The present arrangement will in fact lead to four design offices, in the two companies the AEA and the CEGB, and the provision of a strong central body could help considerably to bring the work together and concentrate it. The proposal has at least this to commend it; it would be possible for Mr Benn to adopt it without loss of face, as the formation of the AEB formed part of this original proposal. At the same time, the single coordinating and controlling board would do something to satisfy those who believe that there should be only one nuclear organization in Britain.

Meanwhile, the SGHWR is in limbo, with neither nuclear company eager to take it up. Its future rests, in fact, with the CEGB; if it shows interest in building a commercial SGHWR, one or both of the nuclear companies would doubtless tender. But the main hope of the SGHWR was in export markets, where it has been vigorously promoted by the AEA. If neither of the companies is willing to follow this up (and the early evidence of export promotion does not inspire confidence), then the expenditure on the SGHWR system is likely to have been wasted. In circumstances like these, it is inevitable that there will be a searching inquiry when next the nuclear power industry is discussed in Parliament.

APOLLO PROGRAMME

Dress Rehearsal

from our Astronomy Correspondent

APOLLO 9, which was launched on February 28, will go through the motions of a landing on the Moon but in the comparative safety of an Earth orbit. The enterprise involves the first testing in space of the lunar module which is to ferry men from the command module to the lunar surface and back again. The trials include a manned flight of the lunar module on a trajectory of the kind planned for the Moon landing. The pilot of the lunar module will go outside for two hours, and during their 150 orbits of the Earth the three-man crew will have ample practice at shuttling between the two spacecraft.

Most of the activity which makes Apollo 9 NASA's busiest manned mission yet is crammed in the first five days of the ten-day flight. This is to ensure that as many as possible of the more important tests are carried out if the flight has to be cut short. The remainder of the mission is as much as anything an endurance test to verify that the spacecraft systems—and the men within them—can last the duration of a trip to the Moon and back.

The first manoeuvre which the three-man crew have to carry out begins 2·5 hours after launch, when the command module attached to the service module—a 22 foot long cylinder containing a rocket motor and nuclear equipment—is detached from the third stage of the Saturn launcher. When the separation is about 50 feet, the command and service modules are turned through 180° so that the conical point of the command module can fit with the lunar module still attached to the third stage, from which the three components of Apollo 9 are then separated. The third stage will then be sent out of the way into a solar orbit.

After two days of tests and optimization of the orbit, the spacecraft commander James McDivitt and the lunar module pilot Russell Schweickart will visit the lunar module through a connecting tunnel, leaving behind the pilot of the command module David Scott. On the fourth day, McDivitt and Schweickart go back to the lunar module for more tests and for Schweickart to try to transfer to the command module and back via the exterior of the coupled spacecraft—a test of the procedure for rescuing the crew of the lunar module. The following day, McDivitt and Schweickart again transfer to the lunar module to simulate preparations for a descent to the surface of the Moon, followed by separation from the command and service modules and a sequence of manoeuvres which will take the lunar module to a distance of up to 109 miles from Apollo 9.

During this phase of the activity, lasting 5·5 hours, the intention is that the relative positions of Apollo 9 and the lunar module should represent a lunar landing. Afterwards, McDivitt and Schweickart will return to the command module, the lunar module will be jettisoned and the flight will become less hectic. Various exercises are planned for the sixth to the tenth working days, including some photography to see what sort of information the Earth survey satellites might gather. Separation from the service module and splashdown of the command module in the west Atlantic will be just under ten days after launch. If all goes well, there will be great optimism about the next two Apollo flights to the Moon in May and July.