

Research on the rack?

Chris Sherwell looks at two government documents which do not bode well for Britain's research effort

LAST WEEK, half-way between the publication three weeks previously of the Labour government's White Paper on Public Expenditure and its forthcoming revelations in the Budget, most of the country was being suitably distracted from the immediacy of its economic troubles by the resignation of Mr Harold Wilson, the Liberal Party's leadership problems and the state of Princess Margaret's marriage. Not so the scientific community. Two documents came out which directly affected its well-being. Neither can be said to contain any unexpected shocks, but the implications are that the fate of British scientific research may be hanging in the balance now more than ever: certainly the so-called "party is over" mentality has arrived.

The first document was the report of the Advisory Board for the Research Councils (ABRC)*. The report, the ABRC's second, covers the two years of its operation from the beginning of 1974 to the end of 1975; the first, published in June 1974, covered the year of its work following its formation in November 1972.

The ABRC's focus, understandably, is finance, for one of its main tasks is to advise (and its advice is usually accepted) the Minister of Education and Science, within whose departmental ambit it falls, on the allocation of the department's Science Budget. The allocation is principally amongst the Research Councils—that is, the Science Research Council (SRC), the Natural Environment Research Council (NERC), the Medical Research Council (MRC), the Agriculture Research Council (ARC) and the Social Science Research Council (SSRC)—

*Second Report of the Advisory Board for the Research Councils (HMSO, Cmnd. 6430).

the rest of the budget, amounting only to about 3%, is accounted for by the British Museum (Natural History) (NHM) and the Royal Society (RS).

It is through the Research Councils, which together with the University Grants Committee (UGC) constitute the "dual support system", that the government fulfils its strategic aim of maintaining a fundamental capacity for research in Britain. The Science Budget itself has grown in financial and in real terms over the last three financial years, and will do so again in the coming year (see Table 1). But for the SRC, whose share of that budget has increased up to a high point this year of more than 56%, a fall in that share is now indicated for the coming year, to 54.2%, and the expectation is for a fall to about 52% by 1980-81. More significantly, over the last two and the coming financial years, the SRC has experienced and will experience an absolute decline in real terms in the resources it receives. Annual percentage growth of 3.2% in 1973-74 gives way to negative real growth in succeeding years of 2.2%, 2.2% and, in 1976-77, 1.6%. It is a measure of the change that, in the seven years before 1973-74, growth was less than 3.2% only in 1969-70.

That change, moreover, is not regarded as a temporary phenomenon. The ABRC's guidelines regarding average annual percentage growth (also shown in Table 1) includes for the SRC a rate of -1.9% until 1980-81; and, for this year at least, the gap between the guidelines for the SRC and the other Councils will widen. As for the Science Budget as a whole, this is expected to remain at its present level up to 1980 apart from the 1.7% increase for the coming year, thus confirming both the gloomy prog-



ABRC Chairman Sir Frederick Stewart

nosis of the White Paper on Public Expenditure and the previously indicated intentions of aiming for nil-growth.

The "keynote" of the ABRC's policy over the coming years, as its second report points out, was "re-deployment away from big science (high energy nuclear physics and astronomy, space and radio sciences) to protect prospects for other natural sciences and social science" (see Figure 1). The consequence for the distribution of the SRC's resources within its own constituent parts is that nuclear physics and ASR (astronomy, space and radio) are the ones to suffer (see Figure 2). Thus, following the SRC's 1974 decision that it was unable to finance a major new £20-million radio telescope at Jodrell Bank, and its 1975 decision (in light of the German decision approving Germany's PETRA accelerator project) that international finance would not be forthcoming for its proposed EPIC accelerator, it now looks as though existing big projects are in jeopardy. The most important is NIMROD, the 13-year-old 7000 MeV proton synchrotron at the SRC's Rutherford Laboratory, and a final decision is expected soon. A decision has already been taken regarding the closure of the NINA Synchrotron Radiation Facility.

Table 1 Distribution and annual growth of the Science Budget

	1973-74			1974-75			1975-76			1976-77			Average annual % growth guidelines to 1980-81
	£ million	% of total	Real annual % growth	£ million	% of total	Real annual % growth	£ million	% of total	Real annual % growth	£ million	% of total	Real annual % growth	
ARC	16.824	12.0	4.0	15.114	10.2	-3.7	13.171	7.7	-0.6	18.33	8.5	3.3	1.8
MRC	25.664	18.3	2.7	26.144	17.2	-1.7	29.022	16.9	-1.0	37.36	17.3	2.7	1.7
NERC	15.796	11.2	4.4	16.066 ¹	10.5	-3.0	19.252 ¹	11.2	0.2	26.05 ¹	12.1	2.3	2.0
SRC	71.429	50.9	3.2	83.665 ¹	55.1	-2.2	96.713 ¹	56.4	-2.2	117.19 ¹	54.3	-1.6	-1.9
SSRC	5.854	4.2	8.6	6.767	4.4	5.7	8.749	5.1	6.8	11.18	5.2	2.0	2.0
NHM	2.647 ²	1.9	23.1	2.581 ²	1.7	-2.1	2.873	1.7	1.0	3.86	1.8	—	—
RS	2.170	1.5	3.5	1.499	1.0	2.3	1.733	1.0	—	1.98	0.9	-1.7	1.0
Total	140.384	100.0	3.9	151.665	100.0	-2.1	171.513	100.0	-1.3	215.95	100.1	1.7	

Transferred funds are not included.

¹SRC and NERC figures include an element of the costs of dispersal, not included in the Science Budget.

²Includes cost of buildings borne on Department of Environment Vote (1973-74, £0.9 million; 1974-75, £0.6 million).

Britain's position undermined?

All of which tends to reinforce the view that Britain's position in the "big science league" is likely to be undermined, which some may argue is a bad thing. The ABRC, however, has found itself obliged to take a somewhat different view. Aside from the government's own exhortation that cuts be made, and the fact that these are most readily achieved by axing the biggest and thus most expensive projects, two strands of thought appear to inform the ABRC's overall disposition regarding big science. The first is the general policy one described in its 1974 and 1975 reports: that, apart from the exigencies of overall redeployment, substantial priority also had to be accorded to the SRC's Engineering and Science Boards over the needs of big science, a priority reflected in Figure 2. In 1974-75, fully 60% of the SRC's budget went to big science, while only 11% and 15% respectively went to the Engineering and Science Boards. (Big science's 60% is equivalent to about 33% of the total Science Budget).

It was an imbalance the ABRC thought should be redressed, and one argument its Chairman, Sir Fred Stewart, voiced in justification, apart from the official one of maintaining a "general national scientific capability" overall, was that to support engineering, an activity central to Britain's economic performance, was to improve the chances of more resources for big science later when, with improved economic performance, those resources would be available. No assumptions about such a recovery are being made at the moment, however: the proportion of the total science budget going to big science is projected to fall rapidly from 33% to 27% in 1980-81.

The other important element in ABRC and SRC thinking is inescapable. The SRC faces certain crucial constraints on its capacity to redeploy its funds to the degree it might perhaps wish. These include important international commitments, to the European Space Agency, the European Science Foundation, CERN and so on. These commitments, as they stood last year, amounted to 26% of the SRC's expenditure—and were equivalent to 44% of the Nuclear Physics Board's funds and 24% of the ASR Board's. It is these sorts of commitments, of course, which must be considered in accounting for the sizeable shares going to big science, just as it is the often colossal cost of SRC projects as a whole which must be weighed in any judgments that are made about the majority share of funds which historically goes to the SRC rather than other Research Councils. Both of these factors, by their

nature, must aggravate the impact on British science of the cuts now in store.

Other Research Councils are less harshly treated. The ABRC says it has decided to use extra funds made available by the increase for 1976-77 "in such a way as to reinforce the re-deployment policy" it has adopted, bearing in mind that the increase was only a "temporary departure" from the nil-growth trend. It stresses that there is no modification in its policy of distributing resources secured from savings in big science roughly proportionately to the other Research Councils and to the Engineering and Science Boards of the SRC. As for maintaining the basic research "floor", which it endeavours to do through an improving co-ordination with the UGC, the ABRC says there is "likely to be a need for greater selectivity and concentration of resources on the part of the Research Councils".

White Paper on Defence

The trouble is, British scientific research is not starting to go through a particularly lean period just because of the reductions in funds available to big science, to the SRC, or even to the less badly hit ARC, MRC and NERC. A second document released last week, also in the wake of the Public Expenditure White Paper, is rather more difficult to interpret, but it tends to reinforce the pessimistic view. That document was the government's annual White Paper on Defence†. It is worth remembering, if only for the sake of perspective, that the Department of Education and Science's Science Budget in 1975-76, for instance, accounted for only about 12½% of the total government expenditure on research and development—a level that has in fact tended to fall in recent years (it was closer to 17½% in 1971-72, for example). In 1975-76, when the Science Budget was around the £150 millions mark, government research and development spending in what is classified as "higher and further education" was approximately £116 millions, in "trade, industry and employment" it was about £246 millions—and in defence it was over £550 millions.

Not all of the figure ascribed to defence, of course, goes to pure research. A research and development figure of £702 millions in the latest White Paper compares with last year's forecast (at the same price level) of £669 millions and represents 12% of the overall defence budget of some £5,600 millions. Of this £702 millions, £107 millions is forecast expenditure on research, while the rest goes to

† *Statement on the Defence Estimates 1976* (HMSO, Cmnd. 6432).

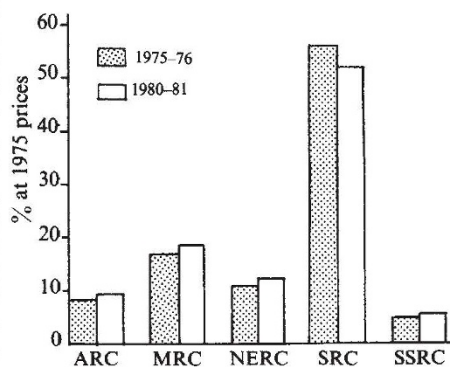


Fig. 1 Research Councils' percentage shares of the Science Budget 1975-76 and 1980-81, as reflected in 1975 guidelines.

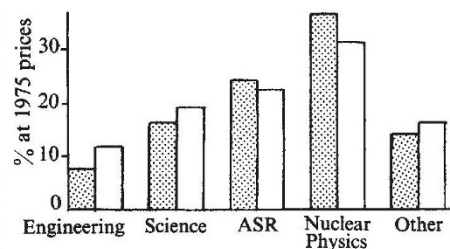


Fig. 2 SRC Boards' percentage shares of the SRC Budget 1975-76 and 1980-81, as reflected in SRC 1975 Forward Look.

"development of approved systems"; of the £107 millions, about two-thirds, the White Paper says, relates to work, including exploratory development, in direct support of projects in the equipment programme. The remaining one third relates to longer term research. Another £22 millions is to be spent on research work "directed to civil objectives".

The breakdown of the £702 millions is not very revealing: £258 millions is attached to military aircraft, £74 millions to guided weapons, £97 millions to "other electronics", £73 millions to ship construction and underwater warfare, £58 millions to "ordnance and other army", £139 millions to "other research and development"—and £3 millions to meteorological research and development. What is revealing, though, is the degree to which the overall cutbacks in defence are forcing the closure of research establishments attached to the ministry. Economies in the Ministry of Defence's research programme, which is organised into 18 major fields (aerodynamics, electronics, armaments and so on) and is done in defence-related industries and university research laboratories as well as the ministry's own establishments, have forced the ministry not only to decide on the second stage of its rationalisation of its research and development programme but also to proceed with "and where practicable to accelerate" it.

As a result, a number of sites will be closed "in due course", some "as soon as possible" but most within five to seven years. They include the Chemical Defence Establishment outstation at Nancekuke in Cornwall, reportedly associated with the development of nerve gas and CS riot gas; future levels of research and development on "defence against chemical and biological warfare", carried out at the parent Chemical Defence Establishment and the Microbiological Research Establishment (both at Porton), are to be reviewed "with the object of making significant economies". They also include the Admiralty's engineering, oil and materials laboratories, and one site of another of the Admiralty's laboratories, as well as a site of the Explosives Research and Development Establishment. In addition, there will be "a further cut on extramural research with industry and the universities where for the time being we shall have to sacrifice some of the longer-term work". Concentration of activities in the field of explosives will enable the work of closed sites to be carried out at the Atomic Weapons Research Establishment and the Royal Armament Research and Development Establishment. Other work will be concentrated as a result of the naval laboratory closures. Redundancies are inevitable, and could amount to many hundreds.

The underlying aim of the rationalisation is to complete "the framework of a research and development organisation based on four main systems establishments—sea, land, air, and underwater—complemented and supported by a number of technology establishments". The aim, in other words, is similar to the comparable one in the civilian area which the Rothschild White Paper foreshadowed, namely, better and more efficient co-ordination of government-backed scientific research and development. While the cuts in defence appear to be encouraging the pace of such a ration-

alisation, though, the redeployment policy of the ABRC as implemented through the SRC is looking increasingly like an issue separable from the other main focus of the ABRC report, the more universal application of the "customer-contractor principle".

"Customer-contractor principle"

Government departments which act as regular "customers" for Councils to which they "contract" research are represented on both the relevant Councils themselves and the ABRC through the comparatively recent institutions of their own Chief Scientific Advisers (CSA). The "customer-contractor principle", outlined by Rothschild in respect of research and development conducted in accordance with objectives formulated by the departments themselves, has already been in operation for some time within the Ministry of Defence through its CSA; its contractor is the Procurement Executive. The principle should have been implemented within three years (that is, by next week) by certain other departments: thus, some of the funds previously lying with the ARC, MRC and the NERC (contractors) should by now have been transferred to their respective customer departments for the departments' own use, which could perhaps be outside the Councils through private research establishments.

The ABRC report is not discouraging about progress in this respect, at least regarding the ARC and MRC. But it acknowledges the complexity of the case of the NERC and its customers, which stems from the sheer diversity of its activity: "There will continue to be some difficulties", the report says, "to which the Council and probably the Board itself will need to give careful thought". But while the ABRC recognises these matters, it studiously avoids the related question of co-ordination amongst the CSAs themselves. That co-ordination, such as it is, is currently pursued largely through the ABRC itself, for at the

moment there is no CSA for the government as a whole: the last one, Sir Allan Cottrell, has not been replaced, and the presence on the ABRC of Sir Keith Berrill, head of the Central Policy Review Staff which advises the Cabinet on strategy, was affirmed as being in his personal capacity only.

These issues are not likely to disappear. But for the moment the main questions surround the government's financing of British scientific research. The country's research effort, while not a party issue, is a political issue insofar as it has to be resolved at the political level. At the moment, however, it manifests itself to the scientific community only as a matter to be rather mechanically resolved at Research Council and ABRC level, and is largely a question of slicing up a financial pie whose size is fixed by Treasury *diktat*. Not only is the size of the pie itself not a major object of contention; the manner in which it is sliced was, as Sir Fred Stewart vigorously insisted last week, the product of consensus. The degree to which the claims of participants in the various branches of scientific research are recognised is unclear, but, in the case of the budget handled by the SRC, it is not obvious that its size, both absolutely and in relation to the other Councils, is an issue thoroughly discussed any lower than the SRC itself.

Thus, whether or not it is true, as the House of Commons Select Committee on Science and Technology recently argued, that SRC funds are directed largely at the behest of a small charmed circle of scientists, it seems clear that that alleged circle may now be losing (if indeed it is conducting) any fight to preserve the share of total funds it has quietly thought itself entitled to in the past. The difficulty, of course, is that in a new nil-growth era, when even the country's defence effort is under scrutiny, Britain's scientists as a whole, like the rest of the country, will over the next few years be losing as well. □

USSR

Broom at the top

Following the disasters of Soviet agriculture during the last Five-year Plan, the USSR Minister of Agriculture Dmitrii Polyanskii has been relieved of his post. Polyanskii was not re-elected to the Politburo at the end of the recent Twenty-Fifth Party Congress, when his Ministry faced sharp criticism, notably from Aleksandr Lyashko, the Prime Minister of the Ukrainian SSR; he did, however, retain his seat on the Central Committee of the Party. Now his dismissal as scape-goat for his

Ministry appears to be a tacit acknowledgement that the criticisms were well-founded, and that more than "abnormal weather conditions" were responsible for the agricultural short-fall.

The new Minister of Agriculture, Valentin K. Mesyats, is a graduate of the Moscow Agriculture Institute. From 1965–1971, he was Minister of Agriculture of the Russian SFSR. Since then he has held the post of Second Secretary of the Communist Party of Kazakhstan (one of the Republics most involved in the Virgin Lands scheme). He is a Member of

the Central Committee, but not a member of the Politburo.

Two newcomers to the Politburo fill the places left by the departure of Polyanskii and the 80-year-old Anastas Mikoyan. They include Dmitrii Ustinov, who has for some 10 years been closely connected with the Soviet's armaments programme, including nuclear arms and missiles. This appointment gives two seats on the 16-man Politburo to military interests—the other being held by Minister of Defence Marshal Andrei Grechko.

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