

COMMENTARY

ROTHSCHILD IN AUSTRALIA? THE ORGANISATION OF R & D IN THE UNITED KINGDOM

John F. Brothie and Malcolm Robertson

The Rothschild scheme was introduced in the UK in 1972 and there have been recent calls for a similar approach from Australian government departments. However, numerous reviews and reports on the scheme have shown it to be largely ineffective, inefficient, inflexible and unbalanced. Consequently, it has failed to produce a coherent national research program. A database scan of the literature confirms these conclusions. Some dismantling of the scheme has now taken place in the UK.

Keywords: Rothschild, science policy, research organisation, CSIRO

INTRODUCTION

The Rothschild scheme was proposed in 1971 in a report by Lord Rothschild, 'The organisation and management of government R & D', in a green paper entitled *A Framework for Government Research and Development*¹. The government's implementation of the scheme is outlined in a white paper with the same title, dated 1972.²

It endorsed the concept that applied research should be carried out by research councils acting as 'contractors' for 'customers' identified as government departments representing different sectors of the economy and acting as proxies for these sectors. The idea was to make the research more relevant to the needs of the departments and, in turn, to the country. The customer departments were expected to create scientific advisory units under chief scientists to enable them to formulate informed and relevant research programs. They also set up industry committees to assist in this task, and bureaucracies to administer the contract funding scheme.

Implementation occurred in the period 1973-76. It was financed by the diversion of a portion of funds from the UK science vote to the various sector ministries to enable them to commission research. The research councils were the primary contractors, which in turn funded government research institutes and some academic research. A

surcharge of 10 per cent of contract funds was intended for general research.

ROTHSCHILD IN AUSTRALIA

From time to time in Australia proposals have been put forward from Commonwealth ministries that administrative arrangements for the conduct of the government's applications-oriented strategic research, mainly carried out in CSIRO, should be varied in accord with Rothschild-like principles. Such proposals have been looked at in depth during the two major inquiries into CSIRO, namely the Independent Inquiry into CSIRO of 1976 and 1977³, and more recently the inquiry by the Australian Science and Technology Council (ASTEC) into public investment in research and development in Australia⁴. In addition, a very recent example of a Rothschild-like proposal has also arisen in the government's in-principle decision that a single building research organisation should be formed incorporating the CSIRO Division of Building Research and the National Building Technology Centre, part of the Commonwealth Department of Housing and Construction.

In its submission to ASTEC, the Commonwealth Department of Industry, Technology and Commerce (DITAC) advocated a change in the basis of CSIRO's funding in order to achieve a greater level of research, particularly technical research, in support of Australia's manufacturing and service industries. So that CSIRO could achieve its full potential to contribute to government objectives, the department proposed that where the organisation undertook R & D on behalf of the government, the customer/contractor principle should be introduced with the funds for the research being appropriated through government departments. The department identified research in support of the government's social objectives (for example, those relating to the environment, water and health) as falling under this aspect of its proposal, but was not able to identify what proportion of CSIRO's current budget might be included.

Similarly, the Department of Housing and Construction, in its submission to ASTEC, proposed that one option for funding CSIRO would be to direct a proportion of funds through policy departments for the commissioning of research, thereby establishing a user/client relationship between departments and research organisations. This proposal was somewhat broader than the DITAC proposal as the latter was restricted to research in support of areas without a clear client industry. DITAC also proposed, if we interpret their submission correctly, that where the client industry was clearly defined, funds to CSIRO should be determined on a matching basis; that is, whatever

the industry contributed to CSIRO (or more particularly to the divisions of CSIRO) would be matched to allow the divisions to pursue strategic research to complement the tactical industry-funded work. Housing and Construction, on the other hand, went a step further, suggesting that all areas of CSIRO research should be funded in part through government departments. In a further bold step, Housing and Construction has suggested, in the context of the government's in-principle decision to form a single building research organisation, that the proposed new organisation should be outside CSIRO as a statutory authority responsible to the Minister for Housing and Construction. At the time of writing, this matter was still under consideration by the government.

Other Commonwealth policy departments have also used the ASTEC review to air publicly their Rothschild-inspired claims to CSIRO. The Department of Health raised the possibility of the Division of Human Nutrition coming within its jurisdiction, and the Department of Resources and Energy revived old claims to CSIRO's minerals research while advocating a concentration of nuclear research within the Australian Atomic Energy Commission. That Rothschild-like proposals continue to be raised at such a high level in the Commonwealth bureaucracy is disturbing considering the increasing flow of evidence from overseas that the scheme has never achieved its promised effect.

THE UK EXPERIENCE

Even before the Rothschild scheme was adopted it had come in for criticism from the Royal Society, which considered its basic premises to be an over-simplification of the principles underlying successful R & D, and that it ignored the effects of its implementation on the factors which motivate individual scientists:

From our consultations with industrial and Government scientists, we conclude that Lord Rothschild's description of the customer-contractor principle is an oversimplification which does not sufficiently emphasise the importance of consultative dialogue between 'the customer' and the working scientist which is a prerequisite of successful R & D.⁵

The Royal Society also criticised the division of science into basic and applied categories, with the applied work being suitable for customer-contractor arrangements. It stated "that there is a continuous transition between pure, curiosity-oriented research at one end of the spectrum and applied research carried out on a specific objective at the other". The Society was concerned that strategic research (that is, work of a longer term nature, but with a clear applications orientation) would not receive the correct level of support. "It is

essential to maintain conditions in which special encouragement is given to such research, generating new knowledge in subjects of proven utility and in order to make possible the next practical advances'. The Society felt that it was virtually impossible for a user department to commission long range or greatly motivated or inventive research.

The high hopes held for the scheme by its proponents quickly faded. By 1980 the Public Accounts Committee recommended abandoning the scheme for medical research and the return of funds to the science vote⁶. The scheme has also generally failed in its other areas of application, but has not yet been abandoned — it is difficult to get sector ministries to relinquish funds once acquired⁷. In the case of government research laboratories, such a reprieve may already be too late. The former Chief Scientific Advisor to the government at the time of implementation of the scheme, Sir Alan Cottrell, concludes:

... with the wisdom of hindsight I think that the scheme can now be criticised on several grounds. It left completely open the question of the future of the Government's own industrial research establishments, which are now so far gone, in suffering the torment of a thousand cuts, that their anaemia may have been terminal. It was also a fragile scheme, depending quite critically on the wisdom of departments in reserving sufficient of their hard-pressed funds to maintain the research councils in a healthy state of activity and in upholding the departmental chief scientist principle against pressure for administrative stream-lining.

Furthermore, in distinguishing so sharply between the supporting of pure scientific research and the commissioning of applied scientific research, it left little room for truly pioneering, original, ventures in applied science, those for which the customers all lie in the future, not the present. A rigorous implementation of the 10% general research surcharge could have had a great and beneficial effect, here, but it was as beyond the power of the scheme to enforce this as it was to endow departments with the wisdom necessary for its success⁸.

Sir Ronald Mason, commissioned to report to the Advisory Board for the Research Councils on the scheme in 1983, made the following observations:

- The scheme "has provided only marginal changes over 10 years in the total research program", but administrative costs amounted to more than £ 2.5m per annum.
- "Over the years 1977/8 to 1982/3 commissions from the four major Departments decreased from £ 26.6m to £ 19.9m (both at 1982/3 values)" — due partly to ministerial judgments on relative priorities of research and more immediate department activities.
- "The working of the arrangements set up between ARC [the Agricultural Research Council] and NERC [the National

Energy Research Council] and their customer departments have [sic] not, in practice, proved satisfactory . . . a substantially increased bureaucracy has developed to some extent at the expense of resources for research”.

- “There are now in many cases four constituencies involved — ultimate customers, government departments or proxy customers, Research Council headquarters and research institute/units”.
- “The bureaucracy for the commissioning arrangements has not been demonstrated to be cost-effective”.
- “Strategic research which should be integral to commissions is not adequately covered”.⁹

New Scientist notes that the scheme had resulted in “unnecessary additional administration” and reports the opinion of the Advisory Board of the Research Council to be:

The new administrative procedures which have had to be introduced to handle commissions cost both money (so reducing the amount of research which can be done for a given sum) and time (by forcing scientists to spend hours on committees and paperwork which they would otherwise have spent on research)¹⁰.

Other evaluations of the scheme are in the same vein. *Nature*, in response to the question of how the Rothschild scheme is working, states:

Not well at all, partly because the government that in 1971 enthusiastically welcomed the doctrine that applied research should be carried out by Research Councils acting as contractors for customers identified as government departments, never gave the doctrine a chance. The notion that 10% of the funds transferred in this way should be for basic research was never tried. Government departments have not been provided with chief scientists capable of operating the system, and have been free to renege on their commitments when it suited their convenience, causing mayhem in the research laboratories concerned¹¹.

The Rothschild scheme seems to have encouraged a mix of top-down program formulation and priority setting, and bottom-up research proposals. A paper on transport research observes:

In Britain research is governed by the customer-contractor principle. If a research project is to be publicly financed, then some government department must have a use for that research . . . In practice that depends only on either the customer or the contractor having a bright idea for research . . . The result is a transport research program which is largely unplanned, meandering haphazardly through universities and research agencies¹².

According to Geoffrey Pattie, Minister for Trade and Industry, the DTI operates the scheme largely through a series of requirements

boards, committees that consist mainly of representatives of the large companies with one board to each sector of industry. He also says:

The system has in recent years come under fire because some departments, notably the Ministry of Defence, have dominated the direction of government R & D In principle, no ministry has the right to question the way any other ministry plans or executes its R & D. This means that there is no mechanism for developing a national policy for R & D that takes into account the work of all the ministries¹³.

Nature reports "the near collapse of the British research enterprise", the rapidly declining contribution of British scientists to world science in the late 1970s, and the contribution to this problem of the inefficiencies of government funding and "the collapse of the Rothschild doctrine"¹⁴. Apparently, the British Geological Survey has almost ceased as a consequence of the Rothschild scheme, described as the biggest disaster to hit the Survey since its foundation¹⁵.

In summary, the customer-contractor scheme has proved generally:

- ineffective in that it did not substantially affect the content of research programs and did not facilitate the development of national policy for R & D, while funds were diverted away from research to other ministerial responsibilities;
- inefficient in that substantial additional administration costs were incurred and in that further scientific advisory resources were required to be installed by customer groups;
- inflexible in that sector ministers were reluctant to relinquish research funds once acquired so that changing national priorities could not be responded to and matched;
- unbalanced in that it moved funds away from enabling technologies for new industries, away from strategic research, away from social research, away from large national projects, and away from research altogether, leaving mainly the smaller, shorter term end of the applied research spectrum; and
- a disaster in that it has decimated government research laboratories, prevented co-ordination of research decision making, fragmented the organisation of research, added further bureaucracies, and failed to produce a coherent national research program.

A scan of the literature using the *CSIRO Australis* database further confirms these conclusions. All publications since 1978 retrieved under the keyword 'Rothschild' are generally critical of the scheme¹⁶. This literature indicates that the scheme, which seemed to many to be a good idea at the time, just did not work out in practice, and that in an environment of constrained resources it never would. The

spreading of research responsibilities that it introduced required additional scientific and administrative functions that the UK government could not afford or adequately staff, particularly in an environment of government spending cuts. This message does not seem to have penetrated Australian government departments, which are still proposing variations of the scheme.

AUSTRALIA AGAIN

During the Independent Inquiry into CSIRO, the review committee, chaired by Arthur Birch, paid particular attention to the Rothschild scheme because at that stage the scheme had been only recently introduced into the UK. The committee wished to assess its suitability in Australian government science. In considering alternative arrangements for the management and structure of CSIRO, the Birch committee identified two alternatives, namely the breaking up of CSIRO into a number of statutory bodies, each responsible to the appropriate Commonwealth minister, and the retention of CSIRO as a single body, but with funds appropriated to ministries for contracting to CSIRO for their research requirements.

The Committee rejected the Rothschild scheme for two main reasons. First, unlike the UK arrangements, CSIRO was not responsible for much of the government's short-term tactical research, which was in general undertaken by state governments. Secondly, the Australian political system of six states and one Commonwealth government provides up to seven potential customers for research for whom the customer-contractor principle must operate and who must be in a position to define exactly what research is required. The committee noted the shared responsibilities of the various Commonwealth-state ministerial councils, which it felt should have a strong influence on CSIRO policies and priorities, but concluded that CSIRO itself should remain a single entity under the policy control of a minister whose responsibilities spanned a large part of the spectrum of government activity.

Despite the compelling arguments put forward by departments during the ASTEC inquiry that CSIRO should either be broken into smaller units or have its appropriation funding varied to achieve more Rothschild-like customer-contractor relationships, ASTEC recommended that CSIRO should be retained as a single statutory authority and that the level of its appropriation funding should be maintained. ASTEC concluded that the case for retaining CSIRO as a single entity was persuasive. The most powerful reason for doing so was to enable the substantial intellectual resource which CSIRO represented to be focused in a flexible manner both on the most

important problems facing Australian industries, and also on those community interest areas of special concern. On the question of diverting funds from CSIRO to other departments, ASTEC noted the failure of such Rothschild-like arrangements in the UK and expressed concern that during periods of fiscal restraint departments that would be responsible for contracting out activities under such a scheme would tend to treat contract funds as discretionary expenditure, giving them a low priority in the budget process. Re-allocation of existing research funding into departmental budgets might therefore contribute to reducing the level of research activity, thereby weakening the research infrastructure.

The government has accepted ASTEC's arguments and recommendations and has decided that CSIRO shall remain a single statutory authority with its funding appropriated direct to the Organisation. The Rothschild lesson appears to have been heeded in the ASTEC review and subsequent decisions, though the government has still to decide on the building research issue. And, of course, governments being what they are, each new issue is dealt with independently on its merits. Rothschild is more than likely to reappear in some form or other as departments jostle each other for kudos, power and a slice of the national interest.

NOTES AND REFERENCES

1. Lord Rothschild, 'The organisation and management of government R & D' in Lord Privy Seal, *A Framework for Government Research and Development*, Cmnd. 4814, Her Majesty's Stationery Office (HMSO), London, November 1971.
2. Lord Privy Seal, *A Framework for Government Research and Development*, HMSO, London, July 1972.
3. *Report of the Independent Inquiry into the Commonwealth Scientific and Industrial Research Organisation*, AGPS, Canberra, August 1977.
4. See ASTEC, *Future Directions for CSIRO*, AGPS, Canberra, 1985.
5. *Memorandum of the Council of the Royal Society on the Consultative Document, A Framework for Government Research and Development*, February 1972.
6. R.M. Mason, *A Study of Commissioned Research*, report prepared for the Advisory Board for the Research Councils, London, 1983.
7. R. Herman, 'Pattie wants a science policy for Britain', *New Scientist*, 109, 1500, 20 March 1986, p. 25.
8. A. Cottrell, 'Government research and development reorganisation in the UK in 1972', *Science and Public Policy*, 13, 1, 1986, pp. 55-7.
9. Mason, *op. cit.*
10. 'Research councils attack government bureaucracy', *New Scientist*, 81, 1144, 1 March 1979, p. 652.
11. 'British research scrutinised again', *Nature*, 319, 6050, 16 January 1986, pp. 163-4.
12. M. Hamer, 'French transport steps ahead', *New Scientist*, 106, 1455, 9 May 1985, pp. 16-19.
13. Quoted in Herman, *op. cit.*

14. 'Inquest of enquiry into research', *Nature*, 312, 5991, 15 November 1984, pp. 183-4.
15. 'A council ripe for abolition', *Nature*, 311, 5986, 11 October 1984, p. 493.
16. In addition to the above, see D. Dickson, 'Gowans washes hands of Rothschild', *Nature*, 290, 5806, 9 April 1981, p. 435; M.P. Duffy, 'The Rothschild experience — health science policy and society in Britain', *Science, Technology and Human Values*, Winter 1986, p. 68; M. Kennard, 'Government reviews organisation of British science', *New Scientist*, 81, 1146, 15 March 1979, pp. 843-4; J. Maddox, 'Mason report proposes yet more reform', *Nature*, 306, 5939, 10 November 1983, p. 102; *idem.*, 'UK research councils, another inquiry under way', *Nature*, 304, 5926, 11 August 1983, p. 476; 'What are the research councils for?', *Nature*, 288, 5786, 6 November 1980, pp. 1-2; 'Reorganisation of UK medical research', *Nature*, 287, 5784, 23 October 1980, p. 669; 'Beating a retreat from Rothschild', *Nature*, 289, 5793, January 1981, p. 2; 'Rothschild rides again', *Nature*, 297, 5864, 27 May 1982, p. 254; P. Campbell and P. Gambles, 'Strategic survey grinding to halt', *Nature*, 311, 5986, 11 October 1984, p. 499; 'How Rothschild has hobbled geology', *New Scientist*, 95, 1322, 9 September 1982, p. 677; 'New blueprint for British science', *New Scientist*, 100, 1383, 10 November 1983, p. 401; 'Abandoning Rothschild', *Outlook on Science Policy*, 2, 11, 1980, p. 2; D. Phillips, 'The priorities for scientific research in the UK', *Science in Parliament*, 42, 180, 1985, pp. 121-5; J. Redfearn, 'Environment research council: Rothschild persists', *Nature*, 294, 5836, 5 November 1981, p. 5; *idem.*, 'More pressures on Rothschild system', *Nature*, 289, 5795, 22 January 1981, p. 213; 'Britain's Rothschild R & D system — five years later', *Science and Government Report*, 9, 1979, pp. 3-6.