Research Policy

Small fish in a turbulent sea

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To the young medical researcher looking for funds to investigate a bright idea the Medical Research Council may look like a big and unapproachable sharp toothed fish. But to the government the MRC is only a small part of a large and complex system for funding research and development, a system with which the government is not much impressed and is now set on radically reforming.

The system is highly complex, and a neat description is not possible because the system is not neat. A rough outline of the system is, however, given in fig 1. Figure 2 is my informed guess of

“better” results. Some scientists also agree with them. The pressure is to reform the system towards something like that shown in fig 2.

This article will describe the research system from the bottom up. The gap between the top and the bottom of the research structure is one of the problems—for how can policies made by the cabinet motivate individual researchers in their private creative endeavours? The reforms proposed by the government (just like those within the health service) are designed to introduce more management and more “value for money.” But how do managers stimulate a

FIG 1 (Left)—The present organisation of the research system. The solid lines are lines of money and power, the dashed lines are lines of advice and influence. FIG 2 (Above)—How the research system may be organised in the future. The solid lines are lines of money and power, the dashed lines are lines of advice and influence.

how the system might look in, say, 10 years' time. The present diversity of the system is viewed by many scientists as a good thing because scientific innovations come from varied and unpredictable sources.¹² The government and its management advisers are, however, unconvinced: they think that too much money is wasted and that more efficient concentration of resources would produce

mercurial process like research? As John Ziman, a fellow of the Royal Society and physicist turned science policy researcher, has observed: “Down at grass roots, laboratory life has a way of motivating the people immersed in it, regardless of larger concerns.”¹³

Bottom up: where is research done and how many do it?

Research and development in Britain go on in institutions of higher education (mostly universities), institutes financed wholly by the research councils, government institutions (which may be

within government departments or in bodies like the Public Health Laboratory Service that receive almost all their funding from government), industry (including nationalised industries), institutes funded by charities, NHS hospitals, and other centres. And these institutions cannot be neatly separated—for instance, research institutions receiving all their money from research councils will often be within universities and their staff will have some university responsibilities. Similarly, university science parks may contain research institutes paid for entirely by industry but again with the staff having some university responsibilities. And much industrial research is funded by the government.⁴

Readers' heads may already be beginning to spin, and it is going to get worse. But those who want to understand (and reform) Britain's research effort must try to understand the complexity of the system, and clearly many of those—like doctors—who depend professionally on the outputs of research do not. Nor, however, do some of those trying to reform it: conferences on academic medicine, for instance, always feature stories like that of the minister for education and science who did not understand that academic surgeons took out appendices.

In 1985-6, 56 952 people were employed in research funded by the government; table I shows where they were working: over two fifths (41%) were working for the Ministry of Defence.⁴ Almost 30% of these people had degrees or the equivalent; almost 15% were technicians or the equivalent; just over 15% were administrative staff; and the rest were classified as "other staff." Table I also shows

Manpower employed on research and development in government departments and research councils

Department	1984-5	1985-6	Plan		
			1986-7	1987-8	1988-9
Civil departments	21 919	21 769	8 236	8 213	8 188
Research councils					
Agriculture and Food Research Council	1 817	2 391	2 303	3 543	4 436
Economic and Social Research Council	171	120	101	101	101
Medical Research Council	3 742	3 667	3 612	3 612	3 612
Natural Environment Research Council	2 748	2 657	2 426	2 270	2 170
Science and Engineering Research Council	2 825	2 797	2 760	2 745	2 741
Total: research councils	11 303	11 632	11 202	12 271	13 060
Total: civil	33 222	33 401	19 438	20 484	21 248
Ministry of Defence	23 820	23 551	23 013	22 849	22 718
Total: all government	57 042	56 952	42 451	43 333	43 966

how the government plans to reduce its research and development staff. About 172 000 people were employed by industry in research and development in 1985 compared with 195 000 in 1981.⁵ The Advisory Board for the Research Councils estimates that about 25 000 whole time equivalent scientists and engineers are employed through the universities or through the research councils.⁶ In addition, these two sources pay for about 25 000 students studying for research degrees.⁵

The UGC, the ABRC, and the research councils: between the government and the researchers

Funds for research come ultimately from the government, industry, charities, and various overseas sources. Government money reaches researchers in universities in two main ways—through the block grant made by the University Grants Committee (UGC) to the universities and through the five research councils, which are "overseen" by the Advisory Board to the Research Councils. This is the much misunderstood "dual support system." The government also sponsors research in its own departments and in industry. Industry in its turn funds research in its own laboratories and within institutes of higher education. One of the government's central concerns is that British industry spends far too little on research and development and its intention is that industry should pick up the research funding that it is relinquishing.⁷

The UGC has been forced by its declining income to begin to be

selective about its funding for research, and in 1986 for the first time it graded the research in university departments into outstanding, above average, average, and below average. Funding was then related to the quality of the departments. Clearly the UGC must get its assessments right, and several studies have suggested that it has not.

The UGC's selection exercise has, however, already been trumped. The Advisory Board for the Research Councils (and the government) is concerned that the UGC is not going fast enough, and the board has published a plan that will lead to three sorts of universities—"top class" universities that do research across the range of subjects, "lower class" ones that do only a little research to support their teaching, and "middle class" ones that do high quality research in just a few subjects.⁶ (The next article will look in detail at the reformation of the dual support system.)

Reforming the UGC

The Advisory Board for the Research Councils considered in its proposals removing all research money from the UGC and distributing it through the research councils, but it rejected the proposal.⁷ For now the UGC will continue to be important in funding research, although many of the people I spoke to thought that ultimately research money will be taken away from the UGC. But while the arguments have been proceeding over whether to take away the UGC's research funds and over the validity of its selection exercise the UGC has itself been reviewed and found wanting.⁸ The Croham committee, which carried out the review, supported the idea that there should be a body between the government and the universities that made independent decisions on how much money individual universities should be given, but it wanted the present UGC replaced by a smaller body that had equal academic and non-academic representation. Another recommendation was that funding should be over three years rather than one year—because even those academics who accept the reformation of the universities that its resulting from the squeezing of funds argue that it is being done too fast without the universities being able to plan ahead.

The government responded to the Croham committee in a report that was itself a break from government traditions: *Higher Education: Meeting the Challenge* was filled with colour pictures and had an upbeat tone borrowed from marketing men.⁹ The document began with a statement of policy, which had a tone now becoming familiar to researchers and academics: the government's first aim was that higher education "should serve the economy more efficiently" and another was that it should "have closer links with industry and commerce, and promote enterprise"; "quality will be enhanced by more selectively funding research, targeted with attention to prospects for commercial exploitation"; and efficiency would be increased by improvements and changes in management and by "the development and use of performance indicators."

The document said that the UGC would be replaced by a smaller body, the University Funding Council, and this has now been incorporated into the Education Bill that was published last month. This new council will be chaired by an independent chairman rather than an academic and have much more representation from industry. The government repeats that it itself will play no part in distributing funds among universities but that the new council will have no say in the overall amount to be given to universities. The government did not accept the proposal for triennial funding, saying that "it would be undesirable to insulate university management from the need to plan for changing circumstances."

Another change is that the University Funding Council will not be required by law—as was the UGC—to inquire into the needs of the universities and so advise the government: an advisory body will thus become a transmission body. This is one way in which the status of the new council will be lower than that of the old committee, and inevitably university research and teaching will have to be more sensitive to the wishes of the Department of Education and Science.

The same white paper also covered polytechnics and proposed funding them through contracts "for the provision of higher

education . . . including research activities." This idea was dropped before the Education Bill was introduced but is likely to reappear—for both polytechnics and universities. An editorial in *Nature* asked: "Following the analogy of commercial practice, will colleges be invited to tender for contracts, with the prize going to the lowest bidder?"¹⁰ The white paper gave less detail on what might happen with university funding but did say that "just as in that sector of higher education [polytechnics and colleges], the government proposes for the university sector that payment of grants to institutions should be replaced by a system of contracting between them and the University Funding Council." Contracts are in abeyance for now, but the new council will have powers to earmark for specific purposes (negatively and positively) part of the grants that it makes. The UGC had these powers but rarely used them. Sir Mark Richmond, the vice chancellor of the University of Manchester, responded to the white paper by saying that "the idea of contracts could lead to a university system directed to the needs of industry and commerce."¹¹ This is, I am sure, what the government intends.

Reforming the research councils

The other main leg of the dual support system, the research councils, is also under financial strain, but there is at the moment no plan to reform their structure, although several proposals have been mooted. There are five research councils—the Medical Research Council, the Agricultural and Food Research Council, the Economics and Social Research Council, the Natural Environment Research Council, and the Science and Engineering Research Council—and fig 3 gives the size of their budgets in 1985-6.⁴ Over 80% of their funds come from the Department of Education and Science, through what is called the science budget or vote. The research councils all have a different style and by law and convention have considerable autonomy. The Secretary of State for Education and Science does have formal powers to direct the research councils, but these have never been used. Nevertheless, he does decide the size of the council's budgets.

Between the research councils and the government is the Advisory Board for the Research Councils, which has the responsibility of advising the government on civil science, making recommendations on the size of the science budget, deciding how the money should be distributed among the research councils, and promoting liaison between the councils. Its advice on how money should be distributed between the councils has always been

accepted by the government but its advice on the overall size of the budget has not. Furthermore, only small changes between councils' budgets have been made, which is one of the reasons why Sir John Kingman, a former chairman of the Science and Engineering Research Council, told the House of Lords committee that the "ABRC is a profoundly unsatisfactory body . . . a talking shop, and one whose recommendations . . . carried rather little influence. . . . It is a body of very distinguished people who get together regularly. They have implicitly on the agenda the whole health of science and technology in the United Kingdom, but in practice their decisions are about whether a million should be taken off one research council and given to another."¹²

One response to this impotence of the advisory board has been to recommend that the board should become one large research council absorbing the present research councils. The House of Lords committee considered the arguments for and against this change and came out against it. The committee did, however, acknowledge that the power of the advisory board was growing—as the government wants—and thought that evolution rather than revolution might eventually lead to one research council. The committee also looked at proposals that a new Biological Resources Research Council should be created (presumably swallowing the MRC either whole or in part) and decided that the disruption would not be worth the gains.

Thus for now both the advisory board and the research councils are set to continue, but the power is already shifting and structural change is likely to come eventually.

From ACARD to ACOST

The one other body that has stood between researchers and central government has been the Advisory Council for Applied Research and Development (ACARD). It is now about to be absorbed into a new body, the Advisory Council on Science and Technology (ACOST). The original council, which has been chaired by an industrialist and made up of industrialists and senior academics, advised the government on applied research, design and development, and the application of research and technology, together with the coordination of these activities with basic research. Its secretariat was provided by the cabinet office, and it reported to the Prime Minister.

One of the advisory council's main jobs was to comment each year on the annual review of government funded research and development, which the Chief Scientific Adviser has called "a very significant part of the process of managing science." Its comments were, however, confidential, which was one source of dissatisfaction with the advisory council. One former member of the council—Dr D H Roberts, a fellow of the Royal Society and joint deputy managing director of GEC—told the House of Lords select committee: "I am not conscious of ACARD making any useful contribution. . . . I have a feeling that ACARD is seen as a subsidiary of the Cabinet Office. It is a little too close to government and does not have the required independence."¹³

Another source of dissatisfaction with the advisory council was its relation with the Advisory Board for the Research Councils: the Committee of Vice Chancellors and Principals described the distinction between their roles as "artificial." The chairman of the advisory board was a member of the advisory council, and the two bodies were supposed to produce together "state of the nation" style reports on science and technology. Only one was produced.

The new Advisory Council on Science and Technology is to have a widened membership and terms of reference—to include all science and technology. This is likely to make even more vague its relation with the Advisory Board for the Research Councils, and perhaps the influence of the advisory board is to be eclipsed. If, however, the advisory board became one large research council, which the white paper mentions and does not rule out, then its distinction with the Advisory Council on Science and Technology would be much clearer. The new advisory council will continue to be located in the new cabinet office, and some of its meetings will be chaired by the Prime Minister.

FIG 3—Expenditure of the five research councils in 1985-6 in £m.

The apex of the research system

One key person who is the link between the old and the new councils and the Prime Minister is the Chief Scientific Adviser, Cabinet Office. He sits on all the important national and international committees concerned with research, including the Defence Scientific Advisory Council. The former Chief Scientific Adviser was Sir Robin Nicholson, a fellow of the Royal Society and of the Fellowship of Engineering and a former professor of metallurgy with experience in industry. Since May 1986 the Chief Scientific Adviser has been Mr John Fairclough, a former director of development for IBM UK Ltd.

The House of Lords select committee understood that there is already a Cabinet committee on science and technology, and, in passing, it deplored the secrecy that meant that it did not know for sure that there was such a committee. The government's white paper said that there will be "collective Ministerial consideration, under the Prime Minister's leadership, of science and technology priorities."

Evaluation

The one other body that hovers around the centre of this complex system for managing research is the Science and Technology Assessment Office. Set up in 1986, it consists of four civil servants and two people who have come from industry and is struggling to find its feet and its methods. Its job is to help government departments, the research councils, the University Funding Council, and indeed any organisation spending government money on research to "assess their R & D expenditures and evaluate the results." It works by encouragement. The director of the office, Mr Vivian Brown, told me that they are interested in "replicating commercial set ups," which means that they want research organisations to have objectives and guidelines and criteria to decide how well they are succeeding.

The government in its white paper noted that the House of Lords

committee recommended that 1% of research funds should be devoted to evaluation, and while not committing itself to that figure it mentions the "need for adequate resources to be devoted to the various stages of the assessment process." But quite how this will be done is far from obvious; as the House of Lords committee wryly observed, "It is clear that the methodology of evaluation is itself less scientific than the science and technology it is designed to assess."

Conclusion

Here then is a highly complex structure in a state of flux. Quite how it will settle is not yet clear. All that is certain is that it will be very different from now, but will the changes actually make any difference in the laboratories? Or will the researchers feel like the members of impoverished countries whose ruling régimes change with regularity and ceremony while their hard lives remain just the same? The central problem is that we do not know whether the new managers can produce the goods.

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MEDICINE AND THE MEDIA

CALLING IN at the BMA's press department the day after the white paper on primary care had been published, I counted over 50 cuttings on the proposals. Front page articles, parliamentary reports, leaders, and cartoons left no doubt that it was a major political event. Among the many trailing articles during the preceding weeks had been a brisk one in the *Economist* (21 November, p 19) strongly urging more competition in general practice—it suggested five year franchising contracts for doctors—as a way of raising standards and improving efficiency.

What did the papers make of the rather less radical proposals that appeared? A riffle through the headlines made me wonder whether the press had all received the same copy of *Promoting Better Health*. But each paper is a political prism for filtering the news so the *Morning Star's* "It's Pay or Pain," the *Daily Express's* "Tonic for NHS," the *Mail's* "Maggie tonic for Health Service," and the *Independent's* less emotive "GPs to be rewarded for quality of their services" were predictable if apparently contradictory interpretations of the government's plans. Among the word play headlines to catch my eye were the *Star's* "One in the eye for all of us," the *Sun's* "Eye, Eye! That's your lot as axe hits free checks," and the *Daily Telegraph's* "Sickening dilemma."

The new charges for eye tests and dental check ups and the inevitable parliamentary row they provoked—including the unhappiness of some Tory MPs—was a gift for controversy addicted editors, and the cartoonists, too, had a field day, with eye testing charts a popular site for such aphorisms as "This is going to cost you an arm and a leg." The expected political slanting of headlines and leading articles aside, however, the press—including even most of the tabloids—deserve congratulations for the detailed explanations

of what the changes would mean for the public. The government's emphasis on preventive medicine and the "challenge" to general practitioners to offer a more consumer sensitive service were strong common themes, with the occasional and somewhat misleading "angry docs" response scattered among the tabloids.

The heavies had some provocative leading articles with the *Scotsman's* dismissive "ideas that miss the real answer," the *Guardian's* accusatory "Health: ducking the real reform," and the *Independent's* even handed scepticism about the government's revenue raising plans and its ability to outnegotiate "the power and sophistication of the general practitioners' trade union" in developing service for the convenience of consumers. Between them the serious papers covered most of the important principles.

Absorbing and analysing an 81 page document (and an accompanying bill) is no easy feat for the daily press. Though government departments try to "help" with summaries and explanatory notes, the wily journalist is well aware of swallowing such offerings whole—they are too often economical with the truth and skip lightly over possible embarrassments for the government. What matters in preparing the next day's story may be as much what is not in the source document as what is. On the whole, I think that the press read as well between the lines as along them. There is clearly a fear—for example, among the less blatantly Tory papers—that the white paper might yet spell danger for the health service as we know it, and the fact that it came out in a week when there was so much publicity about underfunding of the service prompted leader writers to conclude that whatever else was needed in the NHS more resources were certainly the most important.—GORDON MACPHERSON, deputy editor, *BMJ*.