GOVERNMENT AND RESEARCH

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GOVERNMENT AND RESEARCH

Thirty Years of Evolution

by

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Abbreviations

ACSP	Advisory Council on Social Policy
AHPSR	Alliance for Health Policy and Systems Research
CBA	Cost Benefit Analysis
COHRED	Council on Health Research for Development
CPRS	Central Policy Review Staff
CRDC	Central Research and Development Committee
CSO	Chief Scientist's Organisation
CSP	Council for Scientific Policy
CSRC	Chief Scientist's Research Committee
DES	Department for Education and Science
DH	Department of Health
DHSS	Department of Health and Social Security
DSIR	Department of Scientific and Industrial Research
EAO	Economic Advisers' Office
EU	European Union
HPSS	Health and Personal Social Services
HSR	Health Services Research
HSRB	Health Services Research Board
HTA	Health Technology Assessment
MRC	Medical Research Council
NAO	National Audit Office
NEAT	New and Emerging Applications of Technology
NHS	National Health Service
NICE	National Institute for Health and Clinical Excellence
OCS	Office of the Chief Scientist
OECD	Organisation for Economic Co-operation and Development
OPCS	Office of Population Censuses and Surveys
PAC	Public Accounts Committee
PAR	Programme Analysis Review
PESC	Public Expenditure Survey Committee
PMR	Panel on Medical Research
PPBS	Programme, Planning and Budgeting System
PRP	Policy Research Programme
PSSRG	Personal Social Services Research Group

Abbreviations

RAWP	Resource Allocation Working Party
R&D	Research and Development
RLG	Research Liaison Group
SDO	Service Delivery and Organisation
SGC	Small Grants Committee
SHHD	Scottish Home and Health Department
SSRC	Social Science Research Council
UGC	University Grants Committee
UKCRC	United Kingdom Clinical Research Collaboration
WHO	World Health Organisation

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Introduction to Second Edition

Purpose and scope of the book

THERE HAS been a flare-up in interest in science policy, both in national governments and international bodies, and in the academic networks that track and criticise its progress. A key factor in this is the increased interest in analysing the role research can potentially play in informing policy-making. This is manifest, in particular, in areas such as health.

A pioneering venture in this field was *Government and Research: The Rothschild Experiment in a Government Department* (Kogan and Henkel, 1983).* This work, described in a sustained review in *Nature* as 'methodologically path-breaking', sought to depict the ways in which two sets of institutions, science and government, possessed their own characteristics which were however moulded and changed by the interactions between them. It sought to be an authoritative statement on the relationships between science and government and lodge itself in the political science literature of the subject. It thus fell into the tradition being established by American leaders in the field such as Caplan and Weiss.

It was a unique study, inasmuch as none other had penetrated the deepest recesses of government to observe at first hand the attempts of a major department - the then Department of Health and Social Security (DHSS) - to determine its research agenda through collaboration with leading scientists in a whole range of fields, to observe how research was commissioned, and then evaluated by scientific teams, and how it began to enter the policy blood streams of the departments. In order to do this, the two authors of the 1983 work had secured unrivalled access to private meetings and papers to the point of observing scientific groups being evaluated and the subsequent meetings and exchanges of papers within the Department. Over seven years it was possible to evaluate the whole cycle of policy into research commissioning and reception (See Appendix).

Much has changed since the 1970s and 1980s, but much remains the same. The forces at work in the story we told in 1983 about government and science have

^{*} In the Appendix to this book we reproduce the Preface to the first edition, which contains an account of our methods and acknowledgements due to many collaborators.

grown stronger, if also more complex. 1971, the year in which the Rothschild Report was published, saw a major international shift in science policy, which has not been reversed. The idea that science, if left to itself, would serendipitously yield new discoveries that could be harnessed to societies' needs partly gave way to the view that governments, rather than scientists, should set research priorities and that social and economic goals should be the driver of science policies (OECD, 1971). The trend towards utilitarian goals and external influence on scientific agendas gathered momentum in the 1980s and 1990s. The 1993 UK White Paper on Science Policy made it clear that in future 'decisions on priorities for support [of science] should be much more clearly related to meeting the country's needs and enhancing [its] wealth-creating capacity' (para 3.9).

At the same time, industry became an increasingly important player, as collaborator with government and science in pursuit of market success driven by technological innovation, an idea that found expression in the Foresight policies adopted in a number of countries (Irvine and Martin, 1984; Martin, 1996). Long established boundaries not only between government and science but also between the state, the market and academia became more permeable, giving rise to a complex set of relationships sometimes referred to as 'the triple helix' (Etzkowitz and Leydesdorff, 1995, 2000) of government, business and universities.

'The knowledge society' has become one of the most universally adopted characterisations of the contemporary world, signalling, certainly, recognition of knowledge (not least science and technology) as a growing force in politics, economies and social organisation. Whilst the nature of knowledge (including science and technology) is increasingly contested, one of the most significant manifestations of its growing importance is the movement towards evidence-based approaches. A review of the growth of the evidence-based movement across a range of public services recently concluded that, 'the research community in healthcare is truly global, and the drive to evidence-based policy and practice is pandemic.' (Davies and Nutley, 2000). Within the UK, the National Audit Office (NAO) recently reported to Parliament on how government departments could best organise the commissioning of research so that it would inform policy: *Getting the Evidence: Using Research in Policy Making* (NAO, 2003).

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Globalisation and internationalisation have also become increasingly prominent themes in science policies, even if many health and other researchers believe that international working best starts with good national systems from which individual researchers and groups can make their own connections. At the international level, some key themes relevant for our analysis were identified by the World Health Organisation (WHO) in a report prepared for the World Ministerial Summit on Health Research in November 2004. This World Report, *Knowledge for Better Health* (WHO, 2004), its conceptual framework for the analysis of health research systems (Pang et al., 2003), background papers (Hanney et al., 2003) and the work of an accompanying Task Force (Task Force on Health Systems Research, 2004; Lavis et al., 2004), all highlight the importance of organising national health research systems so that they can inform policies to improve national health systems.

Recognition of the desirability of undertaking research to meet the needs of potential customers in local health systems has resulted in much analysis of priority setting methods - in relation to both developing and developed countries (Global Forum for Health Research, 2002; Department of Health, 1993). The 'Linkage and Exchange' initiative developed by the Canadian Health Services Research Foundation is widely viewed as a significant model and involves bringing policymakers who can use the results of a particular piece of research into its formulation and conduct (Lomas, 2000). Such a collaborative approach, or at least interaction between researchers and policy-makers, is increasingly seen as the way of producing research that is most likely to be utilised (Lavis et al., 2002; Innvær et al., 2002). Furthermore, there is a growing focus on the importance of brokerage or translator roles in the transfer of health research findings to policy-makers (Walt, 1994; Dash, 2003) and on the role of receptor bodies (Lomas, 1997; Hanney et al., 2003). Illustrating the greater attention being given to such ideas, several of them now feature in training packages about organising health research systems that have been developed under the Collaborative Training Program (CTP, 2004) by international bodies such as the Alliance for Health Policy and Systems Research (AHPSR) and the Council on Health Research for Development (COHRED). Finally, the notion of the customer for research is itself being expanded. Some governments have promoted an increased focus on the public's perspective in health research agenda setting (Oliver et al., 2004) in addition to more widely encouraging public engagement with health research and utilisation of its findings (Haines et al., 2004).

These developments have given rise to new theories about how research systems work, how knowledge is produced and how science-government relationships operate. However, they mostly reflect substantial continuities with those that underpinned our earlier study, which, because it covered a whole cycle, was able to identify the obstacles facing such moves as well as the potential benefits. We have been persuaded that the account given in our earlier analysis of theories and of developing government practice remain relevant 20 years on. This is attested by reference to it in recent discussions related to the above developments; for example, analysis of how best to organise health research systems and promote collaborative research (Denis and Lomas, 2003) notes a convergence between emerging forces within academia and changing norms within policy and management. It refers to the 'seminal' role of the Rothschild Report, stating that Kogan and Henkel 'describe the lessons from this era well'. It goes on to show how the emerging mode of collaborative research commissioning identified in the first edition of this book has now been bolstered by developments such as the increased interest in commissioning research that, as described above (Davies et al., 2000; NAO, 2003), is intended to lead to evidence-based policies.

We have kept much of the text of the original book, which remains a sustained case study provoking many themes still salient today. We have incorporated some new theoretical perspectives in Chapters 2 and 3. Otherwise the main changes come in the final chapter where developments since 1983 are drawn upon selectively and brought into the analysis. In particular, we describe how, in the 1990s, various strands from the Rothschild period were revisited by those responsible for the health research system in the UK in what was perhaps the first comprehensive attempt in any country to develop a national R&D infrastructure for the health care system (Peckham, 1999; Black, 1997). In drawing conclusions about the lessons from the Rothschild period, it has, therefore, been possible to illustrate their continuing relevance.

The structure of this book

The book retains its previous three main sections. Following this Introduction, Part I (Chapters 1-3) sets the context for the relationship between government and science by considering some of the relevant theories. Part II (Chapters 4-10) is the empirical heart of our study. Here we describe how the organisation of the DHSS (Chapter 4) was extended to include the research management and advisory committee system

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(Chapters 5-7) and to attempt new relationships with the research councils. The particular case of the DHSS research units is taken up in Chapters 8-10 where we examine their purposes and the processes of 'peer' review by scientists and of customer review by the DHSS policy divisions. These chapters provide the empirical grist to our conceptual mill: they substantiate our theses of government's and science's multimodality and explain the difficulties of arranging fruitful encounters between them. In Part III (Chapters 11-13), we take up the same experiences to examine the processes, functions and outcomes of the research commissioning system and how it precipitated such new or reformulated roles as customers and receptors of research, brokers between science and government, and contractors attempting to meet government's needs. In Chapter 13 we also give a brief account of developments over the last 20 years using key points from our earlier 1983 edition to highlight some of the major advances and remaining problems. In drawing our generalisations and conclusions, we show how the concepts developed in the first edition are still of considerable relevance when attempting to evaluate and analyse recent developments in health research systems, and not only in the UK. We recall the methods employed in our seven year empirical study in the Appendix.

Prefatory note to the second edition

In bringing the text up to date, the two original authors are joined by Steve Hanney who has undertaken a series of studies in the field of health research systems over the last decade (for example, Buxton and Hanney, 1996; Hanney et al., 2000; Pang et al., 2003). All three authors are grateful to colleagues who encouraged us to undertake the second edition and provided expert advice, in particular, Martin Buxton, Robin Dowie, Shyama Kuruvilla and Bryony Soper. We are also indebted to Avril Cook who provided excellent secretarial assistance.

Maurice Kogan, Mary Henkel and Steve Hanney, Summer 2005

Part I Government and Science

Chapter 1: Relationships between Government and Science

Our model

IN THESE chapters we recall the encounter between government and science in a stressful and volatile period of British political and social history. Its setting is one British government department, the Department of Health and Social Security. Much of what we have to say will be an historical account derived from our study of DHSS papers, from attendance at many of the key meetings, and from interviews and meetings with some of the principal actors. In the first half of Chapter 13 we bring the story up to date with an account of some of the significant changes in roles and relationships that have taken place since we published our first edition in 1983.

In order to wring the maximum benefit from the natural history of these events it is important, however, that we establish in the reader's mind the broad themes that underlie this history. We begin with the idealised and classic models of some key characteristics of two worlds - science and government - and their relationship with each other.

In the classic and 'internalist' model, science has its own structures of values and of knowledge. These constitute a complicated and varied world of their own. Science contains its own system of power and authority which underpins regulatory, allocative, rewarding and sanctioning institutions. Thus a member of the 'scientific community' is apprenticed to and becomes inheritor of the disciplined accumulation of knowledge, and of the rules by which knowledge is mastered, advanced, tested and refuted. These individual characteristics of the scientist respond to the broader relationships of power and authority applied by scientific disciplines as they license scientists and allocate them status and resources.

An equally idealised model of government assumes that it, too, has its value structures, most usually described in terms of bureaucracy and attendant managerial hierarchies and, somewhat less elaborated in the literature, its own structures of knowledge as well. Its knowledge systems have been typified in terms of the degrees of specialisation and generalism adhering to different functions and roles, and in some literature (Linder, 1980) in terms of the way in which objective data from

Chapter 1

outside become subjectivised within the system. Government has its own authority and power relationships encompassing the worlds of political direction, administrative execution of policy and client groups who form part of both the dependency relationship and groups which press upon the system producing statements of interest for government to reduce into allocations. And government, too, has its own institutions performing regulatory, allocative, rewarding and sanctioning functions.

The classic and idealised models of science and government both assume convergence and unity. They refer to somewhat autonomous entities brought into relationship with each other, from time to time and for particular purposes, but essentially capable of going their own way without decisive interpenetration or significant mutual effect. Science has been assumed to have its own resources and its own authority. The fact that much of the funding has come from government sources was not relevant because they were assumed to be grants made on relatively free terms. Equally, government was hardly challenged in its norm setting or in the preferences exercised between different sources of knowledge by its relationship to science. The notion of a free market of ideas in which government could choose among relatively self-confident providers seemed unassailable until the mid-1960s.

The simplicity of these classic assumptions has been drastically undermined during the period of our story. The elegant abstraction of the 'internalist' model of science (Merton, 1973) has given way first to epistemological doubt and then to sociological scepticism (Mulkay, 1979). Reflection about government, too, has become an arena in which behavioural scientists play with political, constitutional and organisational theorists.

What then were the modifications made to the presented model in our 1983 account? Certainly, we accepted that both science and government inhabit worlds of their own. But increasingly they had been pulled not only into each other's orbits but into those of other institutions too: boundaries were less distinct, and systems more complex.

Partly, but not only because of this, both science and government display dichotomous and conflicting characteristics of *convergence* and *divergence*. Science must act coherently. It can only, for example, license its practitioners through the

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award of doctorates, or be certain that a learned article is worthy of publication, or verify that an experiment has been duly controlled, or certify to the internal consistency and logic of an argument, if it is confident of its techniques of evaluation and of control and is able to insist upon reliable conformity to them.

There are, indeed, principles of testing, of accumulation of knowledge, of ways in which science might be refuted and augmented. Through power, authority and institutions it asserts degrees of uniformity and convergence of norms to which scientists conform. At the same time, however, divergences, less well acknowledged perhaps among the scientific elites responsible for the government of the scientific community, are evident. Much of the disciplined inquiry which the DHSS, albeit tentatively, sought to encourage, did not respond to classic notions of scientific control and had as its starting-point the problems set by client groups in the larger society rather than the unfinished business and logical imperatives of scientific disciplines. Moreover, even within those scientific areas where the client groups hardly penetrated, differences in criteria were evident. The norms set up by the sociologist, the anthropologist, the social psychologist are not the same as those of the experimental physicist, medical scientist or experimental psychologist which remained dominant. There is a wide range of epistemologies each of them carrying different normative assumptions about science. One of the fascinations of our study is the extent to which normative systems might have changed - but largely did not - in response to the pressures placed upon science by those acting as proxies for client groups in the wider society, and those demanding a different view of science in the scientific community itself.

But government too is tribal and divergent. The DHSS acted through many modes in response to the agenda set by ministers, by the dependent local and health authorities - and by client and pressure groups. In some modes it allocated resources and power and was closed and authoritarian. It must then be convergent. In other modes it reflects upon the aggregate of all of these things and tries to set them into priority order. In so doing it may be permeable by external influence. The judgements of its professionals are then modified by those of outside professionals and client groups. When it relates to the scientific community it may act as a customer quite instrumental in its demands or it may set itself up as a broker between customers and the scientific community. Even at the very top of the system in the 1970s and 1980s its different commands, led by Deputy Secretaries, the Chief Medical Officer, the Chief Social Work Adviser, grappled with issues from different dimensions. So did the Chief Scientist, a principal actor in our story - executor of, and adviser on scientific policy, and principal broker with the scientific community - work in different modes.

The *multimodlity* of government is evident whenever science and government engage each other. Each partner defines itself differently. Some brief examples may make this point clear. For example, when the DHSS was working, through its nursing divisions, on what disciplined inquiry will most help nursing develop, it was acting in a field virtually innocent of other sources of finance and also one in which it had a primary interest because nurses were almost wholly employed by the National Health Service for which the DHSS was accountable. The DHSS as the body commissioning research was in an entirely different position when it faced the Medical Research Council in the mode set for it by the Rothschild Report (Rothschild, 1971) - as the holder of funds transferred from the MRC (see Chapter 6), when it could invite the MRC to commission work which it deemed to be necessary. Both the MRC and the Royal College of Nursing defined their relationship with those who carry out scientific research quite differently from the relationship they had with government, or with other research councils, or with the manpower training system with which they were also concerned.

If the institutions of science and government change tactically in response to those with whom they must relate, so is their self-definition altered by the wider social context. The DHSS participated in the social and political movements of its time and thus went through a period of optimism and certainty about the role of government and its ability to commission knowledge that would be useful to it. This was later to give way to a more imperative mood, at the time of the installation of Rothschild, when it was no longer content to offer the blandishments of the market to researchers, but instead sought to be more systematic in its commissioning. And it later fell in with the mood of disengagement which emerged in government in the late 1970s with both a change of government and the general onset of pessimism about the power of rationality and knowledge to order human affairs.

We have, then, complex institutions of science and government. Each displays different modes of working and different degrees of certainty or convergence and volatility or divergence. Normative stances and institutional characteristics are changed and expand as each interacts with the other and with other institutions; at the same time each is resistant to pressure and change. Given these inherent characteristics, what relationships resulted from the commissioning of science by government? Our historical account disposes of the notion that the relationship between government and science has been, or can be, that of a simple managerial or hierarchical relationship, although much science is, of course, hierarchically and managerially ordained. Government departments have their own scientific units which, in differing degrees, are subordinate to the service needs of their departments. In general, however, and certainly in the cases to which we are referring here, there is a pattern of negotiation which needs other, and more complex, conceptualisations than those of naive managerialism. Here we followed the rediscovery of exchange theory already being so extensively applied to the relationship between central and local government (e.g. Ranson, 1980; Rhodes, 1979) and the corresponding consequences in terms of the distribution of power between different groups. A simple exchange model might assume that government gives resources for science in exchange for which scientists give their expertise and commitment to the solution of problems. As we shall see, however, this pattern of exchange, of mutual dependency, became strongly modified by the application of the customer-contractor principle. This wrongly assumed a simple exchange relationship in which the contractor could freely accept or reject government-commissioned work. Because of the conditions under which science began to operate in the mid-1970s, an imbalance of power, resulting from an imbalance in the terms of exchange, emerged, and patterns of negotiation gave way to other and less interactive operations of power.

A further and broader series of conceptualisations concerns the ways in which policy is made, and the ways in which science is called upon to contribute to that policy. It can be asked whether government's connections with groups outside itself are mediated through a system of consultations with elites within its domains of interest. This issue, classic in political science (Crewe, 1974), becomes important when we consider whether DHSS's commissioning is directed towards producing knowledge thought to be usable by those with most status in science, or whether it can accommodate wider groups of scientists, and client groups as well. Merely to introduce the full range of client groups, and a wider range of science, does not, of course, of itself entail pluralist models of decision-making. But there is a spectrum of such practices to which we can address ourselves.

In reciting the history of the DHSS's attempts to commission science before the Rothschild Report, during the high noon of the Rothschild pattern, and in the period when much of the Rothschild principle was dismantled, we shall be testing the assumptions contained in these paragraphs.

The working of each side can be described in terms of their range of values, epistemologies and institutional arrangements for mediating power and authority. As each seeks to work with the other side the resulting relationship can be described in terms of varying degrees of managerialism, negotiation, exchange and dependency. These relationships then take a particular form such as those of brokerage and, perhaps, loosely- coupled elites working within an essentially negotiative pattern.

The policy issues

The problems encountered by the government department and scientists are largely explained by the characteristics and relationships summarised in our critique of the classic model. The issues which the model should illuminate are, first, why is it so difficult for central government and the world of disciplined inquiry to collaborate even when, as in this case study, serious and responsible attempts were made to create conditions for that to happen? How far is government organised to use sources of knowledge outside itself? How far does the research community respond to government's encouragement to contribute towards solutions to the problems affecting public interest? What use can government make of their contributions and how does it evaluate them against those from other sources?

The policy problems may be answered at several levels. Taken as a whole, government may have a limited capacity to tolerate scientific inquiry that intensifies uncertainty or challenges its own working. Equally, science might be asked to meet the needs of society, or government, for information or conceptualisations of a kind that are not easily reconciled with its own structure of disciplines.

The levels of government at which definable and researchable problems can be identified may be limited. At the more baffling levels of policy formulation the scientist may fall away because the issues become predominantly those of values and allocation rather than of the discovery of fact, reanalysis of concept and the formulation of scientific conclusions. The question then arises whether there is such a thing as macro scientific policy. These difficulties become more real when we

consider what affects the work of individual officials and scientists. The policy-maker, as we describe in Chapter 3, is the beneficiary and victim of several conflicting frameworks of knowledge and of social processes. Scientists strive to establish bounded frameworks with their own integrity and logic, and in such examples as those connected to the human genome or bio-technology have demonstrated the great power of science, but, as we contend in Chapter 2, they too respond to social influences beyond those of scientific norms.

The DHSS tried to overcome such problems by inviting academic advisers and researchers to collaborate with them in formulating research policies and implementing them. Why then did the mechanisms for ensuring co-operation become so laborious and eventually in part dismantled? Was the problem one of organisational structure? Or was the Department casualty to particular events and motivations? Or was the enterprise inherently impossible, because of the two different cultures which inhabit the worlds of governments and science (Caplan et al., 1975)?

The story

The story is a complex one and we briefly summarise it here. The Department had begun to commission substantial pieces of research throughout the 1960s. Particularly in areas of health and social services, programmes, sometimes incorporated in units (there were 38 of these, typically on six-year rolling contracts, by the beginning of the 1970s), were established. They were given considerable degrees of freedom to contribute, largely as they saw fit, to the development of a scientific community concerned with applications of particular relevance to policy and practice. The DHSS, in this 'golden age', seemed confident that the enlisting of science to solving problems could be achieved by relatively free negotiation in which customer interest was elicited but was not necessarily made decisive.

By the beginning of the 1970s, as we shall see from Chapter 3, both the optimism and the desire for certainty became stronger. With the return of Edward Heath's government in 1970, government's search for knowledge and rationality became more pressing and the concepts of the client group within government and the customer in the policy division became more strongly sponsored. These trends were visible throughout government, not only in the DHSS, and the most important result was the Rothschild Report which, together with the Dainton Report* was published in 1971 as a consultative document. Almost immediately the government formally accepted the idea of the customer-contractor principle. A White Paper in July 1972 essentially followed the Rothschild Report and modified only the percentages of the research council budgets transferred to government departments.

What Rothschild said

The Rothschild Report made a sharp distinction between fundamental and applied research. Basic research, the province of universities and research councils, is research aimed at furthering 'discovery of rational correlations and principles' (Rothschild, 1972) while applied R & D has 'a practical application as its objective'. For 'applied' research to be funded it must have a named customer, 'the customer says what he wants; the contractor does it (if he can); and the customer pays.' (Ibid, para 6) All applied research funded by government departments should be organised on this principle.

Applied research is distinguished by its objectives. It is not defined in terms of the length of time it takes nor of the techniques or kinds of science it employs. To those who might argue that such a sharp distinction between basic and applied research ignored the potential interactions and spin-offs from each other, and that scientists themselves were capable of identifying social objectives for research, Rothschild replied 'the country's needs are not so trivial as to be left to the mercies of a form of scientific roulette, with many more than the conventional 37 numbers on which the ball may land.' (ibid, para. 6). He might have added that the distinction was intended to settle managerial accountability and public policy issues. It could not settle the ways in which science might organise itself.

Three principal recommendations for government departments followed. First, the customer-contractor principle should govern all applied research. Second, each

^{*} The Future of the Research Council System, Report of a Council for Science Policy Working Group under the chairmanship of Sir Frederick Dainton, was published as part of the same document as the Rothschild Report. It rejected a distinction between pure and applied research because of the interdependence of the two for progress in each, and because the blurring of boundaries between different scientific fields leads to more internal cohesion of science. Instead it proposed a threefold classification of scientific work: *tactical* - that needed by government and industry to further its immediate concerns, whether research involved was long-term or short; *strategic* - general scientific knowledge underlying tactical science; and *basic* - research and training with no practical objectives other than advancing scientific knowledge and maintaining a corps of trained scientists. Its main recommendations were that the five research councils should continue to function as they were, but that the Council for Scientific Policy should be replaced by a Board of the Research Councils.

government department funding research was to appoint both a Chief Scientist to advise customers on research needs, and a named controller of research and development to be the executive head of the R & D function and to provide that service for the customer through either in-house facilities or external commissions. Third, varying percentages of the budgets of the Medical Research Council, the Natural Environment Research Council and the Agricultural Research Council were to be transferred to the relevant government departments in recognition of the applied nature of some of their work.

The control and transfer of funds from three of the research councils would ensure that government departments got what they wanted from them. The proportions of funds taken over by the departments were estimated from the amount of applied research sponsored by the research councils.

The 1972 White Paper was a child of its time. It was optimistic about government's ability to think and act. Thus:

The new framework provides a partnership within which science will have more influence on the government's central policy-making' activities than before, and which will contribute more directly and more effectively to the task of making the best use of science and technology for the needs of the community as a whole (para 61).

The government hoped that application of the customer-contractor doctrine to all of its applied research and development would create clear responsibilities. 'Departments as customers, define their requirements; contractors advise on the feasibility of meeting them and undertake the work; and the arrangements between them must ensure that the objectives remain attainable within reasonable costs.' (1972 White Paper, para 61).

In the light of later experience, the Rothschild formula can be criticised for assuming that government departments were the only source of policy development, that they could state all their requirements from their own sources of knowledge and problem-setting. It failed to note how in those areas of policy where data are diffuse, and analyses most likely to be strongly influenced by value preferences, problems must be identified collaboratively between policy-maker and scientist. It failed to acknowledge that policy-makers have to work hard to identify problems, to specify research that might help solve them, and to receive and use the results of research. Equally, it assumed that research institutions were strong enough to negotiate with government in a market where science might be procured as piecework. The need to defend a science system whose resources and legitimacy were already becoming attenuated, and which were to come under increasing threat as the 1970s progressed, was never anticipated by Rothschild. It assumed that science was sufficiently developed to be used, and thus failed to specify the need for government to assist in the development of science more closely related to practice and service needs than to academic disciplines. It could not anticipate the ending of the UGC quinquennial system or the reduction of research council monies. Possibly the customer-contractor relationship has a better chance of success when the product of research can be more easily specified. But it can work in the social policy areas on the assumptions set for it only if there is much more sensitive elaboration.

Reactions to Rothschild

The reaction of scientists was immediate, almost wholly hostile, but limited to concern for the effect on the research councils (eg *Minerva*, 1972). They argued that Rothschild provided no evidence that the research councils had failed in their tasks. They criticised as artificial the assumed divide between fundamental and applied research, and emphasised the stimulation that each could provide to the other. Moreover, the government departments would not necessarily be more successful in predicting future needs than researchers themselves.

But the issue was not whether science should be free or controlled, but what balance should be struck between the two modes. Science had become so large-scale an investment in many areas where government's interest was strong that the policy-machine could not remain detached from it. Moreover, not all scientists wanted to stay aloof. Some thought it important to have an impact on policy even if it meant adapting their research objectives to customer wishes. That did not mean, however, that all would accept that policy-makers should set the goals for science in the way the Rothschild formula prescribed. The relationship would involve negotiation of *quid pro quos*.

Despite scientists' objections, and these came mainly from those strongest in the academic setting rather than those primarily concerned with application to policy and practice, the DHSS acted upon the terms of the White Paper. It took up membership of the Medical Research Council, where previously the Chief Medical Officer was an

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assessor only. And the Department established an elaborate and multi-level set of committees to draw on the advice of established scientists. These were to give scientific credence to the research programme, and to build connections between policy and science.

The structure of the commissioning system

The DHSS adopted its own version of the Rothschild structure (see Figure 1.1). As noted earlier, Rothschild recommended departments to create two distinct roles: an advisory Chief Scientist to assist customers, and an executive Controller R & D, primarily to provide the customers with an efficient R & D service.

Until 1982 no one at the DHSS was designated as the Controller R & D. In the period 1972 to 1978 the Chief Scientist (Figure 1.1 (vi)) had an advisory function. This involved him in the selection of scientific advisers, the appointment of members of his advisory committee system (Figure 1.1 (i) - (v)) and the assessment of the quality of research, often delegated to advisers and research managers, although the Chief Scientist led the reviews of the DHSS-funded units. Executive action was undertaken by the research management division led by an Under-Secretary. That division was accountable for the research budget and the management of resources was the province of its administrative staff. Research management was shared by career administrators and by professional staff from the medical and nursing divisions and the social work service.

The Chief Scientist's Committees

The DHSS created a committee structure which should have ensured negotiation and collaboration between the Department and the scientific community at all levels.

The Chief Scientist's Research Committee (CSRC) (Figure 1.1 (i)) was to concern itself with all aspects of DHSS-funded research in health and personal social services. It was not able, in its relatively short life, to cover equally all DHSS concerns, and thus worked to a far lesser extent with social security and the more specialised research programmes of computers, supplies and equipment in buildings. The CSRC was to assess the priorities within the entire research programme, to ensure achievement of scientific standards and to consider the adequacy of resources for research. Its twenty members were drawn mostly from social medicine health service studies and the social sciences, reflecting



