Prescriptions for medical research

I—Management within the Medical Research Council

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In their submission to the government in advance of the white paper on science policy in the United Kingdom the Medical Research Council commends the MRC's own approach to managing directly funded research. But a series of semi-structured interviews with the directors of some of the MRC's units suggests a gap between the MRC's model of managed research and the reality. Although such units are theoretically managed from MRC head office (and units are charged an overhead for this), in practice each unit runs its own affairs. Between major reviews average contact time with the head office contact person is seven hours a year.

The first paper argues that a purchaser-provider split would recognise the benefits of decentralisation and allow units to bid for research funds from several sources, the successful ones guaranteeing their survival through a rolling series of research programmes.

The second paper criticises the MRC's cumbersome peer review system. Reliance on outside experts atrophies the scientific skills of head office staff and builds delays into decision making. A purchaser-provider model would allow the head office scientific staff to act like commercial research and development managers, commissioning research, and using the outcome, rather than peer review, as a criterion for continued funding.

The Chancellor of the Duchy of Lancaster has just published a white paper on science policy for the United Kingdom looking at the organisation and management of scientific research into the next century. In its recent submission to this white paper regarding medical research the Medical Research Council maintains: "There is widespread agreement—both nationally and internationally—that the MRC's [organisational] approach to directly funded research has been highly successful. . . . The MRC's own experience in . . . management means that it has well-proven models that can be extended [for the benefit of higher educational institutions and other research providers]." (Submission from MRC to Chancellor of the Duchy of Lancaster, November 1992.)

This is a view which the chancellor, William Waldegrave, seems to have accepted, saying at the recent Save British Science meeting in London that there were aspects of the MRC's performance that he "would like to see formally replicated in other areas."¹ These suggestions that the MRC has a blueprint for wider application within the research community deserve critical evaluation if the blueprint is to be urged on others. This is particularly so as the excellence of MRC practices is not universally accepted. Within the past 12 months, for example, one former MRC director has called for a full public inquiry into the MRC's management performance,^{2,3} and the MRC's failure commercially to protect Dr Cesar Milstein's Nobel prize winning development of monoclonal antibody technology still astonishes informed observers. We seek here to weigh the merits of the MRC's

operational management in the light of recent research within the MRC's units.

Methods

During 1992 a research programme was begun to review the running of the smaller MRC research units, concentrating especially on the way they were managed both locally and centrally. From this we hoped to determine which options were most likely to help the MRC fulfil its published mission.⁴

Management structures in the public services are evolving rapidly, with two pervasive themes dominating the changes. These are the decentralisation of managerial responsibility and decision making and a quest to achieve a good "fit" between the aims, operation, and structure of public sector organisations.⁵ A main aim of our research was to test the growing belief within sections of the MRC that this tide of change, so apparent within other areas of health and research management, has largely passed the MRC by.

The research protocol, involving collaboration between a researcher within the organisation (RG) and an academic management researcher with an interest in public sector management (JH)⁶ offered the advantages of both insider knowledge based on over 25 years as an active scientist and the detached perspective of a researcher with experience of other parts of the public sector.⁷

The study is based on the most exhaustive evaluation of management methods and attitudes ever undertaken among MRC unit directors.⁸ A semistructured interview was administered as the basis of discussion with 11 of the 12 directors of the MRC's research units established round a single prominent scientist, the so-called *ad personam* units. (Although the 12th director was keen to take part, he died before an interview was conducted. He gave his views on many issues in a long telephone conversation shortly before his death.) Ten of the 11 directors agreed to the tape recording of their interview, yielding nearly 24 hours of recorded discussion, which was supplemented by interviews with former MRC employees, managers from industry, a senior defence researcher, and consultants. Promises of anonymity were given in the way the data were attributed to all those interviewed (at the request of some respondents) and agreements that verbatim transcripts of the tapes would not be made. Senior managers within the MRC's head office were the only people approached who declined to contribute. The 100% response elsewhere gave a strong basis of data for the study, amounting to over 125 years of collective experience of the organisation from the research unit directors interviewed.

The data presented relate to the MRC's in house research, conducted by an ever shrinking number (45 at the last count) of research units, most small and most embedded within universities. These units consume about 60% of the £235m that the MRC spends annually.⁹ The *ad personam* units account for 25% of the total, but the findings raise general issues of wider relevance to the organisation. These units have recently

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BMJ 1993;306:1668-72

FIG 1—Directors' estimates of hours per year spent in their unit by MRC head office contact person

FIG 2—Directors' assessment of organisational culture (according to Handy's model) of their own unit and of MRC head office

been described by the MRC as the "jewels in our crown,"¹⁰ yet such is their rate of attrition that two have closed in the year since this research started, with three more under threat.

Who is doing the managing?

We uncovered a paradox in pinpointing the precise location of effective management activity within the MRC's in house programme.⁸ Though the research council has a head office comprising 12% of its total workforce (and consuming 6.1% of its gross budget),⁴ all unit directors interviewed were in no doubt that they and their staff managed their units. This was one of only two questions in the interviews with directors which produced a unanimous response, yet it contrasted sharply with the view of the MRC's director of operations, expressed outside this research: "The residual management load in the units is very light." Though only two of these smaller units had staff whose grading reflected a management function, all directors agreed that they had diverted manpower to cover this activity, often in the person of themselves or a senior colleague, a fate that befell RG early in the history of the unit in which he is based. Estimates of the time taken up with unit management varied from one and a half hours a day (of a director's time) to one full time member of staff plus half the director's working week. Least time was expended on management in units embedded in one particularly supportive university. Few of the staff doing the managing had any management training, though five of the directors expressed the wish that they had.

The role of scientific liaison between the MRC and its units falls to a head office department known as the medical division and recently renamed the research management group in confirmation of its perceived function. Each unit has a specific contact assigned to it within the department. Asked if they viewed head office managers as a resource or a taskmaster, only two directors saw them as a resource, another two as a taskmaster, while another two independently invented the additional category, "an imposition." The remaining five directors saw them as some of each of these elements. Views of the quality of this central management input varied from very poor to very professional, the consensus being that it was highly variable. Only 25% of directors interviewed believed that the MRC's central managers understood how a small unit functioned. This may not be as surprising as at first it appears, as directors estimated that in a normal year (when the unit's work was not being formally reviewed) head office staff spent a mean of seven hours a year actually in their unit (fig 1).

It is difficult to understand how much "research management" can be accomplished with so little contact time, even if the time spent was viewed as effective. The effectiveness of these interchanges when they occur, however, might be gauged from one director's comment: "I have an arrangement with medical division between reviews—I don't bother them and they don't bother me. It seems to work."

Thus the MRC's central administration seems to believe that it is operating a centralised bureaucratic management system, whereas its units seek to run (largely unfunded) a much more entrepreneurial decentralised form of operation. As Peters observes, "If you want to know what is really going on in an organisation, watch their feet not their lips."¹¹ Such a dichotomy of perception seems likely to affect the effectiveness and efficiency of the management process.

Culture and structure

Handy has defined organisational culture in the phrase "The way we do things round here." To be

successful the culture of an organisation should be congruous throughout its parts.^{12,13} Handy proposes a categorisation of organisational culture based on four models, termed "power," "person," "task," and "role" cultures.¹⁴

The power culture revolves around one dominant powerful figure, where nothing is done until approved by this person. A typical example might be Robert Maxwell's former empire. Person cultures also centre on a principal individual but tend to exist to support and facilitate that person's personal effectiveness: an example might be a barrister's chambers or a singlehanded general practice. Role cultures are hierarchical, bureaucratic, and governed by strict rules, such as the police or civil service, while the task culture is very results oriented, with the end justifying the means. Organisations with a task culture are fast moving and, like the person culture, entrepreneurial and loosely structured.

Directors were asked to assess which model most closely fitted their own unit's culture and that of MRC's head office. All but one saw stark differences between the two, with most viewing the centre as having a bureaucratic or dictatorial style (Handy's role or power models) and their units as highly task oriented (fig 2).

What was clear was a general desire for units to have greater autonomy of operation. Six of the small units were firmly in favour of this, while only two favoured the status quo, and none wished to be less autonomous. Clearly this would require a shift of resources from the centre to the research coalface. Interestingly, the MRC already formally assigns 60% of its central administrative spending as a charge to units to cover their management costs (B C Dodd, personal communication). This equates to 10% of a unit's total running costs for each unit yet, remarkably, only two of the 11 directors interviewed were aware of this practice. Once they became aware (and four directors were reluctant to believe it occurred) seven of the remaining nine directors questioned the validity of the charge, one commenting, "That means I am paying £13 000 per hour for the time medical division spend with me."

What this exercise does do, however, is to define the size of the pot available for redistribution were management responsibilities formally moved into units, and it would seem to be fully adequate if maintained at that level. The resultant inevitable reduction in duplication of effort should yield efficiency gains.

Such a move to manage the units from within through a unit manager was viewed very positively by seven of the 11 directors, eliciting such comments as: "Yes, like a GP practice manager. Given the right chemistry with the director that could be wonderful." Many management consultants would see the inevitable reduction of the bureaucracy within MRC's head office which these shifts of resource would achieve as worthwhile in its own right.

The culture perceived to exist within the units seems much more in tune with MRC aims and the research environment than the rather slow and rigid style of its head office. Several models attempt to match an organisation's structure to its aims and context.¹⁵⁻¹⁷ If one accepts that a research unit should be dynamic, innovative, and aware of new developments, then Flynn's model suggests that a manager driven, outward looking stance is the most appropriate (fig 3).¹⁷ As the research environment is undoubtedly dynamic and complex then Mintzberg's concepts indicate that a decentralised, organic, and entrepreneurial structure is most likely to bring success (fig 4).^{15,16} On employee relations Purcell suggests that in a culture where both individualism and team spirit are important, as few

would doubt they are in a research group, a consultative approach with openness, mutual trust, and constructive dialogue is vital (fig 5).¹⁸ However, a survey of 44 of its head office middle managers in 1990¹⁹ described the organisation as "introspective, secretive, paternalistic, bureaucratic, compartmentalised, lacking a team spirit, perfectionist, slow and amateur in approach to managing."

Professionalism

Few doubt the quality and professional qualifications of the MRC's research staff, chosen as they are on the basis of their research record and formal scientific qualifications. The same level of management training and skill is not found among those running the units, however. This task tends to sidetrack very senior staff away from their research activities, and at head office, the Research Management Group too is populated by scientifically qualified staff, often without any track record or training in management. This points to what is termed a "professionalist"²⁰ form of management, such as one might find in a law or accountancy firm.

Such a model has its strengths, though the 1980s have seen a steady change towards the "general manager" approach in much of the public sector,²¹ particularly in health. Key among the advantages of professionalist management is the ability for those involved to use their specialist knowledge while fulfilling their managerial role. The siting of MRC's head office remote from any scientific activity makes practical scientific engagement impossible for these managers, but one might expect their professional opinion to be valuable in their role. However, profes-

FIG 3—Matrix matching management style to culture. Analysis of directors' responses indicate that most identify their units as lying in the lower right hand quadrant, while the MRC central administration's culture lies in the lower left hand sector

FIG 4—Mintzberg's environment matrix

FIG 5—Management style in employee relations

sional opinion on MRC in house science is almost invariably imported from external experts, largely through the peer review system, and the knowledge base of its in house managers remains dormant. As one former MRC manager commented:

"In ten years with them I never used my specialist knowledge once . . . all the expert input came from the external experts . . . you can't blow your nose without taking advice from half a dozen of the Great and Good. No one regarded me for my science, and what's worse in all that time I didn't really learn anything—that's sad when I look back."

This appears, certainly to those in units, to rob their research management group colleagues of any independent decision making capacity. All MRC researchers will be familiar with the interminable delays injected by a tiered committee-subcommittee system with managers at all levels impotent to act without external guidance. For example in the current survey nine of the unit directors viewed their unit's review as unnecessarily protracted (see accompanying paper).²²

If scientific expertise is to be imported in this way a "general management" approach to the staffing of its headquarters may serve the council better than employing people without management skills and precluded from exercising their scientific ones. The current structure robs the system of the pace so vital to the rapidly changing environment surrounding research. As one director commented:

"They [MRC] don't understand how rapid our response has to be in small units. If someone in the US publishes on work I've just started, I drop it the next day and get on with something else. With our level of funding we can't compete on speed with the States; we have to compete on originality. Mind you, you are then faced with explaining to some rule bound administrator whatever happened to that work that the subcommittee had approved years earlier and why it was never completed."

The lack of tempo is already a problem because of the isolated nature of central managers and the poor lines of communication identified by most directors interviewed. As one director commented regarding the time taken up by the review of his unit's work, "It took me away from bench research for two years while I prepared for it, endured it and then fought its aftermath. I'm only just getting back to what I enjoy and I resent that."

These deficiencies in managerial professionalism manifest themselves in other support activities provided from the centre such as finance, management services, and personnel. Here the MRC clings to the civil service concept of the generalist. Thus a unit's point of contact within any of these services is likely to be rotated through departments rapidly, precluding the development of any real skill, rapport, or level of

understanding of unit concerns. This contributes significantly to the poor channels of communication noted by unit directors. Coupled with a head office staff turnover described by one personnel officer as "frightening," this in turn robs the organisation of pace and expertise. It was a source of real irritation to all the unit directors, one typical comment being, "They could cut their staff by a quarter if they let experience accumulate. It makes them slow and amateur." And, from another director, "It's a real problem. I've had five medical division contacts in four years. It's just not worth spending the time to brief them as to what is going on here."

Conclusions

Overall the picture painted by nearly 24 hours of interviews with 25% of the MRC's key active research managers, its unit directors, does little to support the council's assertions of managerial excellence, at least in respect of operational management. Neither effectiveness nor efficiency could be claimed to be good. Managerially the findings support a move for the individual research units becoming much more self sufficient and freestanding.

PURCHASER-PROVIDER MODEL

Such an arrangement would fit much better into a purchaser-provider system of managing research, offering research opportunities in specific areas, than into MRC's peer review based system of scientific management. The purchaser-provider system mooted by such bodies as the Advisory Council on Science and Technology (submission to Chancellor of Duchy of Lancaster, October 1992) envisages that executive funding bodies commissioning research could be separate from research providers, who would compete for the research opportunities and may be university departments, research institutes, or even commercial research departments. The commissioning bodies would offer research programmes of three types: curiosity-driven research, at the most basic "blue sky" end of the spectrum; mission oriented research, with a goal in mind; and experimental development, aimed at bringing research discoveries closer to the marketplace. These more proactive purchasing bodies would have to be leaner, swifter acting, and use more in house expertise than the current MRC, which they might supplant.

If the current MRC units (focused research groups within a university environment but without teaching commitments) were to survive as research providers, which is clearly not ruled out in a purchaser-provider system,²³ their long term survival would depend on their ability to keep winning commissioned research (see accompanying paper). They would have the freedom to modify their research portfolio by choosing which research commissions to bid for, and their size would depend on how much research work they won. Thus the successful groups would prosper and grow while the unsuccessful would perish. Peters describes this risk of "fast failure" that, in his view, inevitably accompanies a decentralisation of responsibility.²⁴ Such a process would be overt, swift, predictable, and a healthy form of natural selection within the system, in contrast to the covert and questionable procedures by which research units currently become earmarked for closure.

Clearly a purchaser-provider arrangement would require a greater management presence within the research provider unit, in the same way as practice managers have become an indispensable part of fundholding general practices. From our findings it is clear that this may in turn release gifted scientists from management tasks, enhancing the productivity of such

units. At first sight, however, the purchaser-provider provision looks to offer a less secure career structure for those employed in provider units. In practice this may not turn out to be the case.

Firstly, such a unit would not have all its eggs in one basket, as it would run a portfolio of research commissions, starting and ending at different times. This would relieve such groups from the anxieties of the periodic "all or nothing" funding decisions to which they currently are subject. By moving staff from commission to commission a core staff could almost certainly be kept continuously employed. Units might at times have to pick up research in areas which were not their primary interest to maintain activity. But for the individuals concerned that is no different from the current situation where if an MRC unit closes a scientist may be moved to another unit doing work which holds little fascination. Such a change in direction is currently permanent whereas under the proposed arrangements it might be reversible.

Secondly, a unit would be free to win work from the public, charitable, and private sector, which should significantly expand the work open to a unit. Currently few charities will consider funding MRC units, and the uncertainties engendered by the unit review procedure significantly reduce the attractiveness of collaboration between MRC units and industry (see accompanying paper).

Thirdly, up to 80% of scientists in existing MRC units are on three year short term contracts, which are rarely renewed more than once. Insecurity under a new regime is unlikely to be any greater than that which exists already. Thus the added career risk from a purchaser-provider arrangement is likely only to affect those vulnerable to "fast failure."

NOT CHANGING FAST ENOUGH

There is some evidence that the MRC is changing in response to the waves of change currently sweeping through management in the public sector, though in many areas little seems to have changed from the situation described by Smith over five years ago.^{25 26} Many of the initiatives being undertaken now within the MRC will be familiar to those working in the National Health Service four to five years ago. Nevertheless, many would question whether the MRC has the will or the managerial ability to change at the pace required simply to keep up with its changing environment, a common occurrence in management.²⁷ In particular the advantages of devolving decision making and responsibility away from the centre is a recurrent theme in public sector management²¹ yet one simply not being effectively addressed within the MRC.

The MRC's own set of proposals to the Office of Science and Technology very much defends the status quo. Starting from the assertion that, "Developing and carrying through a national strategy for research requires a research council structure" it contains little new thinking and its retrospective stance in defence of current arrangements seems complacent. It does not suggest the existence of a willingness to see, or be part of, change in the organisation of research within the United Kingdom.

While proposing the MRC's operational model as a potential blueprint for others to follow, its secretary Dr Dai Rees chose also to attack the radical proposals from the Advisory Council on Science and Technology as "false prophets preaching false remedies."²⁸ As Mr Waldegrave confirms that there will be little or no new government money to accompany his white paper,²⁹ and as all science funders agree that deserving work is currently going unfunded, it is logical to seek more effective ways of managing the whole process and using resources. A reassertion of current arrangements, even

if defensible, is unlikely to bring about clearly needed change.

Sharpe recently identified one of Britain's failings in scientific research as an inadequate supply of technical and managerial skills to capitalise on the innovative skills of the research community.³⁰ Certainly Richard Nixon's war on cancer in the United States in the 1970s proved that money alone will not solve research questions if the infrastructure to manage its use is inadequate. If British medical science is being held back by its management in the same way that British manufacturing industry was a generation ago, then the white paper is timely. In its reaction to this challenge to look into the future the MRC has shown again that its culture does not embrace change easily. Our research also shows that Dr Rees's colleagues within the MRC's own research units do not uniformly share his belief in the excellence of his particular remedy.

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(Accepted 14 May 1993)

II—Is medical research well served by peer review?

The research community uses peer view widely for assessing work both when making funding decisions and for publishing the results. The appropriateness of peer review in both arenas is being questioned increasingly on theoretical and practical grounds. Some believe its use retrospectively, as in publication review, is less objectionable than when used prospectively in steering funding decisions for original research, though many of the weaknesses apply in both applications. Its use in both contexts, however, continues undiminished and largely unaltered.

In the previous article we examined aspects of the management structure of Britain's largest single funder of medical research, the Medical Research Council and highlighted the unsuitability of its centralised bureaucracy to the research environment.¹ Much of this central structure exists to service the council's peer review mechanisms, and any attempt to restructure the way the MRC works must address the central part that this form of review plays. We examine here the concept of peer review, appraise its operation in the light of recent research within the MRC, and consider an alternative operational pattern which could overcome the MRC's dependence on a system which is theoretically and practically flawed.

The problem

Within the MRC, peer review is carried out by ad hoc panels of the "great and the good" from the scientific community who are asked to review researchers' achievements or their future plans—or both. The flaws in this system lead to the suboptimal application of available funds, incur considerable hidden costs, and result in many lost opportunities through the long periods of uncertainty generated, particularly in MRC's own flagship units.

THEORETICALLY FLAWED

The work of Kuhn² and others^{3,4} shows that peer review must favour incremental research which defends the existing body of understanding of a subject—the current paradigm. Kuhn goes on to demonstrate that fundamental scientific progress stems from completely new approaches which break the mould of current thinking. In Braben's words: "The central problem with the peer review approach is that it is only any good for next step research of limited vision. It is totally inappropriate for the exciting big leaps which carry understanding forward."⁵

Kuhn² and others also argue that those chosen to perform peer review, having long careers and prestigious reputations founded in the current paradigm, are likely to be hostile to its overthrow and thus least receptive to innovative science.^{6,7} When the paradigm changes accumulated experience of the old paradigm counts for nothing—what Barker terms the "back to zero effect."⁸ In looking at the practicalities of the peer review process within the MRC this paper draws on recent research⁹ as outlined in our previous paper.¹

SUBJECTIVE

No final mechanism exists within peer review to resolve conflicting views among reviewers or between reviewer and the scientist under review. This makes the process essentially subjective.^{2,10} In turn this further undermines its appropriateness both theoretically and practically.

One leading academic researcher, widely experienced on both sides of the review process acknowledged that, "We seem to suspend scientific method when involved in peer review and objectivity and self doubt are replaced by preconception and subjective conviction. I have seen it on all sorts of granting

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BMJ 1993;306:1672-5