It is becoming more obvious in the United Kingdom that the problems affecting academic departments of anaesthesia, present for many years, are assuming even greater severity. These difficulties, of recruitment and funding, are becoming more acute because of modification of the structure of the National Health Service (NHS), alterations in the pattern of training of clinicians, and changes in the mechanism of funding research in both universities and the NHS. If we fail to respond to these changes the consequence will inevitably be a reduction in professional status, with anaesthesia becoming a purely technical service.

**Recruitment**

Recruitment of able clinicians into academic medicine, particularly anaesthesia and some surgical specialties, has always been difficult because of a potentially large difference in income between NHS consultants and academics who may be prevented contractually or inhibited by time in undertaking private practice. Furthermore, the terms and conditions of academic service have always been less favourable than those in the NHS, in respect of domestic removal expenses and also superannuation. More recently, because of the increased expansion in consultant numbers to compensate for the reduction in the permitted hours of work of trainee anaesthetists, there is a huge imbalance between the demand for consultant anaesthetists and the supply of accredited senior registrars; thus the competitive element in obtaining a consultant post in the NHS has been diminished and often eliminated. One consequence of this is that some of the incentives to undertake research have been eliminated. This is reflected in the pattern of submission of manuscripts to *British Journal of Anaesthesia*. Over the past 5 years, there has been a 65% increase in the total number of papers submitted for publication but only a 20% increase in papers from the United Kingdom and these are predominantly from academic departments. While the mere desire to furnish a curriculum vitae is unlikely to be accompanied by substantial research output, none the less we believe that the process of exposing trainee anaesthetists to research opens new horizons, permits dormant talents and enthusiasm to blossom, and thereby helps to create potential candidates for academic posts.

Another problem likely to affect recruitment into academic anaesthesia is the proposed Calman training structure [1] which will shorten the duration of anaesthesia training to 6 years. In contrast, the aspiring academic will require additional years of research training before being able to compete for a senior academic post with honorary consultant grading. At the time of writing this editorial, the working party on academic posts set up by Calman has not been published but it is unlikely that there will be an alternative pathway to specialist recognition for academic posts. It is generally believed that academic clinicians should achieve clinical competence equal to that of their NHS colleagues.

**Funding**

The second major problem affecting academic departments is that of funding research. Recently, changes have occurred in the way in which medical research is funded in the United Kingdom both in universities and in the NHS. Essentially, as a result of Government policy, naked competition has been introduced into the methods for distribution of grants between and within universities.

Until recently, academic departments were provided with basic funding by the University Grants Committee (UGC) largely on the basis of undergraduate numbers; within universities there was frequently an arbitrary redistribution to individual departments. This funding paid for buildings, academic and technical staff, and basic facilities, including some equipment. Obtaining research funds from external grant awarding bodies such as the Medical Research Council (MRC) has always been difficult and because of the perceived lesser importance of anaesthesia compared with major health problems in medicine, few departments had substantial external research funding. For some years, the MRC seemed to recognize this by earmarking research fellowships for selected “underprivileged” clinical specialties, including anaesthesia, but these were discontinued by 1980. Subsequently, the MRC published a business plan which favoured research funding of five major areas, notably cancer, cell biology, AIDS, mental illness and cardiovascular disease. This trend was followed by other major grant awarding bodies. This policy of focusing on specific areas appeared to decrease the opportunity of anaesthetic departments to compete successfully for research funding from major charitable organizations and the MRC.

Now, in order to redistribute the basic university grants, the Higher Education Funding Council (HEFC, the successor to the UGC) has introduced a scoring system which is intended to grade the research quality of different departments and universities. The Research Assessment Exercise
(RAE) for the current period (1993–1996) will be determined largely by the total external grant income obtained from “blue chip sources”, for example MRC, British Heart Foundation, Wellcome Trust, etc., with less importance attached to commercial funding. In addition, there will be an assessment of four publications proffered by all full-time academics. In view of the frequency with which expert assessors disagree in their views on papers submitted to peer-reviewed journals, we have grave doubts about the accuracy of this process, especially because comparison of research is intended between widely differing areas. Also, it is assumed that journal impact factors will be used to assess quality of publications. The impact factor is calculated as the number of citations to articles in a particular journal appearing over the previous 2 years in all journals covered by the science citation index, divided by the number of articles which that particular journal published in those 2 years.

Table 1 shows the most recent impact factors for highly rated anaesthetic journals together with those for a range of general and other specialist journals for comparison. Impact factors have been criticized as they are open to manipulation by self-citation, and possible editorial influence. The size of a journal’s circulation in North America also has a marked effect on possible editorial influence. The size of a journal's impact factors will be used to assess quality of publications. The size of a journal’s circulation in North America also has a marked effect on impact factors. Space does not allow full discussion of the problems of interpreting impact factors and the reader is referred elsewhere [2, 3]. Impact factor is only one estimate of “quality” of a journal and others such as citation half-life are largely ignored in the UK; British Journal of Anaesthesiology has the longest citation half-life of all the anaesthetic journals but this will have no importance in the UK in relation to the RAE. Despite these criticisms, impact factors have assumed enormous importance in recent years in Europe: in some countries they are used in internal promotion procedures within universities. In general, impact factors are greater for basic science than clinical journals which therefore biases the RAE ratings towards preclinical and non-clinical departments.

A further feature of research selectivity has been introduced recently by a change in what the MRC is prepared to fund. In the past, it was assumed that a university department, capable of undertaking research, was “well-founded” with sufficient university-funded staff, including secretaries, technicians and basic equipment. Now universities cannot guarantee that happy state. Instead, the MRC provides a 40% on-cost (overheads) to meet this need. Of course, those departments that cannot guarantee a continuing flow of such support fall into a poverty trap; not only do they lack the resources to compete for funding, but ultimately the university cannot afford to keep them. What compounds this problem is that at present some of the major grant awarding charities will not provide such overheads to cover part salaries of secretaries or technicians. Thus a department incapable of achieving continuous external funding may gradually be stripped of the means to undertake even the simplest clinical research.

Faced with diminishing university resources or having difficulty in competing for external funding, many university departments turn to the commercial market to sustain income by undertaking phase II and phase III drug trials. Academics are disadvantaged in comparison with their NHS counterparts as universities demand at least a 40% overhead charge on such commercial work, increasing to 100–200% if it is identified as “contract research”. In contrast, many NHS departments will undertake such studies without any overheads although this may change as management of trusts recognize this source of revenue. Not surprisingly, therefore, some pharmaceutical companies have a powerful incentive to pursue phase II/phase III studies in non-academic departments of anaesthesia.

The RAE-induced changes are part of a basic philosophy of government and its scientific advisers

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<th>Anaesthetic journals</th>
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<td>Anesthesiology</td>
<td>Annals of Surgery</td>
<td>New England Journal of Medicine</td>
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<td>American Journal of Ophthalmology</td>
<td>British Journal of Hospital Medicine</td>
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to encourage research-funded universities but also to create others funded for teaching only. Similar considerations may apply within a university such that some departments may be retained for teaching only, others for research and yet others will be allowed to wither and disappear. The survival of academic departments of anaesthesia will then depend entirely on their success as research groups or on their persuasive powers in convincing deans and vice-chancellors that anaesthesia is part of the core curriculum of an undergraduate medical education.

In summary, therefore, there is now substantial redistribution of existing funds based on measures of excellence which are arbitrarily defined. These changes have already been clearly detrimental to academic anaesthesia and universities have been influenced by the RAE in the appointment of professors; this is illustrated by the fact that two recently vacated and still unfilled chairs of anaesthesia were re-advertised as being suitable for either a clinician or non-clinical scientist (on the grounds that the latter may be more successful in raising research funds from the MRC, etc).

THE NATIONAL HEALTH SERVICE

In addition to these changes within the universities, there have been profound changes within the NHS. In the past, the NHS provided some support at local level from old endowments frequently dating to before the NHS was established, and also at regional level from NHS “locally organized” research schemes. This type of funding is now managed centrally via the NHS Research and Development (R&D) directorate (Director, Professor Michael Peckham) [4]. A similar scheme also operates in Scotland, through the office of the Chief Scientist. The R&D Directorate consults widely and publishes lists of priorities for research expenditure within the NHS. Many R&D initiatives are aimed at research methodology and epidemiology in order to establish “evidence-based practice” for medicine. Of the R&D funding aimed at health problems, it is no surprise that cancer, AIDS, diseases of the cardiovascular system and molecular genetics have priority. More recently, the Culyer Report [5] has suggested amalgamating all the separate methods of funding clinical research (NHS locally organized research, the R-component of SFI/STR, and MRC clinically based research) and also introducing a research assessment exercise into the NHS similar to that for the universities. These changes create an even greater degree of central control over the distribution of funding for medical research.

The way forward

What can we do about these threats to the future of academic anaesthesia but also, and in the long term, the standing of clinical anaesthesia? It is unlikely that pleading a special case for anaesthesia or any other clinical specialty will succeed with a government dedicated to free-market forces. Furthermore, at the present time, we have no influence on major funding bodies; there is no anaesthetist on any MRC committee, the council of the British Heart Foundation, Wellcome Trust or any other large charitable body. Only one anaesthetist sits on the NHS R&D Directorate and to date we do not know if an anaesthetist has been appointed to any committee scheduled to conduct the Research Assessment Exercise for the current period 1993–1996. Obviously we should try to correct this deficiency. In the long term, the quality of clinical anaesthesia will suffer if the academic base of the specialty ceases to exist and anaesthesia lapses into a purely technical service.

A strategy of more immediate impact is to raise funding for research within our own specialty. In this context, British Journal of Anaesthesia plays a leading role in the UK. The journal supports: grants for research fellowships (£100 000 per annum); project grants, for equipment, technicians, post-doctoral research fellows, PhD students, etc. (£100 000); the journal also supports and pays for writing and research workshops, which are designed to improve both the conduct of research and also preparation of manuscripts for publication.

The Association of Anaesthetists of Great Britain and Ireland also makes a contribution to supporting research in the UK. Since 1972, the Association has supported one research fellowship (current value approximately £35 000 per annum) and small research grants of up to £5000. In addition, it has shared with the Royal College of Anaesthetists the salary costs of a senior lectureship in intensive care (about £60 000 per annum) and has just launched a project grant of £25 000 in value.

The Royal College of Anaesthetists (RCA) has also begun to nurture academic anaesthesia in the UK. The first priority for the College when it became independent in 1989 was to obtain premises and financial independence from the Royal College of Surgeons. This was achieved by a fund-raising appeal, and in 1992 the College was given a Royal Charter. The Appeal was closed in 1993; a new second wave appeal has now been launched to provide funds to support academic anaesthesia. In addition, the first President of the Royal College, Alastair Spence, set up a research committee with the role of promoting academic affairs. Until the second appeal realizes funds, the RCA itself has no assets to support research; none the less, through the generosity of a grant from the British United Provident Association (BUPA), the Research Committee has managed to fund one research fellowship at a cost of approximately £35 000 per annum; in addition, it has obtained travel grants from Pharmacia and, through the generosity of a grant from Intavent (c £45 000 per annum), is co-
administering the AAGBI/RCA Intavent Fellowship.

Invaluable as all of these contributions may be, they are inadequate as judged by the current level of external grant income enjoyed by academic departments in the UK. The Research Committee of the RCA has recently undertaken a survey of external grant income; 26 departments replied indicating that they had generated a total mean external grant income of about £293,000 per department. Only eight departments possess MRC grants (mean value of £161,000) while nine possess Wellcome grants (mean value of about £95,000). To some, these data are comforting as an even worse scenario had been envisaged, and it is encouraging to find evidence of energy and initiative. However, it is noteworthy that 33% of all external funding reported by departments originated from commercial sources. This is of concern as commercial organizations are bound to dictate the direction of research activities and it is likely that this relates to studies of new drugs. Although departments use commercial funding as a means of supporting other research activity, none the less contract research may be a diversion of energy away from a department’s primary research objectives. Also, this source of revenue is threatened if universities continue to maximize overhead charges while NHS departments offer a similar but cheaper service.

Research in medicine continues to grow at an astounding rate, particularly in such areas as genetics and molecular biology, and new therapies are being unveiled at a rate undreamed of many decades ago. The implications of this growth is that funding for medical research will become progressively even more competitive. Construction of grant applications is a complex exercise, costly in both time and effort. Clinical anaesthetists should not underestimate the effort and energy involved in what is frequently an unsuccessful outcome and moral support for their academic colleagues is essential.

What other steps are required to assist the survival of academic departments of anaesthesia in the UK? One possible solution is to move these departments from universities to the NHS. In the past, many were created in order to establish a focus of teaching and training in anaesthesia but the political philosophy has changed to one in which research is the current imperative.

What has also become clear in recent years is the importance of “critical mass” in an academic department, a sufficient number of academics within a department to provide an adequate foundation for successful research grant applications. In addition, clinical anaesthetists must be more forceful in their support for academic departments. Currently, anaesthesia enjoys a high reputation and is considered an academic-based specialty. The rate at which it will founder to one which is merely a technical service subservient to surgeons and management may be fast as academic chairs are vacated. Unfortunately, self-interest, even of the enlightened variety, is always short-sighted and one must question why some anaesthetists who as intelligent, gifted and talented senior registrars exhibit genuine enthusiasm in undertaking research, yet when they become consultants, demonstrate little interest. It is regrettable that a minority even manifest anti-academic tendencies. When a research selectivity exercise is introduced into the NHS, and it governs a significant element of funding of trust hospitals, there will be a powerful incentive for chief executives to scrutinize the research activities of their employees and it is likely that this will be used as a measure in locally determined pay, in addition to performance-related pay and other types of distinction awards.

Academic anaesthetists must also examine carefully their own activities. Research and pursuit of scholastic activities are inordinately time consuming and without assistance from a well-founded department of adequate critical mass, university staff should not become involved in activities which are inconsistent with academic achievement. It is questionable if, in the current climate, professors or other senior academics should participate extensively in national or international anaesthetic bodies, medico-legal work or even editing journals.

References