

## Royal Society submission to the House of Commons Science & Technology Committee inquiry into short-term research contracts

- 1 The Royal Society is pleased to have the opportunity to comment on this important subject, which is one in which it has taken a deep interest over the past 20 years, and believes that it has made a significant contribution to easing some of the structural problems associated with the career routes for university researchers. While there may be short-term solutions to some of the current problems faced by contract research staff (CRS), the issue needs to be tackled within the wider context of a radical review of the internal structure of our universities and their deployment of human resources. In the time available it has not been able to assemble all of the material that it would have wished to present, nor to undertake any surveys of CRS, and this note therefore confines itself to an outline view on the future development of human resource aspects of university research. The Society hopes to contribute to the on-going debate on this topic over the coming years.

### **The Development of the Current University System**

- 2 Over the past four decades, the university system has gone through a major restructuring to accommodate the massive increase in the number of students undertaking higher education courses. Since the start of the 1960s the proportion of young people entering universities has increased from about 5% to 30% now, with Government plans to increase this percentage further. This has been accompanied by an increase in the number of mature students taking the opportunity to partake in the higher education that they missed when they left full time education. The number of undergraduate students has risen from some 400,000 in the mid 1960s to 1,800,000 now.
- 3 The number of universities has risen several fold between 1960 and the present time, although much of this expansion has been through conferring university status first on the Colleges of Advanced Technology and then the Polytechnics and the larger Colleges of Higher Education, which had previously had parallel major roles in the provision of higher education. Furthermore, the size of many established institutions has increased significantly since the 1960s, as has the complexity of their management.
- 4 This massive increase in the number of students could only be afforded by significant decreases in the unit cost of State provision both for tuition and student maintenance. This, and the consequential need for universities to increase their income from other sources has had a significant impact on the universities in a number of areas:
  - a) the need to find efficiency savings to achieve the required expansion of within the lower unit costs;

b) less stability and certainty in the level of public funding for teaching;

c) an increase in the proportion of short term funding associated with:

- overseas students;
- contracts for from the private sector for in-service training;
- fixed term grants for from the Research Councils and the charities (in the bio-medical area)
- contracts for research from the private sector.

d) in some institutions a major increase in the income devoted to research.

e) the emergence and rapid growth of new academic departments, and relatively small growth in some of the traditional subject areas eg chemistry, physics and mathematics. Indeed, in some universities there have been closures of traditional discipline departments, either as a result of reduced student demand, or of low rating in the RAE, or a combination of these. Other departments have been merged with related disciplines, sometimes as a result of the establishment of completely new academic structure.

- 5 The financial pressures on universities have had two major impacts on their human resource structure. First, a major decrease in the pay relativities of academic staff compared with almost all other professions; and secondly a major increase in the proportion of staff on fixed term contracts, as opposed to as indefinite contracts with the full protection provided by employment law. The contrast is even greater when compared with the tenure enjoyed by established members of academic staff or faculty, even though tenure was weakened in the 1980s to ensure that staff could be made redundant on the grounds of severe financial exigency.
- 6 Now that the expansion of higher education has slowed considerably, this is an opportune time for the universities to reconsider their overall structure to ensure that it is appropriate for the 21<sup>st</sup> Century. In particular, the sector's treatment of its human resources must recognise that UK universities have to compete on a world level not only for students, but also for staff. Unless this is achieved, it is difficult to see how universities can survive as vibrant organisations, capable also of attracting their fair share of our brightest young people to carry forward higher education to subsequent generations.
- 7 While the Royal Society is deeply concerned about both teaching and research within our universities, the remainder of this note largely concentrates on the human resource aspects of research in the research-intensive universities, within the context of the overall structure of the university. It deals mainly with postdoctoral CRS, although there are other important CRS supporting research activity.

## **UK Research And Career Paths**

- 8 The majority of basic and strategic research in the UK is undertaken in the universities rather than Government Laboratories, although in some subjects there is a small, but important contribution from Research Council and independent not-for-profit research institutes. This arrangement has probably contributed significantly to the high standing of UK research and its cost effectiveness (May 1998), and in this

the UK is similar to the US and significantly different from France and Germany. Those wishing to pursue basic and strategic research as a career therefore have to look almost exclusively to the universities and research council institutes.

- 9 There is an important applied research and development sector within UK industry and Government research establishments, and other science based professional careers in the private and Government sectors. All of these depend on an adequate supply of the high quality university trained researchers at all levels up to post-doctoral positions and beyond. A constant supply of teachers is also required elsewhere within the higher education sector and in other areas of education, where it is essential to ensure that science and mathematics are taught by talented and enthusiastic graduates in the particular subject. Finally, highly trained researchers in all disciplines find satisfying, and often well paid, positions well outside their specialisms such as in general management, accountancy, finance and the public services. It is important to recognise the value both to the country and to science and engineering of having science and engineering expertise throughout the economy. Hence there is a wide range of worthwhile and challenging alternative career paths for academic researchers at all stages of their career.

### **University Research**

- 10 University research is funded through three main streams:
- i. Funding Councils' block grant;
  - ii. short term grants from the Research Councils and, particularly in the biomedical area, the research funding charities;
  - iii. contracts from industry and Government Departments.
- 11 Overall there has been a significant increase in university research expenditure, but much of research expenditure is concentrated within 20 or so universities. Over the past 20 years, the proportion funded through the Funding Councils' block grant has fallen, even taking into account the dual support transfer from the Funding Councils to the Research Councils at the beginning of the 1990s. Hence more research has been funded on short-term money. Furthermore, since much of this money is accounted for at a departmental level and below there may be insufficient scope for handling fluctuations, with examples of world-class research teams being broken up through failure to obtain follow on grants or even because of delays to secure a grant.
- 12 Another important factor is that the expansion in research activity in many disciplines has been greater than the expansion in student numbers, and it is the latter that broadly determines the number of established academic posts within a Department. This has resulted in established members of academic staff at research-intensive universities supervising an increasing number of research assistants.
- 13 In the next two sections we outline the requirements of universities and of the researchers themselves and then bring these together in a concluding section.

## **University Requirements for Research Staff**

- 14 The research active universities need a range of researchers to maintain and develop their research standing, including already recognised world class researchers, to whom they need to be able to offer attractive established posts; bright up-and-coming research leaders of the future; and support staff at all levels such as post doctoral research assistants, PhD students, graduate research assistants and technicians.
- 15 The traditional structure of university research is one based on established members of academic staff with both teaching and research responsibilities, who are supported by postdoctoral research assistants/associates and technicians together with research students. This structure is changing, however, with the formation of larger research groups than hitherto and the formation of formal or virtual research units, particularly in cross disciplinary areas, usually headed by a members of established academic staff, but sometimes by a specially recruited full time director. At the most senior levels some leading research academics have sought to concentrate on their research and have obtained appointments as “Research Professors”, some of which are provided by external funding (eg The Society’s Research Professors).
- 16 With this varied and changing structure, universities have a wide range of requirements for postdoctoral researchers. First and foremost they require a constant flow of young researchers from across the world to bring in new ideas and techniques. They also need to identify high-flying researchers who will be the academic leaders of the future. Finally there will be a need for competent postdoctoral researchers and professional support.
- 17 Hence universities need to have the flexibility to:
  - a. maintain the throughput of young post doctoral researchers;
  - b. offer a career path to attract and retain high-flyers;
  - c. offer a career structure to other more senior researchers.
- 18 We return to these when we have considered the needs of the researchers themselves.

## **Personal requirements of the postdoctoral researchers themselves**

- 19 Suitably qualified researchers undertake postdoctoral research for a number of reasons, which will vary as they get older. At the start the main reason is to seek further research experience and to gain recognition as a researcher in their own right, primarily through publications and participation in scientific conferences, ie to enhance their CV in pursuit of their future career. For those seeking to continue in academic research the main goal is to secure an established academic post, and there should be a recognised route to this end. In particular, researchers need the opportunity to show that they can initiate new research projects and lead research teams. This can be achieved through suitable positions within large research groups, or through opportunities to pursue their own research.
- 20 The sheer numbers of postdoctoral CRS means that only a proportion of those entering can expect to secure an established academic research and teaching post, or a longer term research post within a university research group, or unit. For those

postdoctoral researchers who have reached their early thirties without securing an indefinite contract, working on a series of fixed term contracts is clearly undesirable, not least because of the adverse effect that this can have obtaining a mortgage. At that point, there needs to be satisfactory routes to other careers in research – in Research Council or Government Research Institutes or in industry, in scientifically based professions outside R&D in the public and private sectors, in teaching outside higher education or in other non science careers in management finance etc. This means access to high quality relevant careers guidance and vocational training, with the development of generic skills such as management and communication.

- 21 Not everyone will wish, or be able to continue a postdoctoral research career without a break, and there must be suitable opportunities for re-entry, which will require opportunities to catch up with developments both in the science and in relevant cases the underpinning technological support for the research.
- 22 Finally, there will be some who wish to continue with fixed-term contract appointments for a range of personal reasons, and so a limit to the number of fixed term research appointments that can be held could well be unpopular. However, this should be seen as the exception rather than the rule, and consideration should be given to career counselling in such cases.

### **Initial view on way forward**

- 23 An international perspective on this would be instructive, but at the present time most countries appear to be wrestling with the problems of early career progression into established academic posts and other human resources and other structural problems facing their universities.
- 24 Vibrancy of research requires a balance of new and more experienced researchers, and a range of different types of post-doctoral and other research positions. Universities require flexibility to ensure that the system retains the throughput of new post-doctoral researchers and does not consist of an aging cohort of researchers with little prospect of career progression. The following provides a perspective on the three categories of CRS considered in the recent Research Careers Initiative report (RCI 2001).
- 25 Hence we believe that there is a continuing role for fixed-term post-doctoral CRS posts in university research, this is a growing trend in other areas of graduate employment, especially in the early years. In the university sector fixed term contracts should be seen primarily for those starting off on their research career. These contracts should rarely be for less than two years duration and the norm should be three; the inefficiency of very fixed-term contracts needs to be more widely recognised. These fixed term posts will largely be associated with research grants and contracts under the direction of established members of academic staff. These are the apprenticeship positions and there should be an expectation that after two or at most three of these positions postdoctoral researchers will have moved to another part of the academic system or on to another career path. It is important to be clear that neither universities nor individual principal investigators should exploit staff on fixed term contracts, and that they have a duty of care for their staff's future careers wherever these may be. Hence, it is important for universities to do more than lip service to the provisions of the Research Concordat, especially with regard to various

leave provisions, access to relevant professional careers guidance, and efforts should be made to increase the level of esteem associated with these posts. We consider these and other points further below.

- 26 Within the universities, it is essential that there should be recognised further steps, available through competition to take postdoctoral CRS into other more permanent employment within the sector, either in a position where they can have an opportunity to develop their skills, and external recognition, as an independent researcher, or in some longer term support or infrastructure role.
- 27 For the most gifted researchers, who will be candidates for being the research leaders of the future, there must be longer term employment prospects, either directly into established teaching and research academic posts, or to personal research fellowships. The latter should be designed as “tenure track” appointments. Both institution and central bodies have a role to play here. The universities should consider establishing such posts in order to attract the highest quality postdoctoral fellows in particular Departments, possibly in conjunction with the Funding and Research Councils. There is also a role for more centrally funded posts of this type, where the researcher has greater freedom to move to different institutions. The Royal Society’s URF scheme, for example, supports some 300 high quality scientists across the disciplines. In these university or centrally supported fellowships, the holder has the opportunity to develop his own independent career, with the possibility of applying for grants for postdoctoral research assistants. It allows researchers to develop their career often to the stage where they can apply for more senior academic posts at reader or even professorial level. Although we have called these positions “tenure track”, this is not to imply that this should be the only way into an established post at a research-intensive university. Universities will wish to appoint from a range of candidates including also those in fixed term CRS position, from Research Council Institutes, industry and abroad.
- 28 Within large research groups there is also a need for researchers at postdoctoral level who can continue in a support role, but on a more secure basis. There are many areas where it is important to retain expertise, especially in techniques, within a team. Hence universities should consider funding a proportion of postdoctoral research posts on an indefinite basis, as senior research officer positions. These posts should also be filled through open advertisements. As indicated above, the arguments about the financial impropriety of funding indefinite contracts on “soft” money need to be examined carefully, as the university as a whole should be able to even out fluctuations, although this may require consideration of the way that grants are devolved to departments and perhaps involve discussions with the Research Councils.

### **Further consideration of the role, status and employment conditions for researchers on fixed terms contracts**

#### **Employment conditions**

- 29 The EU directive on fixed-term work will have implications on contract researchers, particularly in terms of fixed-term contracts, redundancy pay, and general employment conditions.

- 30 Irrespective of this, the universities must reconsider their human resource arrangements taking account of the Research Concordat and the points set out below.
- 31 The future of the RAE is under discussion, but if it is retained in some way or other, it could be used as a means to ensure that CRS are properly guided and trained. The details need developing, but quantitative indicators of career paths for ex-CRS could be made available for consideration by the panels.

### **Gender imbalance**

- 32 Women are about 30% more likely than men to be employed on a fixed-term contract (HESA data, 2000-2001) and yet are particularly poorly catered for by the provisions of these contracts – maternity leave and flexibility in terms of part-time work or job sharing is rare. It has been shown (ETAN, 2000) that one of the key factors in ensuring that women remain in higher education employment is flexibility of working practices. The Royal Society Dorothy Hodgkin Fellowship Scheme, though open to both men and women, has proved particularly attractive to women as its flexible terms allow for career breaks and part-time working (see Annexe 1).

### **Careers guidance and relevant training**

- 33 The lack of adequate career guidance and support has been highlighted ('Realising our potential' White Paper, Roberts report 2002) as a major deficiency of the current system. Improvements need to be made at institutional level, as well as through encouraging staff themselves to take a more proactive interest in their career development. As indicated above, CRS do not form one homogeneous group – they have a variety of skills and aspirations. Both Bett and Roberts reports suggest that there is room for many institutions to reduce their use of fixed-term contracts, and distinguishing more appropriately between types of CRS would help to identify where more permanent contracts could be usefully offered (to Research Associates, for example). Better and ongoing career advice is needed to raise awareness of outside opportunities and to motivate staff to better shape their own careers. More structured and comprehensive training should also be instituted by the universities as part of ongoing professional development.

### **Involving CRS**

- 34 Efforts should be made to consult regularly with CRS who, by definition, form an ever-changing group, in order that the community can inform strategic decisions about its future. This should include some CRS representation on RCI committees and on university bodies. A recent article by a current Royal Society URF, who has had experience of shorter-term contracts, is attached at Annexe 2.

### **Research Support Networks**

- 35 Contract-research staff in some universities have established departmental support networks. These are valuable mechanisms for sharing information, improving communication with management and offering support. We would encourage these to be supported in all university departments.

## Good Practice Guidelines

- 36 The RCI published a guide to best practice in October 1998. All universities should be made aware of these and Research Councils should encourage and support examples of best practice where it is evidenced.

## Should CRS be allowed to apply for Research Council Grants?

- 37 There are arguments for opening up Research Council grants to contract researchers, allowing them to apply for funds to cover their own salaries as well as the additional research costs. Some fixed term researchers have good ideas and have to rely on persuading permanent members of staff to apply for the grant and then employ the research using the awarded funds. Furthermore, it has been argued that the fact that grant schemes are not open to researchers on fixed-term contracts compounds the problem of an under-representation of women in positions of influence.
- 38 On the other hand, most scientific research requires significant infrastructure support and commitment by the home institution. This is difficult to achieve for researchers who do not have a formal link to the university. We believe that rather than opening up Research Council grant schemes, such applications need to be handled either through existing or new fellowship schemes, where the infrastructure arrangements can be confirmed through agreement between the university and the funding body.

## Career re-entry

- 39 Finally, those researchers on fixed-term contracts wishing to take a career break, many of whom will be women leaving to have children, try to return to their fields through CRS posts, but with no assurance of finding work and much less support than those on permanent contracts. Better mechanisms for re-entry are required possibly building on the pioneering work of the Daphne Jackson scheme.

## References

Bett (1999). *Independent review of higher education pay and conditions: Report of a committee chaired by Sir Michael Bett*, Stationery Office, May 1999.

ETAN (2000). *Science policies in the European Union: Promoting excellence through mainstreaming gender equality*, European Commission, 2000.

May (1998). *The Scientific Investments of Nations*, Robert M. May. American Association for the Advancement of Science, July 1998.

Realising our Potential White Paper (1993). *Realising our potential: A Strategy for Science, Engineering and Technology*, Stationery Office.

RCI (2001). *Research Careers Initiative 3<sup>rd</sup> (Interim) Report*, September 2001.

Roberts (2002). *The supply of people with science, technology, engineering and mathematics skills: The Report of Sir Gareth Roberts' Review*, The Stationery Office, 2002.