Minutes of evidence taken before the Select Committee on Science and Technology, Sub-Committee II - Academic Careers for Graduate Scientists.

HOUSE OF LORDS SESSION 1994-95

MINUTES OF EVIDENCE
TAKEN BEFORE

THE SELECT COMMITTEE ON SCIENCE AND TECHNOLOGY

(SUB-COMMITTEE II: ACADEMIC CAREERS FOR GRADUATE SCIENTISTS)

Tuesday 14 February 1995

WELLCOME TRUST

Dr J Julian B Jack, Dr Bridget M Ogilvie and Dr David Gordon

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Present:

Craig of Radley, L.
Dainton, L. (Chairman)
Dixon-Smith, L.
Hilton of Eggardon, B.
Howie of Troon, L.
Phillips of Ellesmere, L.
Redesdale, L.
Platt of Writtle, B.

Memorandum from the Wellcome Trust

The Wellcome Trust welcomes the opportunity to give evidence to the House of Lords Sub-Committee enquiry into Academic Careers for Graduate Scientists. This is an issue which the Trust regards as of great importance: it is also relevant to most of the Trust's support for research in the United Kingdom. The Wellcome Trust is concerned about the preponderance of short-term posts in universities which has created an unstable research environment, inimical to the long-term thinking and experiments which should drive scientific enquiry. The Trust is very worried that the increase in the number of short-term posts may discourage young and talented individuals from considering scientific research as a worthwhile career, and that such arrangements may stifle the career development of young scientists.

The Wellcome Trust was founded under the will of Sir Henry Wellcome who died in 1936. The objective of the Trust is to promote research in medicine, related basic sciences and other subjects which have the potential for improving health and welfare. In seeking to achieve this, the Trust's strategy is to strengthen the capacity of individuals to pursue their research to the highest standards by providing them with the necessary resources, career development, training opportunities and other support. The Trust expects to spend in excess of £200 million on medical research in 1994–95.

The Wellcome Trust views the future of scientific research in the UK with mixed feelings. On the one hand there is excitement about current research discoveries, and optimism that new research directions will lead to revolutionary improvements in the quality of life. On the other hand there is great concern about the mismanagement of scientific personnel and that without a resolution of this, the considerable intellect of the UK research community will not be exploited efficiently. The Association of University Teachers (AUT) recently commissioned a survey of contract researchers. This concluded that quality research output is produced in spite of the system rather than because of it.

THE PROBLEMS OF THE CURRENT CAREER STRUCTURE

Almost half of the academic scientific staff in long-established universities are in short-term posts which are partly or wholly funded from sources other than the relevant Higher Education Funding Council (HEFC) grant. Whilst there has been a recent increase in the number of those who hold posts in universities and who are trained in the core sciences, this growth in number is almost wholly accounted for by an increase in the number of those who are employed on short-term contracts. In contrast, the numbers holding established posts has fallen slightly. An apparent growth in the size of the potential research base may seem welcome, but pleasure is dispelled by the realisation that it is the already high number of well qualified individuals (normally in their most productive years) with no permanent job that has been increased. Of special concern to the Trust, is that the biological sciences have a larger proportion of short-term posts (grant-funded staff are in the majority) than the other sciences, and has seen an above average growth rate in the number of these staff funded from outside normal university resources. (22 per cent increase 1989–92; Source: University Statistical Records/Institute of Manpower Studies).

The current pattern of contract staffing in universities has been recognised by the Government as a matter of concern (sections 7.26-7.31 of the White Paper "Realizing our Potential"). However, the Government has also pointed out that the movement towards employment of staff on short-term contracts is not unique to the universities. The Trust views as unfortunate the comments made in paragraph 7.27 of the White Paper that "this can be productive" since "it provides employer and employee with greater flexibility and encourages more mobility between employers and betweeen sectors". The Wellcome Trust hold the view that mobility of scientists between different institutions is undoubtedly important for the dissemination of ideas and skills both within and outside scientific research. However, this mobility should be driven by scientific needs and be appropriate for the career requirements of the individual. In the opinion of the Trust, a number of important issues concerning health and quality of life require high quality, basic research, which in turn requires long-term planning. It is quite unreasonable to expect young scientists to take a long-term view, when the quickly-recycled need to justify further personal funding forces them to take the short-term approach. The AUT survey of externally-funded research staff in UK universities reported high levels of job dissatisfaction, poor morale and insecurity. The prospect of working on a number of short-term contracts

may discourage talented individuals from embarking on a scientific career; planning for a home and family, or taking on long-term financial commitments is not possible with an uncertain future. For the established scientist too, their work may be curtailed because of the ever present instability and constant need to recruit and train new staff. In such circumstances it is easy to envisage how research funds are not being put to best use and thus how the move towards employment of staff on short-term contracts can be counter-productive.

The short-term contract has a place. In the Trust's view it should be used to support those who are in the early stages of a scientific career and who are still able to move between "sectors". The three year project grant is a flexible vehicle for funding hypothesis-driven and focused projects addressing specific research questions. It is not an appropriate means of continually renewing the contracts of highly qualified scientific staff. In the Trust's experience this often seems to be how it is used. The Trust is particularly keen to address this problem, and this is why it has set up its career development scheme for non-clinical scientists.

The Trust's Career Development Scheme

The Trust launched its Career Development Scheme for Basic Scientists in 1993. It is relevant to many levels of an individual's progression in biomedical research. It starts with the provision of vacation scholarships which are awarded to undergraduates reading a biomedical subject. These have the dual aims of giving young people a taste of what life is like in a research laboratory, and motivating those who find they have a thirst for scientific enquiry to undertake further scientific training. For post-graduate scientists, the Trust provides well-funded PhD research training grants. At the post-doctoral level, Research Career Development Fellowships (40-50 per year) provide important opportunities for the Fellows to gain independence as research scientists. For those who have established an impressive track-record of independent research, Senior and Principal Fellowships are provided, enabling the best biomedical scientists to remain fully active in research—in some cases to retirement. The level of investment by the Trust in career development in universities is substantial, representing about 30 per cent of the total money committed each year to funding biomedical research. The Trust cannot however deal single-handedly with all the problems of career insecurity in biomedical research by providing careers for life for a sufficiently large number of scientists. The Trust's aim therefore, is to focus on providing career development opportunities at the stages of an individual's career when they are most needed. This is achieved by recognition of the research contribution and potential of named individuals, by paying them an enhanced salary, by funding their research to a proper level, and by supporting them for four, five or 10 years at a time, as appropriate.

The Trust is moving to a situation where a greater proportion of its grants are funded for five years. The Trust was supporting over 3,000 research posts in universities in October 1994. Of these, 92 were Fellowships of five or 10 years duration for independent research scientists, about 800 were for scientists (mostly non-clinical) in research training positions, and 800 posts were scientific staff on long-term grants—five years, potentially renewable. Of 300 technical staff supported by the Trust, 120 were employed on grants of five years duration. The remaining positions (*ca.* 1,000) mostly employed post-doctoral scientists on grants lasting three years. However, it is estimated that two-thirds of those supported in this way are under the age of 31.

Careers of Scientific Support Staff

The Trust is also concerned about the career structure of technicians. The lack of adequate career provision and remuneration of these individuals has probably led to the current paucity of career technicians in universities. It seems clear that with the increasing technical sophistication of modern research methods, steps should be taken to encourage those with technical skills to join research teams for the long-term. There is evidence that hitherto the "gap" in technical assistance has been inappropriately filled by employing an increasing number of short-term, grant-funded research assistants. The Trust applauds recent efforts by some universities to reverse this trend.

What else needs to be done?

The responsibility for considering the employment arrangements for those on short-term contracts funded by non-university sources rests primarily with universities; they are the employers. The Trust is therefore particularly keen to address the careers issue in partnership with the universities. Universities must bring on stream their own career development schemes and improve their ability to manage human resources. Due and equitable consideration for appointment to suitable vacant full-time posts must be given to those who have been employed on more than one short-term contract. Similarly, career advice should be available that encourages those with little prospect of a career in scientific research, to seek alternative employment. The Trust applauds the efforts of University College London in instigating a career scheme along these lines. The Trust is also pleased to note the initiatives taken by Imperial College London and the University of Warwick in offering Fellowships to relatively young post-doctoral scientists with an expectation of appointment to a permanent post at the end of the Fellowship. The Trust will watch with interest how the research councils adapt their grant-giving mechanisms to help universities improve the career opportunities of research staff and how information on the receiving institutions' personnel policies are to be used (paragraph 7.31 of the

White Paper). The Trust has intervened on behalf of research scientists supported by Trust grants when it has not been clear that a short-term post-holder has been given equality of career opportunity by the university employing them. This policy will be maintained.

The Trust believes that its Career Development Scheme for basic scientists is a significant step in the right direction, and would encourage other funding bodies who are able to do so, to follow suit. In addition, the general move towards longer-term funding is believed to be right. The Trust is concerned that a culture has developed whereby funding science in three-year blocks is seen as the norm, and even virtuous. This has affected recommendations made during the peer-review process, and five years' support is often seen as the rightful property of only the high-flyer or the eminent. The Trust is keen to get its view across to the assessors of science that it is intent on changing this belief.

The Trust notes that academic salaries have increased less in real terms compared to other non-manual staff—including medically qualified personnel. Closing this gap would be desirable as an added incentive for non-clinical scientists whose research activity underpins medical advances.

The Government's Master of Research (MRes) Degree

The Trust, along with many others, sees little to commend this scheme. It is the Trust's expectation that, in the biological sciences, potential employees will not come to recognise the MRes as a significant qualification. As the Royal Society have said, students leaving education with an MRes may be left with the need to justify a lack of a PhD.

The quality of PhD training needs to be improved. There is a widely held view that UK postgraduates are given too narrow a training, and are not fully prepared following graduation for life within, or outside, scientific research. Employers in universities and the private sector see the need for more formalized training to enable those qualifying to have a broader overview of their chosen disciplines. The MRes has little prospect of tackling this. The Trust expects little interest to be expressed in a one-year general reseach training course, which will offer a meagre stipend.

The Trust is disappointed that the Government has overturned attempts by the Medical Research Council and the Biotechnology and Biological Sciences Research Council to set up four-year PhD training courses in the biomedical sciences. These courses would have incorporated means to train students in a wider range of scientific skills, as well as specific non-science abilities—such as communications skills. These are often sorely lacking in British scientists. Universities have expressed considerable irritation and disappointment at having invested much time in preparing applications to find that their preparative work has been to no avail due to an apparent vacillation in official circles.

The Trust supports a four-year PhD training scheme at the University of Liverpool. The course entails an initial year of laboratory rotations during which students are being taught a wide range of scientific disciplines. They will be encouraged to play a significant role in devising their own research training projects. The course organisers were very pleasantly surprised by the high interest, numbers and academic quality of those who applied for the studentships offered. The students themselves welcome the arrangements, and there are hopes that they might generate truly novel ideas.

The Trust sees the training of the next generation of scientists as a priority. Moreover, as 43 per cent of those established university funded staff who are qualified in the core sciences are now over 50 (within 15 years of retirement), it is important that the level of funding and the nature of the supervision provided for those currently training to become research scientists recognises this future need. The Wellcome Trust pays a realistic stipend to the students it supports: it is higher than those provided by the research councils. The Trust (it seems uniquely) provides a realistic level of funding for the cost of the research—10 times the Research Training Support Grant (RTSG) paid by most of the research councils. The Trust organises and hosts a residential course in science communications skills for students it supports. This is consistent with the Trust's determination that an understanding of science should be better communicated between scientists, and between scientists and the general public. If the Government is seriously concerned to attract the best quality young people into postgraduate training schemes it needs to:

1. Allow the research councils to raise the student stipend to a level akin to that paid to postgraduate research assistants.
2. Encourage, and at least not stifle, the plans of universities and research councils to test novel training schemes, which have the potential to build on best practice, and introduce broad and transferable skills to those intent on training for a career in research.
3. Facilitate the funding of the RTSG to a level which is sufficient to meet the real costs of training.
4. Not necessarily require that all Research Councils have identical training schemes: since the training needs of biomedical science are not the same as other scientific disciplines (for example, chemistry).

All this is far more important than the introduction of an entirely new qualification, which is unlikely to have impact on the properly diverse training systems already in existence.

CAREERS FOR WOMEN IN SCIENCE

Women make up almost half of all science graduates, yet they make up only 16 per cent of non-clinical academic staff in science departments and fewer than three per cent reach professorial level. The Wellcome Trust's opinion is that this is a waste of skills and a lost investment in training. In recognition of this, the Trust has carried out a pilot survey of attitudes in male and female under-graduates to seek out possible reasons for this inequity. The findings confirmed that most women and men were motivated to study science by their interest in the subject, and the majority wanted a career in science. However, poor conditions of employment and an uncertain job market were seen as factors making a research career an unattractive proposition. Women, more so than men, thought that scientists worked inappropriately long hours, and that the enforced nomadic lifestyle was not compatible with a stable family life. Contrary to expectation, there was no evidence of active discouragement from tutors whilst training, although many women claimed difficulty in being taken seriously in a male-dominated profession. Women are amongst the ranks of those (others being part-time and older research staff) who report being the principal victims of inequality of opportunity, both between contract researchers and other academic staff, and within the realms of contract research itself.

Sexual prejudice is seen by women as a factor in their under-representation. However, a major disincentive may be the perception of current research practices, which make a scientific career unpopular for both sexes, but discourages women more than men. Therefore, to recoup some of the lost investment in training this half of the scientific workforce, it is necessary to tackle the issues of career insecurity as highlighted above. To facilitate the emergence of women in science will also require the more widespread provision of part-time working and career breaks, as well as opportunities to re-enter a scientific career path after a period away from research.

The Trust's science-funding mechanisms recognise this. All research posts supported by the Trust can be occupied part-time. Also the Trust has recently set aside £2.5 million each year for Re-Entry Fellowships in which Fellows who want to return to a career in science are re-trained over a period of four years. During this time a Fellow is provided with the opportunity, supervision, and resources, to empower him or her to regain their former status as a competitive and independent researcher. These Fellowships are not reserved for women but are expected to be of particular value to anyone who has taken a career break from scientific research to raise a family.

Supplementary memorandum from the Wellcome Trust on University Awards

The Trust is prepared to help strengthen University Departments by providing funds to enable them to make a proleptic appointment to the established staff.

Sometimes, for lack of a staff vacancy, a university finds itself unable to recruit or retain a member of staff who is outstanding in research. In such cases the Trust is willing to entertain an application to supplement or provide a salary for up to five years. Support under the scheme is available at all levels from lecturer to professor.

Candidates are nominated by the Head of the Department concerned. Applications have to be supported by an undertaking from the Head of the Institution, the Vice Chancellor or Dean or someone of equivalent standing guaranteeing that the individual's personal support will be taken over by them at the end of the Trust grant. If the institution wishes to insist that the final commitment to take over the funding of a university award holder is contingent upon a progress review, the Trust should be involved in this review. During any such review the Trust would wish to be able to compare any decision not to take over the salary of an individual funded by the Trust under the University Award Scheme with decisions being taken on renewal or termination of the salary of other members of academic staff of the same institution.

Decisions on application under the scheme are made on the merits of the research involved. Normally the candidate will be interviewed at the Trust. The awards provide the candidate's full salary for three years, 50 per cent of the salary in the fourth and 25 per cent in the fifth year and may include some support for the candidate's research programme.

Examination of Witnesses

DR J JULIAN B JACK, Chairman of the Scientific Committee and Deputy Chairman of the Wellcome Trust, reader in cellular neuroscience, University of Oxford, DR BRIDGET M OGILVIE, Director, and DR DAVID GORDON, Programme Director, the Wellcome Trust, called in and examined.

Chairman

230. Thank you very much for coming. We are delighted to be able to see you. We are most grateful too for your letter and the annex. The letter shows only too clearly how strongly you feel about this particular issue. Therefore, I should like to invite you to say something if you would like to by way of introduction to amplify or to elucidate what is in your statement if that would suit you. I should add that we do have a copy of the Stirling University

[Chairman *contd.*]

report commissioned by the Association of University Teachers, AUT, to which you make reference in your document. I think that I ought just to put your mind at rest. There is a typing error in the list of questions which you have had. It is question No 11, "women in non-clinical science reach *professorial* level". I hope that that has not misled you.

(*Dr Ogilvie*) No, my Lord Chairman, we assumed it was a typing mistake.

231. Dr Ogilvie, I take it that you are the leader, as it were?

(*Dr Ogilvie*) My Lord Chairman, we are delighted to come and talk to you all because the whole question of careers and career development is one that the Wellcome Trust has always had a particular interest in. The three of us represented here I think take this as probably our highest priority. We are all very concerned to look after the people whom we fund as far as we can, albeit at one remove, because of course everybody that we fund is a member of the university staff formally so that we work in partnership with the universities and that is our general style of operation, as many of you would know, my Lord Chairman. We have been increasingly concerned, of course, at the ever increasing numbers of people on short term contracts, particularly I think in the biomedical sciences in the universities, and as we have grown over the last few years we have redoubled our efforts in terms of training. Now we have come up with what we think is a reasonable career structure for the staff, both clinical and non-clinical. Perhaps my colleagues might like to add to that general remark.

232. Is there anything that you would like to add, Dr Jack?

(*Dr Jack*) My Lord Chairman, no, I do not think so, apart from of course just noting that the kind of situation that we reported about the proportion of university staff over 50 has existed in some form or another for quite some time but that our concern in noting that relates to the fact that we feel now with the much larger proportion of people that we are funding, with the growth of our funds, that we have to be much more active in encouraging universities to be more responsible jointly with us in the management of such staff.

233. Dr Gordon?

(*Dr Gordon*) I have nothing to add at the moment, my Lord Chairman.

234. May I just ask a question which is down on the paper but which comes directly to what you have just said, that is, when you make a grant to an institution are the people who are employed on your terms or on the university's terms? Do you make a grant to the institution? Is that the legal employer which therefore has control of the terms?

(*Dr Ogilvie*) That is the case, my Lord Chairman. Our grants are to the universities and the universities employ them and therefore they are subject to the terms and conditions of the university. We do from time to time intervene but bearing in mind that we fund non-geographically, so to say—we have about 70 institutions that we give grants to, of one sort or another—we have therefore in general terms to abide by their terms of employment. But of course we do actually pay our staff rather more, particularly the graduates, than the average going rate. We do that really because everybody the Wellcome Trust supports is on contract; they do not have an established post, and we feel that those on contract are living a more dangerous life and therefore should be paid a bit more. That applies not only to the absolute stars who win fellowships and the like but also to support staff who are graduates.

235. To get this absolutely clear, the university or the institution—it may not be a university—sets the terms and conditions in the sense of, what, tenure, lack of it, period of contract?

(*Dr Ogilvie*) The tenure would be related to the length of the grant, normally speaking.

236. Yes, well, you have a grant with the university, but the university has a contract with the contract research staff, but you say that you are able to intervene and you award salaries which are larger than what would normally be the case in the university? Does that create problems within the university?

(*Dr Ogilvie*) No, I do not think so, my Lord Chairman. We have not particularly had difficulties of that sort.

(*Dr Jack*) Perhaps I might just add, my Lord Chairman, as someone working in the university who sees it from the other end as well, there are problems. The problems are greatest or have been greatest with the doctoral students. The basic view that the Trust has taken overall in its policy is that it would prefer to have its scientists being trained and paid adequately at a satisfactory level and if necessary support less doctoral students. When we first introduced the Prize Students Scheme, of the trust, they were funded at nearly double the level of the research council stipends and that did of course create problems and some jealousy. With respect to post-doctoral scientists to whom we do pay more—and we have persuaded in recent years the university to accept that we should pay two or three increments above the standard national scale—in those cases the problem is less because of course the differential is less than it has been in the past for doctoral students. On the other hand, however, it is certainly true, if I may speak as a person who is heading a research group, that those of the post-doctoral scientists in my group for whom I might be seeking renewed funding would far rather that that funding came from the trust so that their salary remained at the higher level, so these are problems. These may be minor problems, but they are still clearly there, and it is I think one of the difficulties about the Trust policy in trying to pay what it regards as a more satisfactory level than the national academic scales that we do create tensions because of that differential.

Lord Dixon-Smith

237. If I may just pursue that a little further, my Lord Chairman, the trust it seems to me is an enormously generous and beneficial body in this field, but if there is not a tension within the universities, then somewhere in the trust there must

[Lord Dixon-Smith *contd.*]

be a tension between establishing the levels of salaries that you are prepared to award, if you like, and the volume of work which you would actually like to undertake. How do you resolve that?

(*Dr Jack*) In discussion at meetings, my Lord Chairman, particularly the scientific committee, but in fact I do not think that there is a great deal of tension about that. The kind of extra remuneration that we offer the contract research staff is still a relatively small percentage and we do have a very clear commitment—and I think that this is absolutely unanimous among the Governors and the scientific staff of the Trust—that at the moment, contract research personnel are not paid as well as they should be. We have noticed, of course, the relative reduction in those salaries related to the academic pay scale, compared with the national average wage or gross national product in the last five to ten years.

Lord Phillips of Ellesmere

238. I was told the other day, Dr Ogilvie, that you were going to discontinue support for graduate students. Is that true?

(*Dr Ogilvie*) That is not the case, my Lord Chairman. We are changing the way in which we are going to give support for graduate students. We have in the last few years had a quota system which we allot to universities and we have decided for a number of reasons to change the way in which we award our students. We are certainly not discontinuing it.

239. Perhaps I may then ask another question, my Lord Chairman. One of the causes for tension to approach it in this way in the university system when I was a part of it was the use by the Medical Research Council of the researching units which enabled them to implant in the university a laboratory which they managed themselves and which employed their own staff. Those staff were also paid somewhat more than corresponding university staff, hence the tension. Nevertheless those units were in my view very often very successful in terms of the research that they produced. Have you ever contemplated adopting such a system yourselves?

(*Dr Ogilvie*) No, we have not actually. There are many inequities in pay within the University system. The greatest is the difference between clinical and non-clinical salaries, and I think that that causes real tension, but that is not just applicable to the staff funded by the Wellcome Trust. When you have non-clinical staff working closely with clinical staff, particularly those who do not have a large clinical load, or any clinical load, but are paid more, I think that creates real tension.

240. On the point of units, have you contemplated units and, if not, why not?

(*Dr Jack*) We have discussed it certainly in the past and decided certainly not at the moment to proceed in that manner. I think that there are two issues, or three, about units. One of course is that they are within the university but administered by the funding agency. At the moment we do all our funding through the universities and we have not yet thought of abandoning that, but we would probably have to if we did go down this route. The second thing is that in the Medical Research Council units, staff have effective tenure up to certain periods of time, whereas at the moment our career structure provides fellowships which start off being shorter in duration and become increasingly longer. We have never made the commitment for someone, say, aged 30 to 35, that we will then support them through to retirement in a single move. Then the third thing is the issue of remuneration. If we did go to units, clearly we could pay a lot more if we wished to but even with those of the scientists that we support in the university system higher grade, our so-called principal research fellows, they often are paid substantially more, and the universities sometimes with some reluctance come to accept that higher pay.

Lord Craig of Radley

241. My Lord Chairman, the Trust's career development scheme is clearly a very important part of the Trust's future thinking and you are moving more towards five year contracts or funding of five year contracts. Looking at your very interesting paper on this would I be right in assuming that still about one third of those you support are on three year contracts whereas the rest are on five or longer. I wondered how you see that as a sort of steady state or whether you felt it was not because there is a reference earlier in your paper to a wish or a view of being able to provide careers for life; the two do not quite hang together? It would be helpful if you could just separate the two so that we can understand your thinking.

(*Dr Gordon*) My Lord Chairman, I will try to deal with the point. Yes, it is true that about one third of the staff funded on grants are on three year grants. We are not in a steady state, and I hope that we are evolving towards a situation where more of the science is funded for five years and in the case of the more senior people in their careers to give a guarantee of support for ten years. Of course, there has to be a balance between the need to give people security and the way that science can move very rapidly. One does not want to be committing to a particular project for a very long time if that area is going to move on within two or three years. There is also, as we say in the paper, the point that most of the people on the shorter term contract are the more junior ones, in other words, these are people who have completed their doctorate and they are in their first or second post doctorate appointment and they are at the stage where it really is useful for a young man or a young woman, having gained experience in one laboratory doing a PhD, perhaps to move on to another and then perhaps to another with all the skills that they have gathered from those different places before settling down to a more concentrated and long term period of work. That is why within the trust's portfolio of career development awards at the intermediate stage someone can come in for a fellowship for four years when they are starting to make their name and then later as a senior fellow for five years with the possibility of renewal at least once. So, yes, my Lord Chairman, there are tensions between those two sides and we are in an evolving

[Lord Craig of Radley *contd.*]

situation. We want to evolve to a situation where staff have better conditions of employment and more security in what they do without destroying the flexibility that I think is essential for any kind of original work.

242. So I think perhaps the Committee can take from that that there is no universal wish on your part to do away with some short term contracts and they have an important part to play at least from your point of view in the early stages of a research scientist's career?

(*Dr Gordon*) Yes, I think that that is true, my Lord Chairman. It goes back to one of the points that my colleagues brought up earlier on in response to Lord Phillips' question about studentships. There is a change in the way that the trust funds studentships. It does mean a modest reduction in the number of studentships, but I think that we all of us within the trust feel that it is often best for science to do perhaps slightly fewer things, fewer grants, but to do them better, and for anyone at any stage in their career it is important to have the work really thoroughly funded so that they do not have first to get their fellowship and then support for the research and then wonder whether they have got somewhere to do it but to be able really to settle down and get the work done in a concentrated way, so, perhaps sometimes fewer people, but properly looked after.

Chairman

243. This is an implied criticism of the situation as it exists in the public sector funding of scientists, is it not?

(*Dr Jack*) My Lord Chairman, with respect to the behaviour of the Medical Research Council I think that—

244. I am sorry, I did not ask you that, Dr Jack, I asked Dr Gordon because it is quite an issue here, is it not? You have fewer but better people on the one hand—I think this is what you are saying—with better career prospects and more committed therefore to their work?

(*Dr Gordon*) I would not, my Lord Chairman, want my comments to be taken as an implied criticism of any particular body or group of bodies. Many organisations I think work with constraints that the Wellcome Trust is mercifully free of. For example the trust took the lead some time ago—Dr Ogilvie was leading in this particular activity at the time—to look at the way in which fellowships were funded by many other bodies and to suggest in discussion with them that it would be inappropriate for one charity just to provide the salary of research workers and then for those research workers to have to go and set out and find their research funding from the Medical Research Council or the Wellcome Trust or elsewhere. There are some other foundations that as a consequence of thinking this issue through decided to make slightly fewer awards but to make sure that they are funded more completely. But it is not meant as a criticism of any particular group.

245. You mean that there are many patterns which are possible and appropriate?

(*Dr Gordon*) That is true, yes, my Lord Chairman.

246. May one perhaps come back to the main issue—I led you, I am afraid, slightly astray—that is, that while in the last ten or 12 years the number of staff in established university posts has remained constant and universities have expanded, the contract research staff has increased by a factor of about two and a half, and you express very great concern about that; I think you say that it creates an unstable research environment and you are worried that that increase may discourage young and talented individuals. Would you like to expand that? You do not give us any evidence for the instability or for the anxiety and worry and discouragement. Do you have evidence on that, on either of those two points?

(*Dr Gordon*) My Lord Chairman, if I may deal with that point, concrete evidence is very difficult to gather. It is like a question that I know that you have in mind to ask us about later on about the perception of the nomadic lifestyle. These are perceptions that people have.

247. How do they come to you?

(*Dr Gordon*) If anyone were to sit behind my desk from day to day, one meets individuals who have a very sound record in research and they have got good ideas that will survive in the peer review system. However they as individuals say that they are not certain that they want to carry on because of the uncertainties and the doubt whether they will actually be able to make a real career in the system. Doubts whether you will succeed in your career are common in any profession, of course. I suspect that they are rather more common among scientists than, say clinicians—and I see clinicians interested in research: perhaps they have a little more confidence because they have a safety valve in moving into health service work. So it is a perception, my Lord Chairman, it is a thing that we say from day to day. I cannot quantify it.

248. May I ask, are they looking for an established post in the university, most of them, if they are not medically qualified and therefore not looking to the National Health Service?

(*Dr Gordon*) Very often in the long term they are doing so. We also of course see people who are at a point in their career where they are deciding—they do have the opportunity of an established post in the university, but this might make it more difficult for them to concentrate on their research, it will give them extra responsibilities that they might feel that they did not want to take on, and not infrequently we find these individuals if they really have confidence in their ability deciding not to take an established post and coming in to the Trust or to the Medical Research Council or the Cancer Research Campaign for a senior fellowship or similar high level award that will allow them to have themselves funded externally and give them the freedom to continue their research.

249. Do you think that this situation can continue? I only had on my desk today a letter from the Committee of Vice-Chancellors and Principals pleading for further expansion of the university system. I do not know whether they were well informed or under an illusion that with that would come resources that would enable them to expand

[Chairman *contd.*]

the university established staff which in a sense would go towards solving this problem. It seems to me that it is rather unlikely, and this brings one back to the problem of, assuming the system to be static, when do you think that there will be some loosening up as people drop off the end at retirement or even early retirement?

(*Dr Ogilvie*) Perhaps I could make a comment there, my Lord Chairman. I think that part of the problem comes from the enormous pressure on the universities to produce more and more research, to produce more and more teaching, and to produce more and more of everything. That is reflected in our activities by a huge increase in the number of applications that we have to process. As our funds have gone up the percentage success in awarding rate has dropped so that we now process four or five applications to make one award, whereas when we were much smaller we processed three to make two awards. So there are all sorts of forces that are operating on the universities which then impinge on us.

250. Are those forces due to the nature of the formula funding which comes to them from the funding council primarily—let us say there is an assessment of research—and are you saying that assessment is based on quantity rather than a real assessment of quality?

(*Dr Ogilvie*) Certainly the requirement to perform is pressing the universities. As to whether it is quantity or quality, it is supposed to be quality, but the effect on all funding organisations, whether it is research council or charity, is to receive more and more applications because I suspect that the vice-chancellors feel that the more applications they have safely funded, the better their research rating. One assumes that it is quality because certainly we feel—although it is always very difficult to make a judgment—that our quality has not gone down. The judgment of the peer review process has got tougher and tougher in my view as our funds have gone up.

251. Has the success rate gone down? You said the applications had gone up.

(*Dr Ogilvie*) Oh, yes, right down, my Lord Chairman.

252. Gone down significantly?

(*Dr Ogilvie*) Oh, yes, down to about 20 per cent.

253. From what was it in the better times?

(*Dr Ogilvie*) Between 50 and 60.

Chairman: A major change.

Lord Dixon-Smith

254. My Lord Chairman, perhaps I may pursue that. If the success rate has gone down, yet if we look at what the Trust is doing, the Trust clearly in purely monetary terms has increased its funding, and I am not going to argue about it in real terms because I have not done the calculations, what you are implying surely is that the supply of if you like researchers, or the people who want to do research, has increased and presumably the initiative for that has come from the universities for whatever reasons we have already been discussing, volume of research, and we are back into qualitative analysis of the universities themselves who feel that with quantity goes perhaps a higher qualitative assessment at the end of the day?

(*Dr Ogilvie*) That is what we think has happened, my Lord Chairman, but it is very difficult to prove.

Chairman

255. Given something like this to be true for argument's sake, and then expanding the universities by a factor of two, as has happened recently, that is to say, they are all now funded by the same funding council with the same criteria, is that not going to add enormously to the demand for new universities to get brownie points in cash from research, and what is your judgment of that as a good or a bad situation?

(*Dr Ogilvie*) My Lord Chairman, I do not think that we have a view. Most of the new universities do not actually do very much research in the area that we fund. Whether they wish to I do not know, but certainly we would expect people to compete across the sector.

Lord Dixon-Smith

256. My Lord Chairman, may I ask the reciprocal of that. You said, whether the new universities would wish to—would you wish to fund them if they came to you?

(*Dr Ogilvie*) Oh, yes, we accept and fund grants whatever universities they come from if they can win in competition.

Chairman

257. I see that both Dr Gordon and Dr Jack wish to speak?

(*Dr Gordon*) My Lord Chairman, perhaps I might just follow on on two points from Lord Dixon-Smith's question and Dr Ogilvie's answer. We do have data in one area, and I am referring now to the funding of project grants rather than the funding of individuals as fellows. When a project grant is assessed we take care to distinguish between an applicant who has applied to the Trust before, an applicant who has never applied to the Trust before and an applicant who is applying to the Trust within the first two or three years of their lectureship. New lecturers, newly appointed academic staff, do better than average, they have a higher awarding rate for their grants. Individuals who have never applied to the Trust before have a worse chance of getting their funding, their award rate is lower, and the implication of this (although it is difficult to verify) is that these are very often individuals who have been in an established post for many years working without any external funding and in response to pressure, normally from the vice-chancellor or dean of their faculty or whatever, they have been prodded into attempting to get external funding and are not succeeding in the competition. I might follow this with just one other point if I may, my Lord Chairman, in relation to the new universities. In those new universities academic staff often have very substantial teaching duties and that may be inhibitory for them in getting their research started,

[Chairman *contd.*]

and through the initiative of one of my colleagues in the Trust, the Trust does have a scheme that will help newly appointed lecturers in the new universities to keep their research running, often in collaboration with the laboratory from which they came. They may have come from a university which has more slack. There is targeted money towards these individuals. This has been running for only a short time, but it seems to be very successful.

(*Dr Jack*) My Lord Chairman, Dr Gordon has covered the point that I wanted to make, which is the direct answer to Lord Dixon-Smith, that we do have a scheme that we set up deliberately to assist newly appointed lecturers in new universities.

Lord Phillips of Ellesmere

258. My Lord Chairman, perhaps I may ask one question here. Am I right in assuming that only established academic staff can apply for your project grants?

(*Dr Gordon*) It is a complex issue, my Lord Chairman, that would take me perhaps far longer than we have to explain in detail. In general the applicant for a project grant must hold an established post. The exceptions are easier to deal with than the cases at the margin. The Trust does not consider an application, say, from an established member of Medical Research Council staff; they have their own body to which they can go. Nor do we welcome applications from university staff members whose salary funding comes from a cancer charity; they can go to their own cancer charity. But members of staff in universities with medium term posts funded perhaps by another charity in some circumstances may well be eligible to come to the Trust. It is a complex issue that I would not want to go into in great detail.

Lord Howie of Troon

259. I have a more general question about funding that I should like to ask, my Lord Chairman. On page 5 of your submission you say that the trust provides a realistic level of funding and that seems to be ten times the amount paid by most of the research councils. Does that mean that the research council grants are unrealistic?

(*Dr Gordon*) My Lord Chairman, I believe that it is true to say that the normal level of the research training support grant coming with a research council studentship studying for a PhD has been increased recently from £400 a year to £600. If my memory of that information is correct, £600 is a very modest amount indeed actually to pay for the expenses of modern research whether in the biological subjects that are the trust's main concern or in some of the physical sciences, in some areas of which we do have some experience. A single research worker using modern molecular biological techniques might easily use £10,000 worth of materials and consumables a year and therefore an under-funded studentship can be a strain on the laboratory.

260. So that it is unrealistic?

(*Dr Gordon*) Yes, my Lord Chairman.

261. It is not a matter of you being lavish?

(*Dr Ogilvie*) In the field in which we operate we would consider £600 unrealistic.

Lord Phillips of Ellesmere

262. Perhaps I may intervene here, my Lord Chairman, to say that this is of course another complicated issue because the support of graduate students was not supposed to come entirely from the research training support grant but from the research funding of the funding council?

(*Dr Jack*) Yes.

263. There has recently been a study of this issue which was begun under the auspices of the ABRC and it has led to a discussion paper issued by the Office of Science and Technology and I think the Department of Education on how the funding of graduate students ought now to be arranged—how it should be partitioned between the funding council and the research councils. I absolutely accept your point that the funding of graduate students is a difficult issue and that a graduate student in your field costs a great deal of money every year, but it is not all supposed to come from the research training support grant.

(*Dr Gordon*) Of course, my Lord Chairman, we know all the points that are being brought up and we accept them absolutely.

Chairman

264. I should like to get back to the problem of what is the fate of these people, are there going to be opportunities, which was the question that I asked you before? When will they come? What is your perception of that? What should be done about those who are going to have to stay on these grants or go off and do other things?

(*Dr Ogilvie*) May I start on that, my Lord Chairman. Research training takes five to eight years from the time of graduation, the period spent gaining the PhD degree is not the whole of the training process. Most of us in the business I think would accept that it is not till five to eight years that you really know whether somebody has that flair, knack or whatever it is to do research, so therefore it is a good thing initially in the career of a young scientist to move about, to train in various places. The nomadic lifestyle is really very necessary as part of that training so that they get different experience and they work for different people, so we feel quite content about that lifestyle until people reach the age of about 30. All our experience indicates that that is when people make up their minds whether or not they are going to stay in the system, so we are not so concerned about that. Certainly personally also I feel that we would not expect everybody to stay in the system, that would be quite unrealistic, and it would be a very good thing indeed to have people who are well trained scientists moving to other walks of life, whether it is teaching or business or political life I do not think it matters; it is an excellent thing. What we feel should happen is that people should be managed in a positive way, not allowed to drift along, and that is where we often enter into debate with the

[Chairman *contd.*]

universities. I think that many of the better managed universities have begun to grasp this nettle and to make a positive decision about all their staff, at this crucial time, round about the age of 30—it varies with the individual. We police our Prize Students in particular very carefully. We get them together, we talk to them and we feel quite strongly that it is a privilege to have a very bright young person in your laboratory. We sometimes feel that not everybody shares that perception. We do think that positive management should start at the PhD level and continue throughout somebody's career. That is the nature of the debate that we often have with the universities—are they managing their staff in a positive way rather than by accident?

265. Who is doing the managing, where does it lie, at the departmental level, the central university personnel level, a combination of the two? One has to bear in mind, of course, that the new arrangements within universities where departments are cost centres would look to be the natural focus because that is where the money is both gained and spent. What is your view?

(*Dr Jack*) I turn to my university colleague here, my Lord Chairman.

266. It is an unusual university, I think!

(*Dr Jack*) My Lord Chairman, perhaps not from a university which has such clear cost centres as yet.

267. Nor is it short of a bob or two, is it!

(*Dr Jack*) I think that it is going to be a problem for universities, my Lord Chairman—particularly big and successful universities which have a large number of contract research staff—to do this management, and we do not have a clear view, speaking from the trust point of view, about how a particular university should do it, as long as they have a system for doing it. We do not feel that we should particularly suggest that. But perhaps as well as trying to put pressure on the universities to move towards some clearer management of the people who have been contract research staff within that university for some time—that if you like is the stick—we do have a very clear carrot. One of the carrots that we have that is used quite a lot, but perhaps not as much as we would wish, is what we call a University Award system, in which we assist the university to make a proleptic appointment to established staff. In those cases, we pay the previous contract researcher's salary while he is a university lecturer, fully for the first three years, half for the fourth year, and a quarter of that for the fifth year. So we are offering universities a real financial opportunity to make slightly longer term planning in making these proleptic appointments. We would certainly take the view that it is a really important way of attempting to assist universities to come towards better management of their older contract research staff.

268. Is that embodied in any document of the Wellcome Trust?

(*Dr Jack*) Oh, indeed, my Lord Chairman, it is widely advertised.

269. May we have a copy?

(*Dr Jack*) Of course, my Lord Chairman.

270. I think that it is a very interesting notion.

(*Dr Ogilvie*) And may I add, my Lord Chairman, that we have had this scheme in existence for 20 years or more and some universities take great advantage of it; others do not.

271. Are there any other trusts, foundations or bodies which are following a similar course?

(*Dr Ogilvie*) Not that I am aware of, my Lord Chairman.

(*Dr Jack*) No.

Lord Craig of Radley

272. Perhaps related to this, my Lord Chairman, and going as it were to the earlier stage of interesting people, you say that the prospect of working on a number of short term contracts may discourage talented individuals from embarking on a scientific career. I wonder whether you have anything more that you would like to add to that particular line of thought? It is quite important.

(*Dr Ogilvie*) If I may start, my Lord Chairman, again this is something that it is very difficult to give you very hard evidence about. Apart from the fact that my colleagues involved in our science funding activities spend a great deal of time talking to people in universities, we did a small study arising from the problems that women have in staying in science. Our policy section undertook a questionnaire investigation of 140 undergraduates and postgraduates at Leeds and Cambridge in physics and biochemistry and asked what their perceptions were. It was well organised within the limits of that kind of study. The interesting thing was that both the men and the women but particularly the women commented that they did not think that the nature of the scientific lifestyle was compatible with, in their cases, family life. But the men were not far behind the women in this perception.

Baroness Platt of Writtle

273. My Lord Chairman, what strikes me is that there is this instability, but is it not an instability in every part of national life at the moment? Many of us when we went down from university thought that we would get a job which might in fact mean you moved two or three times and then you would settle into, in my case it would have been industry, and work there for the rest of your life, but that is no longer the case anywhere. Is this not something that every young person has to face up to rather as they say that in the United States the average change of job is eight times during a career? There are obviously stable careers that people go into, but possibly people do have to be more entrepreneurial in choosing what they are going to do?

(*Dr Jack*) Yes, my Lord Chairman, indeed, there has been a change in the attitude of people that is linked with that, and I think that in a way the Trust policy is also still firmly of that kind. As Lord Phillips raised earlier with respect to the units the Medical Research Council has very successfully supported, they do offer tenure after a certain period of time. We have chosen not to support tenure but simply to move more of our funding, particularly of the older

[Baroness Platt of Writtle *contd.*]

contract research workers, for longer and longer periods as they get older, which is roughly the kind of circumstance that you are suggesting should hold. Now one of our reasons for deciding not to go for tenure, and therefore not to go to units, is just simply the concern that as a trust without the kind of national responsibility that the research councils have, we do want to keep our money reasonably flexible so that we can respond to new needs.

Baroness Hilton of Eggardon

274. Perhaps I may just follow up on that question, my Lord Chairman, relating to that. Do you think that the quality of science is affected by people's feeling of insecurity and the need to continue to look for new funds and new jobs? That is the anxiety, the quality of research and long term commitment to particular lines of research?

(*Dr Jack*) Yes, it is, my Lord Chairman, and of course it is why we have this particular concern about reaching some agreement with the universities, so that one of the escape routes for people who have been supported, say, for five or perhaps ten years by the trust, might be the ability to move from being a contract researcher, to membership of the established university staff, or help to find other jobs elsewhere outside the university centre.

(*Dr Ogilvie*) My Lord Chairman, may I add that in America the contracts are getting shorter and shorter, and we have always felt that one of the advantages of Britain, very much smaller though our effort is, was that people had longer time horizons so that they could therefore take on more difficult projects. If you shorten the time span to three years or less, which is what is continually happening, then people are much more inclined to put up applications for projects that are safe and sure rather than something that requires more imagination and more thinking time. This is the key issue, that I think the changes generally are reducing the time for real thought. If you are going to be original you really do need protected time, and that is why we are very concerned in respect of our stars in particular, but not just them, to give them longer time.

(*Dr Jack*) My Lord Chairman, if I may just add to reinforce that, among the group of people that we do now fund on relatively longer term contracts are people who have come from overseas and who have made an active decision to come to this country—many north Americans now—and one of the major points that many of them offer now as grounds for coming—and perhaps they have never been to this country before—one of the attractions of coming here is that they can get secure funding for a longer period of time and they feel that that actually makes the possibility of them doing research with real innovation much more realistic.

Chairman

275. Before Lord Phillips comes in, and I know that he wants to put a question to you, you have touched on something that goes to one of our questions, which is where those who fail go to, and you are now introducing a new element and saying that your particular scheme is one which actually is attractive to people to come in from high quality scientific countries, if I can put it that way, to work in the biomedical field because of your grants?

(*Dr Jack*) Yes.

276. Is that something that you think is—

(*Dr Jack*) It is quite a common point that is made by people when we ask them why they have sought to get funding from us and move to this country.

277. Really?

(*Dr Jack*) Yes, my Lord Chairman.

Chairman: Well, that is very interesting.

Lord Phillips of Ellesmere

278. My Lord Chairman, may I say to begin with before I go on to my question how much I agree with the point that was made about the need somehow to promote long term research funding. But of course there is a countervailing pressure from the research assessment exercise which is looking for results every three or four years, so that you have that working against your scheme. However, the point I wanted to come to really was this: I was astonished, as I think other members of the Committee probably were, to hear from the Association of University Teachers that 46 per cent of this rather large pool of contract research workers are looking for permanent research jobs. Now there is no tradition really in universities of having a cadre of permanent research people, at least, not to any great extent. Medical Research Council units provide one opening. Institutes of various kinds produce another opening. But you are really not offering in the end permanent research jobs. In the counselling of your people—and I assume that you too are involved in counselling your people—is that made absolutely clear to them?

(*Dr Gordon*) My Lord Chairman, perhaps I may deal with that point, because I have to deal personally with the Trust's Senior Fellows and Principal Fellows. A Senior Fellow might be appointed in his or her early thirties for five years in the first instance, renewable, but in the long term not necessarily to be funded by the Trust unless they succeed in the Principal Fellowship competition. We know each of these people individually and we know what their plans are and we know where they are likely to be able to go. If somebody, for example, is coming up for renewal we discuss with them very frankly the prospect for success in the peer review system, what other alternatives are available to them and so on. Now it is not as difficult a task as it might sound because these people have been very carefully selected before they enter the Senior or Principal Fellowship scheme and we know that in the most longstanding of those schemes, the Senior Clinical Fellowship scheme, individuals who have been funded through that for five or ten years do very well in finding the next post whether it is an academic post, occasionally in industry, occasionally in the health service, often abroad; we know that they do very well. But, yes, we do actually talk to the individuals at that senior level very carefully and realistically about the future for them.

279. Often abroad, you say?

[Lord Phillips of Ellesmere *contd.*]

(*Dr Gordon*) Not infrequently abroad. The world of learning ebbs and flows internationally, and Dr Jack referred earlier on to the pleasure that the Trust has in supporting some very good research workers who have come from abroad or who have come back from abroad and who have decided that for the time being this is the best place to do their research, but when defining the Trust's remit, Sir Henry Wellcome asked us to support research, he did not say support the research in the United Kingdom, and part of doing the best research might be for someone to work here for five or ten years and then to move into an established post in the United States or Australia or wherever if that is the best place to do that work.

Lord Howie of Troon

280. Dr Gordon mentioned something called the Principal Fellowship competition, I think?
(*Dr Gordon*) Yes, indeed.

281. Is that a competition among a number of people for a number of posts or grants or is it a career hurdle or what is it?
(*Dr Gordon*) At each point—appointment to a senior fellowship, renewal or appointment to a Principal Fellowship—there is a competition in the sense that the application has to be peer reviewed and then survive an assessment by an expert committee. For it to be a competition we actually have to take the different applications and place them one against another. For example, each year perhaps we get 100 or 120 preliminary inquiries for a Senior Basic Biomedical Fellowship, and that is whittled down in a process which I hope is as fair as we can possibly make it to a total of perhaps eight new awards each year. The clinical scheme is similar but perhaps two thirds that scale. With regard to Principal Fellowship inquiries we do not have very clear data on the number of inquiries each year, but again that is a competition where perhaps 10 or 15 inquiries each year will come down to a maximum of four or five awards.

Chairman

282. I wonder whether I may just press you a little further on this. With your past experience and with what you have said about the necessity for counselling and the universities perhaps not fulfilling their proper task here, can you advise us as to what is the kind of age range in which you think critical career decisions should be made with guidance and help and full information by researchers who having taken a doctorate have then gone on? Is it early thirties?
(*Dr Gordon*) My Lord Chairman, I would agree absolutely with Dr Ogilvie's comment earlier on. There is a time around the early thirties where an individual has had their training, it is possible to see what they can do and it is possible to come to a view as to what the likely outcome is for that individual. The people who are best placed to make that assessment are those who are around the individual and who are working in the same field because different fields of science have different patterns of research.

283. That raises another very difficult point because if one thinks of the unutilised half of the population that is an age at which they are most seriously handicapped in many cases by child bearing.
(*Dr Gordon*) If I may as far as possible quote from the Trust's rubric, my Lord Chairman, of course, in every case due allowance is made for a career break whether for personal or family reasons or for some other cause. We are moving to a situation where every one of the Trust's advertisements about this or that fellowship scheme does not say, "You must apply by such-and-such an age" or "This is the guideline age"; we say it is likely to be a certain number of years after, say, completing the PhD with due allowance for any career break in that time—so it is working years, not years plus time away from work.

284. You have allowed therefore for the problem of re-entry after a career break, have you?
(*Dr Gordon*) Yes, my Lord Chairman.

285. How do you manage that?
(*Dr Gordon*) My Lord Chairman, I might pass this to Dr Ogilvie in a moment because I know that she has looked at it closely recently. We do have a new scheme of Re-entry Fellowships to help people get back into research after a career break. These provide not only the support for the research, but also support to bring back a person who has been away from science completely or sometimes nearly completely. It gives them help to get them back up to speed, because science moves along very rapidly. This is a new scheme. The Trust has supported relatively few of these career Re-entry Fellowships, but if you look at the general pattern of individuals funded by the Trust whether on an existing fellowship scheme or supported on project or programme grants there are a large number of people who come back in gradually. I have papers on my desk at the moment of someone wanting to appoint two individuals part time to one post to help both these individuals to get back into science. I think that Dr Ogilvie has looked at this more closely.

Lord Craig of Radley

286. My Lord Chairman, would all these people coming back or being considered for a Re-entry Fellowship be people well known to you because they had been earlier supported by you?
(*Dr Gordon*) Not necessarily, my Lord Chairman.

287. It is a wider field?
(*Dr Gordon*) It is a wider field, yes. It relates to the earlier question about the way in which people going into a career as graduates in science are having perhaps to live in the uncertain world that all young people live in. I am struck by the contrast between the science graduates and the medical graduates with whom I also deal. Medical graduates of course all lead a nomadic lifestyle, they work for six months at a time, their contracts are for a year, two years, and so on, but they do not enter that career with the same uncertainty that the graduate scientists have. They know that the situation is more in balance and they also have a more clear cut set of alternative routes

[Lord Craig of Radley *contd.*]

into clinical practice, into hospital work or whatever, and one of my perceptions is that the graduate scientists do not feel that the system is adequately in balance. There may be an awful lot of them in the immediate post doctoral phase and there is not the right balance of posts at the more experienced level to take up those post doctorals.

Chairman: Thank you very much.

Baroness Platt of Writtle

288. Just before we finish, my Lord Chairman, I wonder whether Dr Ogilvie could come in and also—this sounds such a good scheme on your page 6—could we be told whether you are unique and whether other people do it too?

(*Dr Ogilvie*) You are talking about the Re-entry Fellowships?

289. Yes?

(*Dr Ogilvie*) So far as we are aware it is unique but we ourselves have only had it for two years. But when I looked at the detailed structure of some of the research groups that we fund I found to my interest and surprise that there were a number of women—and I am going to talk now specifically about women—who had re-entered in different ways. I can think of one woman in one group who had been out of science for 12 years, had an excellent record up to then, took time off to have a family and she is now coming back and working initially as a technician in the group in order to get her skills up to date. So that is one way of coming in. Another individual in another group was somebody who came back into science after five years away with the support of a Trust post doctoral research fellowship, not a re-entry fellowship but one in our normal competition, and she now has an MRC five year fellowship. Thus women are taking advantage of the flexibility that we and others offer. I do not think that we are alone in being flexible. Certainly all our schemes can be held in a flexible way and, of course, it is primarily to the benefit of women, but not solely. We have always had this flexible arrangement throughout the time I have been at the Trust.

Lord Phillips of Ellesmere

290. My Lord Chairman, this is a peculiar point. I was very interested in Dr Gordon's comparison of science graduate students and clinical students. It is one area of national life where manpower planning still exists, clinical students.

(*Dr Gordon*) Yes, my Lord Chairman, although—

291. You are not advocating that some degree of manpower planning would be useful in the area that we are worrying about?

(*Dr Gordon*) No, manpower planning of course is a very difficult subject. We know what goes wrong in Stalinist economies.

Lord Phillips of Ellesmere: Yes, indeed.

Chairman: Be careful, I was once a member of the Committee on Manpower Planning! It was called manpower resources.

Lord Craig of Radley

292. Exceptions prove the rule.

(*Dr Gordon*) There are factors other than just the careful planning of manpower numbers that operate in that system. The medical profession itself actually has learned to have some flexibility and it has to because it also has a large number of female graduates who take time out. Indeed, I would go a little further and say that in recent years, in terms of medical manpower, we have had instances where the planning of numbers in the training grades has been rather difficult for us supporting research—that is a question separate from those of direct concern to your Committee, but it is just to illustrate the difficulties I think you are alluding to.

Chairman

293. I should like to find a sentence which expresses in shorthand form the impression which you have given to me by these discussions and see whether you approve. My impression of what you have said is that while we are faced with a situation in which the established staff of universities have not grown in science while we have seen that at the same time a very large number of these contract research staff grow, they are not well managed, but even in a static condition as far as resources are concerned you believe that there are ways of managing them a very great deal better and getting through the next ten years until more of the established posts in universities become free and we have a more rapid flow again and a system steady state with more rapid flows in and out. Is that right broadly speaking and therefore, if it is right, would you say that the thrust of our comments should be towards directing the universities to do what you have told us some universities are already doing, which is to study this question more carefully and have systems in place which can both improve the quality of the research which is done and minimise the number of very short term appointments which you regard as relatively unproductive to good research and manage their personnel better?

(*Dr Ogilvie*) My Lord Chairman, I would say that that is very fair. But may I add to that that one of the problems that we have with scientists is that they do not believe that there is any life beyond bench work.

294. I am sorry, they do not—?

(*Dr Ogilvie*) They do not believe that there is any other way of earning a living as a bench scientist, so that one of the ways of handling them is to persuade them that there are other ways of spending one's career—they might even go and work for the Wellcome Trust, for example!—and I think that this is a rather narrow perception which needs to be modified in various ways.

295. Could one add to that what has been hinted at already, that is, that perhaps universities have a responsibility to try to help people to get more transferable skills so that they can meet what you seem to foresee by agreement with what Baroness Platt was saying, that life was going to be more varied in the jobs that they take from time to time?

(*Dr Jack*) My Lord Chairman, in that respect—

[Chairman *contd.*]

296. Well, do you disagree or agree?

(*Dr Jack*) I would agree with that, my Lord Chairman, and I would just like to supplement in a couple of ways. The first is that the trust when funding its full time researchers certainly does not discourage them and actively encourages them to participate in some teaching within the university system so that we do not expect them to be dedicated full time researchers. We think that actually it is part of their possible preparation for a transfer to an established university post that they should get teaching experience. The other point I should like to come to, to go back to something that Lord Phillips remarked on earlier, is that I do not think that it would be any surprise to us to hear that a lot of contract researchers would like to stay on as contract researchers but just have more security of tenure. The problem here is that often they are unrealistic and actually are seeking to have a life which despite the shortness of the contract that they are on is much more enjoyable for them than, for instance, being an established member of the university staff. It is a common observation made by both the contract researchers and even the doctoral students that we fund and that we talk to that they say that if they do want to stay on they would prefer to be researchers because they see the kind of range of pressures and demands made on established university staff as potentially a less enjoyable career. But it is certainly nevertheless a career that allows the continuation of research.

(*Dr Ogilvie*) My Lord Chairman, may I add something to what Lord Phillips raised? We are told now by some people in universities that when they are appointing new professors and they wish to appoint a real high flyer in research, these may say that they will only come if they have a contract that guarantees that they can spend most of their time on research, so the boot is almost on the other foot. Therefore, there is great pressure on the universities from the real high flyers in research to protect their time for research if they become a member of the staff; and by the same token the very, very high flyers often do not want to become university staff, as Lord Phillips said. They feel sufficiently self confident to survive by taking posts that have to be renewed at intervals, so there is a pressure coming back on the universities in unexpected ways. Chairman: I think that one can understand that pressure.

Lord Craig of Radley: My Lord Chairman, there is one other line of thought that I should like to follow, if I may, and it may be that I have it wrong. As I understand it, there are quite a considerable number of senior long term people who will come to retirement age making more jobs available on the permanent side. We also have a situation in which there are many more younger research scientists coming in than previously. If we bear those two facts in mind, is the opportunity which an individual will have to get a long term appointment actually going to increase in percentage terms as the years go by compared with the present situation? In other words, what I am saying, my Lord Chairman, is, are more people searching after a greater number of jobs but the percentage chance of an individual getting a long term job may be no greater than it is today?

Chairman: In fact, if there is a long residence time, to use a chemical kinetic analogy, then the flow of people must diminish.

Lord Craig of Radley

297. And are we actually confusing ourselves—maybe I am confusing myself, my Lord Chairman—in believing that there will be more opportunities for an individual in the future when in fact he is going to have to compete with more people?

(*Dr Ogilvie*) I think that it is very difficult to answer that question, my Lord Chairman, because we are dealing with an international market. It was not just Britain in the 1960s that had a huge expansion in academia, the generation that is coming up to retirement now, but the United States and I believe most of the English speaking world did too. I believe that in the United States there is going to be an enormous number of posts becoming vacant. Therefore, to answer the question you have to look at the whole scene internationally, and I do not have the figures to do that so I cannot give you the answer.

Lord Craig of Radley: No, but that is a very valid point, and I thank you for it, that one should look at it internationally and not just nationally.

Chairman: That is the position. We already know that the National Academy of Sciences and also the American Philosophical Society are concerned about exactly the same problem there that we have here; and you yourself, I think, have said that some contracts over there are even shorter term.

Lord Howie of Troon

298. My Lord Chairman, I have one very small question. You say the ninety-two principal and senior fellowships are from five to ten years' duration. Do you have any that are more than ten years, and what is the longest serving old stager, if I might put it that way?

(*Dr Gordon*) My Lord Chairman, the top, the most prestigious, of the Trust awards, Principal Fellowship, will guarantee funding for an individual for up to ten years, and then that can be renewed. There is nobody who has had a guarantee for longer than ten years from the Trust although some individuals have been funded and survived in the renewal competition. Individuals currently supported on the Principal Research Fellowship scheme include a few people who are within five to ten years of the normal retirement age.

299. Would you have anybody who has had a grant for more than ten years?

(*Dr Ogilvie*) I can think of one individual, my Lord Chairman, whom in fact we supported throughout his career on an annual basis!

Chairman

300. Shows a degree of indecision on your part!

(*Dr Ogilvie*) He worked in Brazil actually for all his career and eventually became a Fellow of the Royal Society, but he was a very unusual individual anyway. May I just add to that that almost without

[Chairman *contd.*]

exception I would say the people who win our Principal Research fellowships and most of our Senior Research Fellows actually have an agreement with their universities that if we do not fund them their university will support them.

(*Dr Gordon*) In many cases.

(*Dr Ogilvie*) In many cases, yes. They are very, very high quality individuals who have won in some very savage competitions.

301. I should not like this occasion to pass without hearing you speak as you have already written somewhat astringently about the Master of Research degree, and in particular my own interest would be to see what lies behind your statement that "the Government has overturned attempts by the Medical Research Council and the Biotechnology and Biological Sciences Research Council to set up four-year PhD training courses in the biomedical sciences", and then you go on to say that you have had some experience of this at the University of Liverpool. Now this is an issue which we are looking at actively. Some people are keen on the Master of Research; in some subjects they are quite the reverse. What have you to tell us?

(*Dr Jack*) Our general position, my Lord Chairman, is that we see great advantages in having diversity in research training and perhaps the phrasing is a little astringent about the Master of Research as one possible route in which this may be done. The reason for the astringency I think is the fear that a Master of Research degree of one year might be regarded in some way as an adequate form of research training for biomedical sciences. We certainly take the view that adequate training in our field, the field in which we fund, does require a longer period of time. But, of course, whether it is a Master of Research and then a three year doctorate, or whether it is a four year doctorate, might seem on the face of it to be just an issue of semantics. We are not clear that it is because the Master of Research, as least as we understand it, is expected to have a substantial component of research (probably of the order of 60 per cent or more). Our view is that for some areas of biomedical science, there may be required, if you are going to allocate a total of four years for that research training until you reach the post doctoral phase, a substantial amount more in-course elements as well as research experience, and that might be better folded into more than one year. That is the reason why we initiated this experiment in Liverpool in which there is a four year doctorate, and we have recently decided that we are actually going to go ahead and advertise some more opportunities for other universities to come in and make bids for four year doctoral programmes. Although we have got some guidelines as to how they might do that, we are going to leave individual universities to make their specific form of bid in the way that they think best suits their local scenes.

302. But within a four year span?

(*Dr Jack*) Yes, my Lord Chairman, a four year span, so I suppose that basically the Trust's position is that we think that it is coming to the stage, because of the depression in first standards of people when leaving school and hence in standards that they reach at the level of a three year undergraduate—

303. Can I just stop you at that point? It has always seemed to me that if a subject is really advancing in science oddly enough what you say about it gets less and less, not more and more, because the nature of science is that a new theory replaces old theories because it encompasses more information and makes it understandable. Why do we have to assume that courses must be longer and people are less well prepared at the end of it?

(*Dr Jack*) In many areas of biomedical science, my Lord Chairman, it is simply the diversity of skills that may be required to attack a problem.

304. Are you speaking purely now of the research element?

(*Dr Jack*) Yes, I am sorry, at the point at which—

305. I thought you were saying that the people at the end of their first degree were ill-fitted to go on to research and therefore this was necessary.

(*Dr Jack*) The standard at which they are taught is such that they may not at that stage be fully equipped.

306. Standard means content in this, does it?

(*Dr Jack*) My Lord Chairman, yes.

307. I see. I had taken it as something different.

(*Dr Jack*) So that if one accepts that slight drift in standards downwards, then a four year doctoral programme given the much wider range of expertises that may now be required to attack a biomedical problem, means that we think that a four year course to complete a doctorate is, or can be, beneficial. Not that it necessarily is the only route, but that it could be for some circumstances beneficial. With respect to the particular course that we have already had running at Liverpool, Dr Gordon has recently been there and had a preliminary look at it, my Lord Chairman, so perhaps I could pass that over to him.

(*Dr Gordon*) My Lord Chairman, I only looked at it a little and one of my colleagues looked at it much more closely. The interesting feature there—

308. Could you just tell us the subject, is it tropical medicine?

(*Dr Gordon*) My Lord Chairman, no, this is a course based in the Department of Physiology in Liverpool which, as I am sure you are aware, is an extremely strong department with a number of very good research groups, and the proposal that they made, accepted by the trust, was that if they had a grant for five four year studentships each year there would be an opportunity for more in-depth research training and there would be the opportunity for the students to look more closely at possible projects, to rotate between laboratories and actually to settle into a project that, on mature reflection, was more suited to their own abilities and interests. The first year of students is now in place and there are a number of features that have come out immediately. The first is that it is extremely popular. The demand for places in response to advertisement is very high indeed, 130 or 140 applicants each year.

309. From universities other than Liverpool?

(*Dr Gordon*) Yes, indeed, my Lord Chairman, for five places. The second feature is that students who enter the course welcome the opportunity to try out work in different laboratories and are going towards

[Chairman *contd.*]

one of the ideals that we would like to have in all cases in PhD training where the student himself or herself, on the basis of their experience, is actually able to set the project themselves and sometimes to come up with novel ideas of working between two different laboratories on a problem that those two approaches will illuminate. So it is very early days, my Lord Chairman, but the response from the students and from the course organisers is very positive, and I think that this is one of the features that led towards the governors agreeing to extend it to some other centres.

310. In what way would it differ from one of the old style mastership courses and then followed by a normal PhD? Is it in the range of choice of moving round between groups?

(*Dr Gordon*) I think it is in part in that and it is in part also in the factor that Dr Jack has alluded to, that there is not the requirement for any taught elements or gaining particular skills to be all confined within that first year; it can work organically through the four years of the course.

311. So that your general approach to the Master of Research is that there can be derived schemes over four years which would mean that the person coming through that will be better placed from your point of view than any of the existing schemes?

(*Dr Jack*) Yes, my Lord Chairman, we suspect that the university staff who are going to have to participate in one or other of these kinds of schemes, if we accept the total of four years, be it an MRes and a PhD or a four year doctorate, are likely to find that the four year doctoral scheme is more attractive simply on the grounds that they know when they select the students to come in—providing that they pass the internal university hurdles at an earlier stage—that they are going to have an opportunity for those people to continue on in their research laboratory. To run an MRes course, for example, without any of those people staying on, because perhaps they may go off elsewhere, is actually quite a heavy commitment in teaching time and in time in the laboratory where a great deal of it could be spent in simply training them in techniques; and, of course, one element of the pleasure of having a doctoral student in your laboratory is that once they are trained they are then productive and make exciting contributors to the research that is going on in the group.

Lord Phillips of Ellesmere

312. My Lord Chairman, most of the discussion I think has been about high flyers, as you call them, potential research leaders, yet a very large proportion of the contract research staff that we are concerned with in this inquiry are at a rather lower level than that; they are not going to be research leaders ever, they are in many ways rather advanced technicians or potentially rather advanced technicians. What do you have to say about that particular body of people?

(*Dr Gordon*) My Lord Chairman, that is of course absolutely true. An army does not consist of just generals—it is an awful army if it does. We recognise that every time the trust supports someone at a senior level as Senior Fellow or Principal Fellow that implies also support for that fellow's research programme, and that may include anything from two or three support staff to perhaps nine, ten or even more, and each one of the individuals who form part of that support staff has his or her own career. We would be concerned if no one had taken thought as to where they came from and where they might go. It is true to say, I think, my Lord Chairman, that an important feature in looking at the track record and proposals of any senior researcher coming in for one of these fellowship awards is how they actually handle the careers of their younger people. A person who ruthlessly exploited their PhD students and their post doctoral scientists and then did not have the strength of character to explain to a young person of 30 or 32 that really they had no long term future in science would be someone who would, I think, be much less likely to be funded themselves. It is part of running your research team that you actually look at where the members of that team come from and where they are going.

313. So that is part of your career counselling in a way?

(*Dr Gordon*) Yes, my Lord Chairman, I think it is part of that and it is part of the assessment of the individual. As I mentioned earlier, I know each one of the Trust's Senior Fellows and Principal Fellows individually and I am very struck by the care with which these individuals think about even quite junior members of the team—for example, they ask is it really appropriate for this person, I have recommended this one to move on, I think this person should stay, this person should come in for a Senior Fellowship in his own right—that kind of issue is always in their mind.

314. Are these people necessarily young? There are advanced technologies in biomedical research nowadays that require skill and a degree of experience so that one knows of quite senior scientists in this role?

(*Dr Gordon*) Yes, they are not necessarily young, my Lord Chairman. A Principal Fellow who is 45 or 50 years old himself or herself might well have an important right hand man who was of comparable age and who had taken a positive decision to hitch his star to the principal investigator and for them to go through together, we hope to retirement.

315. And you would support both of them?

(*Dr Gordon*) If it were appropriate for the individual, yes.

Lord Craig of Radley

316. I have one small point, my Lord Chairman. On the question of the nomadic lifestyle I am not quite clear whether your Trust helps with removal expenses and relocation expenses if an individual has applied from one location for an appointment in another or whether it is down to the individual concerned?

(*Dr Ogilvie*) We do provide up to £1,000 per fellow for removal expenses, my Lord Chairman, but I regret to say that there is at least one university that refuses to award this.

Chairman

317. I will just raise one point and then I think that we ought to conclude. You have spoken with praise of the four year scheme. You said that the Government has overturned attempts by the Medical Research Council and the Biotechnology and Biological Sciences Research Council to set up four year courses. Were those courses similar to your scheme and therefore did you approve of them as sufficiently similar? How did the Government come to overturn them? These are matters for the research council themselves, are they not?

(*Dr Jack*) My Lord Chairman, both those two research councils advertised schemes and asked for universities to make submissions. I am certainly aware of the fact that to both of those research councils two different sectors of my university applied. Then at a very late stage when the four year doctoral scheme had been submitted to those research councils there was a letter I think from the Director General of the research councils saying that in fact these schemes were not to go ahead. This caused a great deal of demoralisation and upset in my university among those people who had spent a great deal of time preparing for these courses. We have not had access to those applications although recently when Dr Ogilvie and I met Sir Dai Rees, the chief executive of the Medical Research Council, when we told him that we were going to proceed to advertise for some four year doctoral schemes he did offer us the possibility of seeing the applications.

318. May I ask the question whether those schemes that you prepared were rather like the Liverpool scheme? Was there a lead in through techniques into research?

(*Dr Jack*) My Lord Chairman, I am familiar with only one of the two schemes, but certainly that had elements that were very similar to the Liverpool scheme except that in the first year there was a substantial amount more course work involved. But this was a scheme for neuroscience where people may have entered neuroscience from a variety of different undergraduate backgrounds and this was to make sure that everybody had the opportunity to learn a range of intellectual techniques, if you like, that can be helpful for proceeding and giving freedom to pursue a variety of different approaches to neuroscience research via a doctorate.

319. Is it your impression that if you had in fact said to these research councils, we would be prepared to give an MRes at the end of one year, you would then have got away with it? You see where the whole argument is going.

(*Dr Jack*) My Lord Chairman, presumably that is subject to negotiation between the universities and the research councils—I do not feel I could comment on that.

320. Well, we shall be seeing the research council. We have seen Sir John Cadogan, but we can ask him again about this if we need to. Now are there any questions that you would like to comment on that we have not raised with you which are in the paper or within your minds which you have not had the chance to speak about?

(*Dr Ogilvie*) My Lord Chairman, I should just like to thank you very much for this opportunity to talk about something that is very close to our hearts.

321. Thank you very much, Dr Ogilvie. Would Dr Jack and Dr Gordon like to add anything?

(*Dr Gordon*) My Lord Chairman, if there are any specific questions we should be very happy to supplement our written submissions with any matters that might come to us.

Chairman: We shall not hesitate to ask you. Thank you very much.

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