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THE INDEPENDENT CAMPAIGN FOR EFFECTIVE SCIENCE POLICIES

SBS 04/07

ATTRACTING THE BEST

Report of a Save British Science Symposium
on recruiting and retaining world class researchers in the UK's universities

Sponsored by the Wellcome Trust

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SUMMARY

• Universities in the UK are routinely experiencing difficulties in recruiting and retaining world-class researchers in science and engineering.

• The market for top-class researchers is complex, and is driven by factors such as the degree of freedom to pursue one's own research, the level and nature of teaching commitments, the amount of bureaucracy and administration, the availability and standard of facilities and equipment, the availability of project funding, and the level of remuneration.

• Handling variations among individuals' interests in these various factors requires a more sophisticated menu of options than at present, in which people can choose different proportions of research, teaching and administration, in return for different packages of benefits from their employers.

• Nevertheless, average salaries will need to rise of the Higher Education sector is to remain competitive.

• A proposed average salary trajectory is presented, together with arguments and market comparisons to justify both its shape and the quantification.

• If other factors were held roughly constant, the proposed trajectory would strongly alleviate the financial pressures on individuals, and hence make substantial progress in reversing recruitment and retention difficulties.

• The total cost of proposal would be approximately £250 million per year if it were implemented for research-active permanent staff in science, engineering and technology at English universities.

• Although the average trajectory is presented, our proposal envisages a substantial increase in the variance of salaries, so that people would be paid more where the market demands it. The scheme involves a small number of people being paid very substantially more than the majority.

• Implementing the scheme will require changes in the way salaries are negotiated.

• More will need to be done to ensure that under-represented groups, especially women, are attracted into scientific careers, if the UK's universities are to recruit and retain the best researchers from the widest possible pool of talent.

• Mechanisms such as the Research Assessment Exercise need to accept that some research-active staff who have returned to research after a period of absence will need time to up-date their knowledge of their fields, and will need at least two or three years before they can be expected to achieve the same level of output as their colleagues who have not had a break in their careers.

• Some new data are presented on the current level of academic salaries in the sciences.

BACKGROUND

Universities in the UK are routinely experiencing difficulties in recruiting and retaining world-class researchers in science and engineering.

The problem does not apply to all subjects in all universities, but there are difficulties in many institutions, and across many disciplines. For example, 57% of universities responding to a national survey reported that they had left scientific posts unfilled because none of the candidates were of the appropriate calibre, while 37% admitted that they had been forced to appoint members of staff who, in the past, would not have been considered good enough.[1]

The reasons for such difficulties are complex, but it is clear that many attractive career options are available to the kind of first-class scientists who might otherwise become or remain academic researchers.

One such option is to work in better-funded universities in other countries, especially the USA. A quantitative study of those people who had been awarded doctoral degrees in scientific and engineering subjects in 1988 found that the best of them are now carrying out research in the science base of the USA.[2]

Other career options include working in scientific industry. As one indication of the attractions of such an option, university scientists in the UK are paid substantially less than their counterparts working in the pharmaceutical industry. The differential varies from about 20% to about 50%.[3] In the chemical industry, scientists in their thirties earn about 12% more than university scientists of a similar in universities, while those in their early fifties can earn as much as 30% more.[4]

Following discussions with Government and other interested parties, SBS convened a two-day Symposium on the issue, for which we received sponsorship from the Wellcome Trust.

The event included participants from a wide range of groups, including Government, industry, the universities and the charity sector. Fuller details of participants are given in Appendix 1.

Section 1 of this report attempts to bring together the strands of thought and discussion at the event, in order to examine some of the factors that affect scientists' career choices.

Although everyone present agreed that many of these factors are important, we decided to focus in detail on the remuneration of university scientists, because it is undoubtedly of huge importance. Section 2, therefore, outlines some of the results of the symposium's discussions about the salary structure of researchers in the UK's universities.

There was a strong feeling among participants that more needs to be done to attract those groups that are underrepresented in the science base at present, notably women and ethnic minorities. A short appendix (Appendix 2) outlines a few comments on this issue, which will, without question, need to receive a great deal more attention in the future.

This report is produced by SBS, based on the discussion at the Symposium. It represents the collective view of SBS, informed by the views of those at the Symposium. We make no claim that the report reflects the personal opinions of any individual who took part, or the view of any organisation by which they are employed.

SECTION 1: Some factors affecting recruitment and retention

The pool of talent

Although this report focuses on the need to recruit and retain people into research careers in universities, there is a wider problem. The pool of scientific talent from which universities can draw is diminishing, because young people are turning away from science subjects at school and at university.

This problem is not unique to the UK; it is shared by most of the industrialised nations of the world, and we recognise that it is important to undertake a variety of steps to encourage more children and young people to take an interest in science, engineering and technology.

Most of those steps are outside the scope of this report, but it may be that if employers other than universities – notably scientific industry and government departments – were to offer more attractive career prospects and remuneration packages, it may help to increase the flow of young scientists entering research careers.

A university career

Many factors affect a person's choice to follow a scientific career in a British university. Some measure of freedom to pursue one's own research interests, some leeway in organising one's own time, and the collegiate nature of the enterprise are all aspects of the job that are particularly appealing to a large number of researchers. Many of these features of an academic career are less prominent than they were in the past, but they remain important nevertheless.

Although the Symposium focused principally on remuneration, it also touched on some of these issues.

Freedom

Traditionally, one of the great attractions of an academic career has been the acceptance that researchers will have some freedom to pursue one's own research interests. The degree of such freedom inevitably varies among institutions, subjects and individuals, but a high proportion of university researchers enjoy some measure of liberty.

Recent changes in the ways in which research is funded have made inroads into this freedom, including the hypothecating of particular pots of money for areas that are politically expedient[5] and the listing of specific scientific questions that the research community must work to solve in "the next few years".[6]

As a more general point, the balance between funds for the Research Councils the Funding Councils should swing back towards the latter, which are supposed to provide money that can be used entirely at the discretion of local managers and researchers.

Bureaucracy

Almost everyone involved in academia in Britain appears to believe that his or her job is becoming substantially more bureaucratic than it used to be.

There may well be good reasons for this, but paper-shuffling should be kept to a bare minimum.

Thus, the Funding Councils' proposals to substantially complicate the Research Assessment Exercise by introducing three mechanisms in the place of one were a move in the wrong direction.

Teaching

Good teaching and good research often go together, but neither can thrive in an environment in which funding deliberately favours the other.

In recent years, the Research Assessment Exercise has been the only way in which universities can increase their financial rewards they receive for excellent performance. Research has been favoured over teaching.

One of the effects has been that teaching is sometimes seen as a

second-class activity, and a large proportion of individuals have been attracted into the system who have no interest in teaching. Others have been encouraged to believe that an interest in teaching will be harmful to their careers.

If we really want to attract the best scientists into the UK's science base, it is ridiculous to give the impression that researchers who are also interested in teaching are unwelcome. Moreover, if we want to encourage more of the best students to consider university science as a career, it is foolish to deny them access to some of the best role models.

A more sensible balance between research and teaching needs to be restored to the university system.

Commitment

Employing individuals with a commitment to their subjects is an important requirement for a world-class science base. The best research is performed by those people who genuinely care about their subject.

There are undoubtedly a small number of people who cannot imagine pursuing any other career path than academic science. Indeed, we heard reports of researchers who, literally, neither know nor care how much they earn. As long as they have enough to get by, their love of science outweighs their needs or desires for money.

However, almost all such people are young, and few people in their thirties or older can afford this luxury. Housing costs, family obligations, and other commitments increase, and the nation would be foolish to rely on the commitment of its researchers, without taking other factors into account.

The fact that some young people will join the science base without being properly rewarded may marginally affect the average salary of researchers in their twenties. But in the competition to attract and keep the best people, it will have little overall effect.

A menu of options

Different individuals within the science base have different motivations.

The traditional contract for an academic job in a university requires individuals to carry out teaching, research and administration, often in unspecified proportions over an unspecified number of hours.

It is entirely possible that some people would be prepared to take on more administration in return for a modest pay rise, while others would make less financial demands if they could be relieved of some research duties in order to focus on their excellent teaching.

To some extent this already happens, in the sense that Deans and Heads of Department are paid more for taking on administrative and management responsibility.

But in seeking to attract and retain the best people, and the best mix of people, into university science, it would help to get the most out of individuals if a more sophisticated system of rewards and benefits was available.

SECTION 2: Remuneration

Although the factors addressed in Section 1 are important, the Symposium focused on financial remuneration, assuming that the balance between research and teaching, the degree of freedom to pursue one's own research, and other factors will remain constant.

We did not start from the premise that the UK's university scientists are "underpaid," although nobody who has looked seriously at the problem has suggested that salaries are currently too high.

Rather, we started from the evidence that recruitment and retention of good people is increasingly difficult, and that one way of addressing the problem will unquestionably be changes in the ways in which academic scientists and engineers are remunerated.

The "average trajectory" of the salaries of researchers

As a single, achievable exercise, the Symposium attempted to plot the average of researchers' salaries from the point at which an individual joins the system as a postdoctoral researcher until the point at which he or she changes career, dies or retires.

The outcome is shown in Figure 1.

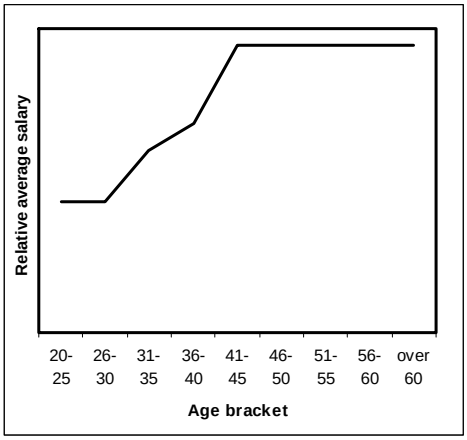

Figure 1. Proposed trajectory of average salaries for academic scientists, based on discussions at the SBS Symposium (as described below).

It is important to note the difference between the average trajectory and that of any individual researcher. We did not attempt to plot the salary of any one individual, but rather to describe the average of all individuals within the system at different ages.

We also recognised that it will only be possible to justify some of the proposed increases by making it clear that, overall, the variance in salaries at just about every career stage will need to increase from current levels. In a market for the best talent, it is not credible to pay all researchers roughly equal salaries. Some individuals, in some subjects, at some universities, will be able to command higher salaries than others.

We also recognised that the variance in salaries will increase with age, so that postdoctoral researchers will mostly earn similar salaries to one another, while there will be a wider spread among professors.

To define the shape and magnitude of the average trajectory, the Symposium broke into three groups, which separately considered the "crunch points" and external pressures affecting the decision to join or remain in the science and engineering research base.

The final outcome was refined by comparing and contrasting the three different options that the groups produced.

Crunch points

There are a number of career stages at which competition for talent might be particularly strong. Three that are important are (i) the point of entry into the system (for example, as a postdoctoral research assistant), (ii) the point at which a researcher has "proved himself or herself," and (iii) the point at which academics are beginning to take on leadership roles as heads of important research groups, departmental heads or deans.

The precise ages at which these events occur will vary from person to person, but roughly speaking, a researcher will enter the system in his or her mid twenties, will have proved himself or herself to have potential by his or her early thirties, and may begin to take on additional leadership roles at the approximate age of 40.

Entry
Choosing whether or not to enter the research system at all is the first crunch point in a career.

Pressures at this stage include the need to pay off student debts, and the desire to start out on a career that will reward one's interests and personal ambitions.

In a highly competitive market for the best talent, universities must recognise that they cannot rely too heavily on the fact that many young people may be relatively idealistic, and consider academic research despite the drawbacks. Higher education institutions must nevertheless compete with industry and overseas institutions to ensure that they attract their fair share of the best researchers.

Proving oneself
After a doctorate and a few years of postdoctoral research, an outstanding individual researcher will have shown real signs of their talent. For the typical researcher, this will happen at about the age of 30, and for those who have demonstrated their potential, other employers (especially scientific industry) will be keen to attract many of the best.

Thus, to compete for the best, universities need to be able to offer enhanced average salaries for researchers at this stage in their career, and in a free market, most of the best researchers will be able to command substantial pay rises. In the overall trajectory of average salaries, there will therefore be a sharp increase at this stage.

Leadership
After a few years of independent research, some academics will be promoted to have significant leadership responsibility. They may become Heads of Department, Deans or Pro-Vice Chancellors, and equally importantly, some will be leading major research programmes, either by being in charge of a significant research group or by forging an innovative path as a internationally renowned individual.

Not all academics will have the skills or the inclination to perform these leadership roles, although good universities will offer training and professional development to help equip those with the potential to fulfil these functions.

Industry needs such leaders, and will be keen to poach some of the best. Universities need to be able not only to retain the best of their research managers, but may also want to bring in new talent at this level. Part of the reason for importing such people is to relieve the management burden on those existing research leaders who do not have the aptitude or desire to fulfil these roles, so that they can make the greatest contribution through their research.

To retain or attract such people may require substantial salaries, since industry is understandably keen to hold on to and attract the cream of first-class researchers who are also able leaders, administrators and managers.

Although not everyone will command the highest salaries, attracting and retaining the very best of these mid-career scientists will mean that the average salaries of researchers will rise sharply between the mid thirties and mid forties.

During this stage, some people will leave the system. At present, there are roughly twice as many research-active scientists and engineers in British universities in the second half their thirties as there are in the second half of their forties (but this

may be partly due to temporal variations in appointment, not just people having left the system).

In other words, the system is increasingly competitive, and it is notable that between the stages of lecturer and professor, the differential between academic and industrial scientists increases dramatically.[7]

Later career

The overall average salary in later career stages for researchers is unlikely to change substantially. Many will stay, but are unlikely to be able to argue that there is an unusually high demand for their skills. Industry may consider them to be too set in their ways, and the foreign academic market is far more concerned with current achievement and future potential than past performance. Although some will inevitably be able to command salary increases in a market for the best, the effect on the average may be modest, because others may even take real-terms cuts as they wind down towards retirement

Some of the best researchers may want to move on and find new challenges after thirty or more years in a similar job, and it is unlikely that the universities will be able to tempt them to stay. So at the higher end of the market, pressure for increases in the average salary will be reduced.

Overall shape of the trajectory

Taken together, these arguments suggest that, in a system designed to attract and retain world-class researchers, the overall shape of the average salary trajectory will look something like Figure 1. It is characterised by a sharp rise relatively early, and a boost in mid career, followed by a levelling off.

The proposed scheme represents a broad outline, and the process of implementing it would no doubt refine it. Nevertheless, the arguments below explain why it is a fairly good approximation of the optimum.

However, it is clear that the proposed scheme is somewhat unlike the current situation, which is described in Figure 2. Apart from a modest rise in average salaries in their early forties, researchers' salaries increase almost linearly with age.

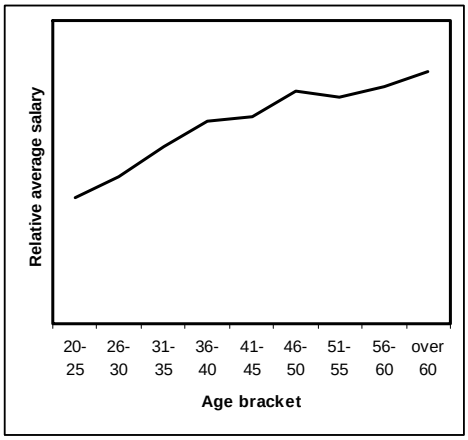

Figure 2. Shape of the current trajectory of average salaries for academic scientists.[8]

Quantifying the graph

Having determined the overall shape of the trajectory of average salaries, relative to different stages across careers, we now offer various quantitative arguments to fix the absolute values for average salaries.

Early career

In the earliest career stages, universities probably compete for bright, recent doctoral graduates most fiercely with science-based industry, and with schoolteaching. Industrial salaries vary enormously, but chemistry graduates working in industry would expect to earn about £27,850 in their late twenties, while chemists working in education earn a median of £29,200.[9]

Allowing for the fact that these figure includes both people at the very start of their career and some with a three or four years experience, a reasonable starting point for scientific graduates entering university research might be around £26,500. This is consistent with evidence presented to SBS's symposium, suggesting that some well-known science-based companies pay around £27,000 per year for new recruits.

Mid career
As far as it can, industry understandably wants to reduce the risks it takes. It therefore wants to maximise the proportion of its scientific employees who have a high chance of delivering real discoveries and other scientific results.

For this reason, the competition for people who have 'proved themselves' may be even more intense than for recruits.

According to the remuneration survey of the Royal Society of Chemistry, industrial scientists aged 30-34 earn at least 12% to 13% more than their counterparts in universities, while the HayGroup remuneration survey shows that it is approximately at the stage of being appointed as a lecturer that differentials between industrial researchers and academics begin to increase sharply.

Some researchers in their early 30s will therefore need to earn at least the £38,400 that defines the upper quartile of industrial chemists[10]. The average will be about £33,500, the approximate median for industrial chemists aged approximately 35.

Later career
The competitive average salary of, say, 50-year olds, might be estimated in the following way. In a world-class research department with about 20 senior staff, about ten of these will be senior lecturers, about seven will be excellent professors and about three will be exceptional world-leading researchers.

In a global market for talent with industry and overseas universities, the three world-leading professors will command salaries in excess of £100,000, perhaps as much as £120,000. The three excellent professors will command salaries of around £80,000 and the ten other senior staff might command an average of £50,000. The overall average salary of this group will therefore be in excess of £60,000, possibly as high as £65,000. However, no system will be made up entirely of departments of such international eminence, so the overall average will be moderately lower, probably in the range £60,000-£65,000.

This scheme assumes that a very small number of people command very high salaries, and that the bulk, even in a world-class department, never earn more than an average of £50,000. Given that such an average will include some individuals substantially higher and others substantially lower, it is clear that, in the proposed system, some senior lecturers in internationally-renowned departments would earn little more than £40,000.

In other words, however one wants to adjust the figures, and whatever arguments one might construct in an attempt to lower the overall salary bill, the proposed scheme is not spectacularly generous to the majority of good university researchers.

Overall trajectory
Figure 3 shows a possible trajectory that attempts to preserve the main features of Figure 1, while adding firm values for average salaries, based on the points that can be grounded in the various ways described above.

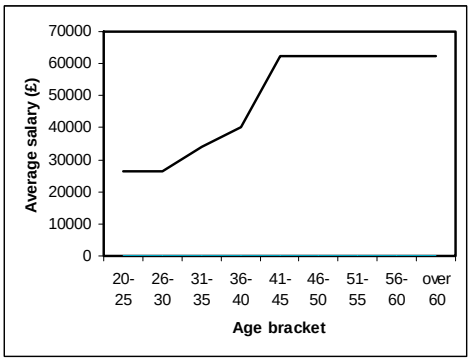

Figure 3. Proposed average salary trajectory for academic scientists and engineers

To reinforce the fact that Figure 3 describes the average rather than the salary of any one individual, Figure 4 shows trajectories for four hypothetical individuals.

Line 1 describes the salary of a dedicated researcher who never wants

to take on extra responsibility, and who cannot be attracted into industry by any offer of an increased salary. Individual 1 always earns less than the average.

Line 2 shows an individual brought into the system in their early thirties after a short spell in industry. Individual 2's salary rises steadily but not spectacularly, and, after ten years in academia, the individual leaves to become a consultant.

Line 3 represents someone attracted into academia at a senior level from industry as a dean. He continues in more or less the same job for ten years before retirement.

Line 4 represents a research superstar attracted to the UK from the USA. The individual continues to bring in significant grants and to attract the best graduate students and postdoctoral researchers to work in her team. As a result, her salary continues to rise before she leaves in her 50s to head a research group in the charity sector.

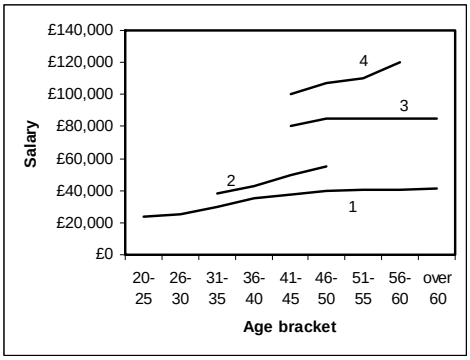

Figure 4. Pay trajectories of four hypothetical individuals described in the text.

OVERALL COST

The overall addition to the wages bill of university academics if the scheme in Figure 3 were to be implemented would be approximately £250 million per year in England.

This represents a little less than 6% of the Government's current annual expenditure on science, engineering and technology research and development in the science base. It is less than 3% of the Government's overall annual expenditure on scientific research and development.[11]

The figure was derived by multiplying the averages in Figure 3 by the estimated number of people in each age group, and summing the total pay bills for each age band. The overall figure was then multiplied by 1.25, to include the extra on-costs of employers' National Insurance and pension contributions.

The total was subtracted from the current pay bill (calculated in the same way using the salary estimates in Figure 2), to give the new money needed to fund the proposed scheme.

The total number of individuals was estimated as the number of full-time equivalent researchers entered into the Research Assessment Exercise in England in 2001, using the "Units of Assessment" (subject areas) numbered 13-32, representing science, engineering and technology.

The distribution among age classes was estimated in two ways. First, we took a sample of 500 people from ten different subjects, and used the Web of Science database to find their earliest identifiable scientific publication. We calculated researchers' ages by assuming that each individual first published a paper when he or she was 25 years old.

Second, we asked senior individuals within universities to give us a breakdown of the ages of the researchers in their departments entered into the RAE, and found that the results were very similar indeed to the estimates produced from the first method

SECTION 3: Implementing the proposal

Implementing the proposed scheme of remuneration for university researchers will require some reforms.

Variance in salaries

First, and most importantly, the variance in salaries will need to increase. As Figure 4 is intended to highlight, there will be substantial variations about the proposed average salaries. Where the market demands it, some individuals in some disciplines will earn substantially more than others.

At the moment, all individuals are paid on the same fairly rigid pay structure, and there is relatively little room for manoeuvre. Most university researchers are paid roughly the same as others at similar stages in their careers, regardless of the market demand for their expertise. As Table A in Appendix 3 shows, within most jobs in most age groups, the difference between the upper and lower end of the salary range is only a few percent. This situation is quite unlike that in the areas from which competition is likely to be strongest – the industrial sector, and overseas universities, particularly those in the USA.

Ensuring that new funds were directed into correcting the market balance will require significant changes to the ways in which salaries are negotiated.

Nine-month salaries

One proposal currently receiving much discussion is to define existing salaries as covering a nine-month period, and increasing researchers' average actual pay by allowing them to raise a further 33% from grants and other sources.[12]

The Chief Scientific Adviser has said publicly that he finds the idea attractive.[13]

The fact that such a scheme is receiving serious attention is a welcome recognition that significant salary rises are necessary for at least some individuals.

However, the scheme has a number of shortcomings. The most serious of these is that it would not allow the kind of flexibility implicit in the pay structure proposed in Section 2.

Under the 'nine-month salary' system, some individuals (those who happen to be principal investigators in receipt of grants) receive pay rises of up to 33%, and nobody else receives anything.

No provision is made for very high salaries in the small number of cases where the market demands it, and only one kind of activity – research that requires grant funding – is rewarded.

Moreover, the 'nine-month salary' system only works if, as in the USA, there is a wide range of grant-awarding bodies that are prepared to accept that they should fund salaries of permanent academic staff. Not only are there many fewer channels of funding in the UK, but none of them currently accepts such a responsibility.

Asked to start paying a substantial element of academic salary, non-governmental funding bodies might legitimately wonder why they are being asked to bail out a Government that appears unwilling to accept its own responsibility to ensure that the universities have the resources to attract and retain the best staff.

Current activity

Government representatives are sometimes reluctant to accept that the university sector is willing or able to recognise the demands of the marketplace for talent.

The sector has, however, moved on, and is committed to recognising that remuneration should be determined individually.

At present, universities are implementing a system of measuring the size of a job, the market value of

the job, and the performance of an individual doing the job.[14]

Outstanding professors will justify their relatively high salaries based on the size of their job, including the expectation that they will make progress in tackling difficult and exciting research questions, and by their position in a very competitive marketplace. Through their Human Resources Strategies, universities have in place mechanisms to reward those who merit it.

Distribution of the money

The additional money needed to implement the proposed scheme should be distributed through the block grants administered by the Higher Education Funding Council for England.

This would target the money towards those institutions which have staff doing the best research.

The Research Assessment Exercise in 2008 would offer an opportunity for the Government to require the universities to demonstrate that the money had been used on attracting and retaining the best scientific researchers.

Other shortage subjects

The figure of £250 million per year is what SBS calculates is needed to generate a competitive situation in UK science and engineering.

We believe that there are other parts of the academic community where low salaries also mean that our universities cannot recruit and retain competitively – economics may be an example.

We urge the Government, and in particular the Department for Education & Skills to undertake an examination of the problem across the full range of subjects.

However, the quantified case for science and engineering has been made here, and so we look for the new investment needed to be made as a matter of urgency.

APPENDIX 1

Participants at the Symposium

• Mr Michael Carr, The Russell Group
• Mr Christian Carter, Personnel Department, University of Bristol
• Dr Peter Cotgreave, Save British Science
• Ms Rosemary Davies, Save British Science
• Professor Hugh Griffiths, Dept of Electrical and Electronic Engineering, University College London
• Professor Ian Haines, London Metropolitan University and Chair of UK Deans of Science
• Dr Sarah Harris, Dept of Physics, University College London
• Professor Richard Joyner, Nottingham Trent University and Chair of Save British Science
• Dr Peter Knox, Metris Therapeutics Ltd.
• Dr Anne McFarlane, Office of Science & Technology
• Dr Sean McWhinnie, Royal Society of Chemistry
• Professor Peter Saunders, Dept of Mathematics, King's College London
• Ms Alice Sharp Pierson, Save British Science
• Dr Anne Taylor, The Wellcome Trust
• Mr Mark Thompson, Hay Group
• Dr Tony Whitehead, Office of Science & Technology

APPENDIX 2 – DIVERSITY

Neither women nor ethnic minorities are particularly badly represented in undergraduate science courses. Indeed, in some areas, women make up significantly more than half of the undergraduate population, and some ethnic minorities are over-represented at university level.

However, even in those areas in which women and ethnic minorities represent a significant proportion of scientists in the early stages of a career, their numbers tend to fall off dramatically at later stages.

Much more is known about the situation concerning women in science than about the situation regarding ethnic minorities, and the Government is already implementing recommendations from a review of the under-representation of women in science.[15]

One of the major concerns focuses on women returning to a career in science after having children. Various schemes exist for such women to return to science, but current funding mechanisms, policies and procedures tend to assume that returners will slip effortlessly back into their old roles, even though their subjects will inevitably have moved on a great deal during their absences.

Mechanisms such as the Research Assessment Exercise need to accept that some research-active staff who have returned to research after a period of absence will need time to up-date their knowledge of their fields, and will need at least two or three years before they can be expected to achieve the same level of output as their colleagues who have not had a break in their careers.

Although the Symposium did not discuss the issues of women or ethnic minorities in science in any detail, it is clear that, if the UK's universities are to recruit and retain the best researchers from the widest possible pool of talent, more will need to be done to ensure that under-represented groups are attracted into scientific careers.

APPENDIX 3

Current salary levels of scientists within universities

The Symposium used two different sources of information about the current salary levels of scientists working within universities.

i. Data published by the Royal Society of Chemistry

The first source of data was the latest edition of the Royal Society of Chemistry's *Remuneration Survey*, which uses a database of information regarding more than 10,000 individuals who are members of the RSC, and who are thus all trained chemists, mostly graduates. The survey reports separate details of people who are Chartered Chemists and those who are not. The SBS Symposium worked on the assumption that this distinction was relatively unimportant in a university setting, and used the average of both groups.

The median pay trajectory of members of the RSC who work in institutions funded by one of the four Funding Councils (representing England, Scotland, Wales and N Ireland) is shown in Figure A below.

ii. Newly-collected data

The second source of information about current salaries was a new dataset collected specifically for the Symposium. Deans of Science at a representative sample of institutions were asked to provide, in strict confidence, up-to-date data about what scientific staff of different ages in their institutions actually earn.

In order to endure that the information remains completely confidential, we report here a bare minimum of detail, avoiding anything that may allow the reader to infer or guess which figures apply to which university. The overall average pay trajectory is shown on Figure A. In general, these figures are moderately higher than the medians obtained from the Royal Society of Chemistry's survey of its members.

The reasons for the systematic discrepancy are unclear, although at least part of the answer may be that the RSC's survey reports medians and the new data are presented as means. It seems unlikely that academic chemists are routinely paid less than other academic scientists.

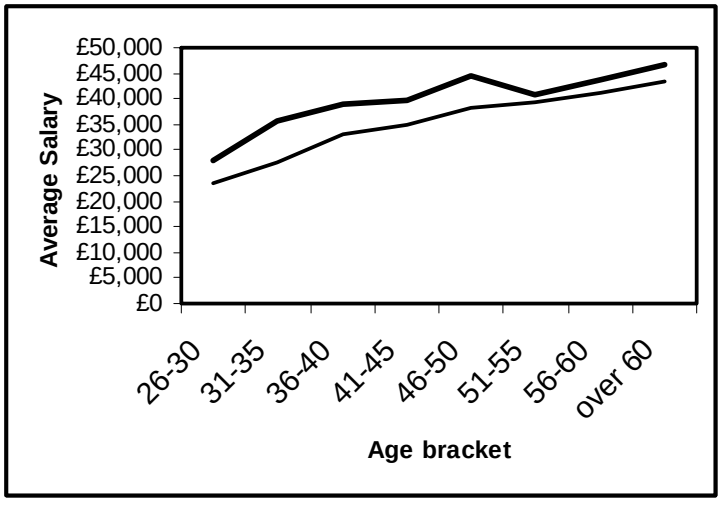

Figure A. Current estimates of the average salaries of scientists working in academia. Top line: means from a survey of Deans of Science, 2004. Bottom line: medians from the Royal Society of Chemistry's Remuneration Survey, 2004.

The outline data from the survey of Deans is presented in the table below.

Age Bracket		Lecturer/ Senior Lecturer	Senior/ Principal Lecturer or Reader	Professor
20 - 29	Old Unis	-	-	-
	New Unis	£28,100 (5%)	-	-
30 - 39	Old Unis	£30,800 (8%)	£37,000 (5%)	£45,600 (3%)
	New Unis	£31,000 (7%)	£41,700 (2%)	-
40 - 49	Old Unis	£32,800 (6%)	£40,800 (3%)	£55,500 (5%)
	New Unis	£35,200 (9%)	£42,700 (8%)	£45,700 (5%)
50+	Old Unis	£33,600 (9%)	£41,200 (3%)	£57,100
	New Unis	£38,700 (18%)	£44,300 (11%)	£47,200 (3%)

Table A. Mean annual salaries for academic staff in UK universities, as surveyed for the SBS Symposium. The percentages in parenthesis give the range (where available).

Notes and References

[1] *Recruitment of researchers in university science departments*, SBS, 2000 [SBS 00/20]

[2] *Citation figures suggest that the UK brain drain is a genuine problem*, *Nature,* 407, p13.

[3] HayGroup Pay Database, January 2004.

[4] *Trends in remuneration: UK survey report 2004,* Royal Society of Chemistry, 2004.

[5] *Allocation of the Science Budget* 2003-04 to 2005-06, OST, 2003.

[6] *Vision for Research,* RCUK, 2003.

[7] HayGroup Pay Database, January 2004.

[8] For the details, see Appendix 3.

[9] This figure is calculated as the average of two slightly different groups of members of the Royal Society of Chemistry aged between 25 and 29, working in industrial or commercial companies, partnerships and forms, industrial research associations and Trade Associations.

[10] *Trends in remuneration: UK survey report 2004,* Royal Society of Chemistry, 2004.

[11] *Forward Look 2003: Government funded science, engineering and technology,* DTI, 2003.

[12] *Research Fortnight,* 9 June 2004.

[13] In a speech to a group of scientists at a meeting in Parliament, 22 June 2004.

[14] *Rewarding and developing staff in HE: evaluation of phases 1 and 2,* A report to the HEFCE by Deloitte and Touche, 2002

[15] *SET Fair,* DTI, 2002.