

## LECTURE/DINNER SUMMARY

### UK science and innovation policy

Held at The Royal Society on 4<sup>th</sup> February, 2009

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- Chair:** **The Rt Hon the Lord Jenkin of Roding**  
President, The Foundation for Science and Technology
- Lecture by:** **The Lord Drayson of Kensington**  
Minister of State and Innovation, Department for Innovation, Universities and Skills
- Respondents:** **The Lord Rees of Ludlow OM Kt PRS**  
President of The Royal Society  
**Sir Peter Gershon CBE FEng**  
on behalf of The Royal Academy of Engineering  
**Dr Peter Ringrose**  
Chairman, Biotechnology and Biological Sciences Research Council  
and Member, Technology Strategy Board  
**Ms Trudy Norris-Grey**  
Chair, Innovation, Science and Technology Committee, Confederation of British Industry

LORD DRAYSON doubted whether the existing national policy on science and technology was adequate in the present exceptional economic circumstances. Had the lessons that he, personally, had learnt in surviving past depressions - the need for a broad portfolio, understanding ones strengths and weaknesses, the importance of investing resources wisely - been learnt? The UK now had to deal with both short-term one to five years survival, and to invest to be able to take advantage of opportunities when economic conditions improved. We had many advantages - a strong science base; a ring-fenced science budget which looked forward to the future; and an outflow of talented scientists from the financial services sector who wanted to return to academia. A crucial role for the Government was to use these advantages and to invest to ensure that the UK would seize the opportunities in the long-term. This meant maintaining the overall investment in science; focusing on excellence; ensuring that there was a continuing investment in pure "blue skies" science, and maintaining a broad base of scientific skills and knowledge. Without such a base we would not be able to take advantage of the currently unknowable demands and opportunities which would arrive. We must therefore have a good supply of STEM graduates from universities. Although we had had some success in improving these numbers, the real problem lay in the reluctance of sufficient numbers of school students to take science A levels. We must also preserve the Haldane principles governing research - peer review and independence. But the crucial question was whether the present balance between overall research and research focussed on specific areas, in which the UK might have significant added value, was right. Much had already been done through the Technology Strategy board (TSB), and the Research Councils to improve knowledge transfer, interdisciplinary working, with concentration on such fundamental issues such as ageing and energy security. But more could be done to focus on areas where the UK had significant advantages; where there were promising growth prospects and where the UK could become first or second amongst providers. He did not mean picking winners; but identifying appropriate areas. Life sciences was clearly one such area, not only because of our world class research, but also because of the unique facility which the NHS, backed by public approval, gave for clinical trials. Other areas might be green energy and digital communications. But if the balance of government investment were to be tilted to such areas, others would be circumscribed. He would welcome a debate on such issues.

LORD REES welcomed Lord Drayson's commitment to a ring fenced, stable science budget, and to the emphasis he placed on excellence. But it was important to recognize that the success of UK science and the global acceptance of its excellence was due to

the status of its universities and their attraction to talented people. The success of universities lay not only in their success in transferring their knowledge to the outside world but in their belief that they were academic institutions whose prime function was in the training and students to work to the highest levels, and then giving the opportunity to do such work. Harvard and Stanford saw this as their mission; so did the best UK universities. Ivory tower research did not short-change the public; it was crucial to our future; it should be seen not as "blue skies" but as not yet applied science. We must recognize the long term nature of much research and the unpredictability of outcomes. We must ensure that we keep outstanding faculties in our universities; this meant long term commitment to resources; responsive mode funding, and recognition of autonomy. He welcomed the sustained support for life sciences, but we needed to have similar support for other areas, such as physical sciences. We must support excellence across the board, but it was essential to make choices when development meant large scale expenditure. We must broaden our industrial base, and learn the lessons of failures in such areas as electronics in the seventies and eighties. Clean energy, in collaboration with new US programmes, was an area for investment.

SIR PETER GERSHON also welcomed Lord Drayson's support for a ring fenced and stable science budget and for his recognition of the importance of a strong flow of STEM graduates. He acknowledged the success that universities were having in transferring knowledge to business and commercialising research. Scientific research was fundamental to growth and future prosperity. But getting through the next five years was the problem this could only be done if businesses, helped by academia, were much more creative and innovative in their operations. They must continually devise new products, new business models, new techniques. Above all, there must be more emphasis on the user/product interface. It was understanding what the customer wanted and tailoring the product to his needs that was important. So we must look at the long-term, and find the resources to take advantage of new opportunities; meanwhile business must improve its present performance sufficiently to enable that long term investment to be financed. We needed much more manufacturing engineering. Nuclear fusion was crucial for the future and investment should go into it; but the payoff was a long way ahead. Meanwhile investment should also go into improving present products and making them more saleable - for example, shaving a fraction of a penny off the cost of a rivet - not high tech, but possibly crucial to a company's continued existence. Government procurement was an important source of possible improvements in products, but government procurement policy suffered from being loaded with too many agendas - equality;

urban regeneration, regional support etc so that it was not consistent or integrated. It should be coordinated, and its fundamental aims prioritised.

DR PETER RINGROSE also welcomed Lord Drayson's emphases; and agreed that tough choices would have to be made if both fundamental and economically targeted research were to be supported. The mechanisms to support the transfer of research into business had had some success and there were already cross cutting initiatives in such prime areas as food security, ageing and sustainability. The TSB would like to see more focus on technically inspired innovation in such areas as energy, and digital science, but would be concerned if there was any significant reduction of basic science. He shared Lord Drayson's concern about the supply of STEM students; the supply could only be increased if they were spurred on by the pursuit of excellence. His concern was that industry was cutting back on research and development - particularly research, and a number of technical companies were facing severe problems. This is where government support could be valuable. We need to improve our knowledge of the commercial impact of research, and how to exploit it. Researchers need to understand finance and commercial activities. He welcomed the link TSB had with universities and business, but more could be done. In particular the Government needed to consider the impediments, in areas such as tax and regulation, which stood in the way of investment. He had to express disappointment that, in spite of the praise given to the NHS; it was amongst the slowest of organizations to take up innovative techniques.

MS NORRIS-GREY also welcomed Lord Drayson's remarks. She agreed that there was a danger that companies were cutting back on research and development without understanding the long-term consequences. But it was simple - those companies who saw such activities as costs, would decline; those who them as investment opportunities would prosper. It was important to recognize that companies in some areas were, in spite of the grim economic and financial circumstances, prospering. She noted such areas as food sciences, low carbon techniques and agriculture. This was because they had understood the problems the world would face - global warming and food shortage - and had made early investments to cope with new demands. Good choices made in time meant watching trends and emerging problems. This was as true for countries as for companies. She agreed with Lord Drayson that difficult choices had to be made. She would like such choices to be made with a clear understanding and clarity about what focus meant and where it was to lie we must also be ambitious and seek to focus on areas where we could be first or second providers. This meant long term focus and innovation - the Swiss watch industry, successful over 300 years was a good example.

Many of the speakers in the ensuing discussion welcomed Lord Drayson's and the respondents comments, particularly on the need to have an appropriate balance between broad based university led research and research focussed on certain areas which would lead the economy in the eventual upturn. But there was concern that insufficient emphasis had been given to what one speaker called "creative engineering" i.e. the engineering which lead to the development of new products from original research. There were examples - Rolls-Royce - where UK companies had proved successful, but on the whole we had failed. There were many reasons, but underlying them was the failure of the engineering profession to attract sufficient bright young people. There was, of course, the underlying anti-science bias and scientific ignorance in much of the public, but engineering, in particular, had the reputation of being dull and dreary. But some of these public attitudes were caused by scientists not recognizing ethical concerns sufficiently early; it was good news that ethical considerations were now being built into science courses. We could do more to inspire students, by publicizing the engineering achievements of the UK and the excitement being participant's major projects. The UK could lead the world in certain engineering areas - such as tidal or off shore wind techniques and engineering. But the lack of success in "creative engineering" was also due to major financing problems in transformational science; i.e. the science which took research into the market, and where development required very large upfront capital sums. These would not automatically come from the UK, if the market place (such as in medical devices) was in the US. Obtaining this finance meant losing control over the UK company which had innovated the research. But did this matter, if the activity and employment stayed in the UK? We must remember that UK companies also

bought research based companies from overseas. The venture capital market in the UK was too small to support major transformational science, and so there would be inevitable external transfers to areas where there was a high value market. But a speaker considered there was more that the Government could do to support the venture capital market, in the way that France and Spain did.

While speakers welcomed the emphasis on investing for the future, they also felt that much benefit could come from completing initiatives and programmes which had already been launched. Particular mention was made of the Government's procurement programme, and Sir Peter Gershon's comments were appreciatively noted. Every Department seemed to have different procurement priorities, there had been no action on the recent report, and coordination was poor. The problem was, of course, that individual Ministers wanted to meet their own agendas, and could not be required to subsume these to a wider purpose. However, the government did recognize the need to get procurement right, and the benefits that could result from doing so. But this was an area which the Government would seek to improve on. There was also benefit to be found in continuing the work on businesses transfer. The liaison between businesses and universities in certain areas was still patchy.

Speakers were concerned about the impact that the very large sums that the US were proposing to invest into research and development in the renewable and energy fields might mean that we might be outgunned in the search for new market opportunities in this area. But other speakers considered that these programmes gave an opportunity for the UK to work together with the US and gain benefit. The problems were global, and no country was going to have all the resources to meet them. The UK also had significant advantages from the consumer's point of view in the acknowledgement of its superior standards and other resources.

Sir Geoffrey Chipperfield KCB

A video of the lecture is on the Foundation web site at [www.foundation.org.uk](http://www.foundation.org.uk) .

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