

DINNER/DISCUSSION SUMMARY

Strengthening international R&D partnerships - is there a case for increased US/UK collaboration?

Held at The Royal Society on Tuesday 12th July, 2005

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BAE Systems, CCLRC, CMI, EPSRC, PPARC and QinetiQ

Chair: **The Rt Hon the Lord Jenkin of Roding**
Chairman, The Foundation for Science and Technology

Speakers: **Sir Gareth Roberts FRS FEng**
President, Wolfson College, University of Oxford
Professor Charles Vest
Former President, Massachusetts Institute of Technology (MIT)
Sir Robin Saxby FEng
Chairman, ARM

SIR GARETH ROBERTS described the background and methodology of his report on International Partnerships of Research Excellence. He emphasized the scale of investment in US research and funding – 37% of world R&D was done in the US with \$56bn of Federal investment from six agencies; set this against £2.14 bn in the UK. He had spoken to funding agencies and University Presidents and VCs in the US and the UK. Collaboration between US/UK researchers was healthy and growing more rapidly than other international partnerships; and the evidence showed that jointly authored US/UK papers were more frequently cited than sole authored papers. But US/UK collaboration should be considered as part of the need to encourage global collaboration. His aim would be to reduce barriers to collaboration. His proposals would be to encourage joint funding and review of collaborative projects in priority areas; to reduce the chance of “double jeopardy”; to seek to increase transatlantic mobility; to co-ordinate technical transfer activities; to collaborate in building research capacity in Africa; and to develop research collaboration and activity between national libraries.

PROFESSOR VEST outlined the factors which made the UK first choice for US researchers to work on a collaborative basis. He also described the cultural differences, which could cause bewilderment. But he instanced the value that collaboration had brought in the past – radar and the human genome – and emphasized the new factors – globalization (“The World is Flat”) and the benefits of cooperation (“Open Innovation”) that made it more important than ever. The Cambridge/MIT project (CMI) was a bold experiment designed to enhance UK competitiveness, productivity and entrepreneurship,

built around the need to learn from each other and expand capacity. It took some time to get the focus of activity effective, but currently the project was demonstrating academic and entrepreneurial success. He also outlined the project for Knowledge Integration in Communities for Research (KICs). This project brought together various stakeholders – industry, academia, government and others - with the aim of working collaboratively from concept through to implementation on priority areas, e.g. reducing aircraft noise (silent aircraft), and competitiveness and education. Successful education for innovation involved (1) a deep conceptual understanding in science and technology, (2) the ability to work together in teams right through product development, (3) a suitable organizational context, and (4) a sense of “self-efficacy” (i.e. a belief that you can do it).

SIR ROBIN SAXBY outlined the history of his company, ARM. He stressed that it was a company which was ideas led, and focussed on R&D. It sought talented engineers wherever they could be found and now had research bases in the UK, US India and France. Partnership was essential, as they needed others to make products. But it was companies such as his, which set essential standards. Unless Europe and the US woke up, the research base would shift east – it was already going to India, and Taiwan and China were developing rapidly. These were the areas where the good engineers were coming from. Unless the West could match their quality, R&D would move East to them; it was unrealistic to expect them to come West to us. We needed to continue to support and increase our science and technology base in such a way that it generated global financial returns. Industry, aca-

demia and government needed to work together to integrate their different time scales, objectives and measures.

An important focus of the ensuing discussion was disaggregating over-simplified perceptions. It was important, for example, not to assume that the US, because of the overwhelming volume of its high quality research, did not suffer from similar problems to those in the UK in developing scientific and technology skills in young people. MIT might be proud of its intake, but it was not typical of normal US university entrants. Similarly it was not right to assume that all subject areas faced the same problems in developing partnerships. There seemed to be little problem in developing partnerships in big science areas under the aegis of PPARC, but there was a long way to go in other areas such as bio-science. There was also a wide difference in the understanding of the benefits of international collaboration in different universities, particularly, perhaps in the US.

A number of speakers noted that the most effective partnerships developed between researchers in a discipline who recognized the need for partnership and got on with implementing it, without developing elaborate bureaucratic or accounting structures around it. A notable example was the international partnership in using ships for oceanographic studies: researchers could apply to join any ship in any area, which was relevant to their interest, no matter which country owned it, or where they came from.

Informal networks, between professors and researchers who had worked in various countries, or had moved between industry and academia and government, were the most effective catalysts of partnerships. This made it all the more important to ensure that such moves took place and were regarded as advantageous, rather than being inhibited by professional or national barriers. It would be valuable if there were more opportunities for researchers to move between countries.

The ultimate reward would be to develop sufficient numbers of relationships across countries, sectors academia, government and industry that collaboration and partnership – involving all four – happened naturally, because a “glue” existed which meant people wanted, and knew how, to work with each other. The Fulbright awards created such opportunities, but there were only seven of them, for which there had been 300 applications, which showed the pent up demand for the ability to travel and work with other researchers. Unfortunately there was no federal or governmental funding for such awards, and in both countries funding for collaborative work and experience had to come from Research Councils.

It was in the light of this discussion that the benefit of CMI, and the farsighted initiative of the UK government in funding it, became clear. While individual initiatives were vital, and the role of institutions could be overplayed, if a crucial aim of collaboration and partnership was to affect the culture of the partners, there needed to be a critical mass. There was no doubt that the 140 students in the CMI project were now beginning to affect the way science was seen and taught.

What was also needed was greater understanding at government level of the benefits of partnership. A start could be made by increasing the scientific liaison resources at the UK embassy in Washington. Accountability would remain a problem: a possible way of dealing with it, would be to work not with individual companies, but with sectors, where intellectual benefits were shared between participants, and IP issues did not arise. Indeed, the example of MIT with the car industry was an example – but it needed care to avoid the impression that a group of manufacturers discussing common issues were not a cartel.

It was clearly important that PhD students looked out beyond their immediate research to think about management and commercial development of their projects; but some warned against taking this too far, at the expense of diluting the emphasis on fundamental scientific learning. It must be recognized that not all researchers will be happy in a commercial environment, or want to take their ideas beyond academic papers. They should know that business is there, and have some idea of what it needs, but they should be required to develop business skills only if they really want to. MIT's success was built on doing good science and being open to business, but it was not its job to concentrate solely on the latter. A suggestion that a commercial company might underwrite the annual costs of a university department, on condition that it researched in certain specified areas, and produced a specified number of patents, was received with mixed feelings.

Sir Geoffrey Chipperfield KCB

The presentations from two of the speakers are available on our web site www.foundation.org.uk

Background information:

www.arm.com
www.mit.edu
www.cambridge-mit.org
www.cclrc.ac.uk
www.epsrc.ac.uk
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