

analysis

Focus pocus

With his proposal to “focus” research on maximising economic returns, the science minister has managed to frustrate leaders of research, engineering and business—and all in one go. **David Hughes** offers him a way out.

Paul Drayson’s speech at the Royal Society a fortnight ago infuriated the research community, whose members see talk about commercialising science as a threat to the independence of research activity (*see I Want to Stimulate a Debate, opposite*). Surely, they argue, the underlying aims of research are to create knowledge and develop minds—not to generate economic returns?

Applications of scientific research may not be apparent for many decades and then often appear in ways that could not have been imagined. For example, genetic fingerprinting has its scientific roots back in 1869 with the discovery of DNA by Friedrich Miescher, and in 1977 with the emergence of DNA sequencing technology. But not until the integration of existing computer technology for automated sequencing did the approach really take off commercially.

Disappointingly, Drayson did not say anything in his speech about the importance of engineering in commercialising science—in fact, there was no mention of engineering at all. The omission compares starkly with the reference to the importance of engineering by Peter Mandelson, the Secretary of State for Business,

Enterprise and Regulatory Reform. In his statement last month on the rescue plan for the automotive industry, Mandelson told the House of Lords: “This industry is not a lame duck and this is no bailout. The industry has been transformed over the past decade. Productivity has risen, catching up and overtaking that in both France and Sweden. In Britain today, we have some of the world’s most productive car plants. For the future, Britain needs

an economy with less financial engineering and more real engineering.” For many observers, it’s not clear that Drayson sees engineering as anything more than a subset of science, which is what has caused so much irritation among engineering’s upper echelons.

Mandelson and Drayson are said to be allies, irrespective of the BERR secretary’s eagerness to wrest control of ‘innovation’ from Drayson’s boss, John Denham, Secretary of State at the Department for Innovation, Universities and Skills. In a speech to the CBI, Mandelson told business leaders: “I want to strongly endorse the science minister Paul Drayson’s call last night for a greater focus of our public science spending on the commercialisation of research and the kinds of innovation that drive our economic growth.” While the support is slightly ambiguous, Mandelson does seem to be pressing for “greater focus...on commercialisation” rather than, as Drayson seemed to be suggesting, a narrowing of the research focus. Once you talk about commercialisation of research, you have the whole world of research to draw on, not just the UK’s. So, a focus on commercialisation (business) is absolutely fine; restricting UK research activity is not.

Drayson has clearly never recognised the point made by the late Akio Morita, co-founder of Sony, in the seminal (and first) DTI Innovation Lecture in 1992: “Technology comes from employing and manipulating science into concepts, processes and devices. These in turn can be used to make our life or work more efficient, convenient and powerful. So it is technology which fuels the industrial engine. And it is engineers, not scientists, who make technology happen.”

Business though is definitely about generating economic returns. It is business that creates economic wealth through commercialising ideas—what we define as innovation. The flaw in Drayson’s proposal is the same flaw that has bedevilled government innovation policy for years—a belief that science and innovation are synonymous and a belief that the so-called ‘linear model’ of R&D is how knowledge gets commercialised.

In July 2007, Alec Broers, chairman of the House of Lords Science and Technology Committee, said: “The vast majority of new technologies are created by bringing together and developing capabilities that have been developed all over the world...They depended upon scientific discoveries but none...emerged directly from basic science.” And so whether technology is being integrated directly into products (for example Rolls Royce’s use of materials science) or the technology is the enabler for new applications (such as Amazon’s use of information technology), wealth creation depends on how businesses seek out, integrate and commercialise technology.

In fact, the latest thinking on how companies can innovate more effectively—the so-called Open

‘The most pressing need is to bring together innovation policy and business policy. In other words, take innovation away from DIUS and integrate it into BERR.’

Innovation model—relies on companies pulling through technological ideas from wherever they are created. As 95 per cent of all research is done outside the UK, there is plenty of fertile ground for new ideas without “focusing” (and restricting) our own efforts—if we can use government policy to help our businesses to integrate these ideas into new products and services quickly.

So, can we recover from this and engage all three communities with a dynamic government policy? I believe we can.

The most pressing need is to bring together innovation policy and business policy. In other words, take innovation away from DIUS and integrate it into BERR. By taking innovation initiatives into BERR, alongside the Technology Strategy Board, and refocusing related expenditure on them, we have a real chance to boost UK industry and wealth creation. At the same time, recognising engineering as a key part of the wealth creation process is important. We know that this is the direction that Mandelson would prefer despite resistance from Denham [RF 8/10/2008, p19].

And as business in general will not fund basic research, this role falls to governments and charitable foundations. In that sense, rich countries have a moral obligation to fund research in the same way that they support the arts and civil amenities. It is therefore wholly appropriate to leave fully funded research with DIUS, and to use excellence in research as the spearhead to pull through related university skills programmes, at undergraduate, post-graduate and lifelong-learning levels.

Reinforcing science/university policy within D(I)US would have a beneficial effect on research, and would be a separation that universities supported. Alison Richard, vice-chancellor of the University of Cambridge, told the annual conference of Universities UK in September: “As institutions charged with education, research and training, our purpose is not to be construed as that of handmaidens of industry.” So, instead of spending huge amounts from research budgets on trying to push the results of research into business, leave business to pull through the technology needed for successful innovation and leave more resources for real research.

We have an opportunity for change as a result of the direction being set by Mandelson. His recent speeches

David Hughes is managing director of the Business Innovation Group and visiting professor of engineering management at City University. In 2002, he moved from the engineering industry to the Department of Trade and Industry where he was the first director general of its Innovation Group and the department's chief scientific adviser until 2006. He produced the DTI's report, Competing in the Global Economy: the innovation challenge, published in December 2003, which led to the foundation of the Technology Strategy Board.

I want to stimulate a debate...

“GIVEN THAT THIS global economic downturn is radically and dramatically reshaping the relative and absolute economic strength of nations—and that other nations are making choices about which areas to focus on in order to drive future growth—shouldn't we do the same to boost the economic impact of our science base?

Has the time come for the UK—as part of a clear economic strategy—to make choices about the balance of investment in science and innovation to favour those areas in which the UK has clear competitive advantage?

As Peter Mandelson has said, ‘Science is not only the ladder by which we will climb out of the downturn—it is also critical to our success in the upturn.’

I know that the research councils and the Technology Strategy Board have already begun to do this. My question is whether we need to go further and—while maintaining our overall investment in science—shift a greater balance of our investment toward those areas.

Perhaps we could consider three criteria for identifying those areas for greater focus: where the UK has a clear competitive advantage; where the growth opportunity over the next 20 years is significant; and where the UK has a realistic prospect of being no.1 or no.2 in the world.

The likely revival in US science has to be an additional spur for the UK to strengthen its position too. They're raising their game. We must identify where our competitive advantage lies and play to our strengths.

Now, I don't intend to provide you with my views on what those areas may be—that's step 2, once we have determined that the identification of priority fields is necessary and important.

It's not, I believe, just a debate about disciplines. Often the best research is inter-disciplinary and our leading facilities, such as the Diamond synchrotron, are used by scientists in many different fields. It is a debate about our focus and the alignment of this focus to ensure that the UK continues to prosper as the world accelerates into the new century.”

This edited extract is from a Foundation for Science and Technology Lecture, The Future Strategy for Science and Innovation in the UK, given by science minister Paul Drayson, at the Royal Society, on 4 February 2008. The full transcript is available at <http://www.foundation.org.uk/>

on industrial activism suggest that there could indeed be a positive intervention by government. “Industrial activism means looking strategically at each sector in the economy, not in order to apply top-down political patronage to companies in these sectors but to assess how horizontal policy can secure maximum benefits across all sectors and reinforce our particular strengths,” he said.

There are some obvious immediate areas from which to start. Last year, for example, the government asked economist DeAnne Julius, chairman of Chatham House, to make some recommendations for government action in what it defined as the Public Service Industry. Actually, this was an inspired review. It turns out that the Public Services Industry, when you integrate all the various elements across sectors, represents about 6 per cent of GDP—or about £80 billion pounds a year.

There are huge opportunities for government and business to work in partnership, use technology to achieve substantial benefits, and set the course for economic growth after the recession. I hope that the government will respond positively to these ideas.

More to say? Email comment@ResearchResearch.com