

martin rees **view from the top**

Focus on strategic choices comes with development, not research

We should all welcome the challenge raised by both Paul Drayson's and John Denham's recent remarks on the balance of investment in science and innovation [RF, 18/2/09, p18]. This government has sustained a positive commitment to science over the past 12 years. Indeed, just last week in Oxford for the Romanes Lecture, Prime Minister Gordon Brown once again voiced his commitment to "maintain investment in science across the board". The government recognises that the payoff can take decades, rather than years, and that the tap can't be turned off and then back on. It recognises that we must not slip backwards, or even stand still, during the recession.

In the Oxford lecture, the Prime Minister spoke of the need to "target key sectors in which we have a strong competitive advantage". It would seem that he recognises that this must not be done at the expense of the breadth of science. Maintaining current investment is a good place to start, but we must also look to see where we can invest more money to capitalise on our world-leading science in areas such as energy. If we fail to deliver extra investment in the areas where we have a strong competitive advantage, other countries will overtake us and reap the long-term economic benefits.

As a scientific nation, the UK is, by most indicators, second only to the United States. It is important to recognise why this is so: it's largely because of our strong research universities. We are the only country, outside the US, to have several in the premier league.

The most readily measurable economic benefit of academic research is direct knowledge transfer from university labs to industry. But research universities fulfil other key roles that are harder to quantify. They network with global research. Their core mission is to educate outstanding graduates, who will spread expertise throughout the private and public sectors, and who can recognise the exploitability of a new idea from anywhere in the world and run with it.

In the clusters that great universities inspire, talent continues to attract talent—and big companies too. Success breeds success; and, just as important, failure is accepted as a step towards later success. In places such as Cambridge, a dynamic and interactive hi-tech community has developed, which offers, says the *Financial Times*, a "low risk place to do high risk things".

Excellent universities are of immense economic and social value to the nation. Much economic growth can be traced back to research that starts in them. It is in this

context that we need to address the issue of 'strategic choices' and, in particular, the balance between responsive mode funding and targeted specific programmes.

To ensure that our universities stay competitive, it is crucial that they attract and retain outstanding faculty members. Once quality is lost, it's very hard indeed to recover it. Traditionally, there's an implicit contract that faculty members have with their institution: relative autonomy, and the prospect, without undue hassle, of gaining 'responsive mode' funding for the research to which they're prepared to dedicate their lives.

So, it would be a real own goal to erode the availability of responsive-mode funding, which now comes mainly from the research councils. There is a symbiosis between applied and pure science—one of my Royal Society predecessors, George Porter, averred that there were two kinds of science; applied and not yet applied.

Strategic choices and a concentration of effort are needed when we confront more costly development, rather than the research behind it. At the development stage, commercial criteria, albeit influenced by government regulatory and tax policy, determine priorities.

We should invest in efforts to broaden our manufacturing base and to seize new opportunities. Energy R&D is, globally, at far too low a level to meet the challenge, and anomalously low compared with the scale of medical and health-related R&D. Energy is a strategic area where we could align with the expanding US effort to our mutual benefit. And I cannot think of anything that would do more to attract young people into physical sciences than a proclaimed national aim to lead the quest for clean energy for the developing and the developed world.

Britain has a great scientific tradition and great scientific strength today: we must build on it and aspire to be the best country in the world in which to do science.

One thing seems a near certainty: and unless we get smarter, we will get poorer. The UK's relative standing will sink unless we keep our competitive edge as discoverers and innovators, unless some of the key creative ideas of the 21st century germinate and are exploited here in the UK.

Something to add? Email comment @ResearchResearch.com

'Britain has a great scientific tradition...we must aspire to be the best country in the world in which to do science...unless we get smarter, we'll get poorer.'