

## Commentary on regional development initiatives

## UK government blows a hollow trumpet

Mike Ward and John Hodgson

The German government has received a good deal of publicity and many kudos for its support for entrepreneurial biotechnology. And now the British government wants its involvement in biotechnology development acknowledged too. With a great fanfare, several UK government ministries—led by the Department of Trade and Industry (DTI; London)—launched the government's "Crusade for Biotechnology." According to Ian Lang, president of the board of trade (part of DTI), it will take Britain's biotechnology into the 21st century.

Lang's case seemed to be that the UK government's current support for biotechnology is already significant and that it has been cruelly overlooked and underappreciated. By adding up all the biotechnology-related funds spent by the various research councils and ministries, Lang claims UK government support is already substantial. "Last year alone, this Government spent some £570 million [\$880 million] on research, development, and technology transfer in biotechnology." This, of course, is slightly more than the combined current R&D commitment of the California couple, Amgen (Thousand Oaks) and Chiron (Emeryville). But it is substantially less than either of Britain's pharmaceutical giants,

SmithKline Beecham or GlaxoWellcome. "It is vital," Lang continued, "that we ensure the benefits of this investment are harnessed in support of national prosperity and competitiveness." Stirring stuff, but too insubstantial to stiffen the spines of Britain's bioscience-based entrepreneurs.

"The plan has the support of all government departments," Lang continued. And indeed, Lang was joined at the launch by the ministers for health, food, agriculture, forestry and the environment, science and technology, and small businesses. But no one from the treasury was present. There was no need. "The plan" had no extra funds.

UK bioscience needs more than just a verbal commitment to biotechnology: Where were the commitments to better funding of science, or to fiscal incentives for entrepreneurs—such as changes to the way share income is taxed. What Lang actually brought UK biotechnology was either trifling, irrelevant, or not really in his gift. "Biotechnology Means Business"—DTI's public relations campaign to get traditional manufacturing industries to use off-the-shelf biotechnology to increase its competitiveness—will receive an extra \$10.8 million over three years; but that comes from existing resources.

The UK Medical Research Council (MRC; London) is to establish a \$39 million seed investment fund to encourage the development of new bioscience companies that are spun out from by MRC research; but that money comes—unencouraged—from venture investors. The government will establish a new Human Genetics Advisory Commission to "bring the public along with us in the development of this exciting field"—which won't provide much practical assistance to those establishing, developing, and running biotechnology companies. But it is very inexpensive.

The UK bioscience sector has achieved what it has without much government encouragement. Many British politicians are now asking themselves why, when the UK biotechnology sector has a critical mass that is attracting investor attention, does it need further support now? The answer, of course, is that investor support is a commodity that is both fickle and opportunistic. It may evaporate like the water in a drought-ridden Yorkshire lake and it may—with the whimsy of an electronic money transfer—seek a more homely refuge outside the UK, or outside biotechnology. And that is all the more likely when the "big news" from the government is so transparently irrelevant. ///

## Commentary on genomics

## Reconstructing the biochemical edifice

William Bains

In late 1978, I parted from a traditional education in biochemistry to start a PhD in molecular genetics. The fact that you could leave DNA standing on the bench overnight and not lose it to autolysis was an attraction, as was the post-Asilomar hype surrounding the then-nascent recombinant DNA industry. But the overwhelming attraction was DNA itself. Genes were obviously fundamental to life, and the tools for discovering their function were so powerful that genetics was the hot place to be.

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Fred Sanger's team had just uncovered the sequence of a complete virus! Could we not imagine a time, by the end of the century, when hundreds of human genes would be known?

Yes, we could. Me and 100,000 others. Molecular genetics and the gene paradigm have dominated biotechnology for 20 years, and its productivity has been phenomenal. It has dominated biology for longer, since the phage group laid the foundations of modern biology 50 years ago. But there are now rumblings that all is not well in Geneland. Genes may be the foundation of life, but foundations only specify the outline of a building, and its maximum possible height. They have little to say about whether the windows are open, the water turned on, whether the floors are safe or the roof leaks. Every now and again a voice cries out that people are not wholly DNA: other molecules play a part. But faced with \$750 million in genome company deals to date, such objections seem like sour grapes.

Such global obsessions with one technique, one approach to life, are not new. Half a century ago, the big prizes were going to metabolic pathway research. The key to greatness then was to discover a new metabolic cycle, and substrate analogs were going to be the drugs to cure all diseases; human genetics was an obscure backwater. The remnants of that wave are with us in the form of the yellowing Boehringer Mannheim metabolic maps that hang on many a laboratory wall, a totem of earlier scientific virility.

I believe the tide is turning on genes too. Our half-century genetic obsession is nearing its peak. As we discover that knocking the p53 gene out of mice actually does not seem to bother them much, and that we cannot identify even the potential function of 30% of the yeast genome, the central role of proteins—their shape, modifications, location, and fate—is being remembered. We recall, too, that we only got into genes in the first place to