


 The logo for the journal Nature, featuring the word "nature" in a white, lowercase, serif font inside a dark rectangular box.

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Innovation: what's in a word?

There is a certain familiarity to British observers in the set of proposals announced last week to stimulate technological innovation in US industry. "Generic technology centers", based at universities and partly supported by industry, have been an active element of Science Research Council policy for several years. Close university/industry links are already enshrined in the SRC's teaching companies scheme and the now flourishing cooperative awards for science and engineering (CASE) fellowship programme. The National Research Development Corporation will be pleased to learn that the US proposal to establish a network of state and regional corporations for innovation development are partly based on its "successful", example — and there will even be annual "President's awards to industry" similar to those bestowed by the Queen on British industry for over a decade.

In Britain, these various developments have taken place in a piecemeal fashion over a number of years, a gradual process of moulding government intervention in the process of technological development, with increasingly important implications for research policy. In the US, they have been put together into a single package which President Carter referred to as a "first step" in supporting industrial innovation as a spur to international competitiveness and domestic entrepreneurship. And also included in the package are a complex set of legislative and administrative proposals ranging from anti-trust rules to technical information services.

The advantage of such packaging is that it provides a central theme around which otherwise disparate activities can be arranged — and Dr Frank Press, the President's Science Adviser, who initially proposed the studies leading to last week's proposals, points out that one immediate effect has been a heightened awareness of the concept of innovation within the administration. The problem, however, is that innovation itself is a slippery concept that is almost impossible to define. And any claim that it is going down (or even up) can only be made on indirect evidence, such as measurements of productivity, or the level of research and development budgets.

Successful innovation, like invention or creativity, cannot be legislated for. The best that can be done is to identify what are considered to be the key variables, and manipulate them in what is considered an effective way. This is partly a matter of technological and economic analysis. But it can also mean the insertion of political or value judgements necessary to short-cut the analysis and make policy decisions possible.

The danger here is that in the absence of hard data, powerful mythologies may be introduced — and subsequently planned for — to legitimate broad-based policy initiatives. In the UK, one such mythology has been to blame a recalcitrant labour force as the major force obstructing innovation, when in practice the problem is part of a complex of domestic and international processes. Poor labour-management relations may well be a part,

but other factors, such as international competition and sky-rocketing energy costs, are just as much to blame.

In the US, there is another myth, that of a lost Yankee ingenuity, the Holy Grail often quoted as the main cause of economic strength and technological superiority, now dimmed by a rising tide of regulation. The problem is that a number of sectors of US industry can be identified — electronics, pharmaceuticals, and biotechnology in general might be quoted as typical examples — where innovation (and profitability) are very far from dead. And again there are external factors, in particular the growing strength of Japan and Germany as technological powers, which may give the appearance of US decline, but can provide only relative rather than absolute measurements.

Certainly the US economy is not as strong as it might be. And declining productivity is an important contributor to double-digit inflation. But there are dangers in reducing the problem to a purely technical one, in particular since this may divert attention from other, equally important, aspects of technological change.

Three of these aspects may be mentioned. The first is the impact of technology on the natural and social environment. Regulation needs to be placed on a rational basis if it is effectively to achieve its intended purpose. In practice, levels of regulation are increasingly being set as the balance of economic against social goals, with the emphasis being shifted back to the former — and this form of rationality speaks less of enlightenment philosophy than of political pragmatism.

The second aspect is the impact of technology policy on developing countries. The United Nations Conference on Science and Technology for Development, held earlier this year in Vienna, drew attention to the ways in which the conditions set by the developed countries for the exploitation of knowledge — for example, on patent and licence policies — can affect the Third World's development prospects. Yet there was virtually no consideration of this particular problem within the US innovation review and the subsequent presidential proposals.

Finally, there are the effects of technological change on the labour force. President Carter, stating that labour's main interest is in early warning about changes, is planning a new labour/technology forecasting system to predict the consequences. But there are many predictions that some aspects of innovation — and in particular the structural unemployment that may well result from the increasing automation of production — will be severe, and that more than advance warning may be necessary.

The Kemeny Commission on the accident at Three Mile Island has warned of the danger of concentrating so hard on the adequate performance of mechanical systems that one fails to pay sufficient attention to the gaps and shortcomings in the social systems which support them. It would be a pity if the current concern with technological innovation were to lead policy-makers further in the same direction. □