

Yesterday's World

Britain must be able to create competitive technology if it is to participate fully in the global order. But our out-dated attitude to science is inhibiting progress, argues **Fred Steward**

Technology is a key indicator of modernity. Britain's performance in its global stakes has been flagging for years.

The problems arise from a stifling legacy founded on past preoccupations with academic science on the one hand and grandiose technological ventures on the other. These have been at the expense of economically useful research and the development of internationally competitive industrial technologies. The policy directions of the past decade have squeezed the traditional areas but failed to create a new technologically dynamic and socially relevant research and business culture.

Britain's standing in academic science was for some years, a consolation for its deteriorating technological competitiveness. While Japanese businesses introduced electronic gadgets, British scientists were winning Nobel prizes. Triumphs such as the DNA double helix perpetuated a comfortable post-war glow of continuing scientific pre-eminence. The traditional academic system with its separation from public and economic life, its cosy elites and its veiled 'peer review' processes trundled on its way. The university expansion of the 1960s was comfortably accommodated with little fundamental change to disciplinary territory and institutional cultures. When the chill winds of financial exigency began to blow in the 1970s and 80s, academic science was singularly ill-prepared. Its requests for more funding, even when well-founded, were viewed by outside observers as merely the special pleading of a professional interest group. The knee-jerk resistance to public indicators of performance and accountability confirmed the sceptics' view.

When academics started to extol the economic benefits of pure science it was difficult to see this as other than a desperate adoption of the rhetoric of

the enterprise culture. The unfortunate consequence of this isolationism and traditionalism has been a failure to resist the erosion of the UK's science base by philistine and short-sighted government funding policies. Britain has fallen behind its main competitors in research and development expenditure as a proportion of GDP. Studies of research output show Britain's world status to be seriously slipping.

There is a case for maintaining an internationally capable science base as an essential element in a modernised Britain but it needs to be made with care. Economic results of pure research are in their nature long-term, uncertain and unpredictable. They may be substantial, but they are by no means inevitable.

The case for maintaining an adequate basic research system cannot rest on its direct contribution to economic performance. Rather, it is about keeping a creative foothold in a distinctive part of the global knowledge system. The capacity to contribute actively to this system of understanding nature rather than to passively absorb its results is an important element in a modern culture. Adequate resources need, however, to be combined with a modernised science system. This does mean the crude subordination of basic science to industrial and economic goals. It does mean that if society gives resources to a relatively autonomous endeavour for knowledge, it can expect that system to be transparent in its procedures, accountable in its choices and comprehensible through popular discussion of its debates. It is also clear that no nation can cover the full spectrum of research. Some selection is necessary while developing a pluralistic system not overspecialised in one area of big science. The strategic areas of science where new knowledge may have practical

applications need new participative systems of choice.

The technology base of Britain is also still bound by its past. The post-imperial obsession with giant projects in the aerospace and nuclear industries has produced enormous distortions. Overblown military projects, most recently Nimrod, have often resulted in technological failure and no economically useful civil spin-off. The prestige civil projects forged in the white heat of Wilson's technological revolution, even when technically successful like Concorde, have been economic disasters. The failure of the misguided technology-push adventures of the 1960s and 1970s legitimated the lurch to simplistic market-pull policies in the 1980s. Instead of generating a new and different technological culture, the failures of the past were used to dislodge the creation of technology from any significant status in industrial and economic renewal. The new business culture of the 1980s prided itself on its exclusive concerns with marketing and finance. Yet all the studies of successful technological innovation show that it needs an integrative management style which crosses the boundaries between technology and business. The traditional systems of management education and culture have failed to establish a modern stratum of innovators. Equally, the ideological resistance to the public creation of new infrastructures of information technology has restricted a new framework for communication and interaction. As with science, no nation can be competitive across the full range of new technology. Yet the indigenous capability to create competitive technology in key industrial sectors remains an indicator of a nation as a participant in the modern global order.

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