1 Engineers in Advanced Industrial Society

This is a book about the work lives of engineers in two British factories, but in another, perhaps more important, sense it is a book about how technical work is socially produced in advanced capitalist societies. Despite widespread speculation about high-tech industry's impact on the social structure of such societies, we know comparatively little about how technical work gets organised, how the technical job market is structured, and still less about technical employees' perception of themselves and their positions in society. If the systematic application of knowledge to production is indeed the characteristic project of advanced society, then we need to improve our present understanding of how that project gets carried out.

Taking a close look at 'Computergraph' and 'Metalco' – the former a small, rapidly expanding, electronic and optics company, located in north London: the latter a large, traditional metal-working company, rooted in the grimy, redbrick landscape of the industrial West Midlands – helps illustrate the social forces which are operating to structure technical work in all Western societies. The distinctive configuration of these companies, and of British engineering as a whole, may be unique, but the social processes that produce and reproduce it are not.

ENGINEERS IN ADVANCED INDUSTRIAL CAPITALISM

We live in a period of rapid industrial and technical change. The smokestack industries of the first industrial revolution are declining, their unionised blue-collar workers face the greatest threat to their economic and political power since the 1930s. In all Western societies the very regions whose prosperity was built on traditional industry are physically and socially decaying. At the same time we are bombarded with images of a high-tech future: instead of turbines, micro-electronics; instead of dirty factories, clean research labs;
instead of grimy overalls, white coats; computers in every school, an engineer in every family. In the place of the decaying industrial civilisation we are offered a ‘post-industrial’ society based on science and high-tech production.

Of course much of this rhetoric is overblown. The new industries are unlikely to absorb the surplus workers from the decaying old ones: many – oil and chemicals for example – are highly automated,\(^1\) others use the cheapest available labour to do simple assembly work and are ready to move to the Third World at the first sign of agitation for higher wages. But one part of the high-tech rhetoric does reflect reality. The growth of high-tech industry has made technical work and the employees who carry it out central features of the social landscape of advanced capitalist societies.

New product technology, for example, is increasingly tied to the latest developments in scientific and engineering knowledge, and research has come to be the first and most basic part of many product cycles. In the extreme case of biogenetics, an industry has been set up in the expectation of scientific advances. Some analysts have even argued that education, training and improved technology have overtaken additional labour and capital inputs as the dominant source of increased productivity, and that knowledge has taken over from labour power as the motor for economic growth (Bell, 1973).

If these new industries of our high-tech future require large technical investments to survive, they also need the technical specialists to run them. Hence the rapid growth in numbers of so-called ‘knowledge workers’, and in particular of scientific and technical employees. In Britain roughly three-quarters of a million engineers and scientists were employed in 1971, compared to only 86,000 in 1921. Between 1911 and 1971 their employment expanded eleven times. In this same period (1911–71) the percentage of manual workers dropped from nearly 80 per cent of the labour force to to 50 per cent (Routh, 1980).\(^2\) Similar changes have occurred in all advanced societies. In the United States, for example, the 1980 census reported over one and half million engineers, and the occupation was growing at two and a half times the national average, despite a slowdown during the recession of the late 1970s.

THE SOCIOLOGY OF TECHNICAL WORKERS

This growth of technical employment has raised many of the same sociological questions that the expansion of clerical labour did