3 Knowledge, Trust and Labour Markets

The feature of high-tech industry most fascinating to social analysts is its close connection with modern science. If the dominant image of the first industrial revolution is that of the artisan, drawing on a combination of native genius and long experience to invent a new loom or steam engine, the image which dominates portraits of new industry is that of a white-coated scientist pushing back the frontiers of knowledge in search of new products and new technologies. Much of this imagery owes its inspiration to commercial advertising, which has drawn on the prestige of science to support all kinds of product differentiation, from toothpaste to foot deodorants. But there is a core of truth to the imagery. The emergent industries of the twentieth century – chemicals, pharmaceuticals, electronics, biogenetics, aeronautics – have been critically dependent on technical advances closely related to discoveries of basic science. The path from the science laboratory to the factory has been growing shorter and shorter.

As far as engineers are concerned, however, the critical assumption of this post-industrial imagery is that these developments have fundamentally changed the nature of their knowledge base. No longer, the argument goes, can good engineering be adequately carried out by anyone with a practical training and experience. To take advantage of the new technology engineers will need to be trained in ‘engineering science’. This will mean university education, and because only appropriately trained engineers will be able to evaluate their performance, engineers will at last be able to free themselves from employers’ dominance and professionalise their occupation (Bell, 1973; Freidson, 1973).

Thus the development of science-based high-tech industry is expected to have the same impact on engineering that the development of the germ theory of disease had on medicine in the nineteenth century, i.e. allow the group which possesses monopoly access to the scientific knowledge to secure a monopoly over practice. In medicine
it was doctors who finally asserted their dominance by controlling access to the medical schools where scientific medicine was taught (Larson, 1977; Jamous and Peloille, 1970). In science-based industry, engineers will be the ones with the training in engineering science. Or so the story runs.

PROFESSIONALISATION IN BRITAIN?

To effect such a change would require a major transformation in the traditional manner of training British engineers. The traditional educational route for a British engineer has been to leave school at fifteen or sixteen and enter a company-based technical apprenticeship scheme. Here they attended day-release classes at a local technical college and followed a combined classroom and industrial training programme leading to the Higher National Certificate (HNC). Previous generations of engineers took such courses part-time in the evening or had similar training entirely within training schools set up by such companies as Rolls-Royce, Metropolitan Vickers and General Electric. Further part-time study could then lead to full professional certification. Such an education does not expose an engineer to very much science or theoretical knowledge, rather it emphasises the continuities between engineering and the artisan experience.

None the less a number of groups have been pressing for just the kind of changes that the post-industrial model predicts, and have used similar kinds of arguments. The professional institutions, for example, have cut off entry to full professional membership for those engineers trained by the part-time route and restricted full professional status to graduate engineers. Some of them are even considering restricting membership further.¹ The Finniston Report recommended the development of special four-year programmes for ‘super-engineers’ (Finniston, 1980, pp. 96–7), and pressed for the continued expansion of degree-level education.² The joint government/industry sponsored training boards have also encouraged employers to upgrade their engineering staff by employing only university-trained engineers in critical innovative positions,³ and they have been actively supported by various coalitions of engineering educators and manpower specialists.⁴ All of these have drawn extensively on the argument that the transformation of the engineering knowledge-base from craft to science requires the reshaping of the occupational structure.