

#### Box 4 The separation of science and technology

It was largely due to the reforming zeal of revolutionary and Napoleonic France that the sciences were first organized into their present, tolerably coherent, disciplines. But there is no question that during the nineteenth century the German universities acquired – and deserved – enormous prestige as the world's leading schools for science teaching and research. The ideal of Wilhelm von Humboldt (1767–1835), perhaps the main architect of the success of the German university system in the nineteenth century, was that a university should advance pure learning and that students should acquire a love of disinterested learning – research – by carrying it out for themselves under a master who was an acknowledged scholar. Practical or vocational studies, that were suggested to require no more than the memorizing of facts, must be excluded. This was an educational creed that went back to Plato and Aristotle and was congenial to the governing elements of all European nations. But von Humboldt's ideal could never be fully realized. As the century wore on, specialization and the educational requirements – the need for more and more school teachers, lawyers, doctors, civil servants and administrators – of a rapidly developing nation state entailed that the Humboldtian programme was progressively diluted. Nevertheless the university ideal of disinterested learning remained and is strongly upheld today. In this was the notion of 'pure science' born. But in practice the 'pure science' was defined administratively; it was the science pursued in universities and not in technical colleges. The model of pure science was imported into America, Britain and other countries by the many students who, having studied at German universities, returned home understandably enthusiastic about German science, research and education. The German technical colleges (*Technische Hochschulen*) and later technical universities could emphasize the importance of free research but they could hardly stress 'pure' learning. They, almost certainly, had far less influence on foreign opinion.

This is not, in any way, a criticism of the admirable system of higher education in Germany. The point is this: a large part of the history and philosophy of science, at least until recently, has been formed in the height of German university practice, a practice substantially followed in the rest of the civilized world. In other words, the history of science reveals the effects of external bureaucratic agencies. To some extent, then, the exclusion of technology from the history of science is a consequence of the exclusion of technology from the German universities.

Source: Cardwell (1994, pp. 8–9)