On 27 June 2000 the quality press struggled to find headlines adequate to mark the announcement that a draft of the whole human genetic code had been completed. In London The Times had the headline, ‘Opening the book of life’ and the Daily Telegraph, ‘All human life is here’. The International Herald Tribune noted in its front-page story: ‘The announcement was hailed almost universally as an achievement that ranks with the invention of the printing press and the splitting of the atom …’. John Sulston, director of the Sanger Centre in Cambridge which had played a major role in the research, was quoted as saying: ‘Over the decades and centuries to come, this sequence will inform all of medicine, all of biology, and will lead us to a total understanding of not only human beings but all of life.’ There appeared to be little disension from this viewpoint in the vast media coverage. Yet there were concerns expressed. The International Herald Tribune, for example, pointed out that: ‘the question of how to regulate this powerful information is likely to challenge society for years to come, scientists and politicians said …’. However, almost without exception, the question of regulation was raised in the quality press in regard to civil applications of the new knowledge. An altogether darker point was made by Professor Matthew Meselson, of the Department of Molecular and Cellular Biology at Harvard University, in the June 2000 edition of the Chemical and Biological Weapons Conventions Bulletin. Meselson argued that every major new technology has been exploited intensively for hostile purposes as well as for peaceful ones. He then raised the crucial question, ‘Must this also happen with biotechnology, certain to be a dominant technology of the twenty-first century?’

The view of the human blueprint becoming the basis for a vast new industry was made time and again in the media coverage of the first draft. 

M. R. Dando, Preventing Biological Warfare
© Malcolm R. Dando 2002
of the DNA sequence. The Financial Times front-page story had a second paragraph reading: ‘The completion of a first draft of the DNA blueprint is set to open up new frontiers in medical science, accelerate the commercial use of biotechnology and pave the way for new treatments for inherited disease.’ On its inside pages the same paper had an article on the commercial exploitation of the human genome sequence entitled ‘Stand by for a gene-rush’. This article was written by the paper’s pharmaceutical correspondent. He began by reviewing the key aspects of interest commercially, and how companies were responding to the new opportunities. Significantly, he ended by discussing the merger of Glaxo Wellcome and Smith Kline Beecham – and summarized as follows: ‘In other words, the biggest pharmaceutical merger of all time was the direct result of the genetic Klondike. Glaxo Smith Kline is now preparing to throw a staggering $4bn a year at prizing golden nuggets from the genome.’ As we saw in Chapter 2, the worldwide chemical industry is a massive mature enterprise, and the periodic table of chemical elements on which it is founded was elucidated long ago between 1869 and 1889. The Human Genome Project’s production of the sequence of human (and other) DNA is quite new, and it can hardly be of any surprise if the biotechnology industry on which it will impact is in a different situation, and perhaps state of mind, from the chemical industry during the recent negotiation of the Chemical Weapons Convention.

The ‘old’ biotechnology

One recent account of biotechnology put its aims rather succinctly:

> The biological sciences are dedicated to the exploration and comprehension of natural phenomena; biotechnology is about using these sciences as a basis for industry and commerce... biotechnology is fundamentally about making money with biology...  

Biotechnology for making bread, cheese and alcoholic beverages dates back into prehistory. Over the longer term it is possible to divide the development of the technology into a series of stages as the basic science and engineering knowledge was developed (Table 4.1). We can thus see that the development of modern microbiology at the end of the nineteenth century led to the rapid development of a new kind of technology increasingly capable of the specific manipulation of microorganisms for commercial purposes, first under non-sterile conditions, then under sterile conditions during the 1940s.