1 *Technology Questions*

It is often suggested that we live in a technological age. Although it is rarely made clear exactly what this statement means, or why or in what ways previous ages are thought not to be technological, most of us seem to agree that technology plays an important role in our lives. We may also agree that this role is becoming increasingly important. In all kinds of daily activities such as buying a bus ticket, guessing how the weather will change, listening to music, paying for shopping at a supermarket, archiving family photos or borrowing a book from the library, we all experience a constant prodding to our routine or 'normal' ways of doing things that can be traced to some or other new technological development. For the most part, moreover, such developments come into being in ways, and for reasons, that lie outside of our control. In other words, we all, through our everyday activities, experience technology's power as an external agent of change.

This experience suggests a range of important questions. To what extent is it possible or desirable to influence the introduction of new technology? To what extent do different technologies determine or constrain the kinds of social changes that follow or accommodate them? Do societies have broad trends or characteristics that are related to the amount or form of technology that have emerged within them – for example, can it be said that people are more or less connected to each other in virtue of the technology they use? Does technology bring with it opportunities for a better life or tend to smuggle in unnecessary problems? Does the form or speed of change of different technologies matter? Is technology always neutral, only taking on good or bad features in some particular context of use? Is it even possible or meaningful to talk in general about 'technology' at all?

Such questions will be familiar to many if not most of us. They have been the lifeblood of science fiction since the beginning of the genre. More formally, or academically, such questions have occupied a wide variety of social theorists since at least the time of the ancient Greeks.

Recently, contributions concerned with such questions have been organised together as constituents of a 'philosophy of technology'. However, it is fair to say that there remains widespread ambivalence towards this newly established discipline. An example of such ambivalence is the fact that as interest in this new discipline is growing, interest in its core questions, such as those above, appears to be waning; in the midst of 'the technological age', those questions that we might call the 'classic' technology questions are receiving relatively less attention. Indeed, such questions seem to be currently very unfashionable.

I want to argue, however, that contrary to recent trends, there is actually much to be gained from systematically pursuing just the kinds of questions noted above. Not only is it the case that these questions are (still) in need of answering, but I want to argue that now is a very good time to address them from a particular perspective. Specifically, this book approaches such issues from a perspective that owes much to recent developments in social theorising, in particular in social ontology, which have as yet received very little interest from theorists of technology. To be clear, neither have social ontologists shown much interest in technology, nor have philosophers of technology shown much interest in the kinds of ontological developments I have in mind. An important motivation of this book is the desire to draw out connections between these two sets of contributions and initiate a dialogue between them.

The rest of this chapter is given over to providing an introduction to the relatively new discipline of the philosophy of technology, and to explaining the apparently contradictory fact that as the philosophy of technology has received increasing interest, there has been an identifiable ambivalence towards its classic problems and questions. Such an undertaking is also strategically helpful, in that it helps to contextualise the arguments that follow in the rest of this book. The starting point, however, is to give a brief overview of the subject matter to which the label 'philosophy of technology' is usually understood to refer, which is the focus of the following section.

On a note of qualification, however, I should point out that I am not at this stage advancing my own conception or definition of technology. Rather the point here is to provide the reader, especially if unfamiliar with the philosophy of technology, with a feel for the kinds of problems and issues that have concerned those usually understood to be contributing to the philosophy of technology. Such a strategy may give rise to

some apparently contradictory conceptions of 'technology', but I shall delay stating exactly what I mean by the term until after the historical discussion of the emergence of the term 'technology' in the following chapter. The reason for doing this is to explicitly incorporate existing meanings and understandings of technology where possible and helpful. As such, the themes discussed in the remainder of this and much of the next chapter serve to introduce the main ideas that a convincing account of technology should be able to accommodate.

The Philosophy of Technology

At risk of severe oversimplification, two broad themes have dominated the philosophy of technology. The first might be briefly described as the moral or ethical evaluation of technology (or more narrowly, the relation of technology to 'the good life'), whilst the second focuses upon the ways in which our lives are constrained, transformed or controlled by technology (especially as formalised in theories of technological determinism or technological autonomy). Although clearly connected, these two broad themes are initially discussed separately, in turn.

It is fair to say that the recent spate of readers on and companions to the philosophy of technology reveal an intellectual landscape in which evaluative attitudes to technology swing back and forth over time.[1] Typically, a story is told of an initial scepticism towards technological ideas that is reversed by an enlightenment optimism, then replaced by a romantic ambivalence or 'unease', which is itself eventually replaced by some kind of neutrality view of technology (see for example Mitcham, 1994).[2]

The philosophy of technology is usually presented as having its origins in ancient Greece, in the ideas of Socrates, Plato and Aristotle. Once more, two broad themes tend to be highlighted. The first revolves around attempts to create (or defend beliefs about) hierarchies of types of knowledge and learning. For example, there is a distinction made

[1] See for example Scharff and Dusek (2003), Dusek (2006), Kaplan (1964), Meijers (2009).

[2] Such retrospective demarcation of the domain of philosophy of technology must, of course, be treated quite cautiously as a summary of ideas about technology, given that it is not clear that the term 'technology' is used in exactly the same manner throughout the contributions highlighted.

between craft, political and philosophical knowledge. Put simply, whilst the craft knowledge of those such as farmers and artisans, is more 'true' and 'honest' than knowledge of a political kind, it still falls some way short of the 'wisdom' available to philosophers (knowledge of the good life arrived at by those who love knowledge). At the heart of these distinctions is the belief that general knowledge is of a higher order than particular or specialised (including technical) knowledge (Dusek, 2006).

This distinction between craft and other kinds of knowledge, relates directly to the second theme, often presented in terms of some kind of scepticism. Greek philosophers tended to believe that although technical knowledge is a necessary part of life, it is in some sense also bad or dangerous. These ideas are evident in a range of stories and myths such as Daedalus and Icarus, the Tower of Babel, and Prometheus. Each of these stories embodies the idea that a preoccupation with technological matters involves a turning away from something good (usually faith in God or nature) and an undermining of individual striving for excellence.[3]

This largely negative or suspicious orientation towards technology is not substantially revised until the writings of Francis Bacon (1561–1626). For Bacon, in contrast to the Greeks, technical knowledge is superior to all other kinds of knowledge and technological artefacts are thought to be inherently good in nature, with any possible dangers being viewed as accidental, or a sign of 'misuse'. Moreover, not only does a turn to technology *not* involve a turn away from God, as seemed to be the case for the ancient Greeks, but according to Bacon a knowledge of nature and its technological uses can be employed by humans to achieve a 'purity of mind and behaviour lost in the "Fall" from the Garden of Eden'.[4] For Bacon, God had given a clear mandate to pursue technology in order to relieve human suffering. Moreover, because humans are created in God's image, it is inevitably in the nature of humans to create and innovate.

[3] '[Technology] according to these myths, although to some extent required by humanity and thus on occasion a cause for legitimate celebration easily turn against the human by severing him or her from some larger reality. This severing manifesting in a failure of faith or shift of the will, a refusal to rely on or trust God or the gods' (Mitcham, 1994).

[4] See for example Bacon (1909).

Traces of Bacon's irrepressibly progressive conception of technology can be found in the work of a range of other well-known thinkers.[5] And even as the Renaissance dawned, with its recasting of questions of theological obligation, the belief that humans are effectively unable to live without technology of some form remained. At the same time the pursuit of technology was thought to have positive effects not only on the morals, but the well-being of humans.[6] In this context, the status of those thought 'expert' in technological matters began to increase, thus initiating debates that would later revolve around conceptions of technocracy, early versions of which can be found in the works of Auguste Comte (1798–1857) and Saint Simon (1760–1825).

This new optimism in the role that could be played by technology emerged at the same time as the unprecedented power that was unleashed in the Industrial Revolution. However, this wealth of power seemed to generate countervailing attitudes towards technology in very general terms. On the one hand, there was widespread awe of the possibilities being opened up by the wealth of inventions and innovations of the period. On the other hand, there emerged a distrust of the actual results of such developments. In fact, the real-life consequences of that revolution prompted a range of contributions that were more critical of technological advance. Within such writings, Bacon's ideas were now held up as the main foil against which criticisms of the enlightenment were made. Perhaps the most prominent of these critics was Jean-Jacques Rousseau (1712–1778). Whereas for the Greeks technology was, essentially, bad but necessary, Rousseau attacked what he saw as a complacent progressivism. For Rousseau, the progress of the sciences would lead to decline and decadence, especially destroying the 'virtue and vigour' of the barbarian nations (see for example Rousseau, 1992). Rousseau's anti-Baconianism played an important role in the Romantic critique of the Industrial Revolution more generally and, especially in Germany and England, it played a part in the general sea change of ideas in which, for instance, an organic conception of reality emerged to challenge Newtonian mechanics, and in which logic and reason were counterposed to imagination and feeling.

[5] One notable, relatively subtle, form is taken by Kant, see especially (Kant, 1784).
[6] This, for example, is the position adopted by Hume (Hume, Green and Grose, 2001).

Many of the contributions that followed, however, fell in between this Baconian belief in technological progress and Rousseau's romantic aversion to it. For example, Karl Marx occupied a complex position which drew upon both developments. As I make clear in Chapter 11, although Marx was very critical of the simple Baconian utopias of those such as Saint Simon and Comte (Marx shared the romantic distrust of the employment of technology in the short run, especially under the conditions in which capitalism was in full swing), he was clearly optimistic about the long-run possibilities of technology's benefits for mankind.

More recently, a fourth position has emerged in which there is a tendency, especially evident in the recent constructivist literature, to criticise all positions that imply either an essentially (or generally) good or bad character of technological knowledge or artefacts. Any evaluative statements about technology are understood to be misguided or simply false. Technology, if the term has any meaning at all at such a general level of analysis, can only refer to neutral means to some end or other and it is the ends that might be evaluated in some limited fashion.

Before focusing upon this constructivist position, however, I should say a little more about the position against which it is so often presented as a reaction – technological determinism. As noted above, technological determinism, along with the thesis of technological autonomy, features centrally in the second core theme of the philosophy of technology, which is centrally concerned with the idea that technology constitutes some kind of power or force that is largely independent of the human will.

Jacques Ellul is perhaps the most prominent theorist of the autonomy of technology (Ellul, 1964, 1980). At the heart of Ellul's contribution is the idea that human control of technology is not as capable (or real) as we would like to think. Ellul often uses the term 'technique' to refer to the way that much of our daily activity is brought into conformity with strictly laid-out rules and regulations that increasingly reduce reason to the instrumental. In the process of producing this conformity, the ways in which we are thought to control technology become, rather, a response to the requirements of technology itself. This is especially true, Ellul argues, for those authorities or organisations most thought to be in a position to control and modify technology to our purposes.

Ellul spends a good deal of time explaining why we are blind to such processes. Experts overestimate their own skills, scientists and

engineers display embarrassing naiveté with respect to the social implications of different technologies, everyday users of technology increasingly give up any attempts to control technological phenomena, leaving such matters to the experts. Moreover, Ellul argues, the technological system as a whole 'entrances' us all (technologists, politicians, consumers). Advertising changes our desires and the endlessly creative force of technological values displace traditional morality (Ellul, 1964). Aspects of Ellul's account are often mixed with the contributions of others to provide a more sophisticated picture of technology's properties. For example Winner's idea of 'technological somnambulism' mixes the properties of technology with human complacency and willingness to defer to experts to explain why technology feels so out of control (Winner, 1983).

However, it is the term 'technological determinism' that is best known for conveying these ideas, even though it is a term that is both less appropriate and less consistently used. A real problem here, is that even amongst prominent and well-respected accounts of technological determinism, it is unclear exactly why they are so labelled, and what exactly is meant by determinism. A prominent example is the discussion provided by Merrit Roe Smith and Leo Marx, who distinguish between hard and soft technological determinism (Marx and Smith, 1994). In fact, the hard-soft distinction turns out to be polar cases of a spectrum of technological determinisms, with movement along the spectrum involving the degree of agency, or the power to effect change, attributed to technology. At the hard end, technology has certain intrinsic attributes that allow little scope for human autonomy or choice. At the other end of the spectrum, soft determinism simply emphasises the large scope for human interventions and choice. Indeed, for Smith and Marx at least 'the soft determinists locate [technology] in a far more various and complex social, economic, political and cultural matrix' (ibid., p. xii).

Why, however, should such accounts be considered to be deterministic at all? To the extent that both hard and soft versions accept that there is some scope for human choice, and merely contest the issue of how much, why would we want to use the term deterministic to describe either of them?[7] In response to this confusion of terminology, Bimber distinguishes nomological and normative forms of

[7] See also Lawson in Latsis, 2007.

technological determinism. The nomological is that which takes the 'determinism' in technological determinism most seriously. For Bimber, 'technological determinism can be seen as the view that, in the light of … the state of technological development and laws of nature, there is only one possible future course for social change' (Bimber, 1996, p. 83). There is no scope for human desires or choices.

Alongside this form of determinism, Bimber distinguishes a version he terms 'normative' technological determinism. In the normative version, technology appears to us as autonomous because the norms by which it is advanced are 'removed from the political and ethical discourse and … goals of efficiency or productivity become surrogates for value-based debate over methods, alternatives, means and ends' (ibid., p. 82). Here technological development is an essentially human enterprise in which people who create and use technology are driven by certain goals that rely unduly on norms of efficiency and productivity, thus excluding other criteria (ethical, moral) and producing a process that operates independently of the political processes and mechanisms usually thought to operate. The end point is one in which society adopts the technologist's standards of judgement. Thus there is a technological domain, which includes elements of society generally, acting as a constraint and a causal force on other aspects of society.

Searching for examples of such technological determinisms proves to be a revealing exercise. Notably, it is actually very difficult to find examples of the nomological technological determinism distinguished by Bimber. Most possible candidates (perhaps unsurprisingly) come from the economics domain. The most familiar of these is Marx's famous statement that 'the hand-mill gives you society with the feudal lord; the steam-mill society with the industrial capitalist' (Marx, 1956, 1955 [1900]). However, it is very difficult to attribute anything like a hard or nomological form of technological determinism once a wider reading of Marx is undertaken (see Chapter 11 or Rosenberg, 1976, Mackenzie, 1984a, Harvey, 2006).

Turning to Bimber's normative form of technological determinism, Habermas is singled out as a particularly good example (Habermas, 1970). Habermas bases his account on the distinction between work, which is success oriented – purposive action concerned with controlling the world – and interaction, which involves communication between subjects in pursuit of common understanding. Modernity is characterised by the colonisation of the system of objectifying (de-linguifying)

behaviour of the former on the latter 'lifeworld'. Thus the problem, with which determinism grapples, is actually one of the inappropriate extension of one domain to another.

Although Bimber fails to mention him, a perhaps more obvious example of the normative form is provided by Heidegger. Heidegger, famously has a conception of technology that involves unavoidable negative change, ushering in a 'dystopian modernity'. For Heidegger, we are engaged in a transformation of the entire world (and ourselves) into mere raw materials or 'standing reserves', objects to be controlled (Heidegger, 1977, p. 183). Methodical planning comes to dominate, destroying integrity and encouraging a view of everything in terms of functionality rather than a respect for things for their own sakes. The central point is that technology itself is not neutral. The domination of technological processes leads to a situation in which everything is reduced to the status of a resource that has to be optimised in some way. Especially disturbing is the tendency for people to see themselves in the same way. Increasingly, sight is lost of what is being sacrificed in the move to utilise human and other resources for goals that become increasingly unclear.

Although many differences exist in Heidegger and Habermas's contributions, their central concern is strikingly similar, namely, the reduction of meaning and value in the domain of everyday living or the *lifeworld* that comes about through our engagements with technology. Underlying the accounts of Heidegger and Habermas is the idea that an instrumental attitude is adopted towards means and ends that results in various activities, including non-technological activities, being drained of meaning. Personal or emotional involvement is reduced to a minimum and the values of possession and control end up dominating social life. Our engagements with technology thus end up transforming us; the use of technology creates a new lifeworld, which isolates and impoverishes both the natural world and ourselves. Moreover, it is easy to see with these examples how the themes of evaluation and determinism are often connected.

Although there is far more to the philosophy of technology than can be discussed in such a short space, the above does serve to introduce the main ideas that this book is concerned with. However, as suggested above, it is important also to convey something of the rather peculiar status of the philosophy of technology as a discipline. More specifically, two overlapping questions require attention. The first is, why has the

philosophy of technology only recently become formalised into a 'respectable' discipline? And, secondly, why have the main questions and themes of the philosophy of technology declined in importance as the discipline has become established? These questions are addressed in turn.

The Late Appearance of the Philosophy of Technology

Until recently, philosophers have been relatively uninterested in anything we may now refer to as technology (Dusek, 2006). The Research in Philosophy of Technology Society, the prime organisation for the philosophical study of technology, dates back only to 1975. And, within analytical philosophy at least, the study of technology has been viewed as at best a rather uninteresting 'specialisation'.

Several factors explain this state of affairs. One problem is the difficulty involved in specifying exactly what the term 'technology' refers to. Even a very casual review of the technology literature reveals the fact that different writers use the term 'technology' in very different ways. Technology is frequently portrayed as knowledge, as artefacts, as ways of doing things, as any means to an end, as a form of study and even as a form of social institution. Sometimes languages or symbolic devices such as calculus are treated as a technology. As noted above, in economics, technology is understood as the relationship between inputs and outputs or even as capital. How are we to adjudicate between such uses? Moreover, whilst there appears to be considerable agreement that certain things can be identified as examples of technology (such as computers, washing machines, aircraft, cameras, etc.,) and others that cannot (small children, flowers, paintings, jewellery, food, toys, etc.,) there is little agreement about which features of each grouping are responsible for the contrast.

If it is difficult to agree upon what the term technology refers to, how is it possible to discuss the broad features of societies that incorporate relatively more or less technology? Indeed, are such questions even meaningful? At least part of the disinterest in the philosophy of technology, or its questions, comes from a wider consensus that in the absence of a clear definition of technology, such questions are not really meaningful.