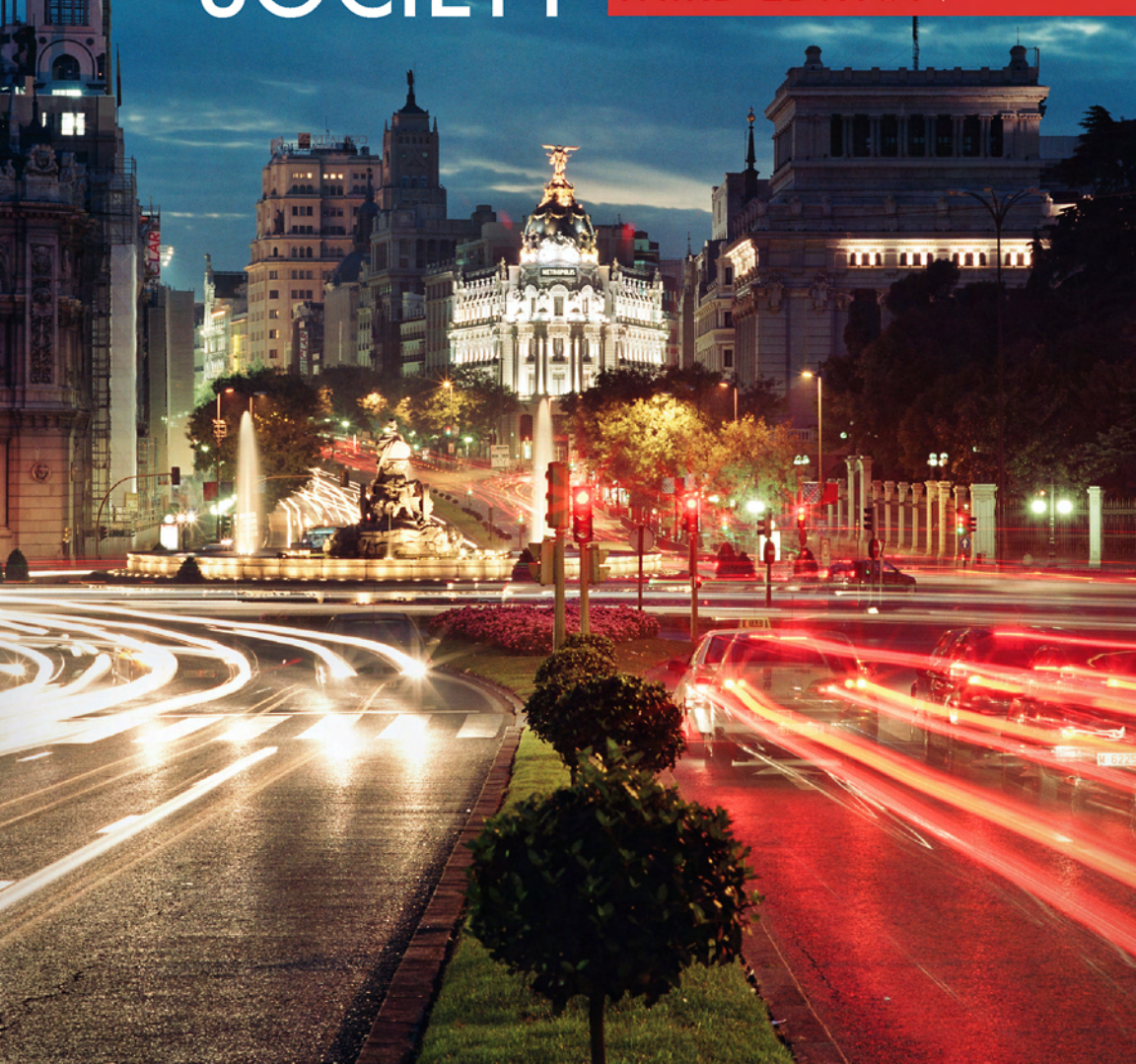




# THEORIES OF THE INFORMATION SOCIETY

THIRD EDITION



FRANK WEBSTER

# INTERNATIONAL LIBRARY OF SOCIOLOGY

Information is a distinguishing feature of the modern world. Where once economies were built on industry and conquest, we are now part of a global information economy. Pervasive media, burgeoning information occupations and the development of the Internet convince many that living in an Information Society is the destiny of us all. Information's presence appears evident everywhere, from daily interaction in postmodern styles to the waging of Information War, from information intensive labour to the iPod. Coping in an era of information flows, of virtual relationships and breakneck change appears to pose challenges to one and all.

In *Theories of the Information Society* Frank Webster sets out to make sense of the information explosion, taking a sceptical look at what thinkers mean when they refer to the Information Society, and critically examining the major post-war theories and approaches to informational development. The 3rd edition of this classic study brings it right up to date both with new theoretical work and with social and technological changes – such as the rapid growth of the Internet and accelerated globalisation – and reassesses the work of key theorists in light of these changes.

The book will be essential reading for students in Sociology, Politics, Communications, Information Science, Cultural Studies, Computing and Librarianship. It will also be invaluable for anybody interested in social and technological change in the post-war era.

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## What is an information society?

If we are to appreciate different approaches to understanding informational trends and issues nowadays, we need to pay attention to the definitions that are brought into play by participants in the debates. It is especially helpful to examine at the outset what those who refer to an information society mean when they evoke this term. The insistence of those who subscribe to this concept, and their assertion that our time is one marked by its novelty, cries out for analysis, more urgently perhaps than those scenarios which contend that the status quo remains. Hence the primary aim of this chapter is to ask: what do people mean when they refer to an 'information society'? Later I comment on the different ways in which contributors perceive 'information' itself. As we shall see – here, in the very conception of the phenomenon which underlies all discussion – there are distinctions which echo the divide between information society theorists who announce the novelty of the present and informatisation thinkers who recognise the force of the past weighing on today's developments.

### Definitions of the information society

What strikes one in reading the literature on the information society is that so many writers operate with undeveloped definitions of their subject. It seems so obvious to them that we live in an information society that they blithely presume it is not necessary to clarify precisely what they mean by the concept. They write copiously about particular features of the information society, but are curiously vague about their operational criteria. Eager to make sense of changes in information, they rush to interpret these in terms of different forms of economic production, new forms of social interaction, innovative processes of production or whatever. As they do so, however, they often fail to establish in what ways and why information is becoming more central today, so critical indeed that it is ushering in a new type of society. Just what is it about information that makes so many scholars think that it is at the core of the modern age?

I think it is possible to distinguish five definitions of an information society, each of which presents criteria for identifying the new. These are:

- 1 technological
- 2 economic

- 3 occupational
- 4 spatial
- 5 cultural

These need not be mutually exclusive, though theorists emphasise one or other factors in presenting their particular scenarios. However, what these definitions share is the conviction that quantitative changes in information are bringing into being a qualitatively new sort of social system, the information society. In this way each definition reasons in much the same way: there is more information nowadays, therefore we have an information society. As we shall see, there are serious difficulties with this *ex post facto* reasoning that argues a cause from a conclusion.

There is a sixth definition of an information society which is distinctive in so far as its main claim is not that there is more information today (there obviously is), but rather that the character of information is such as to have transformed how we live. The suggestion here is that *theoretical knowledge/information* is at the core of how we conduct ourselves these days. This definition, one that is singularly qualitative in kind, is not favoured by most information society proponents, though I find it the most persuasive argument for the appropriateness of the information society label. Let us look more closely at these definitions in turn.

## Technological

Technological conceptions centre on an array of innovations that have appeared since the late 1970s. New technologies are one of the most visible indicators of new times, and accordingly are frequently taken to signal the coming of an information society. These include cable and satellite television, computer-to-computer communications, personal computers (PCs), new office technologies, notably online information services and word processors, and cognate facilities. The suggestion is, simply, that such a volume of technological innovations must lead to a reconstitution of the social world because its impact is so profound.

It is possible to identify two periods during which the claim was made that new technologies were of such consequence that they were thought to be bringing about systemic social change. During the first, the late 1970s and early 1980s, commentators became excited about the 'mighty micro's' capacity to revolutionise our way of life (Evans, 1979; Martin, 1978), and none more so than the world's leading futurist, Alvin Toffler (1980). His suggestion, in a memorable metaphor, is that, over time, the world has been decisively shaped by three *waves* of technological innovation, each as unstoppable as the mightiest tidal force. The first was the agricultural revolution and the second the Industrial Revolution. The third is the information revolution that is engulfing us now and which presages a new way of living (which, attests Toffler, will turn out fine if only we ride the wave).

The second phase is more recent. Since the mid-1990s many commentators have come to believe that the merging of information and communications

technologies (ICTs) is of such consequence that we are being ushered into a new sort of society. Computer communications (e-mail, data and text communications, online information exchange, etc.) currently inspire most speculation about a new society in the making (Negroponte, 1995; Gates, 1995; Dertouzos, 1997). The rapid growth of the Internet especially, with its capacities for simultaneously promoting economic success, education and the democratic process, has stimulated much commentary. Media regularly feature accounts of the arrival of an information 'superhighway' on which the populace must become adept at driving. Authoritative voices are raised to announce that 'a new order . . . is being forced upon an unsuspecting world by advances in telecommunications. The future is being born in the so-called *information superhighways* . . . [and] anyone bypassed by these highways faces ruin' (Angell, 1995, p. 10). In such accounts a great deal is made of the rapid adoption of Internet technologies, especially those that are broadband-based since this technology can be always on without interrupting normal telephony, though on the horizon is wireless connection whereby the mobile phone becomes the connector to the Internet, something that excites those who foresee a world of 'placeless connectivity'— anywhere, anytime, always the user is 'in touch' with the network. Accordingly, data is collected on Internet take-up across nations, with the heaviest users and earliest adopters such as Finland, South Korea and the United States regarded as more of information societies than laggards such as Greece, Mexico and Kenya. In the UK by summer 2005 almost six out of ten households could access the Internet (<http://www.statistics.gov.uk/CCI/nugget.asp?ID=8&POS=1&COIR>), putting it several points behind leading nations such as Denmark and Sweden that had 80 per cent household connectivity, but still far ahead of most countries (<http://europa.eu.int/rapid/pressReleasesAction.do?referenec=STAT/05/143>). The spread of national, international and genuinely global information exchanges between and within banks, corporations, governments, universities and voluntary bodies indicates a similar trend towards the establishment of a technological infrastructure that allows instant computer communications at any time of day in any place that is suitably equipped (Connors, 1993).

Most academic analysts, while avoiding the exaggerated language of futurists and politicians, have nonetheless adopted what is at root a similar approach (Feather, 1998; Hill, 1999). For instance, from Japan there have been attempts to measure the growth of *Joho Shakai* (information society) since the 1960s (Duff *et al.*, 1996). The Japanese Ministry of Posts and Telecommunications (MPT) commenced a census in 1975 which endeavours to track changes in the volume (e.g. numbers of telephone messages) and vehicles (e.g. penetration of telecommunications equipment) of information using sophisticated techniques (Ito, 1991, 1994). In Britain, a much respected school of thought has devised a neo-Schumpeterian approach to change. Combining Schumpeter's argument that major technological innovations bring about 'creative destruction' with Kondratieff's theme of 'long waves' of economic development, these researchers contend that information and communications technologies represent the establishment of a new epoch (Freeman, 1987) which will be uncomfortable during its earlier phases, but over the longer term will be economically beneficial. This new



‘techno-economic paradigm’ constitutes the ‘Information Age’ which is set to mature early in this century (Hall and Preston, 1988; Preston, 2001).

It has to be conceded that, commonsensically, these definitions of the information society do seem appropriate. After all, if it is possible to see a ‘series of inventions’ (Landes, 1969) – steam power, the internal combustion engine, electricity, the flying shuttle – as the key characteristic of the ‘industrial society’, then why not accept the virtuoso developments in ICT as evidence of a new type of society? As John Naisbitt (1984) puts it: ‘Computer technology is to the information age what mechanization was to the Industrial Revolution’ (p. 28). And why not?

It may seem obvious that these technologies are valid as distinguishing features of a new society, but when one probes further one cannot but be struck also by the vagueness of technology in most of these comments. Asking simply for a usable measure – In *this* society *now* how much ICT is there and how far does this take us towards qualifying for information society status? How much ICT is required in order to identify an information society? – one quickly becomes aware that a good many of those who emphasise technology are not able to provide us with anything so mundanely real-worldly or testable. ICTs, it begins to appear, are everywhere – and nowhere, too.

This problem of measurement, and the associated difficulty of stipulating the point on the technological scale at which a society is judged to have entered an information age, is surely central to any acceptable definition of a distinctively new type of society. It is generally ignored by information society devotees: the new technologies are announced, and it is presumed that this in itself heralds the information society. This issue is, surprisingly, also bypassed by other scholars who yet assert that ICT is the major index of an information society. They are content to describe in general terms technological innovations, somehow presuming that this is enough to distinguish the new society.

Let me state this baldly: Is an information society one in which everyone has a PC? If so, is this to be a PC of a specified capability? Or is it to be a networked computer rather than a stand-alone? Or is it more appropriate to take as an index the uptake of iPods or BlackBerries? Is it when just about everyone gets a digital television? Or is individual adoption of such technologies of secondary significance, the key measure being organisational incorporation of ICTs? Is the really telling measure institutional adoption as opposed to individual ownership? Asking these questions one becomes conscious that a technological definition of the information society is not at all straightforward, however self-evident such definitions initially appear. It behoves those who proclaim adoption of ICTs to be the distinguishing feature of an information society to be precise about what they mean.

Another objection to technological definitions of the information society is very frequently made. Critics object to those who assert that, in a given era, technologies are first invented and then subsequently *impact* on the society, thereby impelling people to respond by adjusting to the new. Technology in these versions is privileged above all else, hence it comes to identify an entire social world: the Steam Age, the Age of the Automobile, the Atomic Age (Dickson, 1974).

The central objection here is not that this is unavoidably technologically determinist – in that technology is regarded as the prime social dynamic – and as such an oversimplification of processes of change. It most certainly is this, but more important is that it relegates into an entirely separate division social, economic and political dimensions of technological innovation. These follow from, and are subordinate to, the premier force of technology that appears to be self-perpetuating, though it leaves its impress on all aspects of society. Technology in this imagination comes from *outside* society as an invasive element, without contact with the social in its development, yet it has enormous social consequences when it *impacts* on society.

But it is demonstratively the case that technology is not aloof from the social realm in this way. On the contrary, it is an integral part of the social. For instance, research-and-development decisions express priorities, and from these value judgements particular types of technology are produced (e.g. military projects received substantially more funding than health work for much of the time in the twentieth century – not surprisingly a consequence is state-of-the-art weapon systems which dwarf the advances of treatment of, say, the common cold). Many studies have shown how technologies bear the impress of social values, whether it be in the architectural design of bridges in New York, where allegedly heights were set that would prevent public transit systems accessing certain areas that could remain the preserve of private car owners; or the manufacture of cars which testify to the values of private ownership, presumptions about family size (typically two adults, two children), attitudes towards the environment (profligate use of non-renewable energy alongside pollution), status symbols (the Porsche, the Beetle, the Skoda), and individual rather than public forms of transit; or the construction of houses which are not just places to live, but also expressions of ways of life, prestige and power relations, and preferences for a variety of lifestyles. This being so, how can it be acceptable to take what is regarded as an asocial phenomenon (technology) and assert that this then defines the social world? It is facile (one could as well take any elemental factor and ascribe society with its name – the Oxygen Society, the Water Society, the Potato Age) and it is false (technology is in truth an intrinsic part of society) and therefore ICT's separate and supreme role in social change is dubious.

### Economic

This approach charts the growth in economic worth of informational activities. If one is able to plot an increase in the proportion of gross national product (GNP) accounted for by the information business, then logically there comes a point at which one may declare the achievement of an information economy. Once the greater part of economic activity is taken up by information activity rather than, say, subsistence agriculture or industrial manufacture, it follows that we may speak of an information society (Jonscher, 1999).

In principle straightforward, but in practice an extraordinarily complex exercise, much of the pioneering work was done by the late Fritz Machlup (1902–83)

of Princeton University (Machlup, 1962). His identification of information industries such as education, law, publishing, media and computer manufacture, and his attempt to estimate their changing economic worth, has been refined by Marc Porat (1977b).

Porat distinguished the primary and secondary information sectors of the economy. The primary sector is susceptible to ready economic valuation since it has an ascribable market price, while the secondary sector, harder to price but nonetheless essential to all modern-day organisation, involves informational activities within companies and state institutions (for example, the personnel wings of a company, the research and development [R&D] sections of a business). In this way Porat is able to distinguish the two informational sectors, then to consolidate them, separate the non-informational elements of the economy, and, by reaggregating national economic statistics, conclude that, with almost half the United States GNP accounted for by these combined informational sectors, 'the United States is now an information-based economy'. As such it is an 'Information Society [where] the major arenas of economic activity are the information goods and service producers, and the public and private (secondary information sector) bureaucracies' (Porat, 1978, p. 32).

This quantification of the economic significance of information is an impressive achievement. It is not surprising that those convinced of the emergence of an information society have routinely turned to Machlup and especially to Porat as authoritative demonstrations of a rising curve of information activity, one set to lead the way to a new age. However, there are difficulties, too, with the economics-of-information approach (Monk, 1989, pp. 39–63). A major one is that behind the weighty statistical tables there is a great deal of interpretation and value judgement as to how to construct categories and what to include and exclude from the information sector.

In this regard what is particularly striking is that, in spite of their differences, both Machlup and Porat create encompassing categories of the information sector which exaggerate its economic worth. There are reasons to query their validity. For example, Machlup includes in his 'knowledge industries' the 'construction of information buildings', the basis for which presumably is that building for, say, a university or a library is different from that intended for the warehousing of tea and coffee. But how, then, is one to allocate the many buildings which, once constructed, change purpose (many university departments are located in erstwhile domestic houses, and some lecture rooms are in converted warehouses)?

Again, Porat is at some pains to identify the 'quasi-firm' embedded within a non-informational enterprise. But is it acceptable, from the correct assumption that R&D in a petrochemical company involves informational activity, to separate this from the manufacturing element for statistical purposes? It is surely likely that the activities are blurred, with the R&D section intimately tied to production wings, and any separation for mathematical reasons is unfaithful to its role. More generally, when Porat examines his 'secondary information sector' he in fact splits every industry into the informational and non-informational domains. But such divisions between the 'thinking' and the 'doing' are extraordinarily hard to accept. Where does one put operation of computer numerical control systems or the



line-management functions which are an integral element of production? The objection here is that Porat divides, somewhat arbitrarily, within industries to chart the 'secondary information sector' as opposed to the 'non-informational' realm. Such objections may not invalidate the findings of Machlup and Porat, but they are a reminder of the unavoidable intrusion of value judgements in the construction of their statistical tables. As such they support scepticism as regards the idea of an emergent information economy.

Another difficulty is that the aggregated data inevitably homogenise very disparate economic activities. In the round it may be possible to say that growth in the economic worth of advertising and television is indicative of an information society, but one is left with an urge to distinguish between informational activities on qualitative grounds. The enthusiasm of the information economists to put a price tag on everything has the unfortunate consequence of failing to let us know the really valuable dimensions of the information sector. This search to differentiate between quantitative and qualitative indices of an information society is not pursued by Machlup and Porat, though it is obvious that the multi-million sales of *The Sun* newspaper cannot be equated with – still less be regarded as more informational, though doubtless it is of more economic value – the 400,000 circulation of the *Financial Times*. It is a distinction to which I shall return, but one which suggests the possibility that we could have a society in which, as measured by GNP, informational activity is of great weight but in terms of the springs of economic, social and political life is of little consequence – a nation of couch potatoes and Disney-style pleasure-seekers consuming images night and day?

## Occupational

This is the approach most favoured by sociologists. It is also one closely associated with the work of Daniel Bell (1973), who is the most important theorist of 'post-industrial society' (a term synonymous with 'information society', and used as such in Bell's own writing). Here the occupational structure is examined over time and patterns of change observed. The suggestion is that we have achieved an information society when the preponderance of occupations is found in information work. The decline of manufacturing employment and the rise of service sector employment is interpreted as the loss of manual jobs and its replacement with white-collar work. Since the raw material of non-manual labour is information (as opposed to the brawn and dexterity plus machinery characteristic of manual labour), substantial increases in such informational work can be said to announce the arrival of an information society.

There is *prima facie* evidence for this: in Western Europe, Japan and North America over 70 per cent of the workforce is now found in the service sector of the economy, and white-collar occupations are now a majority. On these grounds alone it would seem plausible to argue that we inhabit an information society, since the 'predominant group [of occupations] consists of information workers' (Bell, 1979, p. 183).

An emphasis on occupational change as the marker of an information society has gone some way towards displacing once dominant concerns with technology. This conception of the information society is quite different from that which suggests it is information and communications *technologies* which distinguish the new age. A focus on occupational change is one which stresses the transformative power of information itself rather than that of technologies, information being what is drawn upon and generated in occupations or embodied in people through their education and experiences. Charles Leadbeater (1999) titled his book to highlight the insight that it is information which is foundational in the present epoch. 'Living on thin air' was once a familiar admonition given by the worldly wise to those reluctant to earn a living by the sweat of their brow, but all such advice is now outdated; Leadbeater argues that this is exactly how to make one's livelihood in the information age. *Living on Thin Air* (1999) proclaims that 'thinking smart', being 'inventive', and having the capacity to develop and exploit 'networks' is actually the key to the new 'weightless' economy (Coyne, 1997; Dertouzos, 1997), since wealth production comes, not from physical effort, but from 'ideas, knowledge, skills, talent and creativity' (Leadbeater, 1999, p. 18). His book highlights examples of such successes: designers, deal-makers, image-creators, musicians, biotechnologists, genetic engineers and niche-finders abound.

Leadbeater puts into popular parlance what more scholarly thinkers argue as a matter of course. A range of influential writers, from Robert Reich (1991), to Peter Drucker (1993), to Manuel Castells (1996–8), suggest that the economy today is led and energised by people whose major characteristic is the capacity to manipulate information. Preferred terms vary, from 'symbolic analysts', to 'knowledge experts', to 'informational labour', but one message is constant: today's movers and shakers are those whose work involves creating and using information.

Intuitively it may seem right that a coal miner is to industrial as a tour guide is to information society, but in fact the allocation of occupations to these distinct categories is a judgement call that involves much discretion. The end product – a bald statistical figure giving a precise percentage of 'information workers' – hides the complex processes by which researchers construct their categories and allocate people to one or another. As Porat puts it: when 'we assert that certain occupations are primarily engaged in the manipulation of symbols. . . . It is a distinction of degree, not of kind' (Porat, 1977a, p. 3). For example, railway signal workers must have a stock of knowledge about tracks and timetables, about roles and routines; they need to communicate with other signal workers down the line, with station personnel and engine drivers; they are required to 'know the block' of their own and other cabins, must keep a precise and comprehensive ledger of all traffic which moves through their area; and they have little need of physical strength to pull levers since the advent of modern equipment (Strangleman, 2004). Yet the railway signaller is, doubtless, a manual worker of the 'industrial age'. Conversely, people who come to repair the photocopier may know little about products other than the one for which they have been trained, may well have to work in hot, dirty and uncomfortable circumstances, and may need considerable strength to move machinery and replace damaged parts. Yet they will undoubtedly be classified as 'information workers' since their work with New

Age machinery suits Porat's interpretations. The point here is simple: we need to be sceptical of conclusive figures which are the outcome of researchers' perceptions of where occupations are to be most appropriately categorised.

A consequence of this categorisation is often a failure to identify the more strategically central information occupations. While the methodology may provide us with a picture of greater amounts of information work taking place, it does not offer any means of differentiating the most important dimensions of information work. The pursuit of a quantitative measure of information work disguises the possibility that the growth of certain types of information occupation may have particularly important consequences for social life. This distinction is especially pertinent as regards occupational measures since some commentators seek to characterise an information society in terms of the 'primacy of the professions' (Bell, 1973), some as the rise to prominence of an elite 'techno-structure' which wields 'organised knowledge' (Galbraith, 1972), while still others focus on alternative sources of strategically central information occupations. Counting the number of 'information workers' in a society tells us nothing about the hierarchies – and associated variations in power and esteem – of these people. For example, it could be argued that the crucial issue has been the growth of computing and telecommunications engineers since these may exercise a decisive influence over the pace of technological innovation. Or one might suggest that an expansion of scientific researchers is the critical category of information work since they are the most important factor in bringing about innovation. Conversely, a greater rate of expansion in social workers to handle problems of an ageing population, increased family dislocation and juvenile delinquency may have little to do with an information society, though undoubtedly social workers would be classified with ICT engineers as 'information workers'.

We can better understand this need to distinguish qualitatively between groups of 'information workers' by reflecting on a study by social historian Harold Perkin. In *The Rise of Professional Society* (1989) Perkin argues that the history of Britain since 1880 may be written largely as the rise to pre-eminence of 'professionals' who rule by virtue of 'human capital created by education and enhanced by . . . the exclusion of the unqualified' (p. 2). Perkin contends that certified expertise has been 'the organising principle of post-war society' (p. 406), the expert displacing once-dominant groups (working-class organisations, capitalist entrepreneurs and the landed aristocracy) and their outdated ideals (of co-operation and solidarity, of property and the market, and of the paternal gentleman) with the professional's ethos of service, certification and efficiency. To be sure, professionals within the private sector argue fiercely with those in the public, but Perkin insists that this is an internecine struggle, one within 'professional society', which decisively excludes the non-expert from serious participation and shares fundamental assumptions (notably the primacy of trained expertise and reward based on merit).

Alvin Gouldner's discussion of the 'new class' provides an interesting complement to Perkin's. Gouldner identifies a new type of employee that expanded in the twentieth century, a 'new class' that is 'composed of intellectuals and technical intelligentsia' (Gouldner, 1978, p. 153) which, while in part self-seeking and

often subordinate to powerful groups, can also contest the control of established business and party leaders. Despite these potential powers, the 'new class' is itself divided in various ways. A key division is between those who are for the most part technocratic and conformist and the humanist intellectuals who are critical and emancipatory in orientation. To a large extent this difference is expressed in the conflicts identified by Harold Perkin between private and public sector professionals. For instance, we may find that accountants in the private sector are conservative while there is a propensity for humanistic intellectuals to be more radical.

My point here is that both Gouldner and Perkin are identifying particular changes within the realm of information work which have especially important consequences for society as a whole. To Gouldner the 'new class' can provide us with vocabularies to discuss and debate the direction of social change, while to Perkin the professionals create new ideals for organising social affairs. If one is searching for an index of the information society in these thinkers, one will be directed to the quality of the contribution of certain groups. Whether one agrees or not with either of these interpretations, the challenge to definitions of an information society on the basis of a count of raw numbers of 'information workers' should be clear. To thinkers such as Perkin and Gouldner, the quantitative change is not the main issue. Indeed, as a proportion of the population the groups they lay emphasis upon, while they have expanded, remain distinct minorities.

## Spatial

This conception of the information society, while it does draw on economics and sociology, has at its core the geographer's stress on space. Here the major emphasis is on information networks which connect locations and in consequence can have profound effects on the organisation of time and space. It has become an especially popular index of the information society in recent years as information networks have become prominent features of social organisation.

It is usual to stress the centrality of information networks that may link different locations within and between an office, a town, a region, a continent – indeed, the entire world. As the electricity grid runs through an entire country to be accessed at will by individuals with the appropriate connections, so, too, may we imagine now a 'wired society' operating at the national, international and global level to provide an 'information ring main' (Barron and Curnow, 1979) to each home, shop, university and office – and even to mobile individuals who have their laptop and modem in their briefcase.

Increasingly we are all connected to networks of one sort or another – and networks themselves are expanding their reach and capabilities in an exponential manner (Urry, 2000). We come across them personally at many levels: in electronic point-of-sale terminals in shops and restaurants, in accessing data across continents, in e-mailing colleagues, or in exchanging information on the Internet. We may not personally have experienced this realm of 'cyberspace', but the information ring main functions still more frantically at the level of international banks, intergovernmental agencies and corporate relationships.

A popular idea here is that the electronic highways result in a new emphasis on the flows of information (Castells, 1996), something which leads to a radical revision of time-space relations. In a 'network society' constraints of the clock and of distance have been radically relieved, the corporations and even the individual being capable of managing their affairs effectively on a global scale. Academic researchers no longer need to travel from the university to consult the Library of Congress since they can interrogate it on the Internet; the business corporation no longer needs routinely to fly out its managers to find out what is happening in their Far East outlets because computer communications enable systematic surveillance from afar. The suggestion of many is that this heralds a major transformation of our social order (Mulgan, 1991), sufficient to mark even a revolutionary change.

No one could deny that information networks are an important feature of contemporary societies: satellites do allow instantaneous communications round the globe, databases can be accessed from Oxford to Los Angeles, Tokyo and Paris, facsimile machines and interconnected computer systems are a routine part of modern businesses. News coverage nowadays can be almost immediate, the laptop computer and the satellite videophone allowing transmission from even the most isolated regions. Individuals may now connect with others to continue real-time relationships without physically coming together (Wellman, 2001; <http://www.chass.utoronto.ca/~wellman>). Yet we may still ask: why should the presence of networks lead analysts to categorise societies as information societies? And when we ask this we encounter once again the problem of the imprecision of definitions. For instance, when is a network a network? Two people speaking to one another by telephone or computer systems transmitting vast data sets through a packet-switching exchange? When an office block is 'wired' or when terminals in the home can communicate with local banks and shops? The question of what actually constitutes a network is a serious one and it raises problems not only of how to distinguish between different levels of networking, but also of how we stipulate a point at which we have entered a 'network/information society'.

It also raises the issue of whether we are using a technological definition of the information society – i.e. are networks being defined as technological systems? – or whether a more appropriate focus would be on the flow of information which for some writers is what distinguishes the present age. If it is a technological definition, then we could take the spread of ISDN (integrated services digital network) technologies as an index, but few scholars offer any guidance as to how to do this. And if it is on the flow of information, then it may reasonably be asked how much and why more volume and velocity of information flow should mark a new society.

Finally, one could argue that information networks have been around for a very long time. From at least the early days of the postal service, through to telegram and telephone facilities, much economic, social and political life is unthinkable without the establishment of such information networks. Given this long-term dependency and incremental, if accelerated, development, why should it be that only now have commentators begun to talk in terms of information societies?

The final conception of an information society is perhaps the most easily acknowledged, yet the least measured. Each of us is aware, from the pattern of our everyday lives, that there has been an extraordinary increase in the information in social circulation. There is simply a great deal more of it about than ever before. Television has been in extensive use since the mid-1950s in Britain, but now its programming is pretty well round-the-clock. It has expanded from a single channel to five broadcast channels, and continuing digitalisation promises very many more. Television has been enhanced to incorporate video technologies, cable and satellite channels, and even computerised information services. PCs, access to the Internet and the palm-held computer testify to unrelenting expansion here. There is very much more radio output available now than even a decade ago, at local, national and international level. And radios are no longer fixed in the front room, but spread through the home, in the car, the office and, with the Walkman and iPod, everywhere. Movies have long been an important part of people's information environment, but movies are today very much more prevalent than ever: available still at cinema outlets, broadcast on television, readily borrowed from rental shops, cheaply purchased from the shelves of chain stores. Walk along any street and it is almost impossible to miss the advertising hoardings and the window displays in shops. Visit any railway or bus station and one cannot but be struck by the widespread availability of paperback books and inexpensive magazines. In addition, audio-tape, compact disc and radio all offer more, and more readily available, music, poetry, drama, humour and education to the public. Newspapers are extensively available, and a good many new titles fall on our doorsteps as free sheets. Junk mail is delivered daily.

All such testifies to the fact that we inhabit a media-laden society, but the informational features of our world are more thoroughly penetrative than this list suggests. It implies that new media surround us, presenting us with messages to which we may or may not respond. But in truth the informational environment is a great deal more intimate, more constitutive of us, than this suggests. Consider, for example, the informational dimensions of the clothes we wear, the styling of our hair and faces, the very ways in which nowadays we work at our image. Reflection on the complexities of fashion, the intricacy of the ways in which we design ourselves for everyday presentation, makes one aware that social intercourse nowadays involves a greater degree of informational content than previously. There has long been adornment of the body, clothing and make-up being important ways of signalling status, power and affiliation. But it is obvious that the present age has dramatically heightened the symbolic import of dress and the body. When one considers the lack of range of meaning that characterised the peasant smock which was the apparel of the majority for centuries, and the uniformity of the clothing worn by the industrial working class in and out of work up to the 1950s, then the explosion of meaning in terms of dress since is remarkable. The availability of cheap and fashionable clothing, the possibilities of affording it, and the accessibility of any amount of groups with similar – and

different – lifestyles and cultures all make one appreciate the informational content even of our bodies.

Contemporary culture is manifestly more heavily information-laden than its predecessors. We exist in a media-saturated environment which means that life is quintessentially about symbolisation, about exchanging and receiving – or trying to exchange and resisting reception – messages about ourselves and others. It is in acknowledgement of this explosion of signification that many writers conceive of our having entered an information society. They rarely attempt to gauge this development in quantitative terms, but rather start from the ‘obviousness’ of our living in a sea of signs, one fuller than at any earlier epoch.

Paradoxically, it is perhaps this very explosion of information which leads some writers to announce, as it were, the death of the sign. Blitzed by signs all around us, designing ourselves with signs, unable to escape signs wherever we may go, the result is, oddly, a collapse of meaning. As Jean Baudrillard once put it: ‘there is more and more information, and less and less meaning’ (1983a, p. 95). In this view signs once had a reference (clothes, for example, signified a given status, the political statement a distinct philosophy). However, in the post-modern era we are enmeshed in such a bewildering web of signs that they lose their salience. Signs come from so many directions, and are so diverse, fast-changing and contradictory, that their power to signify is dimmed. Instead they are chaotic and confusing. In addition, audiences are creative, self-aware and reflective, so much so that all signs are greeted with scepticism and a quizzical eye, hence easily inverted, reinterpreted and refracted from their intended meaning. Further, as people’s knowledge through direct experience declines, it becomes increasingly evident that signs are no longer straightforwardly representative of something or someone. The notion that signs represent some ‘reality’ apart from themselves loses credibility. Rather signs are self-referential: they – simulations – are all there is. They are, again to use Baudrillard’s terminology, the ‘hyper-reality’.

People appreciate this situation readily enough: they deride the poseur who is dressing for effect, but acknowledge that it’s all artifice anyway; they are sceptical of politicians who ‘manage’ the media and their image through adroit public relations (PR), but accept that the whole affair is a matter of information management and manipulation. Here it is conceded that people do not hunger for any true signs because they recognise that there are no longer any truths. In these terms we have entered an age of ‘spectacle’ in which people realise the artificiality of signs they may be sent (‘it’s only the Prime Minister at his latest photo opportunity’, ‘it’s news manufacture’, ‘it’s Jack playing the tough guy’) and in which they also acknowledge the inauthenticity of the signs they use to construct themselves (‘I’ll just put on my face’, ‘there I was adopting the “worried parent” role’).

As a result signs lose their meaning and people simply take what they like from those they encounter (usually very different meanings from what may have been intended at the outset). And then, in putting together signs for their homes, work and selves, happily revel in their artificiality, ‘playfully’ mixing different images to present no distinct meaning, but instead to derive ‘pleasure’ in parody



or pastiche. In this information society we have, then, 'a set of meanings [which] is communicated [but which] have no meaning' (Poster, 1990, p. 63).

Experientially this idea of an information society is easily enough recognised, but as a definition of a new society it is more wayward than any of the notions we have considered. Given the absence of criteria we might use to measure the growth of signification in recent years it is difficult to see how students of postmodernism such as Mark Poster (1990) can depict the present as one characterised by a novel 'mode of information'. How can we know this other than from our sense that there is more symbolic interplay going on? And on what basis can we distinguish this society from, say, that of the 1920s, other than purely as a matter of degree of difference? As we shall see (Chapter 9), those who reflect on the 'postmodern condition' have interesting things to say about the character of contemporary culture, but as regards establishing a clear definition of the information society they are woeful.

## Quality and quantity

Reviewing these varying definitions of the information society, what becomes clear is that they are either underdeveloped or imprecise or both. Whether it is a technological, economic, occupational, spatial or cultural conception, we are left with highly problematical notions of what constitutes, and how to distinguish, an information society.

It is important that we remain aware of these difficulties. Though as a heuristic device the term 'information society' is valuable in exploring features of the contemporary world, it is too inexact to be acceptable as a definitive term. For this reason, throughout this book, though I shall on occasion use the concept and acknowledge that information plays a critical role in the present age, I express suspicion as regards information society scenarios and remain sceptical of the view that information has become the major distinguishing feature of our times.

For the moment, however, I want to raise some further difficulties with the language of the information society. The first problem concerns the quantitative versus qualitative measures to which I have already alluded. My earlier concern was chiefly that quantitative approaches failed to distinguish more strategically significant information activity from that which was routine and low level and that this homogenisation was misleading. It seems absurd to conflate, for example, the office administrator and the chief executive. Just as it is to equate pulp fiction and research monographs. Here I want to raise the quality–quantity issue again in so far as it bears upon the question of whether the information society marks a break with previous sorts of society.

Most definitions of the information society offer a quantitative measure (numbers of white-collar workers, percentage of GNP devoted to information, etc.) and assume that, at some unspecified point, we enter an information society when this begins to predominate. But there are no clear grounds for designating as a new type of society one in which all we witness is greater quantities of

information in circulation and storage. If there is just more information, then it is hard to understand why anyone should suggest that we have before us something radically new.

Against this, however, it may be feasible to describe as a new sort of society one in which it is possible to locate information of a qualitatively different order and function. Moreover, this does not even require that we discover that a majority of the workforce is engaged in information occupations or that the economy generates a specified sum from informational activity. For example, it is theoretically possible to imagine an information society where only a small minority of 'information experts' hold decisive power. One need look only to the science fiction of H. G. Wells (1866–1946) to conceive of a society in which a knowledge elite predominates and the majority, surplus to economic requirement, are condemned to drone-like unemployment. On a quantitative measure – say, of occupational patterns – this would not qualify for information society status, but we could feel impelled so to designate it because of the decisive role of information/knowledge to the power structure and direction of social change.

The point is that quantitative measures – simply more information – cannot of themselves identify a break with previous systems, while it is at least theoretically possible to regard small but decisive qualitative changes as marking a system break. After all, just because there are many more automobiles today than in 1970 does not qualify us to speak of a 'car society'. But it is a *systemic* change which those who write about an information society wish to spotlight, whether it be in the form of Daniel Bell's 'post-industrialism', or in Manuel Castells's 'informational mode of development', or in Mark Poster's 'mode of information'.

This criticism can seem counter-intuitive. So many people insist that ongoing innovation from ICTs has such a palpable presence in our lives that it *must* signal the arrival of an information society. These technologies, runs the argument, are so self-evidently novel and important that they must announce a new epoch. Adopting similar reasoning, that there are so very many more signs around than ever before *must* mean that we are entering a new world. We may better understand flaws in this way of thinking by reflecting for a while upon food.

Readers will agree, I presume, that food is essential to life. A cursory analysis shows that nowadays we have access to quantities and ranges of food of which our forebears – even those of just fifty years gone by – could scarcely have dreamed. Supermarkets, refrigeration and modern transport mean we get access to food in unprecedented ways and on a vastly expanded scale. Food stores today typically have thousands of products, from across the world, and items such as fresh fruits and flowers the year round.

This much is obvious, but what needs to be added is that this food is remarkably cheap by any past comparison. To eat and drink costs us a much smaller proportion of income than it did our parents, let alone our distant ancestors who all had to struggle just to subsist. This surfeit of food today, at vastly reduced real prices, means that, for the first time in human history, just about everyone in affluent nations can choose what they eat – Italian tonight, Indian tomorrow, vegetarian for lunch, Chinese later on and so on. For most of human history people ate what they could get, and this diet was unrelentingly familiar. Today,

owing to a combination of agribusiness, factory farming, automation, genetic engineering, globalisation, agrichemicals and so forth (cf. Lang and Heasman, 2004), each of us has ready access to a bountiful supply at massively reduced cost (so much so that obesity is a major health problem now in the advanced parts of the world). My conclusion is blunt: food is unquestionably vital to our livelihood, as it is to our well-being and sensual experiences, and it has become available recently at enormously reduced costs, yet no one has suggested that we live now in the 'Food Society' and that this marks a systemic break with what went before. Why, one must ask, is information conceived so differently?

What is especially odd is that so many of those who identify an information society as a new type of society do so by presuming that this qualitative change can be defined simply by calculating how much information is in circulation, how many people work in information jobs and so on. The assumption here is that sheer expansion of information results in a new society. Let me agree that a good deal of this increase in information is indispensable to how we live now. No one can seriously suggest, for instance, that we could continue our ways of life without extensive computer communications facilities. However, we must not confuse the indispensability of a phenomenon with a capacity for it to define a social order. Food is a useful counter-example, surely more indispensable to life even than information, though it has not been nominated as the designator of contemporary society. Throughout, what needs to be challenged is the supposition that quantitative increases transform – in unspecified ways – into qualitative changes in the social system.

Theodore Roszak (1986) provides insight into this paradox in his critique of information society themes. His examination emphasises the importance of qualitatively distinguishing information, extending to it what each of us does on an everyday basis when we differentiate between phenomena such as data, knowledge, experience and wisdom. Certainly these are themselves slippery terms – one person's knowledge attainment (let's say graduation degree) can be another's information (let's say the pass rate of a university) – but they are an essential part of our daily lives. In Roszak's view the present 'cult of information' functions to destroy these sorts of qualitative distinction which are the stuff of real life. It does this by insisting that information is a purely quantitative thing subject to statistical measurement. But to achieve calculations of the economic value of the information industries, of the proportion of GNP expended on information activities, the percentage of national income going to the information professions and so on the qualitative dimensions of the subject (is the information useful? is it true or false?) are laid aside. '[F]or the information theorist, it does not matter whether we are transmitting a fact, a judgement, a shallow cliché, a deep teaching, a sublime truth, or a nasty obscenity' (Roszak, 1986, p. 14). These qualitative issues are laid aside as information is homogenised and made amenable to numbering: '[I]nformation comes to be a purely quantitative measure of communicative exchanges' (p. 11).

The astonishing thing to Roszak is that along with this quantitative measure of information comes the assertion that more information is profoundly transforming social life. Having produced awesome statistics on information activity

by blurring the sort of qualitative distinctions we all make in our daily lives, information society theorists then assert that these trends are set to change qualitatively our entire lives. To Roszak this is the mythology of 'information' talk: the term disguises differences, but in putting all information into one big pot, instead of admitting that what we get is insipid soup, the perverse suggestion is that we have an elixir. As he says, this is very useful for those who want the public to accede to change since it seems so uncontentious:

Information smacks of safe neutrality; it is the simple, helpful heaping up of unassailable facts. In that innocent guise, it is the perfect starting point for a technocratic political agenda that wants as little exposure for its objectives as possible. After all, what can anyone say against information?

(Roszak, 1986, p. 19)

Roszak vigorously contests these ways of thinking about information. A result of a diet of statistic upon statistic about the uptake of computers, the data-processing capacities of new technologies and the creation of digitalised networks is that people come readily to believe that information is the foundation of the social system. There is so much of this that it is tempting to agree with those information society theorists who insist that we have entered an entirely new sort of system. But against this 'more-quantity-of-information-to-new-quality-of-society' argument Theodore Roszak insists that the 'master ideas' (p. 91) which underpin our civilisation are not based upon information at all. Principles such as 'my country right or wrong', 'live and let live', 'we are all God's children' and 'do unto others as you would be done by' are central ideas of our society – but all come *before* information. Roszak is not arguing that these and other 'master ideas' are necessarily correct (in fact a good many are noxious – e.g. 'all Jews are rich', 'all women are submissive', 'blacks have natural athletic ability'). But what he is emphasising is that ideas, and the necessarily qualitative engagement these entail, take precedence over quantitative approaches to information.

It is easy to underestimate the importance of ideas in society. They may appear insubstantial, scarcely significant, when contrasted with matters such as technology, increases in productivity, or trillion-dollar trading in the currency markets. Yet consider, with Roszak in mind, the import of the following idea:

We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that amongst these are Life, Liberty, and the Pursuit of Happiness.

(Declaration of Independence, 4 July 1776)

These words have echoed round the world, and especially through American history, where the idea that 'all men are created equal' has galvanised and inspired many who have encountered a reality that contrasts with its ideal. Abraham Lincoln recalled them on the field of Gettysburg, after a three-day battle that had cost thousands of lives (and a Civil War which to this day cost more

lives than all US war casualties combined since – some 600,000 men died then). Abraham Lincoln evoked the idea of 1776 to conclude his short speech:

Four score and seven years ago our fathers brought forth on this continent a new nation, conceived in liberty and dedicated to the proposition that all men are created equal . . . we here highly resolve that the dead shall not have died in vain; that this nation, under God, shall have a new birth of freedom; and that government of the people, by the people, for the people, shall not perish from the earth.

(Abraham Lincoln, Gettysburg Address, 19 November 1863)

One hundred years later, in Washington at the Lincoln Memorial, Martin Luther King recollected Lincoln's idea. Speaking to a vast crowd of civil rights campaigners, on national television, at a time when black people in America were beaten and even lynched in some states, Luther King proclaimed:

I have a dream that one day this nation will rise up and live out the true meaning of the creed: 'We hold these truths to be self-evident – that all men are created equal' . . . I have a dream that one day on the red hills of Georgia the sons of former slaves and the sons of former slave owners will be able to sit down together at the table of brotherhood . . . I have a dream that my four little children will one day live in a nation where they will not be judged by the color of their skin but by the content of their character.

(Martin Luther King, address to the March on Washington for Jobs and Freedom, 28 August 1963)

It is hard to imagine a more powerful idea in the modern world than this assertion that 'all men are created equal'. Though a mountain of information can be found that demonstrates that this is not so, Roszak is surely correct to insist that this and similar ideas are more foundational to society than any amount of accumulated information. Accordingly, his objection is that information society theorists reverse this prioritisation at the same time as they smuggle in the (false) idea that more information is fundamentally transforming the society in which we live.

## **What is information?**

Roszak's rejection of statistical measures leads us to consider perhaps the most significant feature of approaches to the information society. We are led here largely because his advocacy is to reintroduce qualitative judgement into discussions of information. Roszak asks questions like: Is more information necessarily making us a better-informed citizenry? Does the availability of more information make us better-informed? What sort of information is being generated and stored and what value is this to the wider society? What sort of information occupations are expanding, why and to what ends?

What is being proposed here is that we insist on examination of the meaning of information. And this is surely a commonsensical understanding of the term. After all, the first definition of information that springs to mind is the *semantic* one: information is meaningful; it has a subject; it is intelligence or instruction about something or someone. If one were to apply this concept of information to an attempt at defining an information society, it would follow that we would be discussing these characteristics of the information. We would be saying that information about *these* sorts of issues, *those* areas, *that* economic process, are what constitutes the new age. However, it is precisely this commonsensical definition of information which the information society theorists jettison. What is in fact abandoned is a notion of information having a semantic content.

The definitions of the information society we have reviewed perceive information in non-meaningful ways. That is, searching for quantitative evidence of the growth of information, a range of thinkers have conceived it in the classic terms of Claude Shannon and Warren Weaver's (1949) information theory. Here a distinctive definition is used, one which is sharply distinguished from the semantic concept in common parlance. In this theory information is a quantity which is measured in 'bits' and defined in terms of the probabilities of occurrence of symbols. It is a definition derived from and useful to the communications engineer whose interest is with the storage and transmission of symbols, the minimum index of which is on/off (yes/no or 0/1).

This approach allows the otherwise vexatious concept of information to be mathematically tractable, but this is at the price of excluding the equally vexing – yet crucial – issue of meaning and, integral to meaning, the question of the information's quality. On an everyday level when we receive or exchange information the prime concerns are its meaning and value: is it significant, accurate, absurd, interesting, adequate or helpful? But in terms of the information theory which underpins so many measures of the explosion of information these dimensions are irrelevant. Here information is defined independent of its content, seen as a physical element as much as is energy or matter. As one of the foremost information society devotees puts it:

*Information exists.* It does not need to be *perceived* to exist. It does not need to be *understood* to exist. It requires no intelligence to interpret it. It does not have to have *meaning* to exist. It exists.

(Stonier, 1990, p. 21, original emphasis)

In fact, in these terms, two messages, one which is heavily loaded with meaning and the other which is pure nonsense, can be equivalent. As Roszak says, here '*information* has come to denote whatever can be coded for transmission through a channel that connects a source with a receiver, regardless of semantic content' (1986, p. 13). This allows us to quantify information, but at the cost of abandonment of its meaning and quality.

If this definition of information is the one which pertains in technological and spatial approaches to the information society (where the quantities stored, processed and transmitted are indicative of the sort of indices produced), we

come across a similar elision of meaning from economists' definitions. Here it may not be in terms of 'bits', but at the same time the semantic qualities are evacuated and replaced by the common denominator of price (Arrow, 1979). To the information engineer the prime concern is with the number of yes/no symbols, to the information economist it is with their vendability. But, as the economist moves from consideration of the concept of information to its measurement, what is lost is the heterogeneity that springs from its manifold meanings. The 'endeavour to put dollar tags on such things as education, research, and art' (Machlup, 1980, p. 23) unavoidably abandons the semantic qualities of information. Kenneth Boulding observed in the mid-1960s that

The bit ... abstracts completely from the content of information ... and while it is enormously useful for telephone engineers ... for purposes of the social system theorist we need a measure which takes account of significance and which would weight, for instance, the gossip of a teenager rather low and the communications over the hot line between Moscow and Washington rather high.

(Boulding, 1966)

How odd, then, that economists have responded to the qualitative problem which is the essence of information with a quantitative approach that, reliant on cost and price, is at best 'a kind of qualitative guesswork' (ibid.). 'Valuing the invaluable', to adopt Machlup's terminology, means substituting information content with the measuring rod of money. We are then able to produce impressive statistics, but in the process we have lost the notion that information is *about* something (Maasoumi, 1987).

Finally, though culture is quintessentially about meanings, about how and why people live as they do, it is striking that with the celebration of the non-referential character of symbols by enthusiasts of postmodernism we have a congruence with communications theory and the economic approach to information. Here, too, we have a fascination with the profusion of information, an expansion so prodigious that it has lost its hold semantically. Symbols are now everywhere and generated all of the time, so much so that their meanings have 'imploded', hence ceasing to signify.

What is most noteworthy is that information society theorists, having jettisoned meaning from their concept of information in order to produce quantitative measures of its growth, then conclude that such is its increased economic worth, the scale of its generation, or simply the amount of symbols swirling around, that society must encounter profoundly meaningful change. We have, in other words, the assessment of information in non-social terms – it just *is* – but we must adjust to its social consequences. This is a familiar situation to sociologists who often come across assertions that phenomena are aloof from society in their development (notably technology and science) but carry within them momentous social consequences. It is inadequate as an analysis of social change (Woolgar, 1985).



Doubtless being able to quantify the spread of information in general terms has some uses, but it is certainly not sufficient to convince us that in consequence of an expansion society has profoundly changed. For any genuine appreciation of what an information society is like, and how different – or similar – it is to other social systems, we surely should examine the meaning and quality of the information. What sort of information has increased? Who has generated what kind of information, for what purposes and with what consequences? As we shall see, scholars who start with these sorts of questions, sticking to questions of the meaning and quality of information, are markedly different in their interpretations from those who operate with non-semantic and quantitative measures. The former are sceptical of alleged transitions to a new age. Certainly they accept that there is more information today, but because they refuse to see this outside its content (they always ask: what information?) they are reluctant to agree that its generation has brought about the transition to an information society.

Another way of posing this question is to consider the distinction between *having information* and *being informed*. While being informed requires that one has information, it is a much grander condition than having access to masses of information. Bearing in mind this distinction encourages scepticism towards those who, taken by the prodigious growth of information, seem convinced that this signals a new – and generally superior – epoch. Compare, for instance, nineteenth-century political leaders with those of today. The reading of the former would have been restricted to a few classical philosophers, the Bible and Shakespeare, and their education was often inadequate and brief. Contrasted with George W. Bush (US President 2000–8), who has all the information resources imaginable to hand, thousands of employees sifting and sorting to ensure that there are no unnecessary information gaps, and the advantage of a Princeton education, the likes of Abraham Lincoln (President 1861–5) and George Washington (1789–97) look informationally impoverished. But who would even suggest that these were not at least as well-informed, with all that this conjures regarding understanding and judgement, as the current President of the United States of America?

### Theoretical knowledge

There is one other suggestion which can contend that we have an information society, though it has no need to reflect on the meanings of the information so developed. Moreover, this proposition has it that we do not need quantitative measures of information expansion such as occupational expansion or economic growth, because a decisive qualitative change has taken place with regard to the ways in which information is used. Here an information society is defined as one in which theoretical knowledge occupies a pre-eminence which it hitherto lacked. The theme which unites what are rather disparate thinkers is that, in this information society (though the term ‘knowledge society’ may be preferred, for the obvious reason that it evokes much more than agglomerated bits of information), affairs are organised and arranged in such ways that theory is prioritised. Though this priority of theoretical knowledge gets little treatment in information society

theories, it has a good deal to commend it as a distinguishing feature of contemporary life. In this book I return to it periodically (in Chapters 3, 5 and 8, and in the concluding chapter), so here I need only comment on it briefly.

By theoretical knowledge is meant that which is abstract, generalisable and codified in media of one sort or another. It is abstract in that it is not of direct applicability to a given situation, generalisable in so far as it has relevance beyond particular circumstances, and it is presented in such things as books, articles, television and educational courses. It can be argued that theoretical knowledge has come to play a key role in contemporary society, in marked contrast to earlier epochs when practical and situated knowledge were predominant. If one considers, for instance, the makers of the Industrial Revolution, it is clear that these were what Daniel Bell (1973) has referred to as 'talented tinkers' who were 'indifferent to science and the fundamental laws underlying their investigations' (p. 20). Abraham Darby's development of the blast furnace, George Stephenson's railway locomotive, James Watt's steam engines, Matthew Boulton's engineering innovations, and any number of other inventions from around 1750 to 1850 were the products of feet-on-the-ground innovators and entrepreneurs, people who faced practical problems to which they reacted with practical solutions. Though by the end of the nineteenth century science-based technologies were shaping the course of industry, it remained the case that just a century ago

vast areas of human life continued to be ruled by little more than experience, experiment, skill, trained common sense and, at most, the systematic diffusion of knowledge about the best available practices and techniques. This was plainly the case in farming, building and medicine, and indeed over a vast range of activities which supplied human beings with their needs and luxuries.

(Hobsbawm, 1994, p. 525)

In contrast, today innovations start from known principles, most obviously in the realms of science and technology (though these principles may be understood only by a minority of experts). These theoretical principles, entered in texts, are the starting point, for instance, of the genetic advances of the Human Genome Project and of the physics and mathematics which are the foundation of ICTs and associated software. Areas as diverse as aeronautics, plastics, medicine and pharmaceuticals illustrate realms in which theoretical knowledge is fundamental to life today.

One ought not to imagine that theoretical knowledge's primacy is limited to leading-edge innovations. Indeed, it is hard to think of any technological applications in which theory is not a prerequisite of development. For instance, road repair, house construction, sewage disposal or motor car manufacture are each premised on known theoretical principles of material durability, structural laws, toxins, energy consumption and much more. This knowledge is formalised in texts and transmitted especially through the educational process which, through specialisation, means that most people are ignorant of the theoretical knowledge outside their own expertise. Nonetheless, no one today can be unaware of the

profound importance of this theory for what one might conceive as everyday technologies such as microwave ovens, compact disc players and digital clocks. It is correct, of course, to perceive the architect, the water engineer and the mechanic to be practical people. Indeed they are: but one ought not to overlook the fact that theoretical knowledge has been learned by these practitioners and in turn integrated into their practical work (and often supplemented by smart technologies of testing, measurement and design which have incorporated theoretical knowledge).

The primacy of theoretical knowledge nowadays reaches far beyond science and technology. Consider, for instance, politics, and one may appreciate that theoretical knowledge is at the core of much policy and debate. To be sure, politics is the 'art of the possible', and it must be able to respond to contingencies, yet, wherever one looks, be it transport, environment or the economy, one encounters a central role ascribed to theory (cost-benefit analysis models, concepts of environmental sustainability, theses on the relationship between inflation and employment). In all such areas criteria which distinguish theoretical knowledge (abstraction, generalisability, codification) are satisfied. This theoretical knowledge may lack the law-like character of nuclear physics or biochemistry, but it does operate on similar grounds, and it is hard to deny that it permeates wide areas of contemporary life.

Indeed, a case can be made that theoretical knowledge enters into just about all aspects of contemporary life. Nico Stehr (1994), for example, suggests it is central to all that we do, from designing the interior of our homes to deciding upon an exercise regime to maintain our bodies. This notion echoes Giddens's conception of 'reflexive modernisation', an epoch which is characterised by heightened social and self-reflection as the basis for constructing the ways in which we live. If it is the case that, increasingly, we make the world in which we live on the basis of reflection and decisions taken on the basis of risk assessment (rather than following the dictates of nature or tradition), then it follows that nowadays enormous weight will be placed upon theoretical knowledge to inform our reflection. For instance, people in the advanced societies are broadly familiar with patterns of demography (that we are an ageing population, that population growth is chiefly from the southern part of the world), of birth control and fertility rates, as well as of infant mortality. Such knowledge is theoretical in that it is abstract and generalisable, gathered and analysed by experts and disseminated in a variety of media. Such theoretical knowledge has no immediate application, yet it undoubtedly informs both social policy and individual planning (from pension arrangements to when and how one has children). In these terms theoretical knowledge has come to be a defining feature of the world in which we live.

It is difficult to think of ways in which one might quantitatively measure theoretical knowledge. Approximations such as the growth of university graduates and scientific journals are far from adequate. Nonetheless, theoretical knowledge could be taken to be the distinguishing feature of an information society as it is axiomatic to how life is conducted and in that it contrasts with the ways in which our forebears – limited by their being fixed in place, relatively ignorant, and by the forces of nature – existed. As I have said, few information society thinkers

give theoretical knowledge attention. They are drawn much more to technological, economic and occupational phenomena which are more readily measured, but which are only loosely related to theory. Moreover, it would be difficult to argue convincingly that theoretical knowledge has assumed its eminence just in recent decades. It is more persuasive to regard it as the outcome of a tendential process inherent in modernity itself, one that accelerated especially during the second half of the twentieth century and continues in the twenty-first, leading to what Giddens designates as today's 'high modernity'.

## Conclusion

This chapter has raised doubts about the validity of the notion of an information society. On the one hand, we have encountered a variety of criteria which purport to measure the emergence of the information society. In the following chapters we encounter thinkers who, using quite different criteria, can still argue that we have or are set to enter an information society. One cannot have confidence in a concept when its adherents diagnose it in quite different ways. Moreover, these criteria – ranging from technology, to occupational changes, to spatial features – though they appear at first glance robust, are in fact vague and imprecise, incapable on their own of establishing whether or not an information society has arrived or will at some time in the future.

On the other hand, and something which must make one more sceptical of the information society scenario (while not for a moment doubting that there has been an extensive 'informatisation' of life), is the recurrent shift of its proponents from seeking quantitative measures of the spread of information to the assertion that these indicate a qualitative change in social organisation. The same procedure is evident, too, in the very definitions of information that are in play, with information society subscribers endorsing non-semantic definitions. These – so many 'bits', so much economic worth – are readily quantifiable, and thereby they alleviate analysts of the need to raise qualitative questions of meaning and value. However, as they do so they fly in the face of commonsensical definitions of the word, conceiving information as being devoid of content. As we shall see, those scholars who commence their accounts of transformations in the informational realm in this way are markedly different from those who, while acknowledging an explosion in information, insist that we never abandon questions of its meaning and purpose.

Finally, the suggestion that the primacy of theoretical knowledge may be a more interesting distinguishing feature of the information society has been mooted. This neither lends itself to quantitative measurement nor requires a close analysis of the semantics of information to assess its import. Theoretical knowledge can scarcely be taken to be entirely novel, but it is arguable that its significance has accelerated and that it has spread to such an extent that it is now a defining feature of contemporary life. I return to this phenomenon periodically in what follows, though would emphasise that few information society enthusiasts pay it much attention.

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