

**Zeitschrift:** Studies in Communication Sciences : journal of the Swiss Association of Communication and Media Research

**Herausgeber:** Swiss Association of Communication and Media Research; Università della Svizzera italiana, Faculty of Communication Sciences

**Band:** 1 (2001)

**Heft:** 1

**Artikel:** Information society theory as ideology : a critique

**Autor:** Garnham, Nicholas

**DOI:** <https://doi.org/10.5169/seals-791137>

### **Nutzungsbedingungen**

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. [Mehr erfahren](#)

### **Conditions d'utilisation**

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. [En savoir plus](#)

### **Terms of use**

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. [Find out more](#)

**Download PDF:** 30.03.2026

**ETH-Bibliothek Zürich, E-Periodica, <https://www.e-periodica.ch>**

NICHOLAS GARNHAM\*

## INFORMATION SOCIETY THEORY AS IDEOLOGY: A CRITIQUE

The serious, concentrated analysis and critique of Information Society theory has been placed unavoidably at the centre of the concerns of scholars of communication by history itself. It is the dominant ideology of the current historical period. It raises questions which are unavoidable for anyone who wishes to understand the relationship between the structures and processes of social communication and social structures and processes more generally. These questions concern: a) impacts at the general level of the mode of production, in particular the relation between forces and relations of production; b) impacts at the level of the organisation of production itself and thus on the structure and consciousness of labour and on social stratification; and c) impacts on the spheres of politics and culture.

Keywords: Information Society; productivity; networks; knowledge workers.

---

\* Nicholas Garnham, Centre for Communication and Information Studies, University of Westminster, London, UK. E-mail address: [garnhan@wmin.ac.uk](mailto:garnhan@wmin.ac.uk)

The history of the study of social communication has been characterised by a series of dominant paradigms which are themselves the product of wider historical currents — effects and functionalism, dominant ideology, audiences/consumption. In this socially and historically determined series it is arguable that Information Society theory is now taking its place as the dominant paradigm.

Confrontation with the theory of the Information Society, both as science and ideology, is now unavoidable. Here is a theory of communication massively presenting itself as both a way of understanding the present historical moment and the dominant development trends in society and at the same time as the favoured legitimating ideology for the dominant economic and political power holders.

The term Information Society is now used in the policy arena — for instance in European Commission documents (for example European Council 1994) — more as a mantra to justify whatever policy is proposed than as a substantive analysis. However lying behind the term is a real theoretical construct. For the purpose of both exposition and critique I will focus on the version of this theory laid out by Manuel Castells in his recent magnum opus *The Rise of Network Society* (Castells 1996) and *The Power of Identity* (Castells 1997). I do this because Castells' is the most sophisticated version available and it is always most productive to critique a theory in its strongest version. Tilting at straw men may occasionally be fun but it is not ultimately very productive. Based upon a wide range of research and empirical evidence from around the world it far out distances the juvenile aperçu of the Negroponte's (Negroponte 1996) and Toflers (Tofler 1980) of this world. Furthermore Castells firmly situates his theoretical project within the Enlightenment tradition of critical emancipatory social science.

## Castells' Information Society: the Argument In Outline

In assessing the validity of Information Society theory in general, and of Castell's version of it in particular, we need to analyse the internal structure and logic of the theory – what kind of explanation is being offered for social structure and dynamics and is it internally coherent? – and then subject the explanations and prognoses offered to the test of evidence. In the current over-hyped atmosphere in which the term Information Society is used, such an exercise of critique is rarely attempted. Indeed the term operates ideologically precisely because its use is, in general, designed to avoid argument and debate.

Although Castells attempts to retain a notion of human agency and is careful to point to the importance and possibility of differing national policy responses and to the growing importance of social movements and local forms of cultural resistance, in the end the Information Society, as he presents it, is technologically determined. The source of the dynamic of social change and what are seen as epochal and global transformations in the structure of the economy, in social stratification, politics and culture are a technological paradigm based upon a cluster of innovation in information and communication technology largely stemming from Silicon Valley in the 1970's. Drawing on Innis, McLuhan and Bell, while acknowledging the influence of Schumpeter and Weber, the argument is that a small group of innovators responded to capitalism's crisis of profitability by introducing a set of new technologies that massively raised productivity. This then had three major impacts on the economy:

a) It lead to the creation of the so-called network firm as a response to increased levels of competition induced by accelerated innovation and thus product cycles (through a process of what he calls “knowledge working upon knowledge”);

b) An increased level of globalisation – particularly for finance capital – made possible by the ability to operate globally in real-time computerised telecommunication networks;

c) A new division of labour polarised between knowledge workers who have the skills and adaptability to operate in networks (what he calls the interactors) and the increasingly fragmented, insecure industrial and service workers who are fixed in location and at the margins of the networks and at the mercy of network flexibility (what he calls the interacted).

These developments in turn work their effects in culture and politics with the end of class struggle and the national politics based upon it, the rise of social movements and the creation of a “culture of real virtuality.”

While I would not wish to deny the reality of some of these developments in economic structure, the labour market, politics and culture to which Castells points, there are serious problems with the theoretical explanation of them which has, as always, implications for political action.

In analysing Castells’ theory of the network society we need to pose three questions.

a) What kind of explanation is being offered of social restructuring?

b) Does the evidence support such explanations or, alternatively, can we draw different analytical conclusions from the same evidence?

c) Are the processes identified sufficiently novel to justify the claim that we are entering a new era of informational capitalism, the network society and the information age?

## A New Mode of Production

The general structure of Castells’ argument is clear. It derives from the classic tradition of political economy and deploys both an expressive totality and base/superstructure model to explain the relationship between changes in the mode of production and changes in society at large, particularly culture and politics. Castells claims that we are entering a new information age

characterised by a new mode of production, informational capitalism, and a new global social structure, the network society. This transformation is driven, or determined, at the base by a change in the mode of production from industrial to informational capitalism that, in its turn, is technologically determined by developments in information and communication technology, which exercises its effect primarily by raising productivity. That this process is technologically determined is made clear when Castells defines Informational as “a specific form of social organisation in which information generation, processing and transmission become the fundamental sources of production and power because of new technological conditions emerging in this historical period (Castells 1996, p.21, f.33).” This process of dynamic change produces changes in the organisation of production and the structure of the market on a global scale, creating the network enterprise and the network society within which domination is exercised via information flows through global communication networks.

There are then two alternative, although not necessarily incompatible, explanations of the effect of these developments on the superstructure of culture and politics. On the one hand informational capitalism restructures the labour process and the labour market and by so doing restructures class relations, while at the same time spatially rearranging global power relations, in what Castells calls a space of flows, such that the power of territorially based and politically accountable entities, especially nation states, are undermined. On the other hand the development of information and communications technologies in the form of the multi-media potential of the Information Superhighway have a direct impact on culture and thus on our understanding of the world and thus on politics by creating a “culture of real virtuality”.

Huge epochal and totalizing claims are being made here and a technologically determinist theory of communication has become THE theory of society with a vengeance. Not only is it technologically determinist but it is also structuralist. For all

Castells' attempts to keep the flame of political hope and action alive and his attachment to social movement theory, in the end it is the logic of the structure that determines because the network constitutes a new social morphology and "the network society (is) characterised by the preeminence of social morphology over social action."

### Castells' Argument In Detail

Let me now turn to look in more detail at the structure of Castells' argument and the evidence adduced to support it.

Following Daniel Bell Castells argues that societies are characterised by what he calls modes of production (what would more usually be called relations of production) that determine the distribution of the surplus and by modes of development (what would more normally be called forces of production) which determine the level and quality of the surplus. The *primum mobile* of the system is productivity, the level of which is technologically determined.

"The social relations of production, and thus the mode of production, determine the appropriation and use of the surplus. A separate yet fundamental question is the level of such surplus determined by the productivity of a particular process of production, that is to say by the ratio of the value to each unit of output to the value of each unit of input. Productivity levels are themselves dependent on the relationship between labour and matter, as a function of the use of the means of production by the application of energy and knowledge. This process is characterised by technical relations of production, defining modes of development. Thus modes of development are the technological arrangements through which labour works on matter to generate the product, ultimately determining the level and quality of the surplus. Each mode of development is defined by the element that is fundamental in fostering productivity in the production process (Castells 1996, p. 16)."

Thus the shift from industrial to informational capitalism is driven and explained by the new sources of productivity growth, "the technology of knowledge generation, information processing and symbol communication". There are a number of problems with the way Castells conceptualises the informational mode of development and its relation to the mode of production which produces a serious fault line at the very heart of his theoretical argument.

### Productivity

The first, and this is common to the whole post-industrial, information society tradition stemming from Bell, relates to the concept of surplus which in turn effects the meaning of the concept productivity. The issue is, first, whether we define surplus in technical terms as a relation between inputs and outputs within the production process or in social terms as a relation between consumption and investment. And second, what numerator do we use to measure differences and thus the level of productivity. This is a problem that the rather outmoded concept of the labour theory of value and the related concept of surplus value was designed to address. This is particularly important because, as Castells and others who think like him are forced to admit (Castells 1996, p.74), the available statistics on productivity do not support the revolutionary claims being made for the impact of information and communication technology (Madrick, 1998; Sichel, 1998). Here claims made for the Information Society merge with those being made for the so-called New Economic Paradigm in relation to the current performance of the US economy and the sustainability of current stock-market levels.

The main empirical problem with this approach remains the celebrated Solow paradox — the continuing failure actually of positive results of investment in Information and Communica-

tion Technologies (ICTs) to show up in the productivity figures: “you can see the computer revolution everywhere except in the productivity statistics.”

The US, the supposed prime exemplar of the New Economic Paradigm, has over the last two decades consistently lagged behind other developed economies in productivity growth. While US productivity has indeed increased recently it is only now returning to the between 2 and 3% rates of growth that were the norm in the 1960's and would appear to be around the long range rates of sustainable productivity of industrial economies. (Productivity in the US grew by more than 2% per year on average between 1870 and 1970, and by nearly 3% per year in the 25 years after World War 2). The rates of productivity growth were in fact higher during the Reagan boom of 1982-1986 but they were not sustained. So there does not appear to be any good evidence as yet in the productivity figures for a new paradigm. The real question is why US productivity growth rates have been so low in recent years compared with long boom of the 50's and 60's and why, contrary to a technologically determined vision of the knowledge economy the US had such persistently low real wage rates combined with relatively low levels of unemployment perhaps associated with a shift from capital to labour intensity. The level of US real wages remains low. The wages of the average worker are only now just reaching their 1989 level and are about 10% below the level reached in 1973 (Madrack 1999).

As productivity is currently measured, in input/output terms, the productivity of the system is independent of distributional relations — that is to say, labour has to be seen as homogenous and measurable, however crudely, in terms of hours worked aggregated over the economy as a whole. If one thinks of an economy as a producer of human material welfare in conditions of material scarcity and in the context of the non expandable real biological time of human producers and consumers, then measuring productivity in terms of human time inputs makes

crude sense, since what is at issue is what level of goods and services, including non-work time, we can consume during a given real life time. For both individuals and society as a whole, hours worked (accepting the problem of measuring non-paid work hours) compared with levels of consumption, whether measured in monetary terms or in terms of a consumption bundle, remain the best available measure of our standard of living and the extent of our freedom from the realm of necessity. The problem here for the information society thesis is that the model is essentially thermodynamic. The labour theory of value works as a model for the process so long as labour time is largely a matter of energy expended, and consumption largely a matter of energy reconstituted or saved. This model has worked because, historically, the major rises in productivity have come directly or indirectly through the technological harnessing and application of energy, and rises in welfare have been rises in energy consumed and a decline in hours worked. The problem with the productivity as a driver model is the question of whether this can meaningfully be applied to non-material production, to a non-entropic economy of bits as opposed to an entropic economy of atoms. This may indeed be why we cannot measure the claimed productivity growth derived from the information and communication technology revolution, but then the proposed technologically determined explanation doesn't work either.

If we look, on the other hand, at surplus as a relation between consumption and investment then it is determined historically not by the forces but by the relations of production. This failure to adequately conceptualise the relations of production flows through, as we shall see, into a failure, crucially damaging to the structure of the theory, to understand the relation between technology, the labour process and labour market re-structuring, the relation between technological innovation and competition and the relation between production and circulation, in particular finance capital.

## The Impact of ICTS

In fact, hidden within Castells' definition of the new informational mode of development lie three quite different explanations for its impact, each of which will have different consequences for social structure and process:

a) The impact of ICTs directly, as both product and process innovation, on material production. If there are productivity improvements there should be no problem of capturing them in existing measures and they do not show up;

b) The impact on productivity through the impact on the organization of production. Here the network enterprise is seen as the driver of productivity growth. The problems here are threefold. First, the need to separate out organizational structures and costs, which are overheads and may indeed lower productivity, from those that do raise productivity. The second is to distinguish the contribution of productivity enhancing organizational change that depends upon ICT's from that which doesn't. A major problem for Castells' argument, as he himself admits, is that two of the most successful world economies in terms of productivity growth, Japan and Germany, have a relatively low level of ICT uptake in production;

c) The impact of the informational mode of development lays in "knowledge working upon knowledge", what Bell called theoretical knowledge, which he placed at the heart of his explanatory framework (Bell 1973).

## The Role of Theoretical Knowledge

This important confusion, then, works its way into the next stage of the argument. The confusion surrounds, first, the definition of the informational mode and the nature of the determinations at work. There is here, as in Bell and other information society theorists, an ambivalent shifting between explanation in terms of

information and communication technology and its impact on the organisation and output of material production on the one hand, and an explanation in terms of information, where the key source of increased productivity and added value (these are often confused) is what is described as "knowledge working on knowledge." Here an important distinction needs to be made between:

a) Knowledge production processes that raise productivity by feeding into the material production process — developments in computer aided design or robotics for instance;

b) Knowledge production processes that improve the quality of the product or service. These will have a differential impact on productivity and welfare in products and service — for instance, innovation in medical science may raise either some or all people's welfare by improving the quality of the medical services they receive without raising the productivity of health workers;

c) Knowledge production as a source of competitive advantage via product or service innovation.

While knowledge working on knowledge, theoretical, or specialised knowledge as it is sometimes called, has clearly contributed over a long historical period to increasing productivity it is not clear either that the trend has been raised by the development of ICT's or that the productivity of knowledge production itself has been increased.

In fact Castells, and others who argue like him within a Schumpeterian paradigm, place great stress on innovation. Indeed one of the major political arguments he draws from his analysis is that the major remaining role for the nation state is the creation of innovation clusters in order to enhance national competitiveness. In so doing he fails to distinguish the role of innovation within inter-firm competition and its role in enhancing system wide productivity. Here we come to a major problem with the technological determinism of the system.

## Informationalism

Castells writes:

"Each mode of development has also a structurally determined performance principle around which technological processes are organised: industrialism is oriented towards maximising output; informationalism is oriented towards technological development, that is towards the accumulation of knowledge and towards higher levels of complexity in information processing. While higher levels of knowledge may result in higher levels of output per unit of input, it is the pursuit of knowledge and information that characterises the technological production function under informationalism (Castells 1996, p.17-18)."

This is a tautology that not only doesn't explain anything; it in fact abandons the previous explanation in terms of productivity growth. It stems from a misunderstanding of the so-called performance principle of capitalism, which in its turn stems from the original mischaracterization of the relation between forces and relations of production. Capitalism's performance principle is NOT maximisation of output — this may or may not be the end result. It has been a system producing and oriented to economic growth because its performance principle is accumulation through competition. It is competition that drives innovation and productivity growth across the economy as a whole. Indeed for both Schumpeter and Hayek the case for capitalist competitive markets rests upon their efficiency as search mechanisms and creators of innovation rather than upon their efficiency in creating characteristics, in the sense of minimising the ratio of inputs to outputs. But at the level of the firm innovation may not raise productivity at all. Its profits may derive from capturing market share and the rent that derives from a temporary monopoly of unique product or service characteristics. Castells claims without producing any evidence that the network economy has become more competitive on a global scale and that the mobilisa-

tion of the informational paradigm has both caused and is a response to this growth in competitiveness. While the increased openness of national markets will induce a temporary rise in the level of competition, the resulting competition for global market share is likely to create oligopoly at a higher level, i.e. the system as a whole does not become more competitive. The problem is that there is much evidence of increased concentration, and an accompanying rise in levels of corporate profitability, which does not usually mean an increase in competitiveness. This increasing concentration is in part attributable not to increased competitiveness, but to the increasing returns to scale and resulting rent capture in high tech innovation. Thus developments in organisational and market structure may have more to do with innovation as a barrier to market entry in technology market than it has to do with raising productivity.

But this misunderstanding of the role of competition as a driver of the capitalist accumulation process also undermines Castells' explanation of the structure of the new network society and the labour market restructuring that accompanies it. At issue here is not only the nature but also the novelty of these processes since a claim is being advanced, as we should remember, that we are entering a new age.

### The Role of Networks

As I have explained, the concept of the network lies at the heart of Castells' theory. The argument is that it is the growth in the speed, reach and functionality of communication networks that is driving economic and social development. This leads to:

- a) Organisational change — the rise to dominance of the network enterprise;
- b) Changes in market structure — globalization and the dominance of finance capital;

c) Changes in the nature of labour and the structure of labour market on a global scale;

d) Resulting changes in the nature of class power and class conflict;

e) A changing role for the nation state and other geographically situated centres of political power;

The concept of the network is used to mobilise three quite different arguments. The first, in some ways the most important for Castells, and the same time the weakest, relates to globalization and finance capital. But all of them exaggerate the novelty of networks as forms of social and economic organisation within which power is exercised, and thus at the same time exaggerates both the extent and the novelty of the impact of ICTs.

"The network society is, for the time being, a capitalist society... But this kind of capitalism is profoundly different from its historical predecessors. It has two fundamental distinctive features: it is global and it is structured to a large extent around a network of financial flows (Castells 1996, p.471)."

Leaving aside what is meant by "for the time being" we need to ask what is meant by this, and is it novel enough to be described as a new form of capitalism?

Castells argues that the capitalist mode of production and the informational mode of development are articulated by finance capital's need for the knowledge and information generated, and enhanced by information technology. Note that we are a long way here from productivity in the process of labour working on matter as the *primum mobile*. Now there is no question that a major driver of the global development of information and communication networks has been finance capital. It can also sensibly be argued that the rise of a global financial market based upon high-speed communication networks should raise productivity by accelerating the turnover time of capital. Nor is it in question that these developments have both increased the instability of the financial system and caused problems for the

exercise of economic power by nation states and other politically accountable instances of power. The question is the extent of its novelty and the wider determining power Castells attributes to it.

Let us start with the concept of networks. The capitalist mode of production and its organisational forms have been underpinned by communication networks of remarkable extension and speed since at least the Roland Hills hub and spoke reorganisation of the British postal service in the early 19th century. The system of monetary market exchange is itself such a network or, in Castells' terms, a space of information flows. In neglecting this Castells is forced to argue that the capitalist class no longer exists because the network has created "a faceless collective capitalist made up of financial flows operated by electronic networks." But wasn't this precisely Marx's concept of the nature of capital? Castells' failure to understand the long term nature of the capitalist market system is underlined when he argues that this faceless collective capitalist "is not simply the expression of the abstract logic of the market, because it does not truly follow the law of supply and demand: it responds to the turbulence and unpredictable movements of non calculable anticipation induced by psychology and society as much as by economic processes." But have any serious analysts of the political economy of capitalism ever seen markets simply following the laws of supply and demand? Ever since finance capital broke free of industrial and mercantile capital through a long historical process of the creation of faceless collective capital through a banking and credit system, joint stock companies, stock, futures and insurance markets, capital flows have been subject to speculative turbulence and rent taking on the part of financial intermediaries. Keynes, among others, wrote of the impact of social psychology on this process. More damagingly, Castells seems to think that capital can induce production (whatever that means exactly) and that value can be created within the autonomous flows of capital on a global network without passing through a process of real production and consumption.

“Capital accumulation proceeds, and its value making is generated, increasingly, in the global financial markets enacted by information networks in the time-less space of financial flows (Castells 1996, p.472).”

But of course capital has to invest if value is to be appropriated. In words of Saskia Sassen (Sassen 1991) global capitalism has always to come down to earth.

Castells turns the relation between finance capital and the rest of the economy on its head:

“What is sometimes called the “real economy” and what I would be tempted to call the “unreal economy” since in the age of network capitalism the fundamental reality where money is made and lost invested and saved, is in the financial sphere.”

Even a swift glance at the list of the world’s richest men would soon disabuse him of this fact.

This failure to see that markets have always been networks also leads him to overestimate, in my view, the significance of the network enterprise and the role of circulation in relation to production.

### The Network Enterprise

But the concept of the network enterprise represents an important step in Castell's causal chain of determination between technology and culture:

“It is the convergence and interaction between a new technological paradigm and a new organisational logic that constitutes the historical foundation of the information economy (Castells 1996, p.152).”

The thrust of the argument is a familiar post-Fordist one — he move from mass production to flexible production and an ac-

companying shift from “vertical bureaucracies to the horizontal corporation (Castells 1996, p.164).” This new organisational form is structured around networks and appears to involve the dissolution of the firm or corporate unit as we have known it in favour of a constantly “varying geometry” of horizontal relationships and alliances which go beyond and escape the managerial control of the firm. However, it is at this point that the argument becomes most problematic. Here we need to distinguish between the organisation of the firm as a set of property relations and control over income flows, a set of principle/agent relations directed at accumulation through profit on the one hand, and the organisation of a specific production or labour process on the other. The relationship between the two has always been variable, both as between firms and sectors and historically. But its dialectic is contained, and has to be so contained for a capitalist mode of production to continue, within the bounds of property relations. Thus, whatever the flexibility of the network enterprise, the flexibility and porosity of organisational boundaries must always be limited. Once again it is not the technical but the social relations of production that are determinant. That is to say, the informational mode of development is developed for and put at the service of a set of property relations and the goal of accumulation, not vice-versa. Indeed, this is why networks have always presented a problem within a competitive market based economic system, as we can see now with Internet. Networks are essentially collaborative rather than competitive systems. They operate as a shared resource rather than a system of resource exchange. Because of network externalities they operate optimally as a monopoly, i.e. everyone is connected, and without internal barriers to the inter-active flows within them. Markets, on the other hand, need barriers because it is only at barriers, where exchange can be stopped or diverted, that prices can be charged and a share of value captured. As the future development of Internet will undoubtedly demonstrate, using a network for the mutual exchange of information with

seamless interconnection of all with all is inherently incompatible with using the network as a technical infrastructure for competitive market relations. It is this contradiction that explains the peculiar nature of Internet economics as analysed by Pogorel in a recent issue of *Reseaux*.

The same dilemma is illustrated by intellectual property. Studies show that knowledge production is highest with free exchange. The problem is that in a society where the incentive structure is based upon extracting differential rents or profits on a market it is necessary to create artificial intellectual property rights and thus barriers to the free exchange of knowledge. Thus Castells' dismissal of the classic theories of the modern corporation, whether Chandler's economies of scale and scope model (Chandler 1977) or Williamson's transaction costs model (Williamson 1975), are misplaced. It is true that new technologies of production and organisational co-ordination will change the trade-offs involved in maximising economies of scale and scope and minimising transaction costs. This may indeed effects the optimum size of the firm, the benefits to be derived from horizontal or vertical integration, the desirability of outsourcing, etc. although Castells' own statistics show an increase in multinational corporate concentration on a global scale, which for property ownership reasons outlined above must be vertical hierarchies, even if the production and circulation processes that they control and from which they derive the necessary profits are more horizontal, i.e. the pyramid of power and control is flatter.

### The End of Class Struggle

This thesis of the rise of the network enterprise is then used as one of the bases for the argument of the end of class struggle between capital and labour. As we have seen, the first argument is that global financial networks have created "a faceless collective capital" and thus there are no longer any capitalists. The

problem with this argument is that it neglects the problem of human agency. Even if we accept a structural argument concerning the determining effect of the logic of capital we are left with the problem of how this is realised in the actions of individual human agents. Class theory, in both its Marxist and Weberian forms, proposes a theory of interests as the motivating relay between structure and agency. It is assumed that there is struggle over scarce resources even if, in the Weberian version, this is not just confined to material resources, but includes the social and cultural resources covered by the term status. Thus the logic of capital only works its invisible magic as a social logic so long as individual capitalists, or the institutional agents of capital, are driven to accumulate through the search for profit on competitive markets. Similarly the Schumpeterian model of “creative destruction,” that in part underlies Castells’ vision, depends upon the figure of the entrepreneur as its *deus in machina* and we are left with the problem of what drives the entrepreneur.

Because Castells, in common with many Information Society theorists, is forced to dispense with competitive property relations as the main driver, since it is technological change that is the explanatory variable, he is also forced to descend into mysticism to explain the power and actions of his new ruling class — the networkers. They are the carriers of a “spirit of informationalism.” Overtly taking his cue from Weber and his conception of the Protestant Ethic as the Spirit of Capitalism Castells argues that:

“[...] for the first time in history the basic unit of economic organisation is not a subject, be it individual (such as the entrepreneur or the entrepreneurial family) or collective (such as the capitalist class, the corporation, the state). The unit is the network... What glues together this network?...The networking form must have a cultural dimension of its own. Otherwise economic activity would be performed in a social/cultural vacuum (Castells 1996, p.198-9).”

This is, in my view, a false question. It is not clear that new forms of economic organisation need – there is certainly no evidence that they now have – a new form of ethical justification. But Castells argues that the network is underpinned by the “spirit of informationalism” which is “the culture of “creative destruction” accelerated to the speed of opto-electronic circuits that process its signals. Schumpeter meets Weber in the cyberspace of the cultural enterprise (Castells 1996, p.199).” Descent into this kind of hyperbolic language, a form of rhetorical bullying, is a sure sign that the writer is on shaky theoretical and empirical ground. In describing the nature of this culture the link between Information Society Theory and post-modernism becomes clear. “It is a culture, indeed, but a culture of the ephemeral, a culture of each strategic decision, a patchwork of experience and interests rather than a charter of rights and obligations. It is a multi-faceted, virtual culture (Castells 1996, p.199).” As we shall see this spirit of informationalism then acts as an important determinant at the cultural level. But, perhaps most interesting of all, by drawing upon Weber Castells is in fact proposing a different explanatory model of social development. When he argues that Weber's work “still remains the methodological cornerstone of any theoretical attempt at grasping the essence of cultural/institutional transformations that in history usher in a new paradigm of economic organisation,” now it is cultural/institutional transformation – the spirit of informationalism – that is the driver rather than technological change or productivity.

## Labour

Leaving that question to one side Castells moves from the Network to Labour as the next step in the explanatory chain.

“The technological and managerial transformation of labour, and of production relationships, in and around the emerging network enterprise is the *main lever* (my italics) by which the informational paradigm and the process of globalization effect society at large (Castells 1996, p.201)”

“Down in the deep of the nascent social structure a more fundamental process has been triggered by informational work, the disaggregation of labour, ushering in the network society (Castells 1996, p.279).”

This is a classic argument from Marxist political economy and none the worse for that. The question we need to ask, however, is whether the picture of the restructuring of labour relations is realistic, and if so, is it a new phenomenon and are the conclusions drawn in terms of the changing nature of global power relations justified?

Two different arguments are embedded in the description of labour restructuring. First, that there is a new global division of labour that decisively shifts power away from labour. Where it shifts power to – whether to capital or to the network – is precisely a matter of dispute. But labour loses power because it is individualised and disaggregated.

“Labour loses its collective identity, becomes increasingly individualised in its capacities, in its working conditions and in its interests and projects (Castells 1996, p. 475).”

## The Networker

At the same time the labour market is dualised and characterised at the top by the rise, familiar from Information Society theory generally, of what are variously described as networkers, interactors, deciders, what are often called knowledge workers or symbolic analysts. Castells is ambivalent as to whether these

developments express an inescapable structural logic, and whether this logic is or is not capitalist.

“Notwithstanding the formidable obstacles of authoritarian management and exploitative capitalism, information technologies call for greater freedom for better informed workers to deliver the full promise of its productive potential. The networker is the necessary agent of the network enterprise made possible by new information technologies (Castells, 1996: 223).”

Here the networker is seen as a technologically determined social role but at the same time the potential hero of a new, freer and more flexible social order, which would or will supersede capitalism. This is a familiar argument from Bell and chimes well with the argument that a de-massified culture is the super-structural effect of the creation of this new type of worker. It is perhaps most interesting that this is a reworking of Marx's argument for the proletariat as the vanguard of history, but born this time round from technology and the network, not the contradictions of the relations of production.

On the other hand he argues that these trends do not stem from “the structural logic of the informational paradigm, but are the result of the current restructuring of capital-labour relations, helped by the powerful tools provided by new information technologies and facilitated by a new organisational form, the network enterprise (Castells, 1996: 273).” Precisely, but this is not an argument for a new era but for a continuation of a long struggle between capital and labour within the labour process, of the separation of mental and manual labour and of what Beninger has called The Control Revolution (Beninger 1986). That global capitalist organisation and the resulting international division of labour poses problems for the organisational co-ordination of labour and for the development of a common class consciousness would hardly have been news to 19th century socialists.

But there is also an argument about a shift of power from capital to information labour because it is argued “the deployment

of information technology increases dramatically the importance of human brain input into the work process.”

The crucial points to be made here are:

a) The need to distinguish between the growth of forms of mental labour and the shift from energy to brainpower as the dominant form of labour’s human capital input into the production process as a long term process, and its impact on the capital labour relation. In short, the shift from energy to brainpower does not necessarily change the subordination of labour to capital.

b) The need to distinguish between types of mental labour — for instance, between mental labour employed within the material production process, within circulation, within services, each with different effects on the over-all economic system and, in its turn, different from mental labour within public bureaucracies such as education, which have a socially mediated relationship to the production process.

c) The need to distinguish between the indispensability of a certain factor of production – in this case information workers – and the exercise of strategic power.

The original source of the information labour argument is Bell’s *The Coming of Post-Industrial Society*. As is now well known, Bell argued that organised knowledge was becoming the key ingredient in value added and therefore in economic growth. It is important to stress that for Bell it was not Information or Knowledge in general that was the key but the application of Weberian rationalisation to the production of knowledge itself. This is important because it then led on to his incorporation of the ICT revolution into his scenario as a technology that enhanced the planned nature of knowledge production and its productivity. From an economic perspective this is a Chandlerian and not a Schumpeterian view. But what was crucial for our present purposes was that on this basis Bell argued that a shift of power was taking place, because the terms of trade were altering, between capital owners and knowledge producers. In this

scenario it is Universities and industrial research labs that become the core institutions of capitalism, not banks.

Two things need to be said about this version of the Information Society argument. The first is that the role of organised knowledge as a force of production and source of value added is hardly new. It goes back at least as far as Germany's success in the second industrial revolution and the resulting exporting of the German model of the science based firm with a linked university model with its associated PhDs to the US and elsewhere at the beginning of this century.

The second is that Bell's exercise in social forecasting has not stood up well in the face of actual historical developments. I would want to suggest that in fact the terms of trade have gone in precisely the opposite direction to that predicted by Bell. So-called knowledge workers both in Universities, research labs and the cultural sector have everywhere experienced increased subjugation to capital — what some, for instance Halsey in the *Decline of Donnish Dominion* (Halsey 1992), have not hesitated to describe as proletarianisation.

Third, there is the argument, of which there are also elements in Bell, that the centre of gravity of the economy has increasingly shifted from goods production to knowledge production. It is this version of the Information Society argument that is captured in the terms Weightless or Frictionless Economy and in Negroponte's hyperbolic claim that increasingly economic activity is focused on shifting bits rather than atoms (Negroponte 1995).

Here it is important to carefully disentangle the shift from manufacturing to services, with which it remains confusingly entwined, from an increased level of knowledge intensity across the economy as a whole. This is particularly important because this confusion often underpins current policy arguments about skill shortages and the changing role of human capital and thus of education. Two distinctions need to be made. First, between the role of services and of knowledge intensification within the

goods producing sector itself. Second, within the service sector between personal and knowledge based services. Once we make these distinctions two things become clear. First, the production, distribution and marketing of goods remain the dominant sector of the economy (64% of total employment according to one recent calculation) and the key source for rises in productivity and employment growth. Second, developments within the personal and knowledge-based services have been and will continue to be very different. This is important because, contrary to a widely held view, the projected rise in employment growth is in personal rather than knowledge based services — for instance, largely in health care; and the types of knowledge or skills required will differ with the result, for instance, that a recent Australian study shows that it is the demand for interpersonal rather than cognitive skills that has risen most markedly (Sheehan and Tegart 1998). From this perspective capitalist economies have been knowledge economies for a long time and for the Information Society thesis to hold up we would need to establish a large step change in what are long-term trends. In my view to lump very different sectoral trends and dynamics together as though they were one phenomenon under the rubric Information Society or Knowledge Economy is not helpful.

Thus, if we look at so-called e-commerce, the growth of which is now touted as the key indicator of the knowledge economy, what we see is the application of Internet based communication technologies either to somewhat enhance the efficiency of the business-to-business supply chain or to shift the nature of the information search and transactional mode within the retailing of goods and services. In goods retailing the efficiency savings to be made are relatively small. In the service sector only some services — those with a relatively low level of necessary human input — can exploit the advantages and thus, for instance, are likely to experience different levels of globalisation and related price competition. Again it is not clear how an overall informa-

tion society approach is useful in the analysis of these very different developments.

These Information Society based arguments about the role and power of knowledge workers are important because they underpin current policy arguments which stress the importance of human capital formation to the economic competitiveness of national economies and firms, blame unemployment on the lack of skills of the unemployed and place a stress on the growth of the cultural or creative industries as sources of future employment growth. Crudely, the argument now mobilised by politicians and other interested parties is that the knowledge economy requires an increased cadre of knowledge workers; that the relative competitiveness of countries depends upon the availability of this human capital and thus on educational investment; that a major cause of unemployment is the low skill levels of job seekers - crudely that the manual workers required by a muscle based economy are no longer required and that therefore these workers have to be retrained for knowledge work. This argument is then also used to justify both increased inequality of income distribution and deregulation in the general field of the labour market and in the field of the media and communication.

There are a number of problems with this argument:

a) The relationship between educational investment and economic growth seems weak, more a matter of faith than evidence – indeed the relationship seems more likely to go in the other direction – rich economies can afford higher levels of education and can afford to keep people out of the workforce for longer periods;

b) The skills shortage is a myth — and a particularly cruel one at that:

1) As the current situation in the UK and the US seems to show normal economic growth and a general tightening of the labour market soon seems to make the supposed skill shortage barrier disappear;

2) From a low skill/high skill perspective recent studies do not appear to show a change in the skill composition of the labour market, at least in the US. As David Howells writes in *The Skill Myth* reviewing such studies “[...] the share of low-skill jobs was remarkably stable from 1983 into the 1990’s. Rather the real shift was away from higher wage jobs (Howells 1994).” A study by Wieler showed that the dispersion of skill requirements was unchanged in the 1980’s even among technologically advanced industries (Howells, op cit). Moreover in terms of employment growth in the US between 1985-95 high-skill jobs grew by 2.1% and low-skill by 2.4% Moreover if the aim is to tackle the problem of increased wage inequality through education the trend seems to be to decline skill and wage levels with rising skill requirements and falling wages for comparable jobs. Gottschall shows, in addition, that for skill measures such as education changes in the skill premium reflects changes in supply rather than in demand. It has been projected that a maximum of 29% of US jobs will require university level qualifications by 2005 implying excess capacity and thus falling rewards (Gottschall 1998);

3) So much for the relation between overall skill levels and the labour market in general. What about the type of skills required? Here we see that the whole concept of the knowledge worker and knowledge economy is incoherent.

We need to distinguish between types of skill — all require knowledge, and perhaps training, but of different types. If we distinguish between motor, cognitive and interpersonal skills, it is true that we find that the need for motor skills has declined. But the growth in the demand for cognitive skills — those usually seen as central to the knowledge economy and to the formation of which higher education might claim a distinct contribution — has been outstripped by growth in demand for interpersonal skills. Some have associated this with the feminisation of the work force. What certainly seems to be the case is that the centrality of interpersonal skills is supported by projections of

occupational growth. In the Bureau of Labour's projection of the 10 largest job growth occupations 1996-2006 only systems analysts and possibly General managers and top executives could be classed as classic knowledge economy jobs the remainder are dominated by Cashiers, Registered Nurses, Sales Persons, retail, Home Health aides, Teachers aides, Receptionists and Truck drivers. In the fastest growing categories Health workers at 873, 000 jobs are only just outnumbered by computer scientists, computer engineers and systems analysts at 1,004,000 (U.S. Government 1998).

Thus we need to distinguish between both specific types of skill and specific job markets.

We are then left with the more generic or, in the current jargon, transferable information skills.

As we have seen current labour market trends do not appear to demonstrate a growth in new information intensive sectors, which require a qualitatively different range of skills or type of human capital formation. On the one hand, there is a growth in high skilled white collar work reflecting the growth in business services where it is not clear that the information skills are either different or more intense than those always needed for management or the associate specialist skills of accountancy, law etc. If, for instance, we look at the big growth in management consultancy it is far from clear that we should be impressed by either the level or novelty of their intellectual endowments rather than of those traditional, socially acquired skills more accurately described as *chutzpah*.

On the other hand, we find the growth of classic service occupations, especially health care. Here technological change has nothing much to do with it. They are jobs based upon human-to-human relations. While in some areas some part of that can be intermediated by communication and information technologies the skills required are interpersonal and humanly embedded.

Such jobs have been central to our economies and societies for a long time. In short, the arguments about the changing nature

of work, the structure of the labour market and their impact on culture and politics need to be integrated into the classic analysis of the growth of a service economy and into a wider ranging sociology of what I will call intellectuals — for instance the work of Bourdieu, or Perkins' historical analysis of *The Rise of Professional Society* (Perkins 1989), which interpret the rise of information work and its place within the structure of stratification and power in a non-technologically determined and more fruitful way, but which do not invest the present moment with the weight of epochal revolutionary change nor invest the information workers with power they evidently don't exercise.

### The Superstructure

Let me now turn finally to the effect of this supposed transformation in the economic base to its effect at the level of the superstructure. I make no apology for using this old-fashioned terminology precisely because, as I have already argued, Castells himself is working within just such a framework.

The superstructural effects of the new informational mode of development are explained in two different ways. These are by no means necessarily mutually incompatible, but they do need to be distinguished for the purposes of analysis and critique.

The first argues that the effect comes via the labour process and the resulting restructuring of the global division of labour and of the relationship between geographical territories or places that result. Here the explanation for a changing cultural and political process is sought in a polarisation between a cosmopolitan global elite on the one hand and locally grounded but trapped labour and its experiences on the other, between the spaces of flows and places.

“Labour loses its collective identity, becomes increasingly individualised in its capacities, in its working conditions and in its interests and projects (Castells, 1996: 475).”

The old struggle between capital and labour is replaced by “a more fundamental opposition between the bare logic of capital and the cultural values of human experience.” We see here a close relationship between Information Society theory and the post-modernist stress on the culture of difference, the politics of identity and social movements.

Common to much current Information Society theorising is a failure to distinguish between the effects of new ICTs on the economy in general, which then may or may not have significant effects in the spheres of politics and culture, and the effects directly on politics and culture themselves — for instance the claims made for Internet as an agent of democratic renewal and the “reinvention” of government or the supposed de-massification and globalization of the media. Crucially, for example, statistics purporting to demonstrate the growth of the media and its importance as a source of employment creation fail to distinguish between producer services, the use of ICTs within the process of production and circulation in general which have shown dynamic growth, and final demand, the domestic consumption of media products and services. These last have certainly grown, but not spectacularly, and, as recent broadband trials have shown, the willingness to consume new services is highly constrained by disposable income.

Within Castells’ theory there are three distinct types of explanation of the effect of the informational mode of development on politics and culture. The first, as we have already seen, is, in effect, a classic class-consciousness effect. Changes in the labour process and the division of labour produce a “spirit of informationalism” which favours a culture of the ephemeral — what Castells calls “timeless time.” Here we can see quite clear relations with certain versions of post-modern theorising which

celebrate the pleasures derived from a constantly shifting play of unanchored signifiers. Apart from the key question of whether we can empirically demonstrate the existence of this “spirit of informationalism” and if so, whether culture really is dominated by the cultural forms hypothesised as its effect, we then need to go on to ask whether this cultural form is liberating, as is often implicitly assumed, or ideological in the sense of distracting attention from underlying, more deeply rooted, structures of interest and whether one of the ways in which this ideological process works is by favouring the entertainment over the pedagogic mode of media function to the detriment of social learning processes and social cohesion. It is to this question, for instance, that critics such as Neil Postman have addressed themselves (Postman 1986). Here we also need to make a connection with the post-Habermasian debate on the Public Sphere. Does democracy itself require a rational mode of discourse to which the very ephemerality of this new culture is inimical? This line of reasoning also shares some points in common with Bourdieu's arguments concerning the new media culture as the culture of a new *petit-bourgeoisie* which, far from possessing the high levels of cultural capital possessed by the networking knowledge workers, lacks cultural capital and therefore requires a high turn-over culture which does not require a long apprenticeship for either its appreciation or production. These are all important questions for current communication theory. But in terms of the claims for epochal change we need also to ask whether these characteristics are new or whether, on the contrary, they are the product of the problems of creating value with information commodities which drives a constant search for novelty and new cycles of cultural consumption of commodities which are not destroyed in use. The pursuit of the ephemeral and the pleasures of the fashionable in the sphere of consumption among all classes was noted at least as early as Voltaire's observations on 18th century Britain. It would appear to be just as

much the spirit of capitalism as Weber's celebrated Puritan abnegation.

### De-massification

The second claimed impact on culture and politics within Castells' theory is that of de-massification — what he describes as “the present and future of television's decentralisation, diversification and customisation (Castells, 1996: 340).” On the one hand, it is argued that the restructuring of work has created individualised workers who then demand a more individualised cultural product and reject mass political parties in favour of a range of issue-based social movements. On the other hand, the revolution in information and communication technology has, by lowering the cost and extending the range of alternative distribution networks, massively extended the range of choice open to cultural consumers and, at the same time and as a consequence, fragmented the audience. This extended choice and fragmentation are then seen as liberating.

There are a number of problems with this de-massification thesis. The first is empirical. Is it in fact taking place, and if so to what extent? The second is causal — is technological change in the system of distribution a cause or necessary condition of the restructuring of the audience? Looked at empirically, de-massification trends can be exaggerated. In cinema and recorded music a small number of titles continue to capture a high proportion of revenues, both nationally and globally. The audience share of network TV has declined in the face of competition from cable, satellite and video, but this decline has not been dramatic and the number of channels watched on a regular basis has only modestly expanded. There is a general and continuing trend towards concentration in the newspaper market. If one factors in globalization, one of the supposed effects of the technological revolution, then the situation is more complicated. At one level the

spread of global media products, services and producing conglomerates is a deepening of massification. After all, one of the logics driving globalization is economy of scale. Secondly, increased choice at a local level may coincide with, even be bought at the expense of, massification at the global level. The problem remains not primarily distribution costs and bottlenecks, but the relation between the costs of production and potential revenues and between hits and flops. Neither is significantly affected by the technological revolution. Indeed it is significant that the new audio-visual distribution technologies of cable and satellite are not diversifying production but fighting to obtain, and thus pushing up the price of, the major global mass audience pullers — feature films and selected high profile sporting events. However, the counter-vailing trends also need to be borne in mind and again they have little to do with technology. Rising standards of living enable consumers to afford a greater choice and the exercise of this choice may take the form of a realisable demand for local material, thus counteracting globalizing trends. Indeed we can hypothesise that the reason the more lurid versions of the US cultural imperialism thesis have not come to pass is that this thesis was based upon the empirical observation of a period before locally generated revenues reached a level at which local production could be supported. Rather than point to a technological process of de-massification, historical evidence supports the idea of a continual dialectic within cultural production and consumption between massification and fragmentation, between the general and the particular, as there is more generally between the individual and society, the citizen and the state, the agent and the structure, a dialectic inflected by technological change certainly, but not determined by it.

## A Culture of Real Virtuality

Finally, most ambitiously but also most problematically, Castells proposes an alternative explanation of the effect of the informational mode of development on culture and politics that is both more systemic and more direct.

“The convergence of social evolution and information technologies has created a material basis for the performance of activities throughout the social structure (Castells, 1996: 471).”

Here, the relation of technology to culture is seen as acting directly within the field of culture itself. Current developments in Information and Communication Technology (ICTs) are compared in their revolutionary cultural impact to the invention of the alphabet.

“Because culture is mediated and enacted through communication systems, cultures themselves, that is our historically produced system of beliefs and codes, become fundamentally transformed and will be more so over time, by the new technological system (Castells, 1996: 328).”

As a result he argues, drawing upon McLuhan and theories of de-massification, “we can hardly underestimate the significance of the Information Superhighway (Castells, 1996: 328).” Why? Because “[...] The potential integration of text, images and sounds in the same system, interacting from multiple points, in chosen time (real or delayed) along a global network in conditions of open and affordable access does fundamentally change the character of culture (Castells, 1996: 328).”

It is, he argues, creating a “Culture of Real Virtuality”. This is an argument familiar from Baudrillard and other post modernists.

“Cultures are made up of communication processes. And all forms of communication, as Roland Barthes and Jean Baudrillard taught us

many years ago, are based on the production and consumption of signs. Thus there is no separation between 'reality' and symbolic representation (Castells, 1996: 372)."

This tired nominalism, derived from semiology's misreading of the nature of language, eludes a number of distinct issues:

a) The relation between communication systems and communication media, i.e. the same audiovisual text can be distributed on networks with different structures and technical characteristics;

b) Between media and language. A range of audio-visual texts can employ a range of languages or codes of representation;

c) Between language and culture. Communication takes place in and through symbols but it is neither exclusively or even mainly about symbols. This is the great deconstructionist fallacy of infinite interpretative regress. A large part of any life is involved in engagement with non-symbolic realities, including other human beings, and symbols are used to communicate about, represent, and to reflect those realities. Of course, there is always a disjuncture between symbol and represented reality, but, while human users are aware of this, the functional fit has been good enough over evolutionary time for humans to act on the correct assumption that, while communicated reality and symbols are distinct, one can communicate accurately about the other. This, in its turn, is a different issue from the relation of concepts or cultural meanings, also communicated through symbol systems, to any underlying "truth", universal or otherwise.

In conclusion, what I have attempted to argue here is that the serious, concentrated analysis and critique of Information Society theory has been placed unavoidably at the centre of scholars of communication by history itself. It is the dominant ideology of the current historical period. It raises questions that are unavoidable for anyone who wishes to understand the relationship between the structures and processes of social communication, and social structure and processes more generally; in short if we wish to

understand and intelligently act upon the world in which we actually live. These questions concern:

a) Impacts at the general level of the mode of production, in particular the relation between forces and relations of production;

b) Impacts at the level of the organisation of production itself and thus on the structure and consciousness of labour and on social stratification. This, in particular, will include an analysis of the social position and function of information workers;

c) Impacts on the spheres of politics and culture.

No relation between these levels and thus no theory of the totality can be assumed, but must be empirically demonstrated. The answers to these questions, both theoretical and empirical, offered by Information Society theory are inadequate and unconvincing. In particular, the claim of novelty, and thus of revolutionary change, is made for what, in fact, are long-term structures and processes. In particular, as Braudel has reminded us in relation to the flexibility of capital within a space of flows, the answers are more likely to be inscribed in the *langue durée* of capitalist development than on the Information Superhighway.

“Capitalism alone has relative freedom of movement ... faced with inflexible structures (those of material and, no less, of ordinary economic life) it is able to choose the area where it wants and is able to meddle, and the areas it will leave to their fate, incessantly reconstructing its own structures from these components, and thereby little by little transforming those of others ... The choice may be limited, but what an immense privilege to be able to choose (Braudel 1975, p 405).”

## Reference system

- BELL, D. (1973). *The Coming of Postindustrial Society*, Harmondsworth: Penguin.
- BENINGER, J. (1986). *The Control Revolution*, Cambridge: Harvard University Press.
- BRAUDEL, F. (1975). *Capitalism and Material Life 1300-1800*, London: Weidenfeld and Nicholson.
- CASTELLS, M. (1996). *The Rise of Network Society*, Oxford: Blackwell.
- CASTELLS, M. (1997). *The power of identity*, Malden (Mass.): Blackwell.
- CHANDLER, A. (1977). *The Visible Hand*, Cambridge: Harvard University press.
- EUROPEAN COUNCIL (1994). *Europe and the Global Information Society*, Brussels.
- GELLNER, E. (1983). *Nations and Nationalism*, London: Blackwell.
- GELLNER, E. (1988). *Plough, Book and Sword*, London: Blackwell.
- GOTTSCHALK, P. (1998). Cross-national Differences in the Rise of Earnings Inequality: Market and Institutional Factors. *Review of Economics and Statistics* 80: 489-503.
- HALSEY, A.H. (1992). *The Decline of Donnish Dominion*, Oxford: OUP.
- HOWELLS, D. (1994). The Skills Myth, *The American Prospect* 18: 81-90.
- MADRICK, J. (1998). Computer: waiting for the Revolution, *New York Review of Books* Vol XLV No 5.
- MADRICK, J. (1999, Sept 23rd). How New is the New Economy?, *New York Review of Books*. Vol XLVI No 5.
- NEGROPONTE, N. (1995). *Being Digital*, London: Coronet.
- PERKINS, H. (1989). *The Rise of Professional Society: England since 1880*, London.
- POSTMAN, N. (1986). *Amusing Ourselves to Death*, New York: Penguin.
- RUNCIMAN, W.G. (1983). *A Treatise on Social theory Vol 1*, Cambridge: Cambridge University Press.
- SHEEHAN, F. AND TEGART, G. (eds.) (1998). *Working for the Future: Technology and Employment in the Global Knowledge Economy*, Melbourne: Victoria University Press.

- SASSENS, S. (1991). *The Global City*, New Jersey: Princeton University Press.
- SICHEL, D. (1998). *The Computer Revolution; an Economic Perspective*, New York: Brookings Institute Press.
- TOFLER, A. (1980). *The Third Wave*.
- U.S. GOVERNMENT (1998). Bureau of Labour Statistics.  
<http://stats.bls.gov/ecopro>.
- WILLIAMSON, O. (1975). *Markets and Heirarchies*, New York: free Press.