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The "Toynbee Dilemma" : Information Superhighways
And "Cultural Meltdown"

By

Graeme Osborne
THE 'TOYNBEE DILEMMA': INFORMATION SUPERHIGHWAYS AND 'CULTURAL MELTDOWN'

by
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Introduction

Economic, political, social and cultural 'invasion' is an almost inevitable consequence of the emergence of major new technologies. So, too, is economic, political, social and cultural change. Both sets of consequences are largely inescapable. The principal questions that arise concern the nature and efficacy of attempts to manage such change consciously and the intrinsic or unconscious capacity of a total culture to transform or dilute the influence of invading technologies. That said, it is necessary to recognise that these are important questions. They remind us that, whatever the power of new technologies and their sponsors, there are choices to be made for they are questions which concern the terms on which societal change and technological convergence will occur in a globalising age.

Writing of the role of communication in the development of major civilizations Arnold Toynbee once observed that

in constructing and maintaining their impressive systems of communications, the makers and masters of universal states usually had a clear and precise idea of the purposes for which they were burdening their subjects with these vast and expensive works. Yet ... the most deliberately planned and organized system could be exploited by other parties than the imperial government ... for purposes which the government, if it had foreseen them, would have ... opposed (Toynbee, 1972, 292).

In the present context, Toynbee's observation reminds us of two things: the construction of communication infrastructures by powerful groups for the purposes of integration and control is not new; and that whatever intentions lie behind the development of new technologies we should not assume that they will always be used in ways that accord with the ideas of their sponsors.

Depending on how they are defined and, of course, whether they eventuate, information superhighways (ISHs) may be seen as the latest stage in the long stream of communication systems which have accompanied the growth in scale and complexity of human society. Like earlier systems, they are sure to produce surprises and unlikely to satisfy all the expectations of them. It has been estimated that only one per cent of innovations succeed, that only some twenty per cent of technology development forecasts are realised and that most of these get the timing wrong (Gregory, 1994, 20). ISH failures may result from
prosaic considerations, for example, the restrictive operation of software patenting laws. The more fundamental explanation, however, is likely to reside in the inability of ISHs to match the expectations of important groups. If ISHs are defined, for instance, as a tool for producing equality of citizenship, they will disappoint those who feel less than equal in society. If defined as a path to perfect marketplace competition or optimal industrial efficiency there will be criticism from those who fail to compete successfully. The introduction of new technologies and systems rarely has an equal impact across and between societies. In any case, such developments emerge not to deliver social equality or a level industrial playing field but precisely to obtain an advantage. Much depends, then, on which groups possess the most leverage over the conditions under which ISHs are introduced into society. Since much of the relevant information will be private, remote, complex and sensitive it seems evident that for a broader society to respond adequately on behalf of all its citizens it will be essential that there is an active public sphere fully engaged in the debate over ISHs.

Although it is not a central purpose of this paper to define ISHs it may be as well to indicate broadly the way in which the term is employed here. ISHs rank with multimedia and ATM (asynchronous transfer mode), with which they are merging, as key components of the latest ‘communication revolution’. Where multimedia influences the complexity of the users’ immediate communication experience, ATM addresses the problem of how huge flows of quite different kinds of data are controlled technically. Information highways become ‘super’ through the use of convergence and digital compression to construct high-speed, high capacity links between computers, telecommunications systems and a variety of media. To do this they will interconnect any route — copper wire, cable, wireless, fibre-optic, microwave — capable of carrying digitalised information (the code understood by computers) into a vast network potentially able to link wired homes, institutions, corporations and governments across the planet. ISHs potentially represent a massive interlinkage, on a global scale, of information, communication and entertainment services. The fundamental driving force is corporate but the concept has profound implications for all levels of society, for relations between societies and for the balance of power between the nation-state and the corporate world economy. The precise contours of ISHs are difficult to predict since both the technology and the issue of which groups will wield the greatest influence are still evolving. While, as suggested, corporate interests appear to be the most powerful in the push for ISHs, it would be a mistake to see the corporate world as having a unified vision. A major divide is evident between those who wish to see the system engineered to meet the data transmission needs of modern corporations and those who argue for primacy for the ‘infotainment’ industries (Amos, 1994, 78). Nonetheless, divided though these corporate sub-sectors may be on focus, they are united in their insistence that private rather than public interests should prevail in the construction and operation of ISHs (Beare, 1994, 79).

However they are defined or regarded, ISHs will alter communication relationships in society if they follow the pattern set by other communication technologies. They will do so because, like most new technologies, they will
serve different individuals and interest groups differently and in so doing alter relations _ economic, political, social, cultural _ within and between societies. Some will have their places, roles and rewards enhanced, others will be less fortunate. Beniger (1986) has depicted 'the control revolution' as a relatively benign bureaucratic and technological reorganisation necessary by the explosive increases in productive power that accompanied the scientific and industrial revolutions which continue today. More recently, Hayes and Miller have questioned Beniger's 'tacit assumption' that the changes which constitute 'so-called information society' are necessarily 'socially progressive' (1994,119). The underlying point here is that the outcome of a potentially powerful new technology convergence such as ISH is uncertain and cannot be assumed necessarily to be in the 'best interests' of all citizens. It will be important, therefore, to devise ways of ensuring that citizenship interests are represented in the design stage of ISHs and in their future operations.

Predicting the possible consequences of ISH has become a small industry in itself. Not surprisingly the prospect produces both optimistic and pessimistic reactions and many shades in between (Rheingold,1994). Conflicting assessments of the possible impact on different kinds of individuals and groups, of the likely access to and security of significant bodies of information in society, of the continued availability of established employment areas, of the prospect of suitable new patterns of work arising, of possible changes to the idea of community, of the future practice of governance, of the balance of power between people, groups and nations, have all emerged as sites of debate over the potential impact of ISHs.

Major questions arise, therefore, as to what individual, corporate and social goals this new technology will serve, how these are to be determined, how ISHs might influence the access to knowledge of the various groups in societies and the global community and what, if any, regulatory frameworks need to be established to shape its impact in these varied contexts. There are also questions over how educators ought to address both the need to describe and explain ISHs and to prepare society for their impact. This paper examines first, some recent observations on the anxiety phenomenon so often associated with new communication technology over the past century or so; second, some ideas on the relationship between the apparently global impulse behind ISHs and the different national frameworks which will carry much of the responsibility for responding to the new technology; third; connections between the idea of the public sphere and ISHs; fourth, some human resources considerations in relation to ISHs; fifth, some specific questions arising from recent gender discussions; and finally, some points of concern for legislators and educators.

New Technology Anxiety

The notion of technology anxiety provides a useful starting point for a discussion of ISHs and human resources. It is not a new phenomenon. Nor is it necessarily irrational. Arnold Toynbee once observed that the communication technology developed to link Ancient Rome to the extremities of its Empire also provided the highways which allowed its enemies to affect its destruction (Toynbee,1972,292). Technology changes relationships and we
need to consider this as we engage with each major new wave of technological change. Indeed, the Canadian economic historian, H. A. Innis, wrote some of the most substantial mid-twentieth century literature on communication around the idea that there was an intimate connection between communication technology and the nature of the host civilisation and its relations with other societies (Innis, 1951).

In more recent times Carolyn Marvin (1989) and Kirsten Drotner (1992) have examined the anxiety that surrounds the arrival of new communication technologies. Marvin notes the tendency for each new technology to be cast as 'the embodiment of a unique and powerful code of messianic or demonic power'. She comments, however, that

New technologies come to existing groups less as transformative agents than as opportunities or threats to be weighed and figured into the pursuit of ongoing social objectives ... They come as elements to be absorbed into existing rules and expectations about the structure of social relations ...

In this view the society-that-exists when the artifacts are introduced has more interest for the historian of new communication technology than the society-that-will-eventually-be, the latter beloved by those who believe the effect of new media on an "old" society is the emergence of a "new" one. The problem is not so much discerning the germ of a new society in an old one ... but how habitual social intercourse is restructured in new media (Marvin, 1989, 190-91).

Marvin's notion that however poorly the new communication technology may be understood by any group there is a recognisable basis of rational self-interest in the anxiety reaction and that any consideration of responses to new technology must take account of existing social traditions, relations and practices provide a useful leaven in this discussion. So, too, does her caution with regard the emergence of 'new societies'.

Drotner focuses on what she terms 'media panics'. She detects changes in such 'panic discourses' over the years. Nonetheless, she argues that the 'similarities of the panics tend to overshadow their differences'. All are 'united by a firm belief in rational argumentation [the essence of modernity]: if people only know about the dangers ... they will change their cultural preferences'. For Drotner, however, the belief is an illusion fostered by an 'historical amnesia'. The participants fail to see that they are acting out a recurring historical drama as an older generation attempts to defend the status quo and continues to struggle for supremacy or recognition (Drotner, 1992, 52). It is an 'historical amnesia' which allows the media uses of youth to be characterised as 'problems' and which is framed within 'the dominant discourse of enlightenment' (56). For our purposes here it is sufficient to take from Drotner the notion of an historical forgetfulness which may restrict the extent to which overlapping generations comprehend the process in which they are enmeshed, and her questioning of the continued relevance of modernist notions such as 'progress'.
The latter point is explored by the French historian, Jean Chesneaux (1992), whose framing perspective is expressed in his particular conception of 'modernity'. Chesneaux sees new technologies as strategies for the reinforcement of the potent but troubled modernist notion of progress. Unlike Marvin, Chesneaux argues that while historical awareness is necessary, it is essential also that no matter how difficult it may be, we must look ahead to glimpse what we can of the world we may be creating, or that may be created, through the adoption of new technologies.

What is usually called the 'new technologies' is in fact a very heteroclite body of procedures, savoir faire and equipment. They do not all respond to the same kind of needs, and in particular they do not at all affect the social body at an equally general level ... The 'new technologies' have been elevated to the dignity of a concept; they have become the symbol of salvation of modernity in crisis, its rallying call. As concerned with their image as with their impact, they carry out increasingly numerous campaigns to promote and upgrade themselves. They are as much declarative as operative, Perhaps they do not just have a technical function but an ideological one, namely to convince mankind, which certainly seems in need of it, of its glowing future (Chesneaux, 1992,88-9).

Chesneaux regards the new technologies as being 'as ideological as they are technical' but sees them as no less 'new' for that. Their newness resides in the fact that they threaten to 'overturn moral assumptions that are as ancient as human consciousness' in the degree to which, through standardisation, robotisation, bio-genetic manipulation and so on, they 'cast doubt on the very identity of the human species'. They are familiar also, however, in their 'close association with political power and capitalist profit'. The 'prima donna' of these new technologies is information technology which 'throws economic and social relations, language and intellect, the we and the I into confusion' (90-2).

For all his anguish over the mixed record of modernity Chesneaux does not seek to halt the experiment. The 'need for reasonable control' should not lead to 'technological nihilism', nor to our 'taking refuge in the quasi-millennial expectation of an apocalypse'. Instead, he suggests, there are three important elements to any sensible response to new technologies that ought to be given particular emphasis: anticipation; technical pluralism; and ethics. Proper anticipation of new technology effects means 'restoring democracy's ability to act over a period of time, instead of surrendering to the technological short-term'. This involves avoiding reliance on 'technology assessments' which are frequently little more than 'public relations exercises designed to allay any fears ... a pitiful parody of what ought to be a genuine assessment of risks and effects'. The defence of technological pluralism means arming ourselves 'against the expansionism of the new technologies' generated by promoters, the market, fashion and 'self-conditioning'. 'The new technologies', he observes, 'are pitiless towards any alternative formula'. The importance of ethics, which he defines as 'moral conscience, a sense of responsibility towards the generations to come', lies in its potential social power. Chesneaux sees ethics as 'perhaps the only social reference that can act as a counterweight to the pressures jointly exerted by the state and the market in favour of the new technologies and that can counter them with critical thought' (105-7). The object, in a world in which there appears to be an erosion of the sense that
humans are in control, is to ensure that humans remain at the 'command post' in the face of 'avant-garde technologies' (107).

Taken together, and in association with the views of Marvin and Drotner, Chesneaux's three elements may help us to construct a more useful evaluatory framework than the simple optimism of reflex modernism. At the very least they provide an illustration of one way in which the discourse around new technology involves a restructuring of social intercourse. Technology anxiety should not be seen as necessarily irrational. Nor should it be seen as solely a matter of the present. In technology anxiety all three _ past, present and future _ are in play.

Globalisation and National Contexts

The ISH discourse contains a significant component of 'globalisation' rhetoric. While enthusiasts have stressed the locally empowering aspect of modern networking, discussion at the corporate level has been driven by the profit potential of international interconnectivity. In this context the idea of globalisation has become a common element in arguments intended to aid in the sweeping aside of barriers to a corporate model of global interconnectivity (Hukill, 1992).

The concept of globalisation, however, has been questioned at many levels. Some sectors of business have expressed doubts concerning its substance (Clarke, 1989, 259). Some non-Western governments have been critical of it, seeing it as essentially 'Westernisation', and have attempted to curb it through regulation (Frith, 1990, 2). Some Western governments have seen it as 'Americanisation' and have also responded through attempts at regulation. Some scholars have interpreted it as a device to further the commercialization of individual cultures around the world (Schiller, 1989, 35). Others have pointed to the absence of both historical perspective and a sense of geographical place in discussions of globalisation (Lewis & Slade, 1994, 31).

Marjorie Ferguson (1992) has provided a useful analysis of globalisation's underpinning assumptions and the 'collection of myths' that have accumulated around the notion. She argues that 'globalization ... and its attendant myths function as a gospel of the global market' (87). Problems of understanding arise because globalisation's meaning varies according to the source being used, the evidence for its actual existence is largely economic, and the evaluation of the evidence tends to ignore the extent to which it conceals 'extensive causal assumptions, normative intentions and value judgements' (70-4). Ferguson identifies seven globalisation 'myths'. All have implications for our discussion but there is space here to consider only two. The 'Global Cultural Homogeneity' myth relates to the interconnectivity of the transnational organization of cultural production, distribution and consumption in the broadest sense. It implies that the consumption of a common range of material and symbolic products around the globe has created a 'metaculture' which has greater importance than the countervailing pull of diverse local cultural, ethnic, social, political and economic interests. According to Ferguson, the metaculture argument seems often to be confounded by the strength of
pluralism worldwide. The 'New World Order' myth integrates the 
'triumphalism' of the 'end of history' thesis of Fukuyama (1989) with the 
postmodernist declaration of the end of the Enlightenment project, as part of an 
essentially US-driven process of reaching for a new system of international 
order in the wake of the collapse of the USSR. Ferguson comments that the 
globalising rhetoric of this myth ignores the exclusionary aspects of NWO 
avvocacy which omits much of Latin America, Africa and Asia. In the context 
of the ISH discussion it may be useful to keep in mind the prevalence of myth 
in such contexts. The objections to the metaculture assumption should remind 
us that cultural homogeneity is a long way from being realised or universally 
desired. The questioning of the NWO myth should alert us to the element of 
reintegration into a world order centred around major power interests that it 
contains, as well as to the exclusionist possibility. Most importantly, this 
exclusion will apply within, as well as between, nations. By itself, then, 
globalisation seems an inadequate base on which to approach the ISH 
development.

A number of scholars have suggested that different national cultural traditions 
provide filters for new information and communication technologies (Sreberny-
Mohammadi, 1991). Writing of the respective roles of culture and the new 
information technologies and the emergence of an integrated Europe, Colas 
(1991) argued that although the new technologies may reshape cultural 
boundaries, the 'transformations in cultural organization and in policymaking 
brought about by the increase in information technologies are largely 
determined by the weight of political and cultural traditions' (76). More 
recently, Svedin (1992, 288) observed that 'The styles of approach to broad 
overriding contemporary issues are coloured by the national culture within 
which they are addressed'.

Some of these national cultural differences emphasise distinctive 
communication preference or privilege contrasting institutional arrangements 
which favour certain kinds of responses to new technologies over others. In 
Japan, for example, despite its position as a major force in the global computer 
market, computers are not especially popular. Whereas some 50 per cent of 
USA office workers have computers on their desks, only 10 per cent of Japanese 
workers use them. Even NEC, Japan's largest computer company, has found it 
difficult to persuade its staff to use computers. The reasons reflect the 
persistence of certain traditional communication practices. While phonetic 
Japanese can be keyed into a computer, the computer cannot translate this into 
kanji (ideographic script in which many words have the same sound) which 
means the user must consult lists to locate the precise kanji. It is a time-
consuming process. As well, there is still a cultural preference for paper-based 
communication in Japan. In addition, the continued existence of a powerful, 
conservative bureaucracy has slowed the widespread adoption of computers 
(New Scientist, 28 May, 1994). In the USA government involvement in 
communication, while important as a source of industry support and as a 
regulator, frequently is viewed with some suspicion. It offends a powerful 
commitment to the idea that government should interfere as little as possible 
with the business dealings of Americans (Schiller, 1984, 9). In Australia, while 
this idea is evident, it has been less powerful than the historical expectation that
government has an important role to play in ensuring that communication development contributes to the good working of society (Osborne and Lewis, 1995). In Sweden, according to Svedin (308), there is an implicit assumption that 'an intelligent social interference with the pace of the world may matter' (309).

Although Svedin is writing about environment, society and globalism there is little doubt that the problem he poses has relevance for those concerned with the shaping of national ISH systems and facilities and the prospect of interconnectedness on a scale unimaginable to earlier generations. In the view of scholars such as Svedin and Colas ('91), while global economic imperatives, private and public, have been the principal driving force behind the penetration of new technologies into national cultures, the more critical element in policy making, ultimately, is historical, cultural and political. The existence of national cultural traditions, then, should be recognised as an important, legitimate, though uncertain factor in determining responses to the ISH phenomenon. As with the environmental issue, however, ISHs may be large enough to exert enormous pressure on national cultures to change to accommodate the requirements imposed by the technological, corporate and bureaucratic forces by which it is driven. As Samarajiva has noted

Almost without exception, satellites have been touted at introduction as deliverers of education, telemedicine, participatory democracy and other "motherhood" benefits to the poor, the rural and the powerless. This has been the case in Canada, Alaska, and Australia, as well as in Third World settings such as India and Indonesia. And almost without exception these systems have been used for telephony and extension of entertainment television and not for the original purposes (1990,13).

In the view of Samarajiva's the explanation lies in the fact that the state has become the 'interlocutor between the world economy ... and domestic forces' (10). If so, citizens will have to consider how they may exert more influence on the role of the state in this process.

The Japanese communication scholar, Ito, approaches the question of national culture differently. Rather than focusing on the role of national cultures as filters through which the ISH technologies must pass, Ito (1993) assumes that countries will have to adapt to new technologies if they are to prosper and considers the different capacities of such cultures to develop modern societies that depend centrally on advanced information technologies. He observes that economies in advanced industrialised countries are becoming increasingly 'international or global' and asserts that 'informization' is 'reinforcing this trend' toward national market based economies connected to the international market system. In his view, however, given the varied experience of contemporary moves in many countries to foster a market economy, there is a question as to whether all cultures are equally capable of developing successful market economies. Like our earlier scholars, he sees the central problem as the belief that the development of a successful market economy requires change only in the economic system. Instead, in his view, the transition involves changes in political, social, cultural and value systems (1993,159). Ito examines the historical experiences of modernisation of Japan, China and Korea. He asks three questions. First, 'how does the basic culture cope with competition?'
Second, 'does the economy have enough and appropriate resources (especially human resources) to effectively compete?' Third, 'how does the culture cope with the changes caused by participation in competition?' In his answers to these questions there is a clear implication that governments have a responsibility to plan carefully for the introduction of change which involves changes to fundamental values and political, social and cultural relations (159-66). It is a conclusion which can be linked with Chesneaux’s call for a focus on application, technical pluralism and ethics and with the quite general view among communication scholars that national cultures constitute a site on which the terms of entry for new information and communication technologies should be negotiated. It also connects us to the idea of the public sphere.

The Importance of the Public Sphere

The degree to which different national experiences support or oppose public sector involvement in the development and operation of communication has assumed a new relevance recently. In an age of increasing commercialisation globally, there is a question concerning the extent to which people are to be seen as consumers (and therefore primarily as discrete individuals) and the extent to which they should be seen as citizens (and therefore primarily as contributors to a larger social entity with larger community responsibilities). If it is true, as some have argued (eg McKenzie Wark, *Australian*, 6 April 1994a), that private sector domination of communication invariably involves treating the individual as consumer rather than as citizen, societies with a concern to maintain a focus on common social goals and cohesiveness will need to think carefully about their policies in regard to new developments in communication infrastructure and control driven by deregulatory considerations. This task will be complicated by the fact that experience may dictate that a particular mode of communication control (eg private sector or public sector) may be seen in different national contexts as providing different outcomes. For example, as we have seen, a largely deregulated environment may be seen in the USA (despite the obvious existence of unease there also) as providing the greatest measure of freedom, whereas in Sweden or Australia, it may be seen as more threatening. The former Prime Minister of Singapore has observed, moreover, that the ideal of democratic individualist freedom itself may be a misleading one in relation to societies whose people require 'good government' before they demand individual freedom (Lee Kuan Yew, 1993,7-8). The historical place of communication in the national experience, the extent to which this persists as a factor influencing planning for the future, as much as anything, will determine the response in the first instance. The importance given to particular goals - individual and social - will be vital. It is a consideration which leads us to the notion of the 'public sphere'.

In recent times the notion of the public sphere has become a major focus in theoretical discussions of communication. Jurgen Habermas has defined the public sphere as a realm of our social life in which something approaching public opinion can be formed. Access is guaranteed to all citizens. A portion of the public sphere comes into being in every conversation in which private
individuals assemble to form a public body. They then behave neither like business or professional people transacting private affairs, nor like members of a constitutional order subject to the legal constraints of a state bureaucracy. Citizens behave as a public body when they confer in an unrestricted fashion ... about matters of general interest. In a large public body this kind of communication requires specific means for transmitting information and influencing those who receive it. Today newspapers and magazines, radio and television are the media of the public sphere ... The expression "public opinion" refers to the tasks of criticism and control which a public body of citizens informally _ and, in periodic elections, formally as well _ practices vis-a-vis the ruling structure organized in the form of a state (Habermas, 1974, 49).

It is not the intention here to follow closely the Habermasian elucidation of the concept though we will be concerned both with the potential for citizenship he sees in it and with his fears in regard to its 'refeudalisation'. The important point in the present context is Habermas' belief that the public sphere continues to be indispensable despite the passing of the essentially bourgeois society from which it emerged. If we conclude that there is contemporary relevance in the notion of the public sphere, one of the benchmark tests in our attempt to assess the likely future of ISHs will be their possible implications for the place, practice and efficacy of public communication.

Habermas has taken as his territory the sweep of history 'from the Renaissance to the mid-twentieth century'. According to Peters (1993, 544) Habermas seeks to revivify democracy in contemporary circumstances by retrieving the idea of a 'sovereign, reasonable public, nourished by the critical reporting of the press and engaged in the mutually enlightening clash of arguments'. He seeks a 'communicatively generated rationality' rather than a representationally imposed one (Roderick, 1986, 43). In the modern world of increasingly industrialised, interconnected, nation-states Habermas sees a weakening of the public sphere as large organizations and the state increasingly reach accommodations out of sight of the public. For this trend to be reversed it will be necessary for there to be a 'rational reorganization of social and political power under the mutual control of rival organizations committed to the public sphere in their internal structure as well as in their relations with the state and each other' (Habermas, 1974, 55).

To make the connection to the preceding section clearer, it is necessary to note here that Habermas draws on a particular reading of post-Renaissance bourgeois European society in which traces the emergence of an active, important 'link between the people and the state via the public sphere'. In this, while the press was the most significant part, Habermas' ideal form of public communication lay in the more participatory aspects of eighteenth century society, 'the salons, coffee-houses and other mini-republics of letters' which spawned the 'ideal of free communication' around which his work is centred, though he was careful not to claim that the ideal had been achieved (Peters, 549-52). His emphasis on 'participation' rather than 'representation' leads him to require of public communication that it be more open, or, to employ language more appropriate to a discussion of ISH, more truly interactive. For Habermas, mass media (of which he is less dismissive and more hopeful than
his first generation Frankfurt School predecessors) is as yet too much concerned with representation and too little with interactivity. The mass media capacity for the presentation of spectacle cannot disguise the absence of 'common access to participation' (546). It is this which permits him to write of the contemporary 're-feudalisation of the public sphere' as a reversion to a pre-eighteenth century model of public communication which fails to support public participation. It is this also which should lead those with an interest in the preservation of the public sphere to be attentive to the possibilities and pitfalls contained within the ISH movement. In particular, if the capacity for interactivity is as potent as the literature suggests, it should become a major interest of proponents of the public sphere to ensure that its potential for refurbishing that particular 'realm of our social life' is realised.

It is important, however, to recognise the necessity for the location of the public sphere formulation within particular unfolding historical traditions. The public sphere notion will mean different things in different societies. The imperatives within different traditions will vary. In Habermas' case, it is one which privileges a certain understanding of democracy derived from his experience as a German citizen of his generation. Lee Kuan Yew, in the discussion of democracy referred to above, although accepting the validity of a Western human rights priority, also sought to locate his assessment of practically available forms of governance in Asia within relevant Asian historical contexts rather than simply adopt a model from another tradition. As such, his argument emphasised public communication's role in fostering social discipline rather than the creation of an arena of public debate. This reminds us that there are many reference points for the idea of the public sphere other than that provided by Habermas. To one degree or another, however, all involve the creation and maintenance of a social zone in which citizens can come together communicatively to conduct public discourse that is relatively free from the restraints of corporate or state interests. Later, we will return to a different usage of the notion of public sphere and its relevance for new information and communication technology.

Finally, here, it is important to emphasise that the public sphere may come under threat not solely from state or corporate interests but from a more fundamental struggle over access to ISHs. It is a question of the security of the ISHs which has arisen from the experience with Internet. Rheingold (1994) has described the societal dimensions of this conflict. Wallich (1994) has considered both its technical dimensions and the extent to which the operations of Internet to date have relied upon 'collegial trust and mutual forbearance' (72). At its heart lies a contest between those who insist on maximum openness and those who seek maximum closure or security, usually through the adoption of increasingly sophisticated methods of encryption. Some insist that while some privacy is necessary, it is simply impossible to have 'absolute privacy' in a network within a democracy and that to seek it would be to erode democratic principles. Others anticipate the 'balkanization' of Internet by which, through the installation of 'fire walls' (a computer which protects internal computer systems from intrusion), it becomes a zone of private enclaves rather than an inclusive net. While some regard these as undemocratic, in the view of Marcus Rannum of a company called Trusted Information Systems (which participated
in the installation of a Whitehouse 'fire wall'), 'brotherly love falls on its face when millions of dollars are involved' (Wallich, 80). Although the implications of this contest for the public sphere are uncertain, it is clear that they will be important.

**ISHs, Human Resources and Society**

Discussions of human resources and ISHs frequently focus on anticipated changes in work patterns. While this is an important focus the view taken here is that the concept of human resources ought not to be conceived of narrowly as simply training people as factors of production or as consumers. Instead, it is suggested that the notion of human resources should be conceptualised more broadly as the development of human potential supporting the evolving socio-political and cultural framework that is commonly accepted by the citizens of a particular geopolitical entity. That is, it is argued here that training for citizenship rather than simply for consumption should frame the way in which the idea of human resources is understood in this context. Such an approach may go some way toward overcoming the neglect of social issues that, according to Van Zoonen, has characterized information technology debates to date (1992, 26). In this section we look at some predictions concerning employment patterns that may follow the widespread deployment of ISHs (and some other technologies and systems) and at some of the speculation on the possible societal implications of convergent information and communication technologies.

It is not easy to find convincing work on the likely human resources implications of ISH. Indeed, it seems sometimes that the task is simply beyond our predictive capacities. The following seem to be common assumptions in the more optimistic discussions of ISHs:

1. People no longer wish to work away from home and will not have to do so as homes become linked to ISHs and people accept the new technology and the need to be competent in its use.
2. Connectivity will increase the sub-division and geographical dispersal of work which was previously unified and centralised.
3. As a result there will be different ways of building communities which may lead to the final disappearance of the company town phenomenon and the rise of Rheingold’s ‘virtual community’ (Rheingold, 1994).
4. These communities will be increasingly electronic and may be less frequently based on human contact and co-location.
5. Employees will be more frequently on specific task contracts and will have a different allegiance to employers, stronger ties to professional bodies (networks) and more openness to working in groups that coalesce for a limited time around particular projects.
6. Time-shifting will erode the traditional delineation of working periods into blocks of days of specified, uniform duration.
7. Part-time work will become more the norm.
8. Older notions of hierarchy and line responsibility will become obsolete and mandatory retirement will become less relevant.
The science weekly *New Scientist* has attempted to put some flesh onto the enthusiastic but skeletal projections of likely changes in work patterns. It offered its predictions as to areas of contraction, growth, transformation and new trades. Under **contraction** it listed the following categories and the technology which would replace them:

- **air couriers** (high-speed data networks)
- **answering machines** (computers)
- **insurance claims assessors** (neural networks)
- **bailiffs** (electronic credit freezes)
- **checkout staff** (image recognition software)
- **cash register suppliers** (computers)
- **coal and solid fuel merchants** (electricity)
- **company registration agents** (networks)
- **dictation and secretarial services** (voice recognition software)
- **layout artists** (computer templates)
- **duplicating equipment** (computers)
- **factory cleaning** (intelligent robots)
- **film processors** (digital, chemical-free film)
- **hotel booking agents** (software)
- **industrial relations arbitrators** (employment deregulation)
- **notaries and commissioners of oaths** (video recordings)
- **draughting equipment makers** (computer-aided design)
- **typewriter manufacturers** (computers)
- **window cleaners** (intelligent robots)
- **airlines** (rising fuel prices)
- **middle managers** (networks).

Under **growth** the list offered was as follows:

- **advertising** (opportunities in new media)
- **alarms and security equipment** (rising crime due to unemployment)
- **corporate entertainment** (to keep staff/customers happy)
- **sports equipment** (more leisure time)
- **hi-fi and computer dealers** (technology convergence)
- **cellular radio dealers** (more networks)
- **cable manufacturers** (more networks)
- **environmental systems** (tighter laws)
- **recycling** (tighter laws, higher material costs)
- **computer programmers** (need for better interfaces)
- **designers** (producing and choosing computer templates)
- **telemarketing** (wider access to public)
- **career consultants** (increased redundancies)
- **trauma consultants** (rise in random criminal acts)
- **personal matchmakers** (less time for workers to socialise)
- **escort services** (importance of appearing sociable in public)
- **cruise companies** (for leisurely business trips).

Under **transformation** the concern was with the move from physical to electronic modes of operation. This was likely to occur in the following areas or professions:

- market research
- novelty goods
- lawyers
doctors
surveyors
cinema
detective agencies
estate agents
journalists
writers.

For new trades the journal was able to conjure up only three:
- internet plumbers (maintaining the ISIs and their domestic cul de sacs)
- workgroup synthesisers (bring together ideas from scattered staff)
- system hosts (Internet DJs and talk-show hosts).

While the lists to some extent are both speculative and tongue-in-cheek the underlying implications are important. Considerable adjustment is going to be required of individuals, institutions and nations. That adjustment will necessitate more than simply marketplace responses if potentially damaging pressures on societal support systems are to be managed successfully. The public sphere, in all its senses, will be a necessary part of a sufficiently broadly based response. As the lists imply, it is essential to recognise that although ISIs may be the central technology, they are not the only source of runaway technological and systems change. Biotechnology is a clear example of technolog- change which challenges society at many points and which has the potential to cut employment in agriculture on a scale that may dwarf the influence of the earlier European agrarian and industrial revolutions.

The broader the sweep of change considered the more sober is the assessment of the human resources implications. The distinguished historian Paul Kennedy (1993), writing speculatively on twentieth century prospects, points out that the forces driving contemporary change (which he terms 'globalisation') are neither philanthropic nor committed to the maintenance of existing geopolitical entities. In a context of burgeoning population growth, growing environmental degradation, a deepening gulf between rich and poor and tightening raw material markets, the mobility which new information and communication technology offers corporations gives them the power to transfer investment and, therefore, economic activity and employment, to wherever the costs are lowest, the returns on capital greatest and legislative restrictions are least likely to interfere with profitability. Kennedy asks "how, indeed, will a technologically sophisticated, transnational, corporate culture, loyal to no government and beyond the reach of local regulation, coexist with the polyglot, hungry and dissatisfied masses foreshadowed by a world population of 8 or 10 billion?" (1993, 58).

Nor is this a problem only for citizens of developing countries. In developed countries such as the USA there are two broad categories of employees: those whose skills make them internationally marketable in a global information society - software designers, biotechnology engineers, strategic planners, etc - and those whose skills are more readily learned - the fast-food server, the policeman, the schoolteacher, the blue-collar worker - and who are locked into a local or a national economy. In the USA some four-fifths of Americans are outside the charmed circle of the those who have become 'functioning and
prosperous parts of a borderless world'. Moreover, within this group higher paid blue collar jobs are being replaced by millions of new ‘low-paid casual or unprotected jobs requiring few skills and offering little opportunity, such as work in fast-food stores, gas stations, discount supermarkets, hotels, and cleaning and gardening services’ (Kennedy, 1993,59-60). Similar trends are evident in Australia where overall unemployment passed the 10 per cent mark in 1991-2 and where youth unemployment reached as high as 50 per cent in pockets. According to the social researcher, Hugh McKay, at least some of this can be traced to the impact of information technology (1993,89-90). McKay points out, moreover, that this structural unemployment has intensified social problems as a consequence of the loss of work’s ‘therapeutic’ function to these people. A growing number of Australians, he suggests, are going to have to be helped to adjust to ‘a life of unemployment, part-time employment or occasional employment’, to ‘the prospect of having several careers rather than one’, and to be taught how to ‘structure and enrich lives which would otherwise be structured and enriched through work’ (90-91).

The principal agencies concerned with anticipating communication futures in Australia do not appear to have these issues firmly in view. The Bureau of Transport and Communications Economic (BTCE) in Canberra, for example, has been engaged in a large scale attempt to draw together the diverse threads and to make policy sense of the convergence phenomenon in communication technology in its Communications Futures Project. The endeavour has wide-ranging terms of reference with a particular interest in the relationship between emerging communications technologies, market developments and implications for future policies. The research plan that underpins the work is divided into ‘four streams’: services, content and marketing; delivery technologies; market behaviour; and policy and regulation (Cheah, 1993,116-17). Although the last of the ‘streams’ expresses some interest in employment potential and ‘social policy implications’ and ‘promoting national culture’, it is difficult to detect any overwhelming commitment in the plan to exploring these though judgement on this will have to await the final reports. The early products of the undertaking have appeared in the form of two substantial work in progress papers which cover the first two ‘streams’ (BTCE, 1994a and b). The first seeks to establish an analytical framework. It is noticeable, however, that the paper’s focus is on the likely uptake of such services and pays only modest attention to the human resources aspect except insofar as the uptake rate is affected by the perceived ‘utility offered by a service and the precision with which it meets the users need’ (1994a,76).

The paper suggests that communication services fail when they do not meet a need or when they duplicate existing services inefficiently (82). However, it appears to identify needs as existing essentially either at ‘the consumer level’ or the ‘business level’ (81). This conclusion seems to be confirmed by the paper’s use of the categorisation of needs provided by Newstead (1993) which asserts that for an innovation or service to be successful among consumers it must meet the following needs: survival (including health and security); socialisation (including social, family, and sexual relationships); esteem (including status, confidence, wealth and power); leisure (including entertainment, culture and hobbies); and development (including education and personal efficiency).
encompassing as this list is, the absence of any specific, developed reference to employment implications is a somewhat surprising omission (BTCE, 1994a, 82). So, too, is the paper's neglect of research focused on the 'changing structure of Australian society' (Langdale, 1994, 13). It is certainly no less important, that there is no reference to potential users as citizens. This links us to Kennedy's observation regarding the absence of philanthropy in the impetus behind ISHs. The ISH phenomenon, should it take off, will be driven by market forces. If it its development is left entirely in the hands of the market, however, accommodation of people will be as consumers rather than as citizens. It will be a development the object of which is not to maximize or to enrich employment but, understandably, to achieve economies. The question that arises, then, is who will address the broader social implications of this technology. This question links us to the earlier discussion of the public sphere and to the issue of how human resources, in the broadest social sense, may be best served by ISH technology.

The Futures Project is not the only Australian example of a relatively narrow framing of analyses of converging information and communication technologies. A recent draft report from another Australian organization, the Australian Science and Technology Council (ASTEC), has been criticised by Wark (1994b) for its failure to understand the wider implications of ISH-related developments. ASTEC's concern was to assess future research data network requirements in Australia. Its draft report focused on Internet and its Australian component, AARNet, which was set up by the Australian Vice-Chancellor's Committee to 'run the backbone of Australia's Internet' (Wark, 1994b).

Although the report acknowledged that AARNet is a 'strategic national asset', that it is 'evolving into a public knowledge and communications utility', and that access to it should be widened, according to Wark the report's weakness lies in its narrow definition of data needs as relating essentially to 'big science and technology' research. What it fails to appreciate is that it is dealing less with a data network than with an essentially new means of communication which, like others before it, will have to await the emergence of 'an appropriate cultural form' before its most fundamental economic shape is revealed. Given its status as an evolving means of communication the report's suggestion that a cost recovery regime replace government funding and that AARNet be listed on the stock exchange demonstrates 'how little its authors know about the history of Australian communication regulation'. Wark concludes

The ASTEC report takes a very narrow view of the future value and use of Internet ... At best it represents some of the issues as they occur to some of the interested stakeholders. Its view of the economic benefit of wiring-up big science research to industry is highly partial and questionable. It ignores the fact that among our most successful export industries are communications, culture and education ... In fact the report does not even seem to be aware that it deals with communications issues.

That AARNet is increasingly part of the 'public sphere' was completely forgotten in the establishment of the terms of reference for this committee an alarming oversight.
Whatever the validity of Wark's concerns, they were to no avail as AARNET was sold to Telecom in May, 1995. That Wark's concerns are not unique, however, is confirmed by a recent *New Scientist* editorial which commented that science and technology provide the possibilities, but the form of the digital revolution will depend on people, politics and money... The bosses of the companies that are getting ready to lay the digital superhighway... believe that everyday life will be transformed and billions made... The digital highways are being built in the hope of creating demand. But will anyone really want to pay for 500 television channels? And how much will it cost to do all your shopping in a virtual mall?... Internet provides an example. It began in the 1960s as a network data intended to let a few scientists swap data. Now, in the 1990s, it is used by millions of people for the most human of activities—sending messages. It has helped to create a new form of communication unlimited by distance. If you are stuck for information about some problem... you can find a kindred spirit somewhere out on the Internet. Take this model, and the digital revolution could create new opportunities for communication, building communities, and developing greater participation in democracy. These are not activities that will make anyone a billionaire (16 April 1994).

Rheingold (1994) agrees. Commenting on USA Vice-President Gore's National Information Infrastructure vision, Rheingold recognises that there is a 'very small number of people controlling this giant machine' but is hopeful that users eventually will be able to take control through network manipulation. The problem is that their capacity to do so rests on the extent to which they can establish their own links in order to communicate in virtual communities without interference from corporate agents. The only way to guarantee this, however, is through legislation that prevents 'megacorporations' from controlling the 'wires' that connect the 'communities' (quoted in *New Scientist*, 16 April 1994). Of course this will raise the question of who controls the legislators.

In this context the experience of Internet is once again instructive. Recent US Internet growth has been business-driven. In 1993 the internet doubled in size to include about 25,000 networks globally. Of this new growth, three-quarters was from business so that around two-thirds of networks now are company owned. By contrast Internet users from countries such as Australia and Taiwan are predominantly academics. Even Singapore, which has made a point of developing business use of Internet remains a predominantly research and education user. Hong Kong, by contrast, uses Internet largely for business purposes (Johnstone, 1994). Countries such as Singapore, and more particularly, China, have displayed some nervousness in the face of the ISHs potential for bringing profound societal change. In February of this year China's Government charged the Ministry of Public Security with the responsibility for supervising all computer information networks. Ultimately, however, that even the formidable powers of the Chinese State may be stretched by this endeavour is suggested by the failure of the prohibition on its citizens dialing bets through to the Hong Kong Jockey Club's computer betting system.
Gender and New Technology

No discussion of the 'human resources' implications of ISHs should overlook the relationship between new communication technology and gender. Yet that, very largely, has been the case among both scholars in general and feminists in particular (Flynn, 1994, 15). We referred above to the capacity of new technologies to alter relations of power and access to power in society and noted that new information and communication technologies are seen as important in this connection. Although there is little doubt that, historically, women and men have not had the same access to these technologies it is noticeable that ISH discussions to date have not addressed this issue in any sustained fashion.

Much of what little literature there is that addresses the relationship between gender and new information and communication technologies comes from feminists. This literature is stimulated in part by the presumption that men and women have different relationships and experiences with information and communication technologies. An important aspect of this analysis has been the distinction between the public and the private sphere of women's experience in which women are seen to have different roles in the home and the broader society. Technology often has been seen as part of the male-dominated public sphere while its intrusion into the home sometimes has been seen as diminishing the more female qualities of the home environment. In a review of the general literature on gender and new technology Frissen identifies several themes: women lack equal access to technology creation, design and production; technology is constructed, socially and culturally, as a male practice in male institutions; women are excluded from decision making; technology is used as a patriarchal means of controlling women as well as nature; women's role is seen as confined essentially to the private sphere but that new technology, designed largely by men, has increased their efficiency but has not reduced the time spent by women on domestic work (1992, 33-5).

Given that the new information and communication technology concepts are seen as more dynamic and as blurring the distinction between the private and public spheres, Frissen notes that questions also arise as to what the consequences may be for women in terms of uses, effects and futures. Among those in the public sphere are whether ISH developments will further marginalise women; whether they will mean that women's work will continue to be less well paid, duller and lower quality; whether they will place more women in unemployment queues; and whether they will require different education strategies in order to prepare women for participation at higher levels. Among those in the private sphere are whether ISHs will deliver the very practical services women need rather than the heavy concentration on leisure, games and 'pink traffic' pornography services that has characterised much home NICT use to date (Van Zoonen, 1992, 25); whether they will reinforce further existing gender separation in regard to household tasks; whether they will be structured around the idea of women as consumers rather than as citizens; and whether they will destroy the present function of the home as something of a refuge from the relentless commercialism of the public arena.
A major question arising directly from the perceived tendency of ISHs to blur the distinction between private and public concerns the relationship between domestic and private work. Frissen asks whether one of the potential dangers of information technology is that it can be used to create a new cheap female labour potential by telework and homework with computers. If this does occur it will mean that the traditional division of labour between the sexes is not disrupted, but only intensified (42-3). Moreover, although telework and tele-education may offer the possibility of combining mothering with paid jobs, further questions arise as to the social implications of women being confined even more strictly to the home. Any change in communication which saw women 'become even more isolated from the outside world' with 'communication and interaction patterns...centred around machines instead of real people' would see women 'not only isolated from the public domain, but in the private sphere as well' (43). Frissen sees the principal relevant concern for the ISH debate in the feminist literature as the focus on exclusion and whether its operation will produce a feeling of being 'trapped in electronic cages'. At the same time, however, it is necessary to ask whether this view is not too much influenced by feminist dogmas which derive from 'an uncomfortable image of women as victims'. To determine the answer to this question more research must be conducted on the 'complex relationship between gender and such technologies in order to compensate for previous neglect (45).

The major reason for this neglect may be the fact that such technologies 'do not seem to have acquired great relevance in people's daily lives yet', perhaps reflecting the extent to which 'the information revolution is driven more by technological and economic considerations than by the existence of social needs and interests' (Van Zoonen, 1992, 10-11). In the particular case of ISH technologies their emergent and, therefore, uncertain status compounds the difficulties of establishing a sensible discourse. A further reason may lie within feminist scholarship itself, specifically in the conceptualisation of technology issues by different groups of feminists. Van Zoonen suggests, for example, that both the liberal and ecofeminist positions are 'problematic' due to 'their universalist and essentialist notions of gender' (19):

Both conceive of femininity as characterized by emotionality, prudence, co-operation, communal sense, compliance, etc., while masculinity is associated with opposite values such as rationality, competition, individualism and ruthlessness. While liberal feminism has it that we learn to accept these canons as natural through women's mothering role in the family and through other socialization agents such as the mass media, ecofeminism believes in the innate essential nature of these differences. Both neglect differences between women along lines of ethnicity, class, culture, nationality, etc. and elevate gender to the most important aspect of women's existence. Radical feminism does rejection of biology and anatomy responsible for gender, liberal feminism by giving primacy to the psychoanalytic formation of the gendered subject through the supposedly universal process of mothering.

In the specific context of gender and technology, neither approach has helped clarify the position. In liberal feminism, the society tends to be taken as given and technology itself remains largely unquestioned. Instead, women are
expected to adjust to society and, therefore, to technology. In ecofeminism, because it is viewed as largely male, the tendency is simply to reject technology.

Van Zoonen's analysis of the connection between gender and technology takes the view that attention needs to be paid to the cultural and historical contexts as well as to their 'social-economic location' (12). In this approach, gender should be seen as a 'discursive construct'. That is, 'not as a fixed property' but as part of the continuing cultural production of meaning 'subject to ongoing discursive struggle and negotiation' between 'contending frames of reference' (21).

Technology, in this approach, while it may not always be profitable to view it as discourse, must still be seen as a constructed notion which both influences, and is affected by, the contexts in which it operates (the user, environmental and cultural contexts). Thus, when the telephone appeared in the United States, it was marketed as a device for professional males and although attempts were made to reinforce this through legal means, the majority of users — women — 'resisted and overruled these prescriptions and turned the telephone from a rational, business medium into an instrument for maintaining friendship and kinship' (24). Van Zoonen's point is that the failure of feminist thinkers to develop useful responses to new information and communication technologies results from the flawed approaches taken by the major groupings, such as the liberal feminists and the ecofeminists, whose discourses are concerned largely with exclusion or difference. They are essentially totalising claims which are incapable of accommodating the ways in which women respond in specific situations to specific technologies.

Some Implications for Legislators and Communication Educators

In this section we focus briefly on some of the implications of the preceding discussion for both legislators and communication educators. Several points can be made in relation to legislators.

1. For legislators the central problem posed by ISHs arises from the need to be clear as to what kind of societal development is desirable, about what implications for society lie in differently controlled and configured ISH systems, and how much distance there is between the two. As it can be assumed safely that in the absence of intervention, corporate sector values will dominate ISHs, the problem becomes one of deciding what kind of intervention is necessary and possible in order to achieve the desired societal result on behalf of the whole community rather than simply bowing to the interests of the national and/or international corporate sector. The most fundamental question, then, is how a statement of 'public interest' in ISHs can be constructed.

2. While addressing this question there needs to be a moratorium against committing society to corporate, administrative or technology driven solutions until adequate public discussion of ISH possibilities has taken place. This means ensuring, where possible, that no fundamental, irrevocable alterations to the regulatory and control systems involved are permitted in the interim. It is essential to recognise that at bottom, the
initial stage in the ISH manoeuvring has been about control of the 'wires' that carry the information and about mergers between the 'wire' controllers and the content controllers. While 'privatisation' and 'deregulation' have flourished in a climate of government budgetary shortfalls around the globe, there is some evidence to suggest that those countries which retained a significant measure of communication pluralism have been able to provide greater choice for their citizens.

3 Addressing this question also involves recognising the essence of what lies behind technology anxiety. Although it can be demonstrated historically that some fanciful claims — both optimistic and pessimistic — have been made about various new technologies, technology anxiety (which finds expression among corporations and government agencies as well among members of the public) has concrete underlying concerns. Frequently, these are less to do with the technology than they are with defence or enhancement of economic, political, social or cultural position. Adequate public discussion, therefore, ought to include these broader matters rather than be confined to matters of technology, commerce or administrative convenience. These are matters which arise from the concerns of individuals or interest groups about their personal or institutional place in society.

There are also issues which arise from concerns about the overall societal values privileged by any major new technology and the way it is operationalised. In this context the ideas of work and community become important. Arguments that globalisation should take precedence over say, national interests, in certain cases may have merits. If, however, globalisation is being driven by values which are antithetical to locally or nationally accepted practices or beliefs, it may be wiser to seek to modify the operation of ISHs in order to allow for the continuance of these values. Does a technology which has the potential to be physically isolating, to confine individuals in 'electronic cages', necessarily suit all peoples in all societies? If ISHs are driven essentially by commercial values which seek to commoditise people's private time in their homes (home is where the heart is), is this an optimal use of the potential for societal enrichment contained within ISHs? If the operation of ISHs promises to reconfigure the workforce into a highly skilled elite with internationally marketable skills and an insecure majority starved of high quality information and technologically incapable of (or excluded from) engaging in important societal decision-making, will there be a price to pay in terms of political, social and cultural volatility?

There is also a paradox to be considered in the extent to which the convergent technology, on which ISH depends, threatens to impose simultaneously both social isolation and a loss of privacy. If either possibility is real legislators must seek means of protecting citizens against these in the interest of retaining a healthy society. In particular, legitimate concerns over the security of data traffic must not be allowed to generate an unnecessarily restrictive approach to ISHs.
6. Fundamental to all the foregoing points is the maintenance of a healthy 'public sphere' defined as an open, interactive zone of communication located, as far as possible, outside undue corporate and government control. Commitment to this should be a central objective in any consideration of ISHs. Consideration of this involves both the setting of principles, standards and targets and the allocation of resources to matters such as the training and education of all citizens in the use of the systems and the guaranteeing of access for all citizens to an essential array of information and communication services.

7. Research into what these services will be should be a funding priority. As well, research into likely ISH work patterns and education for cyberspace to prepare people, as citizens, to inhabit both cyberspace and geospace will be important as people, institutions and governments strive to develop a new sense of reality capable of functioning in a world where formerly sharp distinctions between reality and fiction are crumbling. As Carey (1993,5) observes, accepted binary distinctions, such as public and private, male and female, black and white have become porous boundaries as part of a larger cultural categories crisis in which there is a 'cultural melt-down' but where it is unclear what will replace the terms on which we have navigated our sense of the world and our own nature for at least the last hundred years.

8. Finally, another important issue arises in connection with groups already disadvantaged, or who perceive themselves to be disadvantaged, and for whom special provision may have to be made. In this paper we have considered gender as an instance of this, but we might as easily have taken ethnic minorities, youth, the aged, the unemployed or a variety of cultural interests as examples of groups for whom special provision should be made. There are also a host of more society-specific questions to be considered. For example, what language(s) will any ISH development employ?

For communication educators the problems begin with the need to incorporate converging ISH technologies more adequately into their research and teaching programs and into their theoretical delineation of communication. Samarajiva (1990,6) has argued that 'the central theoretical problem of telecommunication policy, Third World or otherwise, is the problem of the state'. The difficulty lies in knowing precisely what any state stands for in the telecommunications policy process. Samarajiva notes that although the 'sub-field of telecommunication policy has burgeoned in the past two decades', this work has been criticised for its descriptive, atheoretical character. Some conceptualizations of the field have tended to omit telecommunication and where it has been considered, communication is sometimes treated essentially as information within an essentially transmission framework. Garnham (1992) has observed that

The term 'telecommunications' covers all forms of electronically transmitted messages ... But, while it is true that in the US the term is sometimes used in academic institutions to cover the study of broadcasting as well as switched telephone networks and their modern
developments, it has more generally been the case that the study of the media has excluded the study of telecommunications, leaving the field to engineers and economists. Moreover ... the field of telecommunications is seen as ... administrative rather than critical and as inevitably contaminated by the alien values of a technocratic and policy elite.

At one level this is surprising. If one defines the major focus of media studies as being the study of the manifold implications for the individual, for social groups and institutions and for society at large of the historically successive shifts from a-communicative world dominated by face-to-face communication to one dominated by ever wider and deeper processes of technical mediation, the development and utilization of telecommunications has been a key and increasingly dominant factor since the introduction of the telegraph ...

At another level this neglect ... is not surprising if one considers the way in which the field has been overwhelmingly dominated by the concern with the message or text and its effects, rather than with the ways in which the institutions of production and distribution structure the wider social relations of communication. The result has been a tendency simply to see telecommunications as transparent (Garnham, 1992, 340-1).

It is also worth observing that those outside 'media studies' who have concerned themselves more centrally with telecommunications - engineers, economists, policy-makers - also have displayed limitations which may be summarised firstly, as a neglect of the social implications of new communication technologies and, secondly, as a tendency to conceive of communication as information and to employ a transmission analysis. The initial task for communication scholars, then, will be to incorporate ISHs into communication scholarship in a manner which treats them as a communication rather than as a transmission issue and in an analytical framework which facilitates examination of their broader societal implications. The fundamental issue they face is recognising that they are part of a perpetual historical process of reconfiguring society's information and communication infrastructures and operations which advantages some groups and disadvantages others.

The sting in the tail of all this for educators somewhat highmindedly considering the most socially responsible way of responding to the transformational potential of the ISH prospect is that ISHs will plunge educators at all levels in the vortex of change. For almost the first time the phenomenon of technological cost reduction will hit educators as hard or harder than other sectors of the community. Most technologies are driven to a significant extent by a perceived need to target and reduce high cost components of productive systems. In general these have been high employment components. The larger the employment in a function the greater the incentive. The more susceptible the function to systematisation and technological packaging the quicker and more comprehensively it has been targeted. The agrarian revolution targeted the cost of agrarian employment. The first industrial revolution attacked the cost and limited productivity of manufacturing employment. The later industrial revolution, through
bureaucratisation and systematisation, addressed the question of rising costs in the control function necessitated by increased industrial productivity. With the rise of 'information society', robotisation, computerisation and networking on a global scale have emerged as tools to cut away at the employment blowout in the information/communication sector. In a sense the writing was on the wall when Porat (1978), among others, publicly identified the broader information services sector as the largest employment concentration in modern societies at the end of the 1970s.

Educators must now recognise not only that they are part of the information sector but that the new focus of cost reduction pressures around the globe is squarely on that sector. Moreover, just as the information sector is defined as an industry which is measured essentially in terms of profitability rather than in a social objectives framework, so, too, will education tend to be assessed by utilitarian yardsticks. The more information is conceived of as a commodity (Martin, 1988, 52), the more education will be viewed in the same light. The long established practice among educators, of viewing their work as a calling apart, a specially licensed occupation which stands separate from commercialism and which has responsibilities for the cultural, moral and ethical reproduction of society, will be eroded increasingly by the logic of cost-cutting.

While this tendency is not new, the difference as we approach the millennium is that there now exists a technology which is developing rapidly the capacity to systematise, routinise and deliver, in an increasingly interactive mode, from single points to scattered but vast audiences, a consumer product called education. The Open University concept as it has operated to date has barely scraped the surface. Private and public institutions not previously involved will see it as both possible and essential to enter the education 'business'. For the private sector, the combination of ever-intensifying competition, a technology that allows them to shape, control and market a relatively new product for which there is a growing, changing demand, and a rising pool of unemployed or underemployed education specialists (educational human resources) will be irresistible. Already there has been a spectacular growth in private sector niche education services in Australia. For the public sector, governments under immense pressure to slash expenditures and the need to find new functions to justify threatened budgets, will produce a new spirit of competition so that, for example, the ABC in Australia, which for so long sought to dump its educational responsibilities, has now entered the distance education sector (admittedly in partnership with existing universities at present) with some relish. If it appears commercially viable it may be that the private media will follow.

It is unimaginable that in the longer term these private and public sector developments, in a deregulatory environment, will not produce pressures for further and possibly radical reorganisation of the education 'industry'. Educators will have to face the realisation that the discussion over the implications of ISH for society, particularly that component which focuses on the contrasts and connections between citizenship and consumerism, will also be a debate about the structure, status, control, purpose and values of their own profession. The immensity of the stakes that rest on the outcome of these
discussions demands that educators address them with the utmost urgency. As Kennedy (1993,339-40) observed

Social thinkers from Wells to Toynbee have repeatedly argued that global society is a race between education and catastrophe; and those stakes are higher at the century's end, simply because population pressures, environmental damage, and mankind's capacity to inflict mass destruction are all far greater ... An enhanced role for education implies many things, both philosophical and practical. For example, since technological innovation creates new jobs as it destroys old ones, developed countries which do not possess a national system for training and retraining ... will probably find themselves more disadvantaged than they are now. Moreover, not only economic productivity but also the social fabric suffers ... [T]he systems that work rely upon planning and cooperation among schools, business, and government, which laissez-faire political cultures dislike and poorer countries lack the resources to maintain.

The challenge to educators in general is substantial. ISH technology is capable of reshaping the delivery of education. The more fundamental issue, however, is that the values and concerns that in general have underpinned education in many countries for generations (the responsibility to present a broad range of value systems and to provide both a reflective and critical forum) will be undercut by the extent to which the ISH development is constructed around the singular value system of the market place. Such development would leave us with the essential sterility of a monocarpic education system at a critical juncture in human history. To quote Kennedy again

... education in the larger sense means much more than technically "retooling" the workforce, or the emergence of professional classes, or even the encouragement of a manufacturing culture in the schools and colleges in order to preserve a productive base. It also implies a deep understanding of why our world is changing, of how other people and cultures feel about those changes, of what we all have in common as well as of what divides cultures, classes and nations. Moreover, while this process of inquiry ought if possible to be tolerant and empathetic, it cannot be value-free ... Because we are all members of a world citizenry, we also need to equip ourselves with a system of ethics, a sense of fairness, and a sense of proportion as we consider the various ways in which, collectively or individually, we can better prepare for the twenty-first century. In societies where fundamentalist forces block open inquiry and debate, where politicians, to attract the support of special interests, inveigh against foreign peoples or ethnic minorities, and where a commercialized mass media and popular culture drive serious issues to the margins, the possibility that education will introduce deeper understanding of global trends is severely limited (1993,341).

In an article which reviewed American telecommunications research, Rowland (1986) considered the challenge to communication policy researchers in particular. In doing so he pointed to a dilemma which confronts researchers in all applied areas. Writing specifically of the American case Rowland identified four limiting characteristics of the communication research experience there.
The first is the long established connection between moral philosophy, political theory and applied scientific research in a climate of liberal progressivism nourished by a pervasive faith in the authority of the natural, engineering and social sciences. The result has been a predominantly administrative research tradition which stressed a degree of cooperation between 'government, private and academic interests' which has been 'intellectually debilitating' (160-2). The second relates to the simultaneous emergence of communication policy research and the 'first attempts to create a formal science of policy studies' from the same mid-twentieth century positivist stage. The result is a persistent tendency for communication research to 'embed a decidedly mechanistic view of communication' concerned more with technique, entrepreneurship and grants acquisition than with social objectives and alternatives (167). The third reflects the overwhelming extent to which communication policy research has been dominated by 'problems of technological change'. Rowland suggests that this tendency, until very recently, has stressed the inevitability of technological change, its multiple economic and social advantages, the need to adjust public policy to accommodate it, the weakness of the rationale for regulation and the necessity for privatization. Rather than encouraging a socially informed and involving debate it has acted to curtail challenges to prevailing basic assumptions. Underpinning the first three has been the fourth characteristic, the long sway of economics, law and engineering. This has reinforced the ideological framework of liberal industrial capitalism has tended to exclude the development of 'real social and political alternatives for communication policy' (174). The relatively recent emergence of critical and cultural approaches to communication research in the United States gives Rowland some hope that a more socially challenging research tradition is emerging which may produce a 'thoroughgoing critique of our notions and myths about freedom, the marketplace, regulation, the state, and public-private distinctions'. In 1986, however, he was not confident that this would exert any substantial influence 'in the practical world of federal and state telecommunications policy-making':

The old administrative research siren continues to sing her seductive song and the dilemmas of appropriate academic response persist. Congressmen, executive agency officials and regulators all live in a rapidly moving, highly charged atmosphere of immediate economic pressures and political needs. In that environment there is an almost irresistible temptation to continue to see communication research solely and simply as a tool in the short-term struggle over specific problems, rather than as a potentially principal framework for re-examining basic questions about power, cultural values and social well-being. Living in an equally contradictory practical environment of disciplinary in-fighting, curricular struggles and promotion, tenure and and salary problems, communication policy scholars are no less susceptible to the temptations of trafficking in the more immediately practical, applied aspects of their work. The mutual attraction here for the pursuit of the less critical, less metaphysical and less epistemologically conscious form of communication policy studies is undeniable. It is also deeply threatening to prospects for improvements in the intellectual substance of communication research and progressive social change in American telecommunications (178-9).
While these conclusions by an American scholar are intended to apply to that country they resonate with the Australian experience to a considerable extent. There, despite the stronger public sector presence, historically, in telecommunications, the privatisation process has accelerated in recent years. Mainstream ISH discussion in Australia is no less inclined to treat people as consumers rather than citizens with fundamental rights. The nature of these basic privileges of citizenship includes the right to information and communication and to participation in information and communication policy decision-making processes which may have profound implications for their future employment, social existence and cultural experience (Lennie, 1993, 25). The price of ignoring these rights over the long term will be more than the loss of citizens' input to policy making. It will include, as Kennedy suggests, a damaged social fabric in which a loss of values which can support a broader, more inclusive sense of community will be prominent. Educators should consider the potential within ISH for maintaining a more encompassing value system which will respond to other than simply the commercial imperatives which currently dominate ISH discussions. To do so, however, it will be necessary to identify ideas that may have the capacity to support such an endeavour. One of those may be a reworked version of the 'public sphere'.

Conclusion

The dilemma recognised by Toynbee, it seems is always with us, perhaps more so now than in any previous historical era. Societies are compelled to build information and communication infrastructures that permit them to grow in scale and complexity and that connect them to larger worlds. It is to the advantage of at least some of their citizens to do so. In the contemporary world it may be ISHs or it may be some other convergent technologies as yet unimagined by marketing publicists. The undertaking, however, is never without risk, to both people and rulers. The most minimal statement of the risk associated with the incorporation of these new infrastructures is that it will bring economic, political, social and cultural change in its wake. A not uncommon result in history, however, has been the complete transformation or even the destruction of the culture of the host society, whether as originator or recipient. The penultimate question that arises from this concerns how, how far and according to what set of cultural values, should societies seek to manage the process of the introduction and operation of the major new information and communication technologies represented by ISHs. The ultimate question continues to be 'In whose interest?' On current indications the answer is a decreasing number of globally active corporations.
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