Computer networks for social change: the social re-shaping of telematics

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This thesis examines different aspects of a group of interrelated computer networks known collectively as the Association for Progressive Communications (APC) networks. Proponents of the APC networks claim that computer communications, or 'telematics' technology, can be applied as a useful tool to promote progressive social change. By providing a worldwide computer network which offers electronic mail and electronic conferencing services at low cost to activist groups, voluntary organizations and individual subscribers, the APC aims to promote ethical values in society such as peace, democracy, social justice, and equality.

The ideological inspiration of the APC networks can be traced in part to 'computopian' literature and the vision of the 'global village'. Part I of this thesis examines some of the myths and claims associated with computopian rhetoric in order to identify some of the limitations of the APC networks. Part II examines the development of the APC networks to determine how the technology has been shaped and how successful it is as a tool for progressive social change. It is understood that both computer networking in general, and the APC networks specifically, are new socio-technological phenomena, so that the potential of the APC networks is taken into consideration based on the experience and growth since their inception in 1985.

Despite claims that telematics technology has been primarily shaped by the military to enhance surveillance and command control, and by transnational corporations to extend their global reach and dominate foreign markets, and is therefore inherently a technology of social control, it is concluded that this original social shaping does not preclude a re-shaping of telematics into a technology to promote social liberation.
I originally found out about the APC networks while interviewing Karen Paulsell at the Community Memory Project in Berkeley, California, in August 1988. I immediately visited Mark Graham and Geoff Sears at the IGC (PeaceNet) offices in San Francisco who, among other things, gave me contacts of network facilitators in other countries and advised me on a suitable modem and communications software. I purchased a small laptop computer with an internal modem(i) and took out a subscription to the APC networks. I travelled to Europe and South America where I interviewed facilitators at the offices of GreenNet in London, and also IBASE in Rio de Janeiro.

I had originally intended to 'log-in' to the networks regularly from different countries, but the practical obstacles made this virtually impossible. Differences in power sockets and voltages required an assortment of adaptors and transformers. Since I was technically a subscriber of PeaceNet in San Francisco, I could not log-in directly to GreenNet in the UK. International data transmission usually required opening an account with the local telecom authority which was not feasible while traveling. As a layperson in the field of computer communications, I had to learn from scratch how to use my new laptop computer, as well as the communications software and the APC network protocols. Finally, I had to abandon attempts to connect to the networks after my transformer self-destructed from a power surge in a Brazilian town which boasted dual voltage standards - some power sockets operated on 110 volts while others operated on 220 volts! A replacement transformer was not available in either Sao Paulo or Rio de Janeiro.

This background information is given to illustrate some of the practical difficulties

(i) Toshiba laptop 1000 with 1.2Mb RAM and 2400 baud internal modem
to be encountered by new users of the system, particularly in less-developed countries.

Much of the research for this thesis was done after returning to Australia in January 1989 using e-mail facilities on the APC networks. Communication costs were a limiting factor initially, but when Pegasus, the Australian node of the APC networks, came ‘online’ in August 1989, these costs dropped by as much as 70 percent. Much data was also retrieved from electronic conferences which focussed specifically on the development of the APC networks, though a wide range of conferences were investigated to gain an overall perspective. It was found that conferences differed significantly in character, format and level of activity. Several questionnaires were designed and sent out to both facilitators and subscribers to the network. Unfortunately the response was not sufficient to include the questionnaires in this thesis or draw any meaningful insights. More response was achieved by requesting brief and specific information, and when personally addressed to specific network users.
INTRODUCTION

The latter half of the 20th century has been referred to as the 'Atomic Age', the 'Space Age', and more recently the 'Information Age'. A popular conception is that these labels represent crowning achievements in technology which propel Civilisation into the next chapter of history. A more critical interpretation would argue that these labels are promoted by parties with vested interests in the development of these technologies. It is the social elite, the top echelons of the corporate, military, scientific and political hierarchies, that stand to gain most from lucrative new markets and contracts.

It is difficult to justify the need for nuclear power generation given what appear to be intractable problems of safety, waste disposal, and the diversion of nuclear fuel for clandestine bomb manufacture; and it is difficult to justify astronomical budget allocations for space exploration given the miserable poverty and squalid living conditions of much of the world's population. However, information technology, or 'telematics', seems to hold greater promise as a flexible tool that can be used for constructive, socially responsible ends.

Such an assertion must be tempered by the fact that the military and corporate sectors are the main consumers of telematics and more importantly, remain the predominant actors in shaping the technology.
Central Argument of This Thesis

The central argument of this thesis is that telematics technology is still in a 'plasmic' stage of development and therefore it is critical that public interest groups and grassroots organisations act now to consciously shape the technology so that it serves not as an instrument for social control and oppression, but as a tool for human liberation, self-determination and a heightened social consciousness. While the military-industrial control of the technology is deeply entrenched, it is not total.

Herbert Schiller argues that computers and telecommunications technology have been designed, produced, and installed since World War II with two primary objectives: the maintenance of economic privilege, and the prevention of the kind of social change that might overturn and eliminate this privilege. High military budgets have financed the growth of computers, the development of communications satellites, and the vast bureaucracies that utilize both espionage, surveillance, and social control. Schiller argues that it is not possible to use telematics as a tool for social change:

...significant, socially beneficial utilization of the new technology requires societal restructuring. The notion that humanistic social change can be introduced incrementally, via the new communications, is unrealistic to the point of fantasy.

Prevaling power structures, and the strength of the corporate and military machines, means that it is inevitable that telematics will be used for domination and exploitation.

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2 Ibid. p224.
3 Ibid.
However, this thesis will cite examples of how telematics is being used as a tool to empower individual citizens and grassroots organisations, to further the movement toward participatory democracy, and thereby help to undermine military and corporate control, and other rigid social hierarchies.

Social change toward a more egalitarian society involves shifts toward equality in opportunity, wealth, ownership, access to the media, to information, and to the political process. It will be argued here that, used in a socially responsible manner, telematics can be employed by proponents of social equality and democratic reform to radically improve access to the media, information, and to the political process. While this in itself may not bring about the basic structural changes in society necessary to allow greater equality in opportunity, wealth and ownership, it may at least act as a springboard for a broader reformist or revolutionary movement.

The primary focus of this thesis will be the Association for Progressive Communications (APC) family of not-for-profit computer networks as an example of a socially responsible employment of telematics technology. The degree to which the ideology embedded in the APC project reflects 'computopian' mythology will also be examined, as well as how successfully the APC project has resolved traditional problems associated with information technology and international communications such as the issues of equal access and cultural domination.

The term 'telematics' will be used throughout this report to mean the conflation of computer and telecommunications technology, and refers primarily to the transmission of alpha-numeric text but could also be extended to include graphics,
audio and video images that can be recognised and hence manipulated by computers. A glossary of terms is provided at the end of this thesis.

The Social Defining of Telematics

Telematics technology is still in an early or 'plasmic' stage of development in three senses: the efficiency, capacity, speed, size and price of the technology is improving dramatically each year compared to other technologies such as the automobile; the diffusion and application of computers in society is still very strong; and the way society uses the technology and the social relations that develop as a result, are still changing and diversifying. The social definition of telematics, its symbolic meaning, its characterisation and popular image, is still forming. The community at large can either leave it to commercial enterprises and the marketing and advertising establishment to complete that definition, or it can take an active role in shaping the technology and determining its use.

To understand the choice before us we can refer back to the automobile. The social meaning of the automobile reflects very much the values of the establishment which controlled its design and marketing. It was aimed at the nuclear family as an independent private vehicle with seating for five. Occasionally the car is used for car pools, to pick up hitchikers, converted into funky homes-on-wheels, or for street barricades. But essentially, once the social definition was cast, the car served the needs of the daily commuter and shopper, and the annual family holiday.
Opposing Camps

Much of the literature on telematics, often referred to as information technology, or 'IT', falls into two main camps - the hyper-critics, or sceptics such as Dickson, Roszak, Illich, Webster, Robins, Danzinger, Schiller and Winner; and the enthusiastic computopians such as Toffler, Masuda, Bell, Naisbitt, Martin, McCorduck, Pelton, Stonier, Turoff and Hiltz.

Though the sceptics might argue that their role is one of deconstructing the myths and assumptions of the computopians and therefore need not, themselves, actually prescribe any alternatives, their work is implicitly prescriptive. Meanwhile the computopians also fail to provide us with alternatives since they cannot conceive of a misapplication of telematics technology. Their fundamental assumption is that due to the intrinsic nature of telematics, its application will inevitably lead to a highly democratic, creative, and enlightened society.

Between these two camps are a number of authors, Touraine, Miles, Lyon, Held, McLean, Arterton and Gould among them, who give cautious endorsement to telematics technology, yet whose critical analysis still lacks depth. A synthesis of these two positions would be to creatively explore social alternatives with respect to telematics, but to rigorously test these options to see which social groups will benefit and which will be disadvantaged, whether suggested development alternatives are realistically possible in the current political-economy, and to what extent these alternatives will reinforce existing power structures in society.

Telematics technology is high technology, requiring vast amounts of capital to develop new microchips, hard disks, display screens, software packages, satellites, fibreoptics, and digital switching equipment. It relies on the success of
giant transnationals such as AT&T, IBM, General Electric, Siemens, Toshiba, Sperry, Honeywell, NEC, Texas Instruments, Burroughs and so on, for its continuity. It is part of an industrial culture which depends on mass-consumption of materials and energy as well as concentration of power and capital within a small elite. It may be argued, as many have, that the technology is therefore inappropriate - that society needs instead 'soft-technology' which can be produced efficiently on a small scale and which lends itself well to a decentralized society based on self-government and self-reliance.

Society need not commit itself to any particular technology. Nuclear fission power generation would be one technology, one might argue, society could do without. Telematics, on the other hand, offers so many promises to improve our means of production and open new dimensions in social communication, that even among the most critical and sceptical writers, few would reject the use of modern telematics entirely.

Problems With Telematics

Numerous authors have highlighted what they see as problems associated with telematics that have surfaced in the last two decades of widespread application. They include deskilling of the workforce (see for example Wood 1982, Shaiken 1984) alienation and exploitation of the workforce, intensified monitoring of employees by management and intensified surveillance and profiling of individuals by the state and private corporations (Campbell and Connor 1986), problems associated with transborder data flows (Nordenstreng and Schiller 1979; Dordick 1984; Hamelink 1984), cultural domination and alienation (Mattelart 1985), exacerbation of inequities between genders (Faulkner et al 1985, Zientara 1988),
classes (Sieglaub et al 1983), developed and undeveloped nations (Becker 1985; Jussawalla et al 1982), and heightened dangers associated with military control and applications of telematics (Tirman 1984; Smith 1986). Most of these problems can be regarded as part of a tendency toward greater social control.

It is not the intention of this thesis to address each of these alleged problems. It is assumed that none of these serious problems justifies total abandonment of telematics technology, but rather points to the need for appropriate and socially responsible development. Thus automated weapons systems could be banned, military surveillance restricted to verification purposes and open to external inspection, public surveillance severely restricted and open to public scrutiny, and close monitoring or 'pacing' of employee performance likewise severely restricted, if not abolished altogether. Many of the above problems can be redressed with suitable regulatory frameworks, though the process of arriving at adequate regulation is often arduously slow compared to the rapid changes incurred by the new technology.

Other problems may require structural changes in society. If this is the case, telematics, and in particular, computer networks, could be employed as a catalyst in creating social conditions necessary to bring about those structural changes. Three main reasons put forward by proponents of telematics for social change are that computer networks constitute a form of media not controlled by any centralized organization, and therefore there is minimal editorial intervention and maximum public access (for those with a computer). Secondly, computer networks are suitable for ongoing conferences and communications with political representatives - the technology lends itself well to organizing new channels of participatory democracy. Thirdly computer networking provides an inexpensive and rapid form of international communications. One important effect of this is
that political experiments and precedents in one part of the globe are more likely to be replicated in other regions.

The first part of this thesis will discuss some of the broader issues connected with telematics technology. The second part will focus on the use of computer networks for social change by not-for-profit groups, and in particular, the Association for Progressive Communications or APC networks. The APC networks have developed in response to the communication needs of activist groups around the world. No doubt the visions of a computopia or global village have also been a driving force behind their creation. Through discussion of the history and development of the APC networks we can hopefully distinguish between that part of the dream that can become a reality and that part of the dream which will remain an illusion.
PART I

INFORMATION SOCIETY - CONTEXT OF THE APC NETWORKS

The purpose of this section is to investigate some of the claims and myths contained in the computopian vision since much of computopian rhetoric is echoed in mission statements and rhetoric of the APC networks. While it is being argued that overall the APC networks constitute a socially responsible use of telematics, and that similar not-for-profit applications should be encouraged in the community, it is necessary to distinguish between misleading computopian claims and the more promising aspects and attainable goals of projects such as the APC networks.

In Political Terms - More of the Same.

The computopian vision constitutes a techno-fix to the extent that it is assumed that significant political change will occur as a result of the implementation of modern telematics technology (see for example Toffler 1980; Hiltz & Turoff 1978; Martin 1981; Naisbitt 1982).

It is more useful to consider the 'information age' as a society basically the same as society today or society ten years ago, with a few minor modifications, than to think of it as a new kind of society. Any fundamental changes in society will come about through a process of political reform or even revolution, and not from the introduction of a new technology. The essence of a society is less the gadgetry
that it employs, than the way people relate to each other - values, behaviour, ethics, morality, belief systems, tradition, ritual, distribution and structure of power, wealth and status. Contrary to computopian scenarios, many observers doubt that Western society will change much as a result of further diffusion of telematics. Rather, the technology will tend to be shaped to conform to existing patterns and power structures.

Free-market mechanics have been operating for millennia, but always within the context of broader market structures, for example, feudal economies, or economies based on colonial exploitation. Today they operate within the context of a highly integrated global economy where relatively few transnational corporations (TNCs) have considerable influence and control over domestic markets and national governments (see for example Galbraith 1967). Although it is possible that corporations and government bureaucracies may become more accountable to the general public, given a push for reform in that direction, and that telematics may play a role in managing that accountability, it is unlikely that the face of capitalism will change significantly in the near future. Thus:

The new communications technologies that have been discovered, the mode of their invention, the processes by which they have been installed, the factors which determine their utilization, the products that have been forthcoming, and the beneficiaries of the new systems and means of information transfer, are phenomena understandable best in terms of long-established and familiar market-based criteria. (Schiller 1981:xii).

Here Schiller is arguing that telematics technology will tend to be shaped by and tend to serve the current structure of society, and it must be seen in that context rather than the hypothetical utopia predicted by some enthusiasts that will somehow spontaneously and synchronously manifest with the emergence of telematics. The idea that the forces of capitalism are somehow tamed or transcended in the information society can be seen as naive and simplistic.
Not Waiting for the Revolution

At one extreme, computopians assert that the political order will shift automatically once society has been `wired up' (eg. Martin 1981; Hiltz & Turoff 1978). At the other extreme, critical theorists claim that any experimentation with telematics for social change is futile while the technology is controlled by the elite.

Critical theorists, in particular many Marxist theorists, see telematics technology as a means by which transnational corporations can continue extracting surplus value during the crisis of capitalism through centralized management control, deskilling, pacing of tasks and reduced salary and conditions for homeworking or 'teleworking' (see Braverman 1974; Mandel 1978). Telematics, according to this view, will continue to be developed for the purpose of social control until such time as there are fundamental structural changes in society. The inference is that any social experiments with telematics are futile until these fundamental structural changes occur. Schiller believes that telematics has been:

...conceived, designed, built and installed with its primary objectives being the maintenance of economic privilege and advantage, and the prevention of the kind of social change that would overturn and eliminate this privilege.  

However, the futility expressed in this view can be challenged. Telematics can be used as a tool for social change which in turn will create conditions for more responsible and enlightened development and application of the technology. This study will show how the APC networks are an important precedent which may well inspire further exploration of the technology to strengthen the democratic process.

4The term 'critical theorist' is used in a general sense here, and does not refer to the Frankfurt School of Critical Theory.

Furthermore, if the general perspective of critical theorists were accurate, we would expect active resistance and intervention on the part of the social elite and governing institutions to the development of computer networks for social change which, according to its designers, benefit political activist groups, circumvent mainstream media, enhance public access to information, and endeavour to establish vehicles for participatory democracy.

The APC networks have grown rapidly since their inception in 1985. They link individuals and grass-roots organizations actively working for social change in both developed and under-developed countries, in the West and in Soviet Bloc countries. Developers of the network claim that they have experienced little interference by governments or national telecommunications authorities (PTTs). PeaceNet facilitator, Geoff Sears comments:

I don’t think anyone has actively tried to interfere with our development. We are pretty small, afterall, and the idea is quite new. I do know that the FBI keeps close tabs on SFMT, and I would not be surprised that at least some amount of our US-USSR traffic is recorded by the NSA. IBM turned us down for a tiny grant because of the “Peace stuff” (grant application was for EcoNet), but that is about it.

In many cases, the PTTs appear to be cooperative.

**Dubious Origins**

To argue that telematics technology can be used as a means to social liberation, it is necessary to demonstrate that not only is the control of the technology by the

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6San Francisco Moscow Teleport. See section ‘East-West Communication’.

7Geoff Sears, Director PeaceNet, e-mail correspondence Mar. 1990.

8See section ‘Equality of Access to the APC Networks’.
social elite not total, but that the social shaping of the technology by the military-industrial complex does not exclusively determine the nature its application.

Critics of telematics technology, such as Roszak (1986), Schiller (1981) and Tirman (1984), point out that it has been developed extensively by the military in conjunction with large corporations, and that it therefore constitutes a militarization of economic life, if not a further commercialization of private life.

The conversion to high tech is the result of deliberate choices on the part of our political and corporate leadership. It is intimately linked to the steady militarization of our economic life since the beginning of World War II... In their research and development, the high tech industries remain significantly tied to the Pentagon budget. (Roszak 1986:26).

It is possible that society is experiencing an erosion of cultural values and a growing entrenchment of consumer values. There is ample evidence to suggest a consolidation and growing interdependence of academic institutions, government, big business and the military in a process of social rationalization all aimed at improving the productivity, efficiency and conformity in consumer society. The process of systematic rationalization involves the elimination of activities which are perceived as non-productive, activities which cannot be packaged and sold as a product, such as informal cultural activities. Closer monitoring and control of the production system would also be an aspect of rationalization. In production systems, telematics is the key technology of control - control of processes, financial systems, and worker performance. It is also becoming the key technology in consumer marketing databases and strategy.

But there are other trends which undermine the gravity of this Orwellian scenario. In many developed countries the national defence budgets are shrinking in relation to overall government expenditure. While in one sense the military is becoming more integrated with mainstream economic and social life (eg with the
of military hardware for lucrative commercial export), in another sense the world is becoming demilitarized. It is more difficult to resolve international and national conflict in terms of open warfare. The world movement for peace is growing. It remains to be seen, of course, whether the peace movement will be able to dismantle military institutions or whether the military will maintain their power using surveillance and covert war operations.

One of the assumptions contained in the militarization analysis of high technology is that the two cannot be separated. In the US, two unique reasons why much of the R&D in telematics is carried out by the military is that the US has taken upon itself the special role of world policeman, and therefore, it must possess the most advanced and powerful weapons and surveillance technology; and secondly, the US prides itself as the heart of free enterprise with minimal government interference. Hence government subsidies to big business need to be disguised in the form of military budgets.

In other countries this is not necessarily the case: the Alvey project in the UK, and the MITI project in Japan are two examples of massive R&D being injected into telematics by large corporations with the help of government subsidies. These are examples of civilian research with military spin-offs rather than the reverse. An international movement to curb production and exports of military hardware might slow down research into telematics somewhat, but the industry would be far from collapse.

As to the assertion that because telematics technology is shaped by large corporations, it will inevitably lead to a further commercialization of private life, there are many examples to show that this tendency is not complete. Cable television has given more opportunities to public access television. Public libraries
libraries and community centres are using computer networks and databases as public information services. Community colleges and universities are experimenting with online courses. Many of these courses are designed for working adults as recreational interests, and could be said to replace more commercial, passive consumer-oriented recreational products.

**Information as a Consumer Product**

Telematics can be used successfully in the process of social change, but its success depends, in part, on the recognition of certain deluded computopian myths, one of which is that consumers are starved of information. The assumption is that information will become a far more important commodity than at present in relation to material goods and services. It is necessary to examine this myth to see whether computer-based information and communication services will remain the activity of a minority, or will attract the interest of society at large. This point is important in the context of participatory democracy, which, to avoid the pitfalls of elitism, must be a broadbased activity.

One of the main criteria and arguments used to demonstrate that developed countries, at least, are moving into an information society, is that information is fast becoming the dominant saleable commodity. Beniger points out the decline of workers in agriculture and industry, and an increase in the service sector, and more significantly, in the information sector (Beniger 1986).

It is important to distinguish between the production of information for consumption by the corporate sector and institutions, and the production of information for individual consumers. That information is becoming a more
valuable and strategic commodity may well be the case for corporations and institutions where automated production systems, advanced software packages, market analyses and financial and technical data can improve performance and maintain a competitive edge.

End consumers on the other hand already have access to far more information than they can use, for relatively little expense. Unlike material goods and services, information is generally inexpensive to produce and can be duplicated easily and cheaply. For the most part, the market value of information depends much more on the way it is packaged and marketed than on its content.

Information available from databases and online news services is unlikely to attract a significant demand from consumers because of its austere format. Consumers are not used to paying much for information since it is heavily sponsored by advertising, and computer screens do not lend themselves well to advertising. This may change with the introduction of high definition television (HDTV) and ISDN high capacity telecommunications.

In short, there is no guarantee that television or computer terminals will replace newspapers, journals and books as the main media for the consumption of text. Without the common availability of interactive television or computer communications, the task of developing electronic networks for widespread public participation in local or national government affairs (or some other activity of social change) becomes far more difficult.

For political activists, who might be described as 'information hungry', a certain level of inconvenience in logging on to a computer network, and an austere, unpolished presentation of the text, may not deter them from using the network.
The activist is primarily interested in content in information not normally available from traditional media sources. For the general public, however, who may be described as more passive consumers of information, inconvenience and poor packaging may well prevent widespread interest.

While computer activists may believe they are developing a wired global democracy, they may be doing no more than strengthening their own position as political lobbyists (Arterton 1987:110).

Growth of Information

While proponents of home information services may be over-estimating consumer demand for these services, it is clear that the production of information *per capita* is growing. It is necessary to determine how much of this growth is attributable to the mere existence of telematics and expanded information capacity, and how much is due to other factors. To the extent that information is growing irrespective of the presence of telematics, it could be argued that community-based telematics projects such as computer literacy programs, publicly available terminals, and public computer networks such as the APC networks, are necessary for the community to keep pace with large institutions, public and private, which operate sophisticated information management systems.

Statistics on the number of books printed each year and the number of new databases entering the data market point to a growth in the production of information. Naisbitt claims that the production of data is doubling every 20 months (Naisbitt 1982).
Four reasons that could be considered important in bringing about a rapid increase in the production of information are:

(a) The gradual process toward democratic reform. The growing plethora of health regulations, environmental impact statements, committees, review boards, public inquiries, business plans, tenders, and government reports, all contribute to a greater production of information.

(b) The growth and integration of corporations and other organizations. Integration and amalgamation usually occurs to achieve economies of scale, often to then squeeze out smaller competitors. But while integration and consolidation may bring about economies of scale in terms of plant, staff, and marketing, it may result in diseconomies of scale in terms of information.

Complexity, and hence the demand for information production and communication, rises exponentially with size. Kendrick (1976) has demonstrated how the stock of information consistently grows at rates well above economic growth. The military and transnational corporations were able to carry out basic research into telematics due to their ability to amass large amounts of investment capital. Their interest in telematics stemmed to a large degree from the increasing problems and complexities of information management brought about by global expansion in the latter half of this century.

(c) As markets mature and demand levels off, corporations look for ways to refine their competitive edge. Information is seen as a key element in refining the competitive edge, whether it is in the form of improved design, more sophisticated market research, or more complex financial arrangements.
The constant search for new markets entails an ever more complex search for new resources, new materials and new production techniques. Thus research and development, an information intensive activity, takes on a higher priority and command of resources.

Some authors distinguish between 'information work' and 'knowledge work'. Newman and Newman (1985), for example, argue that information work has to do with making decisions, eg. by top management, while knowledge work is associated with scientists, academics and other researchers and is a broader context in which information questions are asked. They define information in specific terms as 'that which destroys uncertainty'. The two concepts are distinguished in order to understand the structure of power and economic control in relation to the control of information. Knowledge work could therefore be described as dealing with 'economically strategic information' or more precisely 'political-economic strategic information'. It could be argued that the general public is saturated with information per se, but that information of a politically strategic nature, information which can empower the individual to determine their own future and help shape a common future, is scarce. The significance of telematics projects geared to progressive social change such as the APC networks, is in making this type of information abundant and widely available.

The growth of information is to some extent self-generating. The development of telematics technology serves as a catalyst for positive feedback. The demand for information stimulates demand for telematics which in turn makes greater production of information a cheaper, more manageable, viable and attractive proposition.
To some extent, extra computer power and memory is being used 'because it is there'. Metcalfe, for example, points out that innovations in physical transport gave rise to an increase in the production of books, newspapers and letters (Metcalfe 1986:41). Telematics has had a similar catalytic effect. To ascertain whether, and if so, by how much, society is becoming more information intensive, it is necessary to distinguish between computer power available to organizations and individuals, and expenditure or workhours devoted to the production of information.

Even if we discount the growth of information created by telematics itself, through greater data processing capacity and memory, ease of duplication and speed of communication, it is likely that the per capita production of information is still growing. The general public therefore needs not only better access to this plethora of information, but more importantly it needs more efficient ways of isolating the politically significant content from the information deluge. Roszak goes so far as to say that this 'data glut' is in fact a strategy of social control:

> What computer enthusiasts overlook is the fact that data glut is not some unforeseen, accidental fluctuation of supply, like a bumper crop of wheat. It is a strategy of social control, deliberately and often expertly wielded. (Roszak 1986:164).

Instead of restricting the flow of information, governments often find it more advantageous to flood the public with it, countering facts, numbers and research with more facts, numbers and research, in a 'statistical blizzard which numbs the attention'. Naisbitt, on the other hand, sees telematics itself as the solution to this problem of data glut:

> Information technology brings order to the chaos of information pollution and therefore gives value to data that would otherwise be useless. (Naisbitt 1982).
It is true that databases can improve the efficiency of access to relevant information, compared to traditional methods of visiting libraries, though databases have yet to fulfil their potential in this regard. Most databases contain only articles from journals or references to hardcopy that still must be found in libraries. Full texts of books are rarely found on databases.

However, in order to make massive government reports accessible to the public, for example, it is necessary to make summaries, to filter and analyse the material. This is not a function of the technology but a political process. Either the reports are interpreted and shaped by databases owned by large corporations, thus reflecting the dominant political paradigm, or they may also be summarized and analysed by numerous types of organizations including grassroots and community groups which may offer alternative analyses and filtering biases. While producers of all databases may endeavour to adhere to principles of objectivity, it is impossible to remain completely objective or neutral. Statistics without interpretation, for example, are often meaningless.

The only way to use telematics to order vast amounts of information for general public access is to encourage a variety of databases reflecting different political paradigms. The development of telematics projects such as the APC networks is therefore crucial.

**Limits to Communication**

As stated above, the development of telematics need not reinforce traditional power structures in society, but can be used in ways which bring about progressive social change. The APC networks provide an example of one such
use. However, the actors involved in the development of the APC networks are influenced by, and work from, assumptions contained in information society discourse. It is therefore necessary to evaluate these myths in order to carefully qualify the example.

A myth contained in the concept of the `global village' is one of universal connectivity - that everybody will be in contact with everyone else, everywhere. However, there are limits to the amount of facts and current events a person can be aware of and limits to the number of people with whom one can communicate.

Even though mail is somewhat slower than electronic mail and the telephone somewhat more expensive, they are both impressive communications systems which envelop the globe. But most consumers are content with the occasional letter and overseas phonecall. Telematics might reduce the cost and increase the speed of global communications but it will not reduce the effort required to converse or compose a letter.

Brian Winston suggests an alternative scenario to the vision of the global village:

Home computing will prove to be a fad - albeit a widespread and probably quite persistent one - like railroad modelling or philately. The central thrust of home computing will continue to be games and this play will constitute the dominant fad within the fad, although in more affluent homes the computer might replace the typewriter. (Winston 1986:4).

The vision of the global village is based on what is conceivably possible with current technology, not what is most likely given present social structure and trends. It is a technological determinist analysis.

Free and unlimited access to information is also part of the vision of the global village. (The question of access to information and ownership of the industry is
discussed more fully later in this thesis). This computopian scenario again begins with the technology and extrapolates into a hypothetical society. Questions of who owns the media conglomerates that produce and market the information; to what extent the structure of the information industry echoes the structure of society in general; which fields of information are produced and marketed extensively, and which are not; and which social/cultural/political filters are used in the production of information are largely ignored.

As the level of communication increases, that is, the quantity of data transmitted, (since the level of meaning and understanding cannot be quantified) the level of non-communication also increases:

...it is important to recognize that, while error-free communication is an ideal, non-communication in modern society appears to be widespread. Examples include failed communications (wrong messages sent as a result of unintentional error or intentional lying or distortion), miscommunication (messages not understood or believed, or resulting in an unintended effect), and junk communication (trivial messages that are received, but are of no importance). (Marien 1985:652).

The immediacy and one-to-one nature of telephone (voice) communications means that once contact is established the chances of no response (non-communication) are remote. However, the time delay associated with e-mail can make the receiver feel removed from the sender and reduce the inclination to respond. The broadcast or multiple addressing of an e-mail message can also depersonalize the communication, thus increasing the chances of non-communication.

Junk fax transmissions have become a problem, particularly since the receiver must pay for the cost of printing the unwanted advertising and press releases on expensive fax paper, and because it blocks other important incoming transmissions. As e-mail becomes more widespread, along with inter-network e-mail directories, junk e-mail may also become a problem and reduce the efficiency
of computer networks such as the APC. This, together with other forms of non-communication could deter many potential users of the system.

Computer networks can be used to improve communications using e-mail and electronic conferences, as well as improve general access to information. However, there are practical and other limits to communication that heavily qualify the vision of a global village. Many people are simply not interested in communicating or retrieving information. The majority of the world's population have little or no chance of participating in any such global village since it is financially and technically beyond them.

The APC networks should not be seen, therefore, in the context of an emerging global village. Limits to communication must be taken into account so that realistic goals can be achieved.

In summary, to understand the potential of not-for-profit computer networks for social change, such as the APC networks, it is necessary to reject certain computopian myths and thereby define a more realistic context. Telematics will not spontaneously bring forth an new, more socially just, political-economic order. The majority of citizens are not queueing up to buy computers and modems because they are starved of information and the opportunity to communicate. Finally, telematics cannot create a transparent global village where all citizens and all information exist in continuous, instant, and complete communication. The flow of information will continue to be restricted in many ways by people striving to maintain relative positions of advantage and privilege in society. Lastly, there are limits to the number of people an individual can communicate with and the amount of information they can access.
However, there are certain claims made by a number of theorists critical of the computopian perspective, that also need to be rejected in order to understand the potential of projects such as the APC networks. While technology is mostly shaped by elite groups in society - corporate directors, top level scientists, engineers, bureaucrats and politicians, and in general serves to reinforce power hierarchies and class-structure in society, it is not necessary to wait for 'the revolution' in order to use technology as a tool for progressive social change. The fact that telematics has been shaped to a large extent by the military does not mean that the application of telematics technology necessarily represents a further militarization of society, and may, in fact, be used as an effective tool in the movement toward the de-militarization of society.
HYPOTHESIS

Part II will test the following hypothesis:

"That telematics can be used as a tool for social change, in a way which promotes peace, democracy, social justice and equality."

The Association for Progressive Communications (APC) networks will be used as the primary focus and test case.

COMPUTER NETWORKING FOR SOCIAL CHANGE - BACKGROUND

In computer jargon "networking" refers to the linking together of computers for exchange of information (such as terminals connected in a Local Area Network (LAN) in, say, a newspaper editorial office, or terminals in a computer laboratory all linked to a mainframe computer). Another common use for the term 'networking' is in the sense of social networking. These social networks may be professional, scientific, community networks, or self-help networks. A social
network is usually less formal and structured than, say, an association. It is something more of a coalition. A social network need have nothing to do with computers or telecommunications at all. The purpose of social networks is to allow individuals and organizations with similar goals and interests to make contact with each other, to facilitate the exchange of information and ideas, and perhaps arrange meetings and conferences. In the case of social activist groups (women's rights, civil liberties, environment and peace groups, human rights, and political reform groups), the networks might also serve to help orchestrate campaigns and act as a more unified lobby force. This phenomenon is nothing new. 'Computer networking for social change', the subject of this report, uses the term 'networking' in the combined definition - social activist networks linked together by computer networks.

**Computer Networking**

Anyone with a personal computer, a modem, a telephone line and some communications software, can participate in computer networking. They can send messages directly to friends with a personal computer and modem. They can dial up and access computer bulletin boards where they can read or post notices, or download public domain software. They can subscribe to commercial videotex services and computer networks where they can then access information services, communicate with other subscribers, and do some 'telebanking' or 'teleshopping'. Some examples of videotex services and computer services are Compuserve in the US, Prestel in the UK, and Discovery in Australia. Users pay a subscription fee, online user time charges, and other charges relating to particular information services.
Not-for-profit computer networks and bulletin boards have been around for the last 15 or 20 years, particularly in the US. They are now prevalent in most developed countries as well as many less-developed countries. Originally they were used by computer buffs to exchange tips and advice as well as software. Now they are being used by a broad cross-section of people for a variety of reasons. Some networks may be oriented more toward computer science or sci-fi, others to academic or scientific interests, others to gossip or dating, or to political activism. More sophisticated bulletin boards are referred to as ongoing computer conferences. Many of these computer networks also provide e-mail facilities which means subscribers can send messages to each other by directing them to private electronic mail boxes.

These not-for-profit networks may cost nothing to access (except the price of a local call) and depend on the voluntary services of a network enthusiast who dedicates a computer and phone line to the bulletin board between certain hours or 24 hours a day. The computer functions as a network 'node'. Node facilitators also exchange many of their conferences. They may also link up e-mail services so that subscribers can send e-mail between networks, and even 'gateway facilities' to allow e-mail to be sent to different network systems or 'metanetworks'.

Two prominent examples of not-for-profit computer networks are UseNet, which is a vast network which links up universities and other participants all over the world (particularly the English-speaking world) and FidoNet which also links up networking enthusiasts in the US, Canada, UK, Australia and elsewhere. There are hundreds of conferences on FidoNet though a local node may only pick up and relay some of them.
Networks for Social Change

There are now a number of local networks in different cities in the US, Canada and UK, specifically tailored to provide community information - health services, legal aid, counselling, accommodation, career advice etc. Some of these are based in municipal libraries. Three forerunners to the APC networks are The WELL, the Data Center, and the Community Memory Project.

The WELL, or Whole Earth Lectric Link was established by the producers of the Whole Earth Catalogue, and while conferences on The WELL are varied (any subscriber to The WELL can initiate a new conference) 'sustainable futures', peace, the environment, appropriate technology and alternative lifestyles are a strong theme on the network.

The Data Center was established in Oakland, California in 1980. The Data Center has compiled extensive databases on areas of concern to political activist groups including the activities of large corporations, military research, and statistics and data relating to political events in Central America.

The Community Memory Project in Berkeley, California, as the name suggests, has a community focus, and unlike The WELL and the Data Center, can only be accessed locally. The object of the CM Project is to create 'a direct democracy of information'.

These three projects, as well as the APC networks, all originated in the Bay Area of California, and it could be argued that they grew out of the same cultural milieu. For this reason it is worth examining some of the claims made concerning the CM Project, which is the best documented of the three.
Community Memory... is convivial and participatory... A CM system is an actively open ('free') information system, enabling direct communications among its users, with no centralized editing of or control over the information exchanged.9

The first terminal was located at a heavily trafficked record store near the Berkeley campus in August 1973. The project went dormant for almost ten years due to lack of funding. It resurfaced in the early 1980's with seven terminals located around the city of Berkeley. The menu format was easy to use. Some of the material posted was interesting, but much was on the level of trivia and graffiti. In the words of Roszak:

..amusing, marginally helpful, an improvement over the three-by-five card on a corkboard, but hardly an instrument for significant social change even in as politicized a locale as Berkeley. (Roszak 1986:140).

Part of the philosophy behind the project is to provide a communications medium which is easy and free to use, readily accessible, and, unlike most forms of media, has no editorial intervention. A problem with this is that the network has become a reflection, not of the community as a whole, but of those who prefer trivia to more constructive dialogue. It is likely that the graffiti image of the network has discouraged many potential users. Recent efforts have been made to encourage community groups to facilitate conferences and edit out irrelevant material where necessary. It is not intended to prevent graffiti and trivia on the network but merely to exclude it from certain forums. This move suggests that some degree of structure and intervention on computer networks is preferable. It may also suggest that the process of social change is unlikely to be purely spontaneous.

The Community Memory network can only be accessed from the publicly located terminals. It cannot be accessed from other networks or even from private PCs at

9Michael Rossman, 1979, 'What is Community Memory?' mimeo quoted in Roszak, 1986:140.
home within the city of Berkeley. Organizers say that it would defeat the purpose
if people did not have to leave their homes to use the system. One of its founders,
Lee Felsenstein explains, 'We want the terminals to be like what public houses are
in England.'

The Community Memory Project has now expanded the number of terminals to 12
with some located in 24-hour laundromats. Tom Athanasiou, one of the project's
developers, defends the project against criticism that the CM Project amounts to
little more than an adventure and fascination with high tech. In an article entitled
'High-Tech Alternativism' Athanasiou responses to a quote from David Noble who
says:

..the fight for alternatives .. diverts attention from the realities of power and
technological development, holds out facile and false promises, and
reinforces the cultural fetish for technological transcendence.

Athanasiou argues that anti-technological confrontation alone is not enough and
that technological alternatives must be explored to 'support the development of a
stronger and more sophisticated technology-control movement.'
(Athanasiou 1985:37).

Projects like Community Memory can lead the way to a 'de-massified mass media'
which could eliminate the distinction between producers and consumers of
information. Athanasiou argues that these types of projects differ from
commercial computer networks by virtue of being embedded within community
social institutions, and thus they empower rather than pacify their users. The CM
Project, Athanasiou argues, 'contrasts itself with the productions of the

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11David Noble, quoted in Athanasiou, 1985:37.
telecommunications corporations, and challenges their reduction of human social interaction to the passive consumption of information commodities.'

(Athanasiou 1985:50).

THE APC NETWORKS - BACKGROUND

Institute for Global Communications (IGC) Networks

PeaceNet started in 1985 as a joint venture of the Tides Foundation and Community Data Processing in California which combined to form the Institute for Global Communications. Soon after, EcoNet, which was a separate project of the Farallones Institute, merged with PeaceNet to form PeaceNet/EcoNet.

Meanwhile in England, another network, GreenNet, was formed using the same Plexus hardware and Unix software as PeaceNet in San Francisco. In 1986 parallel conferencing between the two nodes was implemented and a tightly connected transatlantic network developed. GreenNet became the UK node of the IGC and served subscribers in Europe.

The Web

Claimed to be the most advanced computer network of its kind in Canada, the Web began in 1985 as a joint venture of the Ontario Environmental Network
which provided much of the technical assistance, and the Canadian Environmental
Network which provided some of the initial funding. The Web is based at the
Nirv Centre in Toronto. Like the IGC networks, the Web provides e-mail
facilities and hosts numerous conferences on social and environmental issues as
well as recreational interests. By providing gateway facilities to all the world's
major non-profit and commercial networks, the Web can put users in touch with
up to five million other online users.\textsuperscript{12}

Web and the IGC networks integrated in April 1989, which then took on the
umbrella title of the Association for Progressive Communications (APC
networks).

The Growing APC Networks

In the latter half of 1989 four more regional nodes came online - PeaceNet Sweden
(or FraedstetNet), Pegasus in Australia, Alternex in Brazil (hosted by the research
NGO, IBASE), and Nicarao in Nicaragua (hosted by the NGO, CRIES). New
nodes in Kenya, Germany, and Uruguay are expected to come online shortly with
others in the USSR, Philippines and Italy sometime thereafter. Other networks
closely linked to the APC networks are HomeoNet (homeopathy), GeoNet (Third
World Development), Alternet (another Canadian network) and more recently
Poptel, a large UK network linked to the labour movement, cooperatives and
development organizations.\textsuperscript{13}


\textsuperscript{13}GreenNet newsletter, conference 'netnews' topic 61.
The aim of the APC networks is to have a node in most, if not all countries around the world. The different nodes are regarded as autonomous members of the Association for Progressive Communications. Member networks pay 10 percent of user fees to a fund to further the global spread of the network.\textsuperscript{14}

By the end of 1989 there were an estimated 5,500 users in 46 countries, though this figure could be much higher since many users share the same account. Many of the subscribers are organizations such as Greenpeace International, Friends of the Earth, Amnesty International, Survival International, Sierra Club, and so on. (For a more comprehensive list see Appendix).

**Pegasus**

The Pegasus Network is the Australian node of the APC networks and began operation in August 1989. The Pegasus Network "downloads" most of the 700 conferences from the other nodes and "uploads" many of the Australian-originated conferences. A number of conferences that are considered to have only local interest in each of the international nodes, are not circulated. There are also many closed conferences or "closed user groups" (CUGs). For example, an organization may wish to conduct its private business affairs via a closed user group. There are also conferences which can be freely read but will only accept new material from nominated contributors. A specialized news service may choose this option.

\textsuperscript{14}Pegasus Networks information pamphlet, 1989, Byron Bay, Australia.
It is likely that every popular movement that brought about social change, whether by revolution or reform, has relied on the use of social activist networks in one form or another. What then, is so special about computer networking for social change? Is this not the same thing with a few extra gadgets and toys?

At issue here is whether or not computer networks for social change, such as the APC networks, constitute a new type of social interaction made possible by modern telematics, and thus merit special attention. An implicit claim in the rhetoric of network activists is that the combination of political activism, together with the ability to access and order substantial amounts of information with ease and at little expense, and the ability to communicate with many people in different cities, countries and continents, quickly and easily, has lead directly to the new phenomenon of computer networking for social change.

**Ongoing Electronic Conferences**

Promoters of the APC networks are quick to point out the unique phenomenon of `ongoing electronic conferences'. Ian Peter, director of Pegasus, the Australian node of the APC networks, believes that `ongoing electronic conferences' differ from regular conferences because participants can be remote and participate at different times.\(^{15}\)

This in itself can substantially reduce the cost of organizing conferences by eliminating the need for travel, hiring a venue, and providing accommodation. As

\(^{15}\text{Ian Peter, Director Pegasus Networks, interview, Oct 1989.}\)
This in itself can substantially reduce the cost of organizing conferences by eliminating the need for travel, hiring a venue, and providing accommodation. As a result, conferences can be held far more frequently. Online conferences can cover much of the groundwork and preparation for a live conference, so that the final conference can be more productive.

Online conferences organize discourse and information in a way that telephone conversations, including 'partylines', and live conferences cannot. Protagonists argue that sequencing is more democratic. Where live conferences often have a selection of speakers with a privileged amount of time in which to express themselves, and members of the audience must compete for the attention of the facilitator, with online conferences, time is not a scarce resource so everyone has as much expression time as they wish. The order of expression is determined electronically and not at the discretion of the facilitator.

It has also been suggested that online conferences have a distinct advantage over many other forms of interaction because participants cannot be discriminated against on the basis of appearance (eg stature, colour, gender, affluence, body language):

There is evidence that computer conferences encourage more equal participation than other media. This observation is speculative, but we feel confident that people who are socially uncomfortable and easily dominated in other media can play a more dynamic role in a computer conference. (Johansen et al. 1979:83).

Electronic conferences, unlike regular conferences, can continue indefinitely. Sometimes they cease when their function has been served (for example, a conference relaying news on the San Francisco earthquake continued for a few weeks until the situation began to return to normal). Sometimes they split into several new conferences as they develop and diversify (for example, a conference
on environmental issues in Australia soon split into several conferences on forests, recycling, etc).

At any given moment there is a document of the proceedings of the conference available to everyone. It often takes weeks or months for transcripts of speeches of regular live conferences to be written up and distributed. Audience responses are rarely included in regular transcripts, but in electronic conferences everything is documented immediately.

Some argue that electronic conferences are a new and unique form of social communication. Each new entry in a conference is referred to as a 'topic' and each topic is numbered sequentially and given a title. Each topic may also include a number of responses. A new response can be added to any topic at any time. Users are automatically notified of new topics and new responses when they log into a conference. All topics and the number of responses they carry can be viewed easily by title in the conference index. The nearest forum that comes close to this form of conference might be a journal, particularly the 'Letters to the Editor' section, though even this, proponents say, falls short of the sophistication, sensitivity and flexibility of electronic conferencing.

Johansen et al. suggest that because computer conferencing allows more time for deliberate, reflective responses compared to live conferences, the quality of the information exchange is likely to be better (Johansen et al. 1979:82).

These characteristics of computer conferencing suggest that the technology does facilitate an entirely new form of social interaction and thus merits special attention. However, the following study of the APC electronic conferences demonstrates that the success of such conferences depends more on the
cooperation and commitment of the participants than on the sophistication of the technology.

THE APC NETWORKS AND THE GLOBAL PEACE MOVEMENT

The term ‘peace’ is used here in the broad sense to include not only the demilitarization of society, and the reduction of social conflict, but also the reduction of environmental degradation.

The APC networks promote world peace and environmental protection by providing conferences which function as a forum for debate, formulating policy and strategies for action, and compiling news and background information on peace and environmental issues. Of the approximately 700 conferences on the APC networks, well over half focus on peace and the environment.

Conferences which focus on peace and disarmament include:

- apt.alerts: information about nuclear weapons tests,
- cdi.sovsis: discusses efforts to link sister cities in the US and USSR,
- cec.dialogue: is a forum for ideas on economic conversion or restructuring economies so they do not depend on large military research funding and exports of military hardware,
- iscos.bulletin: promotes peaceful uses of outer space,
- nt.altsecdialog: alternative approaches to national security,
- ppn.nukematerial: nuclear mining, milling, processing, fabrication, waste,
- up.general: discussion related to the University of Peace,
- kin.nonukejapan: facilitated by Gensuikin, a major peace organization in Japan.
Examples of conferences focusing on the environment include:

gp.natlnews a weekly newsletter produced by Greenpeace,
en.alerts urgent alerts on the environment,
en.cleanair dealing with air pollution, acid rain etc,
en.marine covering pollution in oceans and waterways,
en.waste management, recycling, energy, pollution control,
en.wildlife endangered species and wildlife protection,
ric.wrr latest editions of The World Rainforest Report,
sc.natlnews news compiled by the Sierra Club.

Besides acting as a forum, users of the networks insist that they provide a very unique and vital form of communication for the peace and environmental movements. Friends of the Earth report that the APC networks have helped enormously in international lobbying:

EcoNet, (an environmental network within the APC), by facilitating the rapid exchange of information during the Malaysian emergency, played a key role in securing the release of leading Friends of the Earth activists arrested under the Internal Security Act. The immediate international response made possible by the networks system gives campaigning organizations the 'edge' in emergencies which can mean the difference between success and failure.\(^\text{16}\)

Greenpeace International also attest to the importance of rapid text communications:

We've found it very useful in our work, and it is quickly becoming essential. A couple of weeks ago our European trustees were meeting in Hamburg. They needed a twelve page report to proceed with an agenda item, but the only copy was in England. Within half an hour they had the entire report in hand for less than the cost of postage.\(^\text{17}\)

In another example, an urgent letter was e-mailed by the Friends of the Earth office in Sweden on January 08 1990, to numerous other environmental groups in Europe requesting that a letter be faxed to the Swedish Minister of the

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\(^\text{16}\)Pegasus Networks information pamphlet, 1989, Byron Bay, Australia.

\(^\text{17}\)Ibid.
Environment and Energy urging her to cancel a proposal for a hydroelectric project on the Ammeraa river. The matter was expected to be decided upon by mid-January, which allowed only one week for action. Together with the letter was some background information on the river and the project, as well as a sample letter.\footnote{Friends of the Earth, Switzerland, e-mail correspondence, Feb 1990.}

It could be argued that the postal service would have been too slow. Telephone contact might have been faster, but not appropriate for communicating all the background information. Environmental groups were able to construct original letters of appeal using text from the background information and sample letter. They could use the APC networks to send faxes and telexes to the Minister's office.

It is impossible to say exactly how much influence these urgent faxes and telexes had on the final outcome. However, it could be said that international concern for what was previously limited to a national issue, obliged the Swedish government to consider the impact of this issue on its reputation and environmental record abroad. The subsequent decision not to proceed with the hydroelectric project was likewise relayed to the same environmental groups on February 1st via the APC networks.

Friends of the Earth use the APC networks regularly for their own internal international communications\footnote{Friends of the Earth, Holland, e-mail correspondence, Feb 1990.}. Greenpeace, on the other hand, hosts a news service and makes use of conferences, but finds the APC system too inefficient for its own needs and uses a commercial computer network for most of its internal international communications. According to one Greenpeace activist, the main
problems with the network compared to commercial systems are that the APC does not reach enough countries, user interface and log-in procedures vary from node to node, and that the APC system is menu-driven rather than command-driven. Menu-driven systems are generally easier but often described as 'frustratingly slow' by experienced users.20

The success of the APC networks as a forum for debate and action within the peace and environmental movement depends, in part, on how well developers of the network can attract a significant proportion of activist groups around the world. It is evident from the above example that the APC will have to compete with commercial network services, which are likely to have far more investment capital at their disposal than a not-for-profit network.

East-West Communication

One of the cornerstones of the Institute for Global Communications (IGC) which set up the first APC node in San Francisco, has been East-West communication. The IGC developed in the context of a group of projects known collectively as '3220 Gallery'. Some of the member organizations included the Center for US-USSR Initiatives, Esalen Institute Soviet-American Exchange Program, US-USSR Youth Exchange Program, the Russian Satellite Television Facility, and the San Francisco/Moscow Teleport.21 All these projects encouraged greater dialogue and cultural exchange between the superpowers, to promote understanding, cooperation and the prospect of world peace. Some of the projects have used

20Greenpeace International (UK), e-mail correspondence, Feb 1990.
213220 Gallery Newsletter' no.9, June-July 1988, 3220 Sacramento Street, Third Floor, San Francisco, CA 94115.
advanced telecommunications technology, such as direct satellite links, to facilitate debate and discussion between Americans and Soviets. Politicians, scientists, educators, among many others have taken part in these discussions.

Since its inception in 1985, the IGC and its computer network, PeaceNet, have maintained contact with both official and unofficial independent peace organizations in the Soviet Bloc. An APC node is currently being established in Moscow. Contact and computer communications have also developed through Finnish subscribers to the Swedish node of the APC networks FraedstetNet and another associated network, NordNet.

In July 1990, the European Nuclear Disarmament (END) convention will be held in Helsinki. Finnish activists will use the APC network to allow peace groups around the world to monitor discussions at the convention, and perhaps facilitate online debate. One group participating in these online discussions is located in Tallinn, Estonia. Professor Smirnov from the Soviet Academy of Sciences is expected to help establish a computer link to Moscow.

Two environmental groups in Latvia, the Ecological Club of Riga and the Youth Ecological Centre, are beginning to use the APC networks. They see the APC networks as an opportunity to improve the East-West flow of information:

...this exchange is usually going one way - that is West-East, sometimes East-East... but Latvia isn't a big giver (provider of information). So now we hope to change this situation and to make our work and international contacts more logical and systematic.

Besides opening up more international contacts, and serving as an efficient tool for organizing information into a computer data base, these Latvian environmental activists also see the APC networks as a way of saving considerable time and resources by not duplicating investigative research.26 However, while access to a common environmental data base can make small activist groups much more effective, too much dependence on a single data base can have the reverse effect. It can be argued that some duplication of research is healthy because discrepancies in the results can improve the accuracy of the research and can sometimes lead to valuable insights.

By establishing links between groups in the area of peace and the environment, as well as helping to facilitate cultural exchanges, it could be said that the APC networks are playing a vital role in reducing East-West tensions.

Another contribution the APC networks are expected to make in the area of East-West cultural interaction is with the "Baltic Project" initiated by the Foundation for Social Innovations (FSI). This project aims to involve many non-government organizations (NGOs) in Baltic sea countries, 'working in the field of charity, alternative and innovative methods of education, peace, ecology and human rights protection'.27

Organizers of the project see the APC networks as a useful way to coordinate the NGOs, 'to inform each other about their work, programmes, goals, methods and actions'.28

26Ibid.
28Ibid.
We think also that this network could be extremely supportive for development of independent alternative sector in the Soviet Union, Latvia, Lithuania, Estonia and for Baltic nation cooperation in general.\(^{29}\)

As a part of Baltic Project, FSI USSR in cooperation with the Center for Scientific Cinematography, 'Centrnavtchfilm Moscow' will produce the documentary "The Baltic Variant". Director of the film, Vadim Vinogradov, is well known in the Soviet Union. The subject of the documentary is 'the role of public movements, churches, personalities and science in the cause of environmental protection in the Baltic sea region'.

Dmitry Petrov, director of the Baltic Project, and Gennady Alferenko, chairman of FSI (USSR) feel that APC subscribers, particularly in the Nordic Countries can be very helpful in the realization of both the Baltic Project and the film.\(^{30}\)

The APC networks have been fostering cultural links with Soviet Bloc countries long before the radical liberalization in late 1989. Subscribers include the Kurchatov Atomic Energy Institute and the Novosti Press Agency in the Soviet Union, the Academy of Science in East Germany and the International Organization of Journalists in Prague. Subscribers in Chile provided an important link during the latter years of the repressive Pinochet regime. Likewise, subscribers at the Turku University in Turkey and Fundan University in Communist China constitute important cultural links at the grassroots level and demonstrate the potential for much greater cultural interaction and ties.

The APC networks also carry the potential to offer unique sources of information for use by peace and environment activist groups around the world. For example, the 'Transatlantic Peace Newsletter' is available at no cost to users of the APC

\(^{29}\)Ibid.

\(^{30}\)Ibid.
This newsletter not only provides summaries of information from a host of English journals, but it also abstracts material from many non-English sources. Recent articles in the West German newspaper Sueddeutsche Zeitung, for example, discuss the East German arms manufacturer, Zeiss, which employs over 3,000 workers and is now converting to non-military enterprises; the new tolerance toward conscientious objection in Latvia; anti-military protests in Estonia; and news that Poland is abolishing three of its 13 army divisions. Articles from the Frankfurter Rundschau describe the inception of the independent Environment Institute of East Germany and that military training and war toys are being abolished in East German schools. The newspaper Ökumenischer Informationsdienst recounts a protest by medical students at the Semipalatinsk Soviet weapons testing site.

This type of news is vital for the peace and environmental movements, to demonstrate to the general public that moves toward disarmament and a demilitarized society are occurring on 'both sides', and that many of the changes in the Soviet Bloc are occurring due to the pressure of public opinion and despite official government policy. It is likely that much information that is highly valued by peace and environment groups is not picked up by English news syndicates from foreign language sources because it is regarded as having marginal news-value, and the costs involved in translating the material make it financially unviable. The dynamics of a not-for-profit computer network, however, whose users are motivated by a desire for progressive social change, are quite different.

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31The Transatlantic Peace Newsletter is found in APC conference: gn.transatlan.
Saving Paper

The concept of the paperless office was introduced as far back as the late 1960's as an impending spin-off from the computer revolution. Computers, it was said, would save the world's forests from destruction. It is impossible to say just what the net effect of computers has been with regards to the consumption of paper. Many company files stored on hard disk require a parallel set of documents anyway. Computer programs customarily spit out reams of paper, printing on only a small fraction of the surface area. Photocopiers too, have contributed to a surge in the consumption of paper. Even the most optimistic forecasters admit that the paperless office is still a long way off, if it is feasible at all.

Pegasus director, Ian Peter, has worked extensively in the movement to protect the last of the world's forests, particularly rainforests, attending numerous international hardwood industry conferences to lobby for tighter regulations and smaller quotas. He uses the argument that networking can help save the forests since it encourages people to access information electronically rather than from books, magazines, and particularly newspapers. All Pegasus promotions are printed on recycled paper.

Will the APC networks result in less consumption of paper? This is no trivial question since the APC networks are part of a movement which is promoting a shift to online communications. There is significant pressure from the logging industry to log virgin forests all around the world and much of this is due to the demand for paper. The result is an exacerbation of the greenhouse effect and a loss of plant and animal species.

\[32\text{Ian Peter, director Pegasus, in conversation, 13 Nov 1989.}\]
The APC networks represent not a substitution of paper media, but an additional media. They do not replace the functions of newspapers, books or magazines because they carry different sorts of information in a different format. At this stage, the APC networks probably do not contribute to reduced consumption of paper. They may actually increase paper consumption depending on the extent users print out information they have downloaded. There are advantages to hardcopy, such as portability and ease of annotation. However, it could be argued that the potential exists for the APC networks to provide news services which eliminate the need to buy newspapers. Many newspapers are already available on commercial network systems and gateways could be provided to these services.\(^\text{33}\)

Current limitations are that online access is more expensive, and data transfer speeds in particular need to be improved dramatically before such services would be financially viable to the majority of subscribers.

Other hazardous effects of telematics technology would also need to be taken into consideration when assessing the contribution of the APC networks to peace and the environment. The computer industry uses various toxic chemicals. In one instance, 13,000 gallons of the toxic solvent trichlorethane was found to have leaked from storage containers at a microelectronics factory and contaminated town water supplies. A subsequent investigation found that 80 percent of all storage facilites in Silicon Valley were leaking solvents, acids, metals or fuels.\(^\text{34}\)

A study of air pollution revealed that approximately nine tons of 'reactive organic gases' are released into the atmosphere by the microelectronics industry in Silicon Valley each day.\(^\text{35}\)

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\(^\text{33}\)The Sydney Morning Herald and Financial Review, for example, are available through AusiNet 24 hours after publication. The New York Times is available through Reuter's online services, while the Wall Street Journal and Washington Post are available from a number of database vendors such as Dialog.


\(^\text{35}\)Ibid.
also merit concern. Studies have suggested links between radiation emitted from VDUs and stress, eye cataracts, skin problems, and even abortions and birth defects among pregnant women, though studies are far from conclusive. If the APC networks are promoting the use of telematics, one might expect that environmental hazards associated with the industry would receive special attention.

Too Much Communication ?

While most peace and environment organizations would agree that the APC networks are a unique and valuable tool for communicating information and discussion between disparate groups, a few activists have pointed out that direct communication links with the general public can actually hamper their activities due to the deluge of inquiries and messages which are often very long and largely unusable. One member of Friends of the Earth in Holland complains that they often receive 1000 lines of mail of which perhaps 10 lines are relevant.

...while we do communicate with other organizations, in particular in the academic world, a huge number of public users, no doubt concerned, interested and whatever, would end up sending us messages. Most of our staff are occupied full-time answering our own in-house e-mail, let alone conversing with the general public.

Too much information and communication is blocking the "real" work. So many demands for information come in every day.

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36See for example C. Mackay, in Work and Stress, Vol 1, No.1 1987 pp49-57.

37Greenpeace International (UK), e-mail correspondence, Feb 1990.

38Friends of the Earth, Switzerland, e-mail correspondence, Feb 1990.
These comments point to a deeper issue concerning the relationship between organized activist groups and individuals not directly involved in any activist group or non-government organization. Is the primary role of such organizations to lobby the establishment or inform the general public? Assuming that the mandate for such lobby groups comes from the general community, it could be argued that a certain amount of liaison with individuals is essential. It could also be argued that computer networks can help solve the problem of having to respond to numerous individual inquiries with limited human resources. Comprehensive online news services, calendars of events, and databases could answer many inquiries, leaving more time for staff to answer the rest. Long messages are often cited as a problem, not only with e-mail, but also on conferences. Some conference topics are preceded by a warning 'long text follows' or something similar. Experienced users of the networks seem attuned to this problem and are careful to be brief. Many users also provide summaries and indexes to long articles.

It is not merely a question of the time it takes to wade through lengthy tracts of information but the costs involved in downloading these tracts. With regular postal services, cost is not a critical factor - it costs approximately the same to mail a 100 word document as a 10,000 word document, and these costs are borne by the sender. With electronic mail, much of the communication costs are borne by the receiver, and a 10,000 word document will be about 100 times more expensive than a 100 word document. However, costs associated with e-mail, databases and online conferences could decrease significantly for not-for-profit computer networks as advancements are made with modem speeds and storage capacity. When PeaceNet began in 1985 many subscribers were using 300 baud modems. The most common modems in use in 1990 are 1200 and 2400 baud modems, reducing communication costs by at least a factor of four. The APC networks
already use 18,000 baud (trailblazer) modems between nodes, so further reductions in communication costs for the network user are likely in the near future. Likewise the costs of hard disk storage (per kilobyte) has decreased significantly. This, along with faster disk drives should make long tracts of text more manageable.

In conclusion, although telematics technology was developed extensively as a result of large military research budgets, and that both the military and corporate sector have had a strong influence on shaping telematics, the above examples illustrate how the technology can be used to undermine militarism in society by aiding the grassroots movement toward world peace and environmental protection.

Many of the current limitations of the system addressed here can be overcome with suitable communication management policies, better techniques to organize information, as well as improvements in the technology. Since not-for-profit computer networks for social change are still a recent phenomenon, many problems associated with communication are scarcely being identified. Further research in this area, particularly the application of communications theories to the practical experience of APC users, could help in identifying ways of solving many of these problems.
THE APC NETWORKS AND THE PROMOTION OF DEMOCRATIC VALUES

Embedded in the computopian vision, from which promoters and developers of the APC networks draw much of their inspiration, is the promise that telematics will serve as a dramatic tool for social change because it will allow citizens to participate directly in the process of government. With the advent of telematics, it is said, society will shift from a representative democracy to a participatory one resulting in a power shift from the political elite, toward a broadbased and decentralized distribution of political power in the community (see for example Margolis 1979, Toffler 1980, Arterton 1987).

The Telematic Fix

The idea that a technology, by itself, can change class, power, and property relations in society is untenable. Such an argument would have to be regarded in terms of a technological fix, ie. an attempt to solve, or cover up a social problem with a technological remedy.

The telephone has been around for over a century and could easily have been used for televoting purposes and for 'conferencing' using party lines, but there have never been any significant examples of this. Professor Ted Becker at the University of Hawaii is one of a number of researchers who have successfully carried out experiments in participatory democracy in the community using mailouts via the traditional postal service (Arterton 1987). Essentially telematics is not really necessary to bring about wider public participation in decision-making.
The most significant reason why participatory democracy is not being developed on a broad scale is because it is not on the political agenda. There is insufficient space here to give a complete account of the way political agendas are set, but an outline can at least give some insight as to why participatory democracy is not an issue of wide debate. It could be argued that the political agenda is set by:

(a) special interest lobby groups, particularly representing business groups and professional associations, which are highly organized, well-funded, and often have close social/professional connections with politicians. Participatory democracy is likely to reduce their relative lobby power and could result in further restrictions and monitoring of corporate activities and professional conduct. Placing participatory democracy on the political agenda is therefore not in their interest.

(b) widespread public opinion can influence the political agenda, particularly during elections. But the issues on which the public opinion is being gauged are often determined by the media. The media also has a strong influence in shaping public opinion. It could be argued that the media tends to focus more on specific immediate tangible issues (such as income tax, health policy, environment, education etc.) than more general, fundamental and abstract issues such as the need for new improved forms of public participation in decision-making.

(c) professional politicians themselves have a strong influence on determining the political agenda. It could be argued that politicians are not interested in the added complications of a broader decision-making process. More importantly, politicians are not interested in relinquishing political power. Their careers have followed a course of acquiring greater political power as they win higher
portfolios in their respective parties. It goes against all career logic to suddenly start looking for ways of sharing that power.

Debate over the need for greater participatory democracy has probably been most prevalent in the trade union movement. However, this has mostly focussed on democracy in the workplace.

It may also be true to say that participatory democracy is not being developed to any significant degree because the general public is not highly motivated to actively participate in politics. The nature of capitalism is such that it shapes society into passive consumers. Without a tradition of participation, citizens may feel that it is not their place to interfere in the political process except to cast a vote during elections.

These questions of political resistance by the governing elite, and lack of motivation by the electorate, need to be addressed in depth by proponents of social change before attempting to design systems for teledemocracy.

**Democracy in What Form?**

To examine whether the APC networks promote democracy, it is necessary to discuss what is meant by the term `democracy'. This section will define an interpretation of democracy and then test whether the APC networks promote democracy in the light of this interpretation.

Democracy in its simplest sense means that each citizen holds an equal amount of political representation - each person is entitled to one vote only. In practice there
are many forms of democracy, from representational democracy to direct democracy, and from Western-style multiparty democracy to socialist single party democracy. The term "participatory democracy' refers to a system whereby citizens not only vote for representatives, but can actually take part in the decision-making process, or be directly involved in shaping policy in some way.

The many theories of democracy may be grouped into three broad categories - liberal individualism, pluralism, and holistic socialism. Each theory presupposes a different ontological social entity, which are respectively, the individual, the social group, and society as a whole. Gould defines a fourth interpretation of democracy (Gould 1988). Gould points out the limitations of the theories mentioned above and argues that the ontological entity of democracy should be described as 'individuals-in-relations'.

(a) Liberal Individualism: In its descriptive mode, liberal individualism is oversimplified in its description of all individuals acting as free agents. It emphasizes the common, universal characteristics of people while ignoring the concrete social differences (eg in wealth and status). It is an abstract individualist ontology which conceives all social relations as external and ignores internal relations, the personal social relations which influence and change the nature of an individual. Gould comments:

..in failing to recognize in theory the relevance of economic and social inequities and constraints to the political sphere, this model tends in practice to permit them to intrude into the very political process that was intended to exclude them. (Gould 1988:96).

(b) Political Pluralism: The ontology of political pluralist theories shifts the focus away from the individual to social groups and group interests. The purpose of government, according to Schumpeter, Dewey, Dahl et al. was to mediate these
competing and conflicting group interests in order to maintain social equilibrium. These groups may be intrapolitical - political parties or voting blocs, or extrapolitical - groups based on common regional, ethnic or economic characteristics.

The problem with the pluralist ontology is that it ignores the differences and the internal relations between individuals within a group. It ignores the political dynamics within a group which is generally assumed as having fixed characteristics. It also does not recognize internal relations between groups which serve to mutually define each other. For example, a group of tenants is defined in relation to a group of landlords (Gould 1988:99). Like liberal individualism, the pluralist theories do not redress the inequities of power and domination in the political sphere that stem from the economic and social spheres. This fact undermines the basic philosophical tenet of equal access to the political process.

(c) Holistic Socialism: There are two basic types of the holistic socialism models of democracy - one that argues for economic democracy as a way to achieve more equitable distribution of opportunities and goods (characterized in the writings of Galbraith and Rawls), and the other which also includes democratic control over the production of goods and services. In so far as the first model recognizes the need for participation by individuals in both economic and political decision-making, it is close to the participatory theory of democracy proposed by Gould.

However, the ontological premise of the latter socialist model is that society as a whole is the basic entity of social life so that "society is essentially organized for the purpose of the production and distribution of goods to satisfy socially determined needs." (Gould 1988:101). Fundamental agency is attributed to society as a whole and does not acknowledge the importance of agency of the
individual. Ascribing fundamental agency to a group is meaningless, says Gould, because a group is not a single conscious entity with a single capacity for choice.

Another ontological weakness of holistic socialism is that it conceives of the whole as comprising solely of internal relations, meaning that individuals are solely the product of their interrelations with others. It denies, for example, that an individual can choose among relations, and in fact denies that any individual has free will. This form of holistic socialism which subordinates the individual to the perceived needs of the whole tends toward authoritarianism and repression of civil liberties.

(d) Individuals-in-Relations: A new ontology which would underpin a new participatory theory of democracy would have as its fundamental agency 'individuals-in-relations' or 'social individuals' (Gould 1988:105). In Gould's conception, both individuals and relations are considered fundamental ontological entities, but relations would always be dependent; they would be considered relational properties of individuals (to avoid the problem of having to define relations between relations and people, and between relations and relations, and so on, which would be the case if the two entities were considered independent). As relations are dependent on the agency of individuals, so too are individuals dependent on relations since 'the realization of their distinctive character depends on how they exercise this agency in and through concrete relations' (Gould 1988:112).

This new ontology differs from individual liberalism in that no group activity can be understood as the aggregate of individual actions, but must also be understood in the context of working toward a common aim. It differs from pluralist theories because it recognizes the internal relations between groups and the free agency of
individuals working within groups. And it differs from holistic socialism in that members of a group freely choose their shared purpose.

Another important aspect of Gould’s conception of a new democratic ontology is recognizing the capacity of individuals to change themselves - self-determination, self-development, and to change the characteristics of groups and organizations that they work within.

Thus, individuals-in-relations as the fundamental entities of the ontology are understood as free in the sense of having the capacity to create or change their own natures through their activity. (Gould 1988:110).

Taking the above then, as a definition of democracy, it can be argued that the APC networks promote democracy in that they are designed to facilitate the activities of individuals and voluntary associations coming together to work toward social change and political reform. The structure is such that it accommodates the free agency and self-expression of individuals yet facilitates the combined expression of individuals working for a common goal. Groups can assume a clear identity without sacrificing the individual identities of the participants. Without rigid hierarchies, mechanisms for censoring individual expression, and centralized control, both voluntary associations, and the network structure of the APC are political expressions of democracy as defined by individuals-in-relations.

APC Networks and Participatory Democracy

To what extent do the APC networks promote democracy? If the interpretation of ‘democracy’, then, is taken as participatory democracy based on ‘individuals-in-relations’ or ‘social individuals’, one could argue that the APC networks promote democracy in two ways:
First, the structure of the APC networks reflects, to a large extent, individuals-in-relations. Proponents of networks argue that, by definition, a network imposes minimum controls or rigid structures on either internal or external relations. In theory there is no hierarchical relationship between nodes of a network, or between users of a network. Proponents often refer to networks as having a 'horizontal' power structure. APC facilitator, Rory O’Brien says:

...Web enables fast, direct and multiple contact 'horizontally' at the grassroots level with a growing number of like-minded individuals and organizations.\(^\text{39}\)

In practice it could be argued that the more established nodes have more experience and technical skills and therefore command greater political influence. The relationship between network nodes, or between network users, proponents argue, is intrinsically democratic. Different nodes are regarded as autonomous members of the Association for Progressive Communications.

To the extent that network nodes and users associate and communicate freely, in a non-hierarchical structure, one could argue that the APC networks are promoting democratic communications.

However, one could also argue that in practice the relations between the nodes are not always equal or democratic. Regional nodes may modify their software and format to suit local conditions to some extent, but overall they must conform to the software design of the whole system. The design of this software has been determined largely by a handful of computer programmers in San Francisco, and later in London.\(^\text{40}\) Relations between users are democratic in the sense that any


\(^{40}\)Geoff Sears, IGC director, e-mail correspondence, Feb 1990.
user can express their views on public conferences. There is little or no editing of material, though long contributions (e.g., more than a few thousand words) are discouraged by facilitators.

Secondly, the APC networks can be seen as a forum and a communication tool for political activist groups and grassroots organizations. These grassroots organizations are often loosely structured, partly because of their dependence on volunteer input. There is not the same degree of control over members of a grassroots organization as there is over employees in a corporation, and other social institutions.

Members of the group choose their shared purpose. The loose structure accommodates individuality, self-expression and self-determination. It could also be argued that the loose structure is more conducive to experimentation with consensus decision-making and the spirit of cooperation.

To the extent that the APC networks are part of the growing role of grassroots organizations and political activist groups in the political process, it can be said that they promote democracy.

**Direct Democracy**

Proponents of direct democracy often claim that representative democracy is not very democratic because citizens have only a limited opportunity to express their preferences during occasional elections. A system of direct democracy on the other hand would encourage more direct contact between citizens and politicians. Citizens would participate in the formulation of policy, and politicians would act
more as an intermediary in the process rather than making strategic decisions themselves.

The debate as to whether direct democracy is preferable to representative democracy is not settled. Opponents of direct democracy, (such as Burke, M Weber and Schumpeter) argue that direct democracy can lead to mob rule. Their view of democracy is a restrictive one serving merely as a means of choosing decision-makers and curbing their excesses'. (Held 1987:143).

It is not the place here to debate the virtues of direct democracy over representative democracy. It will be assumed that more direct contact between citizens and elected representatives, as well as more citizen participation in decision-making and policy formulation is desirable. Claims by proponents of 'teledemocracy' will be tested in relation to the APC networks.

Between the advocates and opponents of direct democracy there are those who argue that while direct democracy is preferable in theory, in practice it is unmanageable. As Held has observed:

...the size, complexity and sheer diversity of modern societies make direct democracy simply inappropriate as a general model of political regulation and control. (Held 1987:149).

Proponents of telematics argue that computer communications is an appropriate technology to manage this complexity and hence make direct democracy a viable option:

Opponents of direct democracy often dismiss it with a wave of the hand: "It can't be done. Decision-making would take far too long. Anyhow, you can't discuss options at mass meetings." Now that IT (information technology) opens possibilities that were unsuspected only a few years ago, this will no longer do. (McLean 1986:141).
Toffler likens representative democracy to a factory 'batch processor':

The public is allowed to choose between candidates at stipulated times, after which the formal 'democracy machine' is switched off again... people had at best only intermittent opportunities, through voting, to feed back their approval or disapproval of the government and its actions. (Toffler 1980:89-90).

He argues that 'advanced computers, satellites, telephones, cable, polling techniques, and other tools' can be used to facilitate a semi-direct democracy, combining elements of both direct and representative systems. (Toffler 1980:439).

Proponents of teledemocracy cite the general disillusionment with current systems of democracy as a reason why electronic alternatives should be investigated. Gould remarks:

...a major problem in contemporary political practice is that both Western democratic societies and existing socialist societies fail in different ways to provide the conditions for full individual freedom and for equality and social cooperation.' (Gould 1988:247).

One of the main reasons given as to why the democratic process is breaking down is that traditional information systems are inadequate.

In his book 'Viable Democracy', Michael Margolis argues that contemporary problems, including problems associated with modern technology, have outdistanced the current capabilities of democratic political institutions to deal with them. As a result, bureaucratic elites have exerted increasing influence and control over public policy. Margolis suggests that information networks need to be established to preserve the democratic process:

The key element of our theory is the distribution of information. We contend that citizens and their representatives need cheaper, more efficient access to relevant information about political problems and events of concern to them. (Margolis 1979:158).
Margolis argues that because computer communications operate in an interactive mode, they are an appropriate means of establishing some degree of direct democracy.

In practical terms this means that a citizen could easily send a message to any of his (sic) representatives, indicating his opinions about some subjects, his ability or desire to present new information, or any other suggestions he thought appropriate. (Margolis 1979:161).

There have been few experiments where computer networks have been used for policy discussion between citizens and elected representatives. In 1983, Congressman Edward Markey of Massachusetts participated in a computer conference discussing arms control policy using The Source computer network system. 150 subscribers to the Source participated in the conference, 31 percent of whom responded with 217 arguments and comments. Ron Klein, Markey's aide commented:

There were two or three new angles that we hadn't heard before and those we had to rethink, but basically no, we've been through the many arguments many times before. (Arterton 1987:120).

Arterton remarks that:

...the lack of noticeable impact on policy reflects both the nature of the issue chosen for discussion and the legislator's conception of his or her role as a public figure. (Arterton 1987:121).

Until the conception of the role of an elected representative changes from one who endeavours to convince the electorate that their views are correct, to one who listens carefully to the arguments and opinions of the electorate, it could be argued that teledemocracy of this kind will merely serve as a public relations exercise for politicians, rather than as an effective forum for policy formulation. In this instance, Markey's positions on these issues had already been widely publicized,
and so it was unlikely that he would be influenced by arguments from a scattered
group of citizens.

It is not necessarily the stated intention of the APC networks to develop links
between citizens and elected politicians, and act as a vehicle for direct democracy.
However, the use of telematics for direct democracy is part of the global village
scenario and would probably be welcomed by the majority of facilitators and users
of the APC networks.

There are a number of politicians who use the APC networks, and the potential
exists for greater interaction between elected representatives and the electorate.
Richard Jones, MP, a member of the Australian Democrats in the NSW State
Parliament is a subscriber to the APC networks and receives a significant amount
of information on woodchipping and forest logging from the network. He
recently used the network to send multiple letters via e-mail to several groups in
Japan explaining that the reason he had decided to boycott the Mayor of Tokyo in
a recent visit to the NSW Parliament was in protest to Japan's involvement in
whale slaughter, rainforest destruction, and harmful fishing practices.41

Independent members of the Tasmanian State Parliament also use the network. In
one example they posted a request on several conferences asking for material on
Public Initiated Referenda to help them formulate a PIR Bill in the Tasmanian
Parliament.42

41 'Pegasus Network Newsletter', No.4, p1, PO BOX 424, Byron Bay, NSW 2481, Australia.

42 Other users of the network include Jo Vallentine, senator in the West Australian Parliament;
Benedict Haerlin, a member of the European Parliament; Kalle Konkkola, member of the Finnish
Parliament; George Brown, Democrat, US Congress; Claudine Scheider, Republican US Senate; and
Jean Lloyd-Jones, Democrat, Iowa State Senate.
It could be argued that the APC networks foster an environment for communication, and to the extent that political representatives participate on the network, they become more accessible to other network users. While a user might hesitate at ringing up an elected representative, or writing a letter, they may feel more inclined to do so in the context of an electronic conference where citizen-politician communication is actively encouraged, as it is part of the vision of the global village.

To the extent that the APC networks facilitate dialogue between political representatives and network users, it could be said that they have the potential to promote democracy. Close study of the way the views of politicians evolve could determine whether online dialogue at grassroots level is merely window-dressing or is taken into serious consideration.

**Security of Electronic Voting**

Electronic voting is an important element in the concept of online participatory democracy. There has been little use of televoting on the APC networks so far, but it would be reasonably straightforward to do, if voting was going to be done by open ballot. Closed ballot televoting would require new software because present software automatically assigns the name of the author of any message or vote. Other networks, such as the Community Memory Project and most videotex bulletin boards such as Minitel, do not automatically identify the author. This means that someone can send e-mail anonymously or post anonymous contributions onto a conference. Such anonymity adds a new dimension to the concept of freedom of expression. It does not mean, however, that such networks
can be used for secret ballot voting. Without special software, it is impossible to ensure that each participant has posted only one vote.

The other question is, that even with special software, it may be difficult to ensure that operators of the system do not have access to information on how each individual voted, or that the election is rigged. From a security point of view, not only is the central computer a risk, but the system could also be intercepted anywhere in the telecommunications path. Another risk is that hackers could counterprogram the software to allow them more than one vote.

The issue of electronic voting security arose during the national elections in India in November 1989. The Government decided initially to use electronic voting machines in 50 of the 427 constituencies. Advocates claimed that electronic voting would not only save time in counting the votes, it would eliminate accidental invalid votes. But a leading contender of the Opposition, Mr Singh, claimed that "the circuit chip can be programmed to rig the ballot and is a 21st century hijacking of democracy."^43

According to Y K Agarwal, a software engineer who was consulted on this issue, theoretically, any counting program lock could be broken, but that with sufficient programs, entry into the counting program could be made very difficult. Other countries, such as Japan, Sweden, France, the UK, and Italy have so far rejected the use of electronic voting systems.^44

Eliminating accidental invalid votes is one way to improve the democratic process. But electronic voting will also eliminate the option of casting an intentional invalid

^43The Australian, 07 Nov 1989, p28, 'Indians fear voting machines could highjack democracy.'
^44Ibid.
vote, otherwise known as a 'protest vote'. If, then, a protest vote option is made available to voters, it will mean a formal legitimation of what, until now, has been regarded as a wrongful practice. It is possible that the problem of rigging the results can be minimized using elaborate software, so that tampering becomes an extremely difficult proposition.

Disruption of elections is not an uncommon occurrence in some countries, particularly by intimidating voters at the polling booths or by setting up road blocks. Disruption of televoting might be much easier by sabotaging telephone lines or electricity generation. Unreliable power supplies in many parts of India was also used as an argument against the use of electronic voting.

If confidentiality and security cannot be guaranteed for electronic voting systems, the potential for computer networks such as the APC networks to be used as a tool for promoting democratic values, will be restricted to some extent. Open ballots are, perhaps, the most common form of voting among activist groups and voluntary organizations. Open ballots also eliminate the danger of rigging since each vote can be verified. However, it could be argued that closed ballots are more democratic, and virtually essential for voting on controversial issues, or for larger scale elections and referenda. Without a closed ballot voting facility, many groups would have to meet in person to vote, thus defeating one of the main advantages of online conferencing.
Telematics - Elitism and a Barrier to Participation?

Two aspects of the use of computer networks for political participation which could be said to detract from the hypothesis that the APC networks promote democracy are discussed here.

Firstly, it could be argued that people involved in political activist groups generally have above average levels of educational background, and are articulate and resourceful. Their understanding of political issues and knowledge of the mechanics of the formal political apparatus qualifies them, relative to the general public, as a political elite. If the use of computer networks for political participation remains the sole domain of this subculture of political activist groups, it could be seen as enhancing their power and political influence, while the political power of the general public remains the same. Margolis alludes to this when he says that most people are not interested in participation to any great extent. Computer networks used for political activism will therefore result in `a broader (albeit still elite) type of political participation.' (Margolis 1979:162).

Secondly, the move toward the employment of telematics in the political process may mean that computer literacy becomes a prerequisite for anyone wishing to become involved in that process. In this sense, telematics could be seen as a barrier to democracy.

Voluntary Associations - Stepping Stone to Participation

It is suggested above that the facilitators and participants of the APC networks can be identified as pertaining to a common sub-culture which could be described as
elite to the extent that most are reasonably well educated and resourceful. However, it could also be argued that this relative homogeneity of privileged users may be due to the fact that the APC networks, and not-for-profit computer networks in general, are a fairly new phenomenon, and that with time it is reasonable to expect a broader cross-section of the community, from all socio-economic levels, to participate. One could argue that this diversification is already beginning with the close links between GreenNet in London and another computer network in the UK known as Poptel.

The organizations of GreenNet and Poptel are merging, though the actual networks will remain distinct. They now share the same office and staff. There are direct e-mail services to Poptel (no gateway charges) and a Poptel user database is available on GreenNet. Poptel's users include trade unions, local authorities, charities, cooperatives and community computing initiatives. Poptel is part of GeoNet which is also closely linked to GreenNet. Significant users of GeoNet include the international labour movement, tropical rainforest campaigners and the Nicaraguan government.45

Many studies show a strong correlation between low socioeconomic status and low participation in political issues or social organizations (Milbrath 1977). Although there are many exceptions to this, it is reasonable to suggest that members of the working class are already alienated from the political process and feel they have little to gain by their participation. Their participation in voluntary associations is also hindered by the lack of personal resources (spare time, childcare, expenses etc).

45 APC conference: netnews topic 61, Feb 1990.
Since the working class is least represented in the political process (with all their presumed power, trade unions struggle just to maintain real wages and conditions let alone improve them), it is most important that they are able to participate effectively. But many working class people may be inhibited from participation in either political parties or activist groups because they lack confidence in their social skills and abilities to articulate their ideas. Also, they may be inhibited by the complexity of political issues.

An important stepping stone for working class people to achieve a sense of self-confidence and give them better communication skills would be through greater participation in community groups. Research has shown that participation in voluntary associations gives people a sense of belonging, responsibility, and a belief that they can make a difference. They know more about local affairs and social issues generally and they are much more likely to be politically active. (McCourt 1977).

Given that telematics is not a substitute for face-to-face human interaction, it can still be argued that it is a useful tool in establishing more community interaction. Telematics can facilitate much of the organizing of voluntary associations, and provide a valuable entry point into democratic participation. The emphasis is on computer networks, rather than say telephones or two-way TV, principally because of the fact that it operates in text mode and is therefore more appropriate for discussions since it can operate outside of realtime, coordinates the order of speakers, and provides easily retrievable documentation of what has preceded in discussions. 'Telephone trees' have long been used by activist groups as a fast way to spread urgent messages. It is possible that computer networks can also be used in the functioning of voluntary associations.
The danger, as has already been discussed, is that given present circumstances, people from lower socioeconomic levels in society are less likely to have access to the technology, less likely to know how to use it, and perhaps, (currently anyway) less likely to want to use it.

Since voluntary organizations can serve as a stepping stone for deprived members of the community to become more involved in social issues and policy discussion, it could be argued that the APC networks promote democracy to the extent that they facilitate the operation of voluntary organizations.

The Myth of Contact With Representatives

While it has been argued above that participation of elected representatives on the network promotes democracy by giving citizens more direct access to those representatives, it could also be argued that this level of communication will remain limited.

In a hypothetical teledemocracy scenario in the UK suggested by McLean (General Election 1995), citizens can electronically quiz party leaders who are assembled in a TV studio. McLean inadvertently makes reference to this limited access:

(Party leaders) also answer questions sent in by viewers all over the country, a computer in the studio selecting randomly from the hundreds of thousands of questions in the stack, the dozen that can be dealt with in one program. (McLean 1986:148).

In this scenario, the chances that a citizen will be able to communicate with one of the political leaders are about one in 20,000!
The idea that computer communications such as the APC networks can provide direct contact between citizens and political representatives is therefore true only in a limited sense.

Relocating Face-To-Face Politics

A further argument which detracts from the hypothesis that the APC networks promote democracy, is that an important component of the democratic process is face-to-face politics, and that the use of telematics in this process reduces the opportunity for face-to-face interaction.

Winner claims that face-to-face politics of precincts and neighbourhoods is an essential feature of grassroots participatory democracy, and he blames television as part of the cause of declining citizen participation in the US.

Passive monitoring of electronic news and information allows citizens to feel involved while dampening the desire to take an active part. If people begin to rely upon computerized data bases and telecommunications as a primary means of exercising power, it is conceivable that genuine political knowledge based on first-hand experience would vanish altogether. (Winner 1987:111).

To reinforce his argument, Winner cites the example of two anti-nuclear campaigns both launched in the early 1980's but using different strategies. The Ground Zero campaign relied almost solely on mainstream media to publicize its cause, making extensive use of morning talk shows and the evening news. It also made extensive use of mass mailouts using computerized databases. After its initial publicity Ground Zero was largely ignored. Meanwhile, the Nuclear Weapons Freeze Campaign began with town meetings in New England which has a long tradition of active citizen participation. The campaign expanded to other
states with meetings, dinners and parties, a key form of communication. The Nuclear Freeze Campaign achieved wider public support, successful ballot measures and an ability to apply pressure upon political officials. (Winner 1987:112).

The point Winner is making is that remote communication is never a totally successful surrogate for live interaction. While remote communication may have its own unique advantages (such as less susceptibility to intimidation), it lacks the vitality, stimulation, and rich experience of meeting people 'in the flesh'. Far more is communicated through appearance, gestures, tone of voice - in short, one's total being - than in representational, electronic form. Real-time-place social events are therefore likely to be more meaningful.

For proponents of computer networks for social change, Winner's error in the above example is that he is conflating unidirectional electronic media (TV, mailouts using databases) with interactive electronic media. It might be possible to organize a town meeting once a month, possibly even weekly. More than this would be stretching the friendship of even the most enthusiastic participants. But political events can change quickly and for effective participatory democracy, citizens need the option of daily interaction.

For example, a corporation is about to deliver a submission to the Department of Planning for a large construction project. A Resident Action Group formulates a submission to oppose the project. The corporation learns of the opposing submission and, using computer conferencing, e-mail and access to databases, is able to reformulate their submission in a way which renders the opposing case obsolete. The Resident Action Group does not have the use of electronic conferencing, e-mail, and databases, and is therefore unable to convene concerned
citizens and legal and scientific advisors, to build a new case before the submission deadline. It could be argued that there is an even greater need for the use of electronic conferencing systems for the Resident Action Group because there are a greater number of people to coordinate in a democratic decision-making process. The corporation on the other hand, which usually does not use a democratic process, can assign one or a few executives to make all the necessary decisions.

Voluntary organizations need to have access to the telematics resources already available to government, business and professional groups, in order to function effectively and avoid becoming marginalized in the community.

Computer networking can provide a very useful forum for exchange between meetings. Conference facilities on the APC networks could be used to discuss and prepare an agenda for a town meeting, thus reserving more time for discussion of issues during the actual meeting. Clarifying the agenda ahead of time would allow participants to be more adequately prepared for debating the issues.

It could be argued that town meetings are undemocratic in the sense that some residents may not be able to be there at that particular time, and therefore lose their opportunity to vote on important matters. Computer networks could allow residents unable to attend (for example, the elderly, handicapped, nursing mothers) a degree of participation and an opportunity to vote. They could also facilitate 'postal votes' for those residents who cannot participate even remotely (eg shift workers).
In 1989, a conference was held at the University of Technology, Sydney, to discuss the establishment of a Green Party in Australia as well as a Green Environment Electoral Network. The APC networks established a computer link-up to its subscribers in Australia and worldwide. Regular summaries of speeches and discussion were posted on an electronic conference established solely for this occasion. Network users, including members of environmental organizations in Hawaii and Germany, responded with comments and questions, and initiated new lines of discussion. Some of these responses were read out to the conference audience. The APC conferencing system allowed a wider participation and a more diverse input into this face-to-face meeting. In this context, telematics can enhance and encourage face-to-face meetings.

The APC networks promote democracy by providing a forum for political discussion, and in a context which promotes grassroots participation and the activities of voluntary organizations. The potential of the APC networks to further promote democracy depends on the extent the networks are made available to people from minority and low socio-economic backgrounds. The use of the networks for public access to elected representatives or for electronic voting remains largely undeveloped. Further development in these areas could also be said to contribute to the strengthening of the democratic process.

In summary, the potential of the APC networks to strengthen the democratic process is clear. The networks provide a forum for individuals to discuss social issues and thus encourage participation at a grassroots level. Online conferences and e-mail services assist the activities of environmental groups and many other

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voluntary associations working for social change, and provide alternatives to mainstream politics. This diversity can only be seen as beneficial to the process of democracy.

However, this potential needs to be qualified. The technology itself will not promote democracy. If the APC networks are to promote values of democracy, decisions must be made as to what form of democracy is to be encouraged, and how. Either the APC networks can remain as a facilitator and forum for activist groups, or they could expand to encourage people of low socio-economic status with minimum educational background, to participate, and thus avoid any tendencies toward elitism. The APC networks could also tie in more directly with mainstream politics by encouraging dialogue between politicians and network users, and for conducting opinion polls. In this case, problems with electronic voting need to be addressed, and the limitations of liaison with political representatives need to be recognized. On a more general level, the potential of the APC networks to strengthen the process of democracy would also depend on whether the increase in vicarious human interaction 'online', was matched by an increase in direct human contact.
THE APC NETWORKS AND SOCIAL JUSTICE

Facilitating Issues of Social Justice

Proponents argue that the APC networks promote social justice by providing an international communications medium for Non Government Organizations (NGOs) working in the area of Third World aid and development, which is less expensive than telephone, and faster than postal services.

Pegasus director, Ian Peter, gives an example in 1989 when 400 protests had been organized around the world timed to coincide with the trial of a Penan tribesman charged by Malaysian authorities for organizing blockades against logging companies in his native forest. Media releases had been sent out all over the world two weeks before the scheduled date of the trial. The trial was then cancelled. The protests went ahead anyway, but media representatives had to be contacted urgently to update the media release. Ian Peter claims the computer network, using e-mail and conferences, helped considerably.47

Some of the NGO's that use the APC network include Amnesty International, Survival International (concerned with the rights of indigenous peoples), Community Aid Abroad, Freedom From Hunger, Oxfam, Food First, International Development Research Centre, as well as quasi-NGOs such as UNESCO. It could be argued that these NGOs are all based in developed countries and therefore do not promote the views of Third World countries. However, there are many NGOs from under-developed countries participating on the APC networks such as the Instituto Brasileiro de Acção Social, DESCO

47Ian Peter, Director Pegasus Networks, interview, October 1989.
Estudios de Promoción de Desarrollo (Peru), Grupo de Tecnología Apropiada (Panama), Instituto Latino de Estudios Transnacionales (Mexico) as well as others in Africa and S E Asia.

It is claimed that the APC networks promote social justice by providing a new forum for discussion of issues concerning social justice such as human rights, Third World aid, and development. For example, among the conferences available on the APC networks (which number well over 700) are conferences on ethical investment (ethinves.core, ethinves.forum, etc), Amnesty International urgent action (ai.uan), an open forum on 'Southern Africa peace and justice' (asafrica.forum), another focussing on children - 'in war zones, poverty and other crises' (cc.childnews), world hunger and food issues, (ppn.food+hunger), Third World issues (twr.nl), another on 'social justice and education' (uua.general), and issues concerning the survival of indigenous peoples (gn.tribalsurvive).

Software Complexity and a Technical Elite

The development of the APC networks involves the application of high tech computer hardware and the ongoing design and refinement of software. This requires software programmers with considerable training and experience. In such situations there is a tendency for technicians to take control of the design process. Their expertise carries an implicit status which can give rise to a technical elite.

The problem of technical elitism is discussed by Athanasiou in relation to the Community Memory Project in Berkeley, California (see section 'Computer

48From the APC conference database, Nov 1989.
Networking for Social Change - Background). Athanasiou points out that even though the developers of the CM Project referred to themselves as a 'collective', and tried to follow a practice of work democracy, the minority group of programmers maintained considerable control over the design process.

Programming labor always held a special status at Community Memory. Despite occasional conscious and semi-conscious attempts to value non-technical work more highly, the logic of the project itself imposed the centrality of programming labor. In the last instance, it was the success or failure of the programmers that would determine the success or failure of the venture as a whole. (Athanasiou 1985:47).

The technical design of the APC networks has been largely influenced by a handful of software programmers, particularly Weikart, Dean, Nichols and Offen in the early stages in San Francisco. It is difficult to say whether their influence has been excessive. Certainly there is a perceived need and encouragement for more computer programmers to work on the APC project. There is some broad canvassing of issues in conferences such as 'technical', 'techhistory', and 'tech.distnet', but other forums for discussion such as the conferences 'igc.db' (database development), 'igc.intlcomm' (international communications development) and 'igc.management', are closed to subscribers (though non-technical facilitators do have access).

Many technical decisions have far-reaching political and social implications for the APC networks. For example, the current operating software on the APC networks automatically identifies the author of any topic posted in a conference, as well as messages sent via e-mail. This means that closed-ballot voting cannot be carried out on the APC networks. Automatic identification also excludes the possibility of posting articles anonymously. Thus, if a subscriber in mainland China, Guatemala, Iran or South Africa, for example, wished to upload an article.

49Geoff Sears, Director IGC (PeaceNet), e-mail correspondence, Feb 1990.
which revealed information on corruption or human rights abuses that would be potentially damaging to their national government, they run a greater risk of persecution. By contrast, the CM Project allows for anonymous posting of messages. There may be good arguments on both sides. The question is to what extent do the software programmers make decisions with broad implications without consultation or canvassing wide debate with non-technical staff and possibly subscribers also.

As the APC networks go through changes in order to provide a more efficient and versatile service, so the software to run them becomes more complex. Other non-commercial networks such as the CM Project, The WELL, FidoNet and UseNet, have similarly adopted more sophisticated software over the years. This requires either allocating more resources into training operators of nodes how to run the new software, or developing software which specifically makes it easier for the node operators to manage. The shortage of computer technicians is one of the main limiting factors at present in the expansion of the APC networks. Thus the tendency may be to develop more ‘user-friendly’ software for the local operators:

The only thing needful for APC to start installing is people who know how to work it, or admin utilities which reduce the level of skill and/or training required of the local operator.

The lack of skilled computer technicians, particularly in peripheral countries, suggests that either the APC organize a long term plan to train operators of peripheral nodes, or it take the more expedient approach suggested above, and develop ‘admin. utilities’ which make operation and maintenance of a peripheral node easier and user-friendly. The peripheral operators would then become more

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50 Mike Jensen, APC facilitator, e-mail correspondence, Nov 1989

dependent on the core experts when the system software fails. Moreover, user-friendly software is usually more complex and difficult to analyse or modify. The peripheral node operators would become alienated from the software which would assume the form of a package or a less accessible black box. Peripheral node operators would be in even less of a position to take part in the ongoing design process of the APC networks.

To the extent that peripheral node operators are dependent on the expert computer skills of a core technical elite, the function of the APC networks run contrary to the goals of social justice.

Technology Transfer Within the APC Networks

While transnationals tend to restrict the flow of technology transfer (arguing that they need to maintain control over the technologies to recover substantial research and development expenditure), proponents of the APC networks argue that they do not have great expenditures to recover. The networks run on a not-for-profit basis. Much of the software development has been done by voluntary work or using grants which do not need repaying. Each network aims at financial self-reliance based on local subscription and connect fees. More importantly, establishing another network in some other region benefits all the networks as it expands the pool of users, diversifies the range of conferences, and ultimately, strengthens the effectiveness of the networks as a political tool for social change. Therefore, proponents claim, the profit motive for restricting the transfer of technology does not exist for the APC networks as it does for commercial enterprises.
strengthens the effectiveness of the networks as a political tool for social change. Therefore, proponents claim, the profit motive for restricting the transfer of technology does not exist for the APC networks as it does for commercial enterprises.

To further demonstrate the differences between the APC networks and commercial enterprise with respect to technology transfer, Geoff Sears, executive director of the Institute for Global Communications which operates the PeaceNet node of the APC in San Francisco, points out that they have provided technical support and training free of charge to CRIES, a Non-Governmental Organization (NGO) in Nicaragua that operates the Nicarao node of the APC networks. Training and equipment were also provided to Alternex, the Brazilian node of the APC networks, with the help of grants from the UNDP and CESVI international aid organizations.^^

The Question of Cultural Alienation

The Association for Progressive Communications networks can be seen as largely an AngloSaxon cultural construction. The medium and the message are fused together in the sense that there is no point which clearly distinguishes one from the other. They are two aspects of a single phenomenon. Hence Marshall McLuhan's oft quoted maxim 'the medium is the message'. The design of the medium - the hardware, the network structure, and the software, is to a large extent determined by practical, functional, logical, logistical and economic constraints. But there is also a subtle yet significant socio-political and cultural influence in determining the design and construction of these networks.

^^Geoff Sears, Director IGC (PeaceNet), e-mail correspondence, 16 Feb 1990.
up of political activist groups (such as environmental and peace organizations) to swap information and coordinate activities and to make their demonstrations and lobbying more effective, as well as the linking up of what has come to be known (loosely) as the New Age movement where information has been circulated (particularly 'resources' information) on subjects like alternative communities, alternative technology, healing centres and therapies, 'natural' foods and medicine, spiritual disciplines and mysticism. Although both subcultures (which overlap considerably) thrive in Northern European countries and even in Latin America, their origins can be traced largely to AngloSaxon countries, and even to particular regions such as the Bay Area, California, which includes Berkeley, locus of anti-Vietnam War demonstrations during the 60's, and San Francisco, where the seeds of the Flower generation were sown. The social milieu which gave life to the APC networks has its historical roots most firmly grounded in the 'counter culture'.

Roszak supports this view:

...by the end of the 1960's, there was another species of (computer) hacker on the horizon, emerging mainly on the West Coast from the ranks of the antiwar movement... In the spring of 1970, a small group of dropped-out computer scientists who had been involved in the war protest movement at the University of California at Berkeley came together in the midst of the Cambodia crisis to discuss the politics of information. They constituted one of the earliest gatherings of socially concerned hackers. (Roszak 1986:138).

Since Silicon Valley is also in the Bay Area, it would be quite reasonable to assume that the Bay Area was relatively familiar with computer discourse and hands-on experience, and that this brought about an early application of telematics technology within these two subcultures, while activists and healers in the rest of the world still regarded telematics as unacceptably high tech and in the realm of transnationals and the military. At least four significant pioneering projects originated in the Bay Area which applied telematics to the goals of the social
activists and the New Age movement - Community Memory Project (mentioned above), the Well (which is run by publishers of the Whole Earth Catalogue), and the Data Center (an Oakland-based project which produced databases on the activities of transnational corporations, and events in Central America among others). The Bay Area gave rise to such landmark ventures as the People's Computer Company newspaper and the Homebrew Computer Club. It also gave rise, some years later to the Institute for Global Communications and the Community Data Processing project out of which has grown the APC networks.

Development of the APC networks has not always stemmed from the San Francisco node. The Web network in Canada and GeoNet in England were already operating before they merged with the IGC network. However, of the seven principle nodes of the APC networks, four are based in English-speaking countries.

While people in other countries and cultures have been quick to pick up on the concept of computer networking for social change - the APC networks include a node in Nicaragua, Brazil and Sweden, as well as subscribers in many other parts of Europe, Asia, Africa and Latin America - there is a strong influence of AngloSaxon culture in two ways:

(a) in shaping the structure of the network, and

(b) in the language, concepts and worldviews that predominate on the network.

A possible retort to this model, which would deny the importance of any analysis of cultural construction and domination, is to say that the ideology espoused on and through the APC networks is of a global, super-cultural nature. Concern for
social justice, peace and the environment is not an AngloSaxon concept but a universal concept shared by all humankind. But while one could argue that the general goals are universal, the way those goals are perceived and the way they are approached may be largely determined by the predominant cultural influence on the networks.

'Culture' can be defined as people having a common worldview. Worldview can mean a geopolitical view of the world, and it can also refer more to the subjective, perceptual view of life on an abstract level (ie the way concepts of life, death, time, space, human relationships vary from one culture to another). The question of cultural domination and alienation is important in the world today because transnational mainstream media is dominated by AngloSaxon corporations espousing an AngloSaxon worldview. For example, news syndicates such as AP, UPI, New York Times and Reuters, film studios such as Warner Bros, 20th Century Fox, and MGM, TV and radio networks such as CBS, NBC, and ABC, publishing houses such as McGraw Hill, Macmillans, Time Life, Reader's Digest, Penguin, and Knight Ridder, advertising and market research agencies such as Olgivy & Mather, and Saatchi & Saatchi, record companies such as RCA and WEA, and database vendors such as Dialog, Orbit and Lexis/Nexis, are based in Anglophone countries and shaped by AngloSaxon culture. These transnational corporations dominate, and to a large extent control, the international flow of cultural material.53

To the extent that the APC networks repeat and reinforce this imbalance in the international flow of cultural material, they serve to perpetuate the dominance of

53 For a detailed account of AngloSaxon cultural imperialism, see for example, Armand Mattelart, 1984, 'International Image Markets' Comedia, London, UK.
AngloSaxon culture in the world today. Such domination runs counter to principles of social justice.

There is one important difference between the mainstream media industry and the APC networks. While the news syndicates, film studios, TV and radio networks, publishing houses, advertising agencies and database vendors represent a one way flow of cultural material, the APC networks facilitate a two-way flow. The degree of reciprocation is seen by APC developers as a measure of its success. The networks allow for a reverse flow of cultural material originating in non-AngloSaxon countries. A well-established and open APC conference known as 'udc.media' is facilitated by a group known as the Union for Democratic Communications. An important focus of this group and the respective conference, is the need to establish a new international information and communications order.

The process of cultural domination depends on ethnocentric tendencies within the dominating culture to maintain cultural cohesion, the image of self-assurance, and the illusion of superiority. It could be argued that the APC networks promote cross-cultural interaction and help substitute ethnocentricity for a cosmopolitan and multiculturalist perspective.

Reversing the Tide

The problem of domination may resolve itself at least in one aspect: if the number of non-AngloSaxon subscribers grows faster than AngloSaxon - which may already be the case. However, given the financial constraints of owning a PC and affording a higher-than-average phone bill, the majority of subscribers will probably continue to come from the more affluent countries, and so still continue
to reflect a certain cultural bias and perhaps a 'post-industrial' worldview. For example, concern for the plunder of the Amazon and indigenous peoples in Brazil might well be given more attention on the network than say problems of class discrimination, land reform, and social welfare due to the network's predominating ideological agenda. A Brazilian activist might have a different order of priorities, and even a different way of conceptualizing the problems.

**Have Languages, Will Travel**

A more practical problem concerning the development of the APC networks is that of the language currency. Language and concepts are inextricably linked. Translation is possible of course, but always with a distortion - sometimes a negligible distortion, sometimes a significant one.

English is the predominant language on the APC networks. It is possible to find 'topics' (entries in conferences) in Spanish and Portuguese, but usually with an accompanying English translation. It is general policy that all but the most local of conferences are uploaded and relayed to all nodes. In reality, quite a few conferences are overlooked. There may be a tendency to consider conferences in a language other than English as 'local' and not of interest to other network nodes. This may be done to avoid confusion - after all how many people are going to be able to make use of a conference in Finnish? Since virtually all internationally networked conferences are in English, the APC networks are most likely to attract mainly people with some proficiency in English, which will reinforce English as the central language currency. The Alternex node in Brazil, for example, does not currently support many conferences in Portuguese. As it grows it could attract
non-English speaking Brazilians. However, gaping communication rifts could fragment the network, linked only by flimsy, *ad hoc* efforts of translators.

There has been little discussion of problems associated with language barriers in network conferences. Failure to address these problems and the need for translation facilities could restrict the efficacy of the APC networks.

Friends of the Earth in Holland, for example, find that they are often more informed about issues than many contributors to the environmental conferences, yet the translation effort required to contribute to a conference in English restricts their ability to reciprocate:

> The trouble is, most of our info is in Dutch, and it is impossible to simply drop a copy of reports into the network, as others seem to do.54

There is little discussion in APC conferences about the effect language barriers have on the flow of information and ideas between nodes, and how problems may be approached. Some facilitators do not see the need for solutions in this area. Pegasus network facilitator Keith Stewart argues that English is already the *lingua franca* in many fields such as international aviation and computer engineering, so why not make an abridged version available to a wider cross-section of the community, similar to the way the International Civil Aviation Organisation (ICAO) sets out a minimum vocabulary of 560 words that international pilots must learn? An abridged form of English, Stewart claims, is all that is needed to convey urgent messages and news alerts. Meanwhile, local nodes and networks will continue to operate in the local language and therefore serve to protect and strengthen individual cultures.55 Other users look to artificial languages and

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54 Friends of the Earth, Holland, e-mail correspondence, Jan 1990.

55 Keith Stewart, facilitator Pegasus Networks, e-mail correspondence, Nov 1989.
translation software to solve the problem of the interlingual exchange of information on the APC networks.

**Synthetic Standard**

There are a number of synthetic languages in existence, with Esperanto being the most widely spoken (about one million). Others include Euro-Glosa, Inter-Glossa, Interlingua, Ido and Occidental. Besides the general rhetoric about the virtues of universal communication, proponents of synthetic and 'semi-synthetic' languages cite examples such as that only 10 percent of researchers ever consult a foreign book or journal, which means that much research is duplicated and many good ideas are never translated; or that in 1980, 1/2 of the European Parliament staff were fully engaged in translating and interpreting, using 50 percent of the EEC's total administrative costs.\(^{56}\)

However it could be argued that synthetic languages, or International Auxiliary Languages (IAL), tend to be reductionist in their efforts to remain simple. They thus lose the descriptive sophistication of natural languages (though one could argue that any synthetic language would continue to grow in vocabulary and begin to develop its own expressions). They also lack the subtleties of connotation, ambiguity and nuance that come from a long evolutionary history. Mostly they are based on European languages, particularly Latin and Greek, so they are not really 'international' languages at all. Also, if an international auxiliary language was implemented on a wide scale, for example, used in schools throughout the world, as well as by transnational media corporations, it is possible to imagine that it

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could quickly move from auxiliary to primary use and thus displace traditional languages (and culture). In the name of rationalization and improved efficiency, world culture could take a dubious leap toward homogeneity.

Translation Software

Another suggested solution is to develop software which will automatically translate voice and text. Like many other examples of telematics technology, language translation software has its research origins in the US military establishment. According to McCorduck (1985:62) one of the first projects to develop translation software was in the early 1970's when the US military commissioned English-Vietnamese software, and later English-Farsi automatic translation software.

In these instances automatic translation technology was used by one culture (the US) to rationalize the flow of information across cultural boundaries, and bulldoze language barriers in order to gain greater military and political control over another culture (Vietnamese, Iranian). Efficient methods of translation do not automatically encourage a desirable or socially just form of cultural interaction, and may in fact have the opposite effect.

It is not enough to say that translation technology is merely an extension of human translation services. Improved efficiency can significantly reduce the costs of translation which can radically alter the way cultures interact in many different fields - in business, in scientific research, voluntary associations, political groups, professional groups.
Perhaps one of the most ominous potential uses of automatic translation software is with large news syndicates such as UPI, AP, Reuters and New York Times. Telematics technology has allowed these news syndicates to expand and dominate news production all over the Anglophone world. Local newspapers cannot compete with the economies of scale of large news syndicates. They become dependent on lifting news from wire services, particularly international news, because they are less able to afford their own foreign correspondents. Potentially, automatic translation software could pave the way for further domination of the news and general media industries in non-Anglo cultures.

The Fujitsu corporation produces two software packages, Japanese-German and Japanese-English. The latter went on the market in 1985, has been sold to 110 corporations so far and currently sells for around $AUS35,000.\(^\text{57}\) However, a demonstration of the Fujitsu software to Margaret Thatcher showed its weaknesses. She was requested to utter a sentence which was translated into Japanese. A Japanese version appeared on the screen with the computer's interpretation of the original sentence appearing alongside. Thatcher told the computer 'It is an honour and a pleasure to be visiting this company today'. The translator recorded 'I think in honour visiting this company today.' A second attempt translated 'I think it is an honour to visit this company today' as 'I think the visit today in this company in honour' and 'this company's having visited today by me is honourable.'\(^\text{58}\)

The Logos Corporation in the US, which was involved in these early projects, has now developed translation software for English to Russian, German, Spanish, French and Japanese. Though the translation is by no means perfect, it can

\(^{57}\)The Australian, 'Written Language Has Room For Error,' 26 Sept 1989, p56.

\(^{58}\)The Australian, 'Mrs Thatcher Leaps the Language Barrier,' 26 Sept 1989, p27.
improve the efficiency of human translators from about eight pages to about twenty to thirty pages per day. (McCorduck 1985:62,64).

Instead of having to pay many thousands of dollars to purchase the software, the Logos Corporation translation software can be licensed for a `relatively modest fee plus pennies per word of translation' (McCorduck 1985:63). Presumably this puts the technology within range of small businesses such as the APC networks.

Translation software, while not totally competent, could increase the efficiency of translators considerably as they skim the translated text for errors. That efficiency will increase as the software is refined.

If translation software became competent and inexpensive enough to use so that all, or nearly all conferences could be translated into all languages, there would still be an argument for a single `exchange' language. For example, if there were 20 languages being used on the network, 20 translation packages would be needed if all conferences were translated into an exchange language (say English, or a synthetic language) but 190 translation packages would be needed if all languages were translated directly into all other languages. Of the 5000 or so languages in the world today, 169 are considered by the US government to be of `critical importance'. If we restrict ourselves to the 169, then 169 translation packages would be needed using an exchange language, contrasted with 14,196 without. However, on a more sober note, it is unlikely that TNCs such as Fujitsu are going to be interested in developing software for any but the most financially lucrative translation markets.

59(determined by $y=\frac{x^2-x}{2}$ where y is the number of translation packages and x is the number of languages).

60Euro-Glosa pamphlet ISBN 0 946540 11 X 1989, Glosa, PO BOX 18, Richmond, Surrey, TW9 2AU, UK.
The degree to which the APC could be said to promote social justice depends in part on how well the translation problem is solved, and the level of reciprocation between cultures represented on the networks.

In so far as the APC networks provide a forum for discussion and debate, as well as a communications medium for organizations such as Amnesty International, Survival International, and other NGOs aimed at alleviating poverty in less-developed countries, it could be argued that the APC networks promote social justice. Perhaps the true measure of success in promoting social justice depends on how the APC networks approach the question of cultural imperialism, technology transfer, and the way APC facilitators resolve the problem of language.

THE APC NETWORKS AND ISSUES CONCERNING EQUALITY

Equality of Access to Information

A predominant myth in computopian rhetoric is that computer networks designed for individual users can redress the imbalance in access to information. Corporations, the government, military and other large institutions have extensive access to large databases which they themselves compile and control. Citizens have limited access to these databases because they generally do not have computers or training in computer communications, because the costs are too high, or because, in many cases, the databases have restricted access.
Margolis argues that since the databases are already in place, all that is necessary is to make them accessible to the public.

With the power of modern communications technology, it is feasible to facilitate direct access for citizens or their representatives to most of the documentary information which forms the basis of media reports. The means of accomplishing this is extensive public access to computer-based informations systems, systems already in widespread use among civilian and military bureaucracies, big corporations, universities, hospitals, and other large-scale organizations. (Margolis 1979:160-161).

A prime goal of the APC networks is to improve citizen access to information, and thereby help undermine the monopoly of control and access by the military, corporations and government. A Pegasus Network brochure states:

> Information is power. Much of the information revolution grew in the womb of the military and the multinationals. It is time to take it into the hands and homes of the people and to make it accessible to those working to improve the world.61

The APC networks provide 'gateways' to numerous databases, and to the IntelNet service run by IntelSat which can simultaneously search 600 databases worldwide. However, the costs of accessing these databases are basically the same as if a user accesses them directly. The cost structures of these databases are not designed for casual users. To access most of them, it is necessary to have opened an account with the database provider. Online charges may range anywhere from $50-$200 per hour, although there are a substantial number of free government databases available in the US. ‘Scan’ facilities on the APC conferences mean that the combined 700 conferences function as an informal database.

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61 Pegasus Network pamphlet, 1989, PO Box 424, Byron Bay, Australia.
Concentration and Control of the Media

Much has been written on the growing concentration and centralized control of the media over the last few decades. The concentration of ownership, and hence the concentration of power and control, runs against the principle of equality.

Advocates of telematics for progressive social change often argue that computer networks such as the APC networks can be used to bypass the media and information oligopoly. William Bowles, editor of 'New York On-Line' and subscriber to the APC networks, gives reasons why the 'alternative media' (including journals listed in the Alternative Press Index as well as activist newsletters) reach only a small audience, and suggests that networks like the APC networks can be used to overcome these problems.

Alternative news and information providers cannot compete financially with corporations such as Reuters, UPI, AP, the New York Times or Dow/Jones News Retrieval. They cannot afford the costs of reprinting from these news services, and they are unable to sell their own information to these services. In this sense, the alternative press does not have access to the machinery of the mainstream media.

A second reason Bowles gives for the failure of the alternative press to participate in the mainstream media is the cost of distribution which decreases significantly with the economies of scale available to large media conglomerates. Publishers of most alternative journals resort to distribution by mail which is also costly. With

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high distribution costs and lack of significant advertising revenue, they are often obliged to charge higher prices which also restricts broad public access.\textsuperscript{63}

However, Bowles continues,

\begin{quote}
Recent developments in computer technology, both in the field of communications and printing have created the potential to change this situation.\textsuperscript{64}
\end{quote}

Computer networks for social change can solve the problem of access to major news syndicates, since they can link the archipelago of isolated alternative publications to form a major alternative news syndicate. These networks can solve the problem of costs involved in distribution since electronic distribution is relatively inexpensive.

Since the cost of a computer and modem is now within financial grasp of most people, at least in the developed world (Bowles puts this cost at around $US350), the alternative press could potentially reach a much greater audience.

Unfortunately Bowles' arguments, while valid, lack a critical structural analysis and fail to address the central reason why the alternative news providers are not utilized by the mainstream press. The central problem is not economic, it is political. There is a sharp differential and conflict of interest between the editorial policy and focus of the mainstream and alternative media. Mainstream media is closely tied to its advertising revenue from corporations. The corporate sector is not interested in peace issues which may lead to cuts in defense expenditure, and

\textsuperscript{63}\textit{Ibid.}

\textsuperscript{64}\textit{Ibid.}
environmental issues when they result in stricter regulation of corporate activities.

Schiller writes of the control of media and information:

The conditions under which information is purveyed in America today are controlled by concentrated private economic power. Press and broadcasting chains interlock with 'knowledge' conglomerates. Lubricating and underwriting these essentially private communications complexes, which provide substantive content of the country's formal and para-educational-earning outputs, are the advertising expenditures of the nation's supercorporations. (Schiller 1973:172).

In a statement which reflects an underlying utopian outlook and lack of critical understanding, Bowles says:

Our (the alternative press) collective understanding of our increasingly inter-dependent planet is unique. It is something the corporate world does NOT possess.65

It is possible that the corporate world does, in fact, understand the real causes of social problems and environmental degradation, but it is not perceived to be in the interests of corporate directors to support media channels which focus on them in any significant way.

Another major oversight in Bowles' analysis of the alternative press is that the mainstream media, in its subtle packaging of images, myths and information, shapes the worldview, values and media preferences of society. Merely providing alternative publications that are less expensive and more readily available will not necessarily attract the interest of an audience which is used to sensational reporting with a glossy presentation, and which focuses mainly on innocuous, unchallenging issues.

65 Ibid.
It could be argued that the APC and similar networks will fail as a general alternative to the media and communications industries as long as they fail to take into account the way the mainstream media is shaped by the social elite to serve its own interests.

In the light of this structural control of the media industry, alternative media initiatives such as the APC networks would seem futile. However, it could also be said that alternative computer networks are vital in any movement aimed at undermining that structural control since the APC networks are not centrally owned, nor are they centrally controlled. They require low capital start-up costs and they are an interactive form of media. Minimal editorial intervention allows for the expression of a wider range of viewpoints.

Raboy and Bruck reject the notion put forward by the dominant paradigm of critical communications research which insists that because the established media share an all-pervasive ideological bias, 'there is little or no room for alternatives; that the media do their job in a monolithic manner; that social movements are thus systematically excluded and rendered ineffective; and that the dominant ideology is thereby automatically reproduced' (Raboy and Bruck 1989:8)

This notion, they argue, tends to disempower groups and individuals with respect to the media. The fact that hundreds of alternative media initiatives in different parts of the world have taken over pockets of public space 'to the chagrin of economic and political authorities', particularly in the sphere of public radio, represent important seizures of communicative power. Raboy and Bruck view alternative computer networks as another vital area in the struggle to transform the media:
New computer-communication technologies... can, under the right conditions, open up a completely new dimension for social interaction and activism on the micro-level allowing the creation of 'meshed networks' of open spaces which potentially bypass statist controllers or commercial/capitalist intermediaries. (Raboy & Bruck 1989:8).

Raboy and Bruck draw an analogy with public radio and public television. However, the ability of alternative media to make inroads into mainstream media audiences depends more on a shift in audience preferences and culture, than the availability of public access media facilities.

**News**

The APC networks provide alternative news services on a wide range of topics. Events in South Africa, Central America and the South Pacific, for example, are covered extensively by regular independent news service.\(^{66}\) Investigative journalists have an opportunity to publish material that is excluded from mainstream media because it does not conform to editorial policy or because it is written in an unconventional style. English-language news agencies generally send English-speaking correspondents to foreign countries to gather news, and hence it is written from the perspective of AngloSaxon culture. The APC networks, on the other hand, have a greater multicultural structure and input. There is more likelihood of news written from a variety of cultural perspectives. Mainstream news in developed countries, for example, often portrays Third World countries as undeveloped because of internal problems - lack of organization, absence of a work ethic, bad economic management and the prevalence of corruption. It could be argued that from a Third World perspective, the central problems which perpetuate backward economies are corrupt puppet regimes.

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\(^{66}\)see for example APC conferences 'sscan.news' which offers a weekly bulletin of events on southern Africa; 'carnet.elsalnews', 'carnet.guatemalnews' and other 'carnet' conferences for news updates on Central America; and 'spans.wire' for news updates on the South Pacific region.
supported by Western governments, the unfair structure of international trade (eg. low prices for primary commodities such as minerals and agricultural produce), and high foreign debts brought about by Western banks eager to lend money for grandiose projects in the Third World.

News items on the APC networks often differ significantly from news in mainstream journals in that they are presented in an 'active context'. There is an emphasis on analysis. Articles are often written with a sense of urgency and sometimes include the contact addresses of leaders to lobby, and other ways to take action. This contrasts with news items in mainstream media which could be described as being framed in a passive context, removing the reader from any feelings of involvement and shared responsibility.

Databases

A recurrent theme underlying the development of the APC networks is the need to make available the necessary information required to precipitate social change. Schiller describes the current difficulties in accessing strategic information:

Not only is the informational circuitry still firmly in corporate hands, but data essential to prying open the closed system of privilege remain inaccessible. Basic information regarding the ownership of corporations (camouflaging stockholders' identities), the quality of the product ('trade secrets'), corporate profit statistics detailed by taxable assets, and cost and pricing data are practically undiscernible, except in isolated and fragmented cases. (Schiller 1973:176).

The APC networks can help 'pry open the closed system' by acting as a context in which to order fragmentary information. Compiling databases for public access may have limited effect because the most vital information is 'inside information' or 'classified'. Just as land has been considered the key resource of feudal
society, and the means of production the key resource of industrial society, restricted information has come to be seen as a scarce commodity that determines one's class and status.

However, Cleveland argues that information is fundamentally different from other scarce resources. Unlike land and capital, information can be duplicated and has an intrinsic propensity for diffusion. While material goods sometimes diffuse in ways not intended through theft and spillage, this diffusion is insignificant compared to the wholesale leakage of information. Information leakage has become institutionalized. Telematics will increase this tendency of information to diffuse:

Information monopolies will exist, as time passes, only in more and more specialized fields, for shorter and shorter periods of time. (Cleveland 1985:59).

Secret documents are leaked regularly from governments and corporations. Some are published in journals (mostly independent ones), and some are published in book form. A few, like the 4,000 pages of Pentagon Papers leaked during the Vietnam War period, are so voluminous that they become inaccessible by virtue of their size. Computer networks such as the APC networks can be used to facilitate the diffusion of leaked information as well as provide summaries and abstracts of lengthy documents and documents containing substantial technical or legal jargon.

Freedom-of-information legislation in many countries has allowed greater public access to restricted information. Public interest computer networks such as the APC networks can contribute significantly to the diffusion of this restricted information.
The largest information providers are owned by media conglomerates and other transnational corporations. Dialog is owned by Knight Ridder; Orbit is owned by the Maxwell media empire, as is Macmillan and Pergamon publishers and BRS, another significant technical and business database; NEXIS/LEXIS is owned by Mead Corporation, a large transnational corporation dealing mainly in forest products; ARPAnet is run by the US Defense Department and was originally used to exchange information about weapons and military strategies among experts (Roszak 1986:170); Compuserve is owned and operated by tax consultants H&R Block; Reuters News Agency which operates extensive commercial databases, is often claimed to be independent, but Rupert Murdoch and Robert Maxwell, executive directors of two of the world's largest media conglomerates (including newspapers, journals, radio and TV stations, film studios, book publishers, and telecommunications companies) are both influential members of the board of directors.67

Two important effects of this 'rationalization' and 'shakeout' of the media industry over the last two decades is that information production and marketing is now aimed more at the most lucrative top end of the market - well-funded research institutions and the corporate sector. Costing is geared to a specialized market with a wide profit margin rather than a broad market with a narrower profit margin. The major production of information is in financial, scientific and technical data. Information that is useful to individual consumers such as local and national politics (world politics is represented quite well, though with an establishment perspective, and at prices beyond the means of most individual consumers), information regarding general health, employment opportunities, counselling, community services, lifestyles, recreation, self-education, general reference, are under-represented. Compuserve, as well as national videotex

67 from discussion with Reuter's staff, Sydney, Dec 19 1989.
services such as Prestel (UK), Minitel (France), Discovery (Australia - formerly Viatel), and perhaps Dialog's 'Knowledge Index' aim more to the individual consumer. However, they lack the research capacities and sophistication of the larger exclusive databases, and the information provided is often trivial and commercial (flight information, teleshopping, dating services, weather etc.)

Facilitators of the APC networks argue that not-for-profit computer networks have the potential to provide a powerful alternative to commercial databases. There is extensive work currently underway at PeaceNet in San Francisco to develop suitable database software which will allow both facilitators and subscribers to compile databases that relate directly to the movement for social change. These might include databases on military research and development, statistics on countries exporting military hardware, documentation of peace negotiations, environmental track records of transnational corporations, the history of human rights abuses in different countries, research on human-scale technology particularly suitable for Third World conditions, among others.

These databases serve two functions - they can provide access to information already being produced by government agencies and other research institutions, but difficult to obtain by the general public, and they can encourage and provide an outlet for independent research conducted by non-government, non-corporate groups and individuals.

Plans are also underway to provide gateways to commercial databases such as Dialog using a common subscription. This will make commercial databases less expensive and therefore more accessible to the general public because the cost of

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68 APC conference: oz.ideas topic 43.1 'Access to Databases' Feb 27 1990.

69 Ibid.
maintaining subscriptions to various commercial databases is too high for the casual user. Common subscriptions means that the user need only pay online charges.

The Practical Viability of Not-For-Profit Online News Services.

Users of electronic conferences can either read topics directly while staying online, or they can download them and read them later while offline (thus minimising online charges). Both online charges and slow downloading speeds have tended to result in users keeping their posted items brief, (say less than 500 words). There are exceptions to this, but long items, when they do occur, are often accompanied by apologies, or sometimes followed by objections from other users.

On Pegasus, the Australian node of the APC networks, a user can download at around 1,000 words per minute, using a 2400 baud modem, which is roughly two A4 pages of text, at a cost of 13 cents per minute (afterhours rates). The capacity to download lengthy articles quickly should improve as users adopt 4800 and 9600 baud modems, or even faster (an 18,000 baud modem, which is currently used by the APC networks for overseas data transfer can only be used by subscribers with special permission at present). This technological development must also be accompanied by more sophisticated node computers, personal computers and software in order to gain anything from using faster modems. The uploading and downloading speed is also limited by the number of users on the system at any particular time, the quality of the phone lines and the X25 (Telecom) line speed.70

70Ian Peter, Director Pegasus Networks, e-mail correspondence, 08 Oct 1989.
Software is currently being explored by the APC networks (such as ‘distnet’) which will allow for news services to be ‘compressed’ for transmission and thus reduce communication costs to the consumer even further. As downloading speeds increase, comprehensive and structured news services could become a more viable proposition.

Public Feedback in the Media

The interactive nature of computer networks is also cited as a distinct advantage of this technology over other media forms that can lead to greater public feedback in the media. In a study of the most common forms of information transfer in society, McQuail distinguishes four basic patterns of information traffic:

Allocation - the simultaneous transmission of a centrally constituted ‘offer’ of information intended for immediate attention, according to a centrally determined time scheme (eg. TV, radio, print media).

Conversation - an exchange between individuals of information already available to them, according to a mutually convenient time scheme (eg. telephone, mail).

Consultation, the selective consultation by individual participants of a central store of information at times determined by each individual (eg. databases).

Registration - the collection in a central store of information available to, or about, individual participants, according to a centrally determined choice of subject and time (eg market research, census) (McQuail 1986:9).
Allocution and registration information flow is characteristically one-way, and from the perspective of the individual, they are passive. Conversation and consultation on the other hand could be described as interactive, as the individual consumer plays an active role in shaping the flow of information. Allocution and registration information flow is typically controlled by institutions. Mainstream media is characterised by a one-way flow of information, by a central control of the shaping of that information, and by a lack of interaction between sender and receiver.

According to McQuail, telematics technology, and computer networking in particular, is bringing about a shift from a predominance of passive information flow to a growing use of interactive information flow. This shift from passive to interactive is also said to represent a shift in the balance of power from the sender toward the receiver (McQuail 1986:8).

Newspapers and magazines usually carry a 'Letters-to-the-Editor' section, and talk-back radio also provides a channel for public feedback in the media. However, it could be argued that the ease by which users of computer networks such as the APC networks can respond to news items, the fact that space is not a constraint as it is with journals, and the minimal editorial intervention on the networks, means that much more public feedback is possible with this form of media. And whereas letters to the editor often refer to articles printed in journals two or three weeks previously, responses to news items can be posted almost immediately upon publication and juxtaposed along with the original. This may lead to journalists qualifying their article, adding new material, or responding to comments after publication - and would constitute a new phenomenon in journalism.
Equality of Access to the APC Networks

Promoters of the APC networks also point out that because participants in the conference can be remote, there is no disadvantage to people in peripheral regions compared to those in core regions (conferences are invariably held in core regions), whether we are referring to country regions as opposed to city, or undeveloped countries as opposed to developed.

However, this claim could be qualified by the fact that telecommunications infrastructure is not as well developed in peripheral regions. One user in an isolated region of Australia could not communicate because of 'noisy' lines, though the problem was promptly rectified by Telecom Australia. Another user had difficulty connecting from India. Noisy lines resulting from poor quality telecommunications was suggested as the reason. Eventually communications were established but at a low speed of transmission (300 baud), which meant that connect time charges were higher. In many countries of the Third World there is very limited telecommunications infrastructure and very few telephones per capita.

Although there are APC users in undeveloped countries like Nepal, India, Colombia, Bolivia and Swaziland, they are almost invariably located in the cities. Users in peripheral regions must cope not only with extra costs resulting from poor telecommunications, but they must also pay international access costs. Users in the US, Canada, Australia, and the UK pay only a local call fee to access the networks. Users in other countries must pay international access charges. To compensate for this, Pegasus Network subsidizes subscribers in SE Asia and the Pacific:

71 Pegasus Newsletter, No.4 p2, Epicentre, PO BOX 424, Byron Bay, NSW 2481. Australia.

72 Ibid. p4.
Pegasus Networks, as a member of the APC family of networks, has a commitment to the growth of networking in the Asia/Pacific region, and would eventually like to assist in the establishment of low cost host computers in each country linked to the global network.

However, in the meantime, we recognise that Asian/Pacific users incur heavy costs just to make the connection to us. We therefore are prepared to subsidise accounts on our network in order to assist groups interested in networking. Eventually, we hope, the establishment of network hosts in countries concerned will further reduce prices for users.\(^3\)

To compensate for the high international access charges, subscription fees and connect charges are less than 50 percent of the usual fee.

Facilitators of the APC networks are also working toward improving the accessibility of the networks in Third World conditions. Pegasus facilitator, Keith Stewart, says their aim is to make the APC `quick, cheap and very easy for anyone in a Third World country to `log on' at minimal cost from their village (using) 12 volts down a rotten power line.'\(^4\)

Experiments are also being carried out to make the APC networks available to people in regions where there are no telephone systems. In the Philippines and Colombia, for example, the networks have been interfaced with short wave radio. Packet radio systems have allowed the transfer of binary and text files.\(^5\)

This commitment to making the APC networks accessible to users in peripheral regions at affordable rates strengthens the contention of proponents that the APC networks promote equality of access to news and information, both at the national and international level.

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\(^3\) Pegasus Networks conference: oz.netnews topic 17, 05 Dec 1989.

\(^4\) Keith Stewart, facilitator Pegasus Networks, e-mail correspondence, Nov 1989.

On the other hand, as communication, information and news become tied more closely to computer networks, people without computers, modems and computer skills will be at a disadvantage. Studies have revealed that people most likely to fall in this category are lower socio-economic groups in society that are already disadvantaged.

Golding and Murdock, in their study of information technology and the media in the UK, suggest that public information services such as public libraries and government departments are withering in real terms (Golding and Murdock 1986:73) and that new telematics-based information services are out of financial reach of the lower socio-economic strata, which in turn exacerbates inequalities in opportunity. In 1986 there were still 4 million (20 percent) of households in the UK without a telephone. A 1983 study revealed that whereas 23 percent of the professional and managerial households sampled possessed a computer, the corresponding figures for white collar workers, skilled workers, and unskilled and unemployed workers were 11.6 percent, 6.7 percent, and 3.6 percent respectively (Golding and Murdock 1986:77).

One would expect that a commitment by the APC networks to the promotion of equality in society would include a policy of promoting their services among disadvantaged groups in society, as well as subsidised workshops in computer literacy skills.
Studies into the social shaping of technology have led a number of authors, such as Langdon Winner, to conclude that artifacts have politics. According to this view, a technology or artifact reflects and reinforces the political ideologies of the individuals and social groups that are primarily responsible for its conception, design and construction. Winner speaks of:

..inherently political technologies, man-made systems that appear to require, or to be strongly compatible with particular kinds of political relationships.

In the words of Lewis Mumford, whose works (e.g. Mumford 1967) have inspired many subsequent studies into the social shaping of technology, there are two basic categories into which all technologies fall:

..one authoritarian, the other democratic, the first system-centered, immensely powerful, but inherently unstable, the other man-centered, relatively weak, but resourceful and durable.

Since telematics has been shaped primarily by the US military establishment to enhance global surveillance and command control, and by transnational corporations to extend their global reach and allow domination of foreign markets (D Schiller 1982:99-101), it is regarded by many authors as a technology of social control.

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77Ibid. p123.

However, an investigation into the APC networks suggests that telematics can be used to promote values such as peace, democracy, social justice and equality, and that it could, therefore, also be classified as a technology of social liberation. It would be misleading to classify telematics technology as 'inherently democratic', or 'inherently authoritarian'. Telematics can be shaped either way depending on the social and political context in which it is developed.

To further the development of not-for-profit computer networks for social change, it is necessary to understand the ongoing process of social shaping of telematics technology on three levels:

(a) on the macro-level where national governments and large corporations continue to play a major role in telecommunications policy and the direction of hardware and software design;

(b) within the context of activist groups and voluntary associations in general;

(c) within the APC networks.

Ongoing Social Shaping of Telematics On The Macro Level

The APC networks are not a self-contained and independent system. They rely on the vast global telecommunications infrastructure which is controlled by both public and private PTTs. Decisions by national governments to upgrade highly profitable telecommunications routes, while neglecting peripheral ones, can have an important bearing on the effectiveness of the APC networks as a universally accessible forum. Faster transmission speeds and lower communications costs
require improved line quality. Large corporations that can afford to lease lines can achieve transmission speeds of up to one million bits per second because the leasing agreements generally guarantee regular 'cleaning' by the telecommunications carrier.\(^{79}\) The quality of telephone lines to most private homes, on the other hand, means that transmission speeds of more than 10,000 bits per second are unlikely, while in India, one APC user needed to drop to 300 bits per second to achieve reliable communications.\(^{80}\)

The success of the APC networks is also dependent to a large extent on transnational computer and microelectronics corporations for advances in performance and continued production of hardware and software at the lower end of the market. Apple Computers changed the course of computer manufacturing significantly by opening up a popular market for personal computers (Roszak 1986:141-145). Whether corporate research will lead to the development of reliable personal computers at prices affordable to Third World citizens and other low-income earners, is uncertain. Much depends on the perception of potential markets, and the willingness to make long-term investments in a product which may promise only narrow profit margins.

APC facilitators appear to be aware of some of these macro issues and, in one example, Pegasus facilitators have held discussions with Commodore Computers with the aim of developing a suitable inexpensive computer with an internal modem.\(^{81}\) However, the lobbying efforts of an organization such as the APC are dwarfed by the profit-driven machinery of TNCs, with their profound influence on government policy.

\(^{79}\)From conversation, spokesperson, Telecom Australia, 02 Mar 1990.

\(^{80}\)See section 'Equality of Access to the APC Networks'.

\(^{81}\)Keith Stewart, facilitator Pegasus Networks, e-mail correspondence, Nov 1989.
Cooperation Between Progressive Networks

The rapid growth of the APC networks is attributable, in part, to its not-for-profit orientation. The Web was able to integrate with GreenNet and PeaceNet because these networks were not competing for a greater market share. Although e-mail can be sent quite easily to other progressive computer networks such as GeoNet, Poptel, CariNet and the WELL, conferences cannot be accessed.

Close cooperation between these networks, as well as numerous smaller community-based networks that are mushrooming in North America and Europe, can help establish the APC as a popular alternative to commercial networks and videotex systems. Close cooperation could also lead to economies of scale in the further development of software and databases.

Policy Within The APC Networks

A common belief among facilitators of the APC networks is that their role is to provide the computer network system and to sort out technical hitches, but not to intervene in the content of conferences. As one facilitator described it, they are merely the 'librarians'.\(^{82}\) However, according to a social shaping of technology analysis, the system and the content are not distinct but overlap in many ways. To use the analogy of a librarian, decisions must be made as to which books will be purchased and which will not. Similarly, facilitators are actively promoting the APC networks. The way they set about promoting the networks will have a significant influence on the networks' social character and identity.

\(^{82}\text{Ibid.}\)
It has been argued here that part of the reason the Community Memory Project in Berkeley evolved into a mere graffiti board was due to a lack of structure and identity. More recently, a computer networker from the FidoNet system intended to fully integrate the APC networks with FidoNet. This action was resisted by facilitators at Pegasus, perhaps fearing that such a move would shift the political activist and New Age identity of Pegasus to one characterized by computer hackers interested mainly in computer programming and computer games. Pegasus director, Ian Peter, comments:

We’re not interested in becoming FidoNet. I think they’ve got vastly different purposes.

This example illustrates that facilitators do not have a neutral role in the socio-political development of the APC networks. Facilitators could recognize their active role in shaping the networks and perhaps benefit from a clearer definition as to their goals, identity, and growth strategy. Editorial intervention can still be kept to a minimum. A development policy might help avoid the danger of the APC networks being integrated and consequently swamped by larger networks where the original theme of social change becomes lost in a more dominant paradigm that reinforces the status quo. A development policy would also help identify instances when integrating and close cooperation with other emerging networks would be mutually beneficial.

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84 It would be unfair to suggest that FidoNet consists solely of computer-speak and games, as it is a very diverse international network, but the description is used as a very general perception of FidoNet. It should also be mentioned that the APC networks have gateways to FidoNet.

85 Ian Peter, Director Pegasus Networks, in conversation, Mar 1990.
The following is an incomplete list of Non-Government Organizations (NGOs) that subscribe to the APC networks.*

Environment Groups


Human Rights

Amnesty International, Survival International

Political


Peace Groups


Research Institutions


Journals

New Internationalist, Environmental Digest, World Rainforest Report, Novosti (Moscow), Inter Press Service, New Society Publishers, Simply Living.
Development


Religious

Quaker, Bahai, Episcopal Church, Interfaith Justice and Peace Centre, New Jewish Agenda, Unitarian Church

New Age

Aquarian Agency, Findhorn, Homeonet, Interhelp, Solstice, Hopi Epicentre, Permaculture International

UN Agencies


*source: Pegasus Networks information pamphlet 1989 Byron Bay Australia.
## GLOSSARY

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>APC</td>
<td>Association of Progressive Communications, an umbrella organization of seven computer network nodes located in the US (PeaceNet), Canada (The Web), UK (GreenNet), Sweden (FredstetNet), Nicaragua (Nicarao), Brazil (Alternex) and Australia (Pegasus). This umbrella organization also covers networks defined by subject rather than geographical location such as EcoNet and HomeoNet.</td>
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<tr>
<td>baud</td>
<td>bits per second transmission speed of a modem.</td>
</tr>
<tr>
<td>bit</td>
<td>basic unit of digital information.</td>
</tr>
<tr>
<td>byte</td>
<td>comprising of eight bits. This unit of digital information approximates a single alphanumeric character (or space).</td>
</tr>
<tr>
<td>conference</td>
<td>in this work 'conference' refers to an ongoing electronic conference on a computer network. Users can read or contribute ideas and information around a conference theme. Electronic conferences do not need synchronous or 'realtime' participation.</td>
</tr>
<tr>
<td>CUG</td>
<td>Closed User Group, a conference open to specified users only.</td>
</tr>
<tr>
<td>downloading</td>
<td>transferring information from a computer network into the memory of a personal computer.</td>
</tr>
<tr>
<td>e-mail</td>
<td>electronic mail, messages sent between users of a computer network and addressed to private electronic mailboxes.</td>
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<tr>
<td>gateway</td>
<td>network software facility which allows a subscriber on one network to send e-mail or access databases on another network.</td>
</tr>
<tr>
<td>IGC</td>
<td>Institute for Global Communications, organization which developed the first APC computer network node, PeaceNet, and is located in San Francisco.</td>
</tr>
<tr>
<td>ISDN</td>
<td>Integrated Services Digital Network, a telecommunications cable (probably made of optic fibre) which allows rapid transmission of digital communications. It is widely believed that such high-capacity cables will enable interactive television and faster computer communications.</td>
</tr>
<tr>
<td>kilobyte</td>
<td>common measure of data volume.</td>
</tr>
<tr>
<td>LAN</td>
<td>Local Area Network - network linked within a local area and not involving PTT networks.</td>
</tr>
<tr>
<td>log-in</td>
<td>to enter a computer system, or to connect one's personal computer to a computer network via telephone network, usually involving use of a private password.</td>
</tr>
<tr>
<td>Minitel</td>
<td>French public videotex system which provides e-mail, information services and 'bulletin boards' which are a form of computer conferencing.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
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<tr>
<td>Modem</td>
<td>Computer accessory which allows computers to communicate via cable or a telephone network.</td>
</tr>
<tr>
<td>Networking</td>
<td>Used here to mean the linking together of groups and individuals via a computer network.</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-government organization, usually refers to voluntary associations, activist groups and community organizations.</td>
</tr>
<tr>
<td>Node</td>
<td>A computer network is usually structured around one or more central facilitating computers which are called nodes.</td>
</tr>
<tr>
<td>Online</td>
<td>Connected to another computer, computer network, or database via a telephone network.</td>
</tr>
<tr>
<td>PTT</td>
<td>Post, Telephone and Telegraphy, acronym meaning telecommunications authority.</td>
</tr>
<tr>
<td>Telematics</td>
<td>Conflation of computer and telecommunications technology.</td>
</tr>
<tr>
<td>TNCs</td>
<td>Transnational corporations</td>
</tr>
<tr>
<td>Topic</td>
<td>Used here to mean a unit within an electronic conference, a new point of discussion or item of news.</td>
</tr>
<tr>
<td>Uploading</td>
<td>Transferring information from a personal computer into a computer network.</td>
</tr>
<tr>
<td>VDU</td>
<td>Visual display unit, or computer screen</td>
</tr>
</tbody>
</table>
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