Chapter 8

Alternatives

The Great Leviathan

Describing alternatives to capitalism has always troubled Marxists. Marx's early writings contain lyrical evocations of post-capitalist possibilities. But he and Engels were highly critical of "utopian socialisms"--many of them technocratic ancestors of today's information society theory--that drew-up elaborate pictures of ideal societies without recognising the need for struggle and conflict to attain them.[1] Rejecting these "Comtist cookbooks about the future," they held that communism is "not a state of affairs which is to be established, an ideal to which reality [will] have to adjust itself" but rather "the real movement which abolishes the present state of things."[2]

Today, however, mere invocation of the "real movement " is not immediately encouraging. A vast block of despair and cynicism consolidates the dominance of the world market. The catastrophe of state socialism has left millions convinced that, however appalling the trajectory of capitalism may be, there is simply no alternative to it. This resignation is then reinforced by information capital's managers--those whom Pierre Bourdieu recently called the "kings of technocracy-- in whose discourse any attempt to think beyond the `realities' of global competition and automating technology is instantly dismissed as tantamount to delirium.[3] As Massimo De Angelis observes, such "technicism" serves as the "ultimate legitimisation" for capitalism, making its economic order into "a great Leviathan, the unchangeable and unquestionable constraint facing all political and cultural subjectivity, a constraint that subsumes everything."[4]

De Angelis argues that in the face of this conceptual closure there is an urgent need "recover a utopian discourse, in thought as well as in antagonistic and constitutive practice."[5] He observes that, "Through an interesting play on words, the word utopia is defined in English as <u>no</u>where - no place. But this could also be read as <u>now</u> here - here and now."[6] De Angelis goes on to distinguish between "realisable" futures, that "presuppose a pre-conceived plan which must be realised (by subordinating to the plan all the people who don't like it)," and "actualisable" futures, where "whatever is actualisable is already existing in a virtual way, where virtuality is a dimension of reality."[7] He urges utopian invention, "not as <u>the</u> alternative model, not as a party program or a plan in search of subjects to subordinate" but as "an open and inclusive horizon of thought, antagonistic practice and communication" that can "show different possible horizons and contrast them to the poverty of the mainstream one."[8]

It is in the spirit of De Angelis' proposal that I offer a sketch of an alternative future. I propose a series of measures--the institution of a guaranteed annual income, the creation of universal communications networks, the use of these networks in decentralised, participatory counter-planning, and the democratic control of decisions about technoscientific development. These elements would, in their full implementation and synergistic interaction, go a long way towards constituting a viable alternative to capitalism. Moreover, each of the separate elements proposed here, and each of the various gradients and steps in their realisation, can be seen as delineating fronts of struggle. They are conceived of as invading beachheads that can be established on the shoreline of capital and advanced, up to the point where their combined effect overwhelms

the logic of the entire system. The final section of the chapter briefly reflects on some conditions under which this might occur.

The ideas proposed here have not fallen from the sky. They extrapolate not only from a variety of theoretical sources but also from what is really being done, now, in what autonomists would term the "self-valorising" practices of a multitude of activists.[9] The interweaving of elements and possibilities that are now in fact commanding wide attention can constitute what might be considered a utopian future.[10]

This thought-experiment does, however, have some important limitations. It focuses only on those issues that relate to this book's major theme--the social uses of the new information technologies. Its basic orientation comes from Marx's observation in Grundrisse, that while machinery may be the "most appropriate form" of capital, capital is not necessarily the most appropriate social form for machines.[11] To illustrate this point, I assume a society in which high-technologies are fairly readily available. Since currently these conditions obtain most strongly in a handful of advanced capitalist economies, the sketch is Eurocentric. There is a missing dimension, whose importance I acknowledge but do not address, one that involves issues such as the release of the South from an exterminatory debt burden, the reversal of the flows of value from South to North, the payment by the North for the preservation of the ecological resource vital to planetary survival, and the support of spaces for what is sometimes termed "autonomous development" freed from the economic and cultural constraints of neo-colonialism.[12]

I think of this sketch as a proposal for `communism'--a continuation of the red thread which Marx and so many others have spun across centuries. But I also know that this name, `communism,' has become so heavy, so sodden with blood and weighted with

nightmarish history, and carries with it such a burden of explanation, repudiation and qualification, that many regard it as unspeakable, at least for this generation and probably several more.[13] What word might be used instead? I do not want to talk of `socialism,' a concept profoundly tainted--in its authoritarian forms, by terror; and in its social democratic variants, by failed compromise.[14] I might follow the lead of Cornelius Castioradis, who now speaks of an "autonomous society"--but this phrase also is freighted with its author's changing allegiances, and too rhetorically ponderous to be attractive.[15]

Therefore, sometimes use another term: commonwealth. Some of the connotations of this word, too, are unappealing. But others are very appropriate. It designates quite exactly what I have in mind-a common-wealth of collectively shared resources. It derives from a root around which clusters other concepts important to this study --like communism, communication, and commons. Common-wealth also recalls the energy of 17th-century revolutionary republicanism: if this proposal seems like a 21st century version of the visions of Diggers and Ranters seeking a "world turned upside down," so be it.[16]

Zerowork: Guaranteed Income

Marx wrote that:

. . . the realm of freedom actually begins only where labour which is
determined by necessity and mundane considerations ceases: thus in the
very nature of things it lies beyond the sphere of actual material production
. . . Beyond it begins that development of human energy which is an end in
itself, the true realm of freedom, which, however, can blossom forth only

with this realm of necessity as its basis. The shortening of the working day

is its basic prerequisite.[17]

This is the prospect that the' information revolution' seems to bring in sight.
Since the dawn of such computerised automation, people have been concerned about the

consequences for employment. As early as 1949, Norbert Weiner, the father of cybernetics,

raised the spectre of a crisis of work resulting from robotisation.[18] The classic reply to this

anxiety was that labour displaced from the manufacturing sector would be reabsorbed in

the service or information sector. For several decades, this optimistic prediction seemed to

be borne out by the course of events. As I suggested in Chapter 5, the diminishment of

"direct labour" in production has been complemented by a expansion in "indirect"

labour—both in the field of technoscientific work and in the myriad tasks of marketing,

transportation, public service, cleaning and caretaking that constitute the social matrix of a

highly automated economy.

Today, however, there are signs that this logic may be exhausting itself. For the same type

of technological systems which decimated manufacturing jobs are now being applied in the

tertiary sectors meant to soak up the surplus labour displaced from industrial production. In

the banking, insurance, wholesale and retail industries, companies are using seamless, end-

to-end information processing systems to eliminate whole layers of employees. Moreover,

the acceleration of this process is an unacknowledged aspect of the 'information highway.'

Teleshopping, video on demand, and virtual services mean the mass liquidation of clerks,

salespeople, and other supernumeraries.[19] As the spate of layoffs in telecommunications

demonstrates, those who are building the highway are the first to go. Capital is automating not just the factory but the entire social factory.

In many advanced capitalist economies--including those of Canada and much of the European Economic Union--unemployment rates are now at levels unthinkable fifty years ago. In the US, visible joblessness is much lower. However, the relatively low US official unemployment figures quite possibly disguise the scope of the job crisis behind a huge expansion of part-time and temporary work--the so-called `McJobs,' which in effect institutionalise chronic underemployment.[20] This situation certainly can't all be laid at the door of automation. The global relocation of labour (capital's other major weapon against workers, itself made possible by technological advances in transportation and communication) is a factor. There are also are further cyclical, organisational and demographic elements in play. Nonetheless, attempts to deny the contribution of technological redundancy, along with all the negative multiplier effects of decreased consumer demand, seem increasingly obtuse. So serious is the consequent crisis of social disintegration that even some mainstream economists now concede that a serious problem exists.[21] And within the last few years several social theorists from a very wide variety of perspectives--Stanley Aronowitz and William De Fazio in The Jobless Future, Jeremy Rifkin in The End of Work, Barrie Sherman and Phil Judkins in Licensed to Work--have acknowledged that we may be in view of the point foreseen by Marx, where the replacement of living labour by machines fatally undermines the wage relation.[22] Potentially, the extraordinary productivity increases created by high levels of automation could be realised in terms of general increases in income and/or supported leisure time. There emerges the potential for what Paolo Virno terms;

> The reduction of obligatory labour time to a virtually negligible part of life,
> the possibility of conceiving employment as one of the moments of
> existence and not as forced labour nor as the source of a permanent
> identity.[23]

However, because capital continues to impose the linkage of income to work (for all except the owners of the means of production) a diametrically opposite situation is produced: an intensified availability for work, enforced by the immiseration of unemployment. Thus, "the time of non-work, which is a potential richness, presents itself within the established system as a lack, as poverty."[24] Alongside practices of global relocation computerisation has in many sectors of the economy--and quite probably across the board--decreased the demand for socially necessary labour within the zones of advanced capitalism, thereby restoring what Marx identified as the central weapon of capitalist command over the working class--the maintenance of a permanent "reserve army" of the unemployed.[25]

The fear of joblessness promoted by accelerating high-technology automation is a sword held at the throat of labour. It undermines trades union strike power, and allows management to coerce employee `co-operation,' recruit desperate strike breakers, and drive down wages and working conditions. As workers compete amongst themselves for employment, capital sifts them into different strata--the declining core of permanent employees needed to run the new production systems, the periphery of temporary and part-time workers called up according to the fluctuations of the economy or the production

cycle, the absolute rejects destined for the welfare lines or starvation. Labour is segmented into an increasingly vicious hierarchy whose rungs tend to correspond and reinforce discriminations of gender, race and age. Those at the top must work ever harder, faster and more flexibly to save themselves from the immiseration below. Those at the bottom buy survival only at the price of super exploitation, pricing themselves into a job so cheaply it is not worth replacing them with machines.

Faced with this convulsion, the usual response of the socialist left has been to call for the creation of `more jobs,' engineered by a renewal of Keynesianism or an adjustment of interest rates. Not only does this response run in the face of the actual capacities of technological innovation, but it forgets that, in origin, socialism was not a project for the extension of wage labour, but for the ending of what was understood as an exploitative and dominative institution: `wage slavery.' The reduction of this aspiration to a call for full employment--a call, moreover, made more implausible by every advance in computer science--dramatically reveals the attachment of social democratic and trades union leaders to the basic structures of capitalist society, at the very moment when these walls are being breached. Putting the wage-form on an elaborate life-support system is a strategy of "making some people toil unnecessarily so that they can be paid without others complaining that they are hanging around with nothing to do."[26]

One sign of more creative thinking is the re-emergence of an issue Marx saw as vital to the emancipation of labour, but which has since the end of World War II been largely abandoned by trades unions--the shortening of the working day.[27] Demands for the reduction of hours without loss of wage are now on the agenda of the most innovative sectors of labour revolt in North America, as in Europe, and even entertained by social

democratic thinkers.[28] This strategy builds solidarity between the employed and the unemployed. Rather than dividing those impoverished by too little work and those exhausted by too much, it aims for a situation where "everyone works, but only a little."[29]

However, the real significance of such demands is that they point toward an even more radical possibility, namely, dissolving the link between work and income by the institution of guaranteed annual income. The case for this step is quite simple: capitalism has created a productive capacity so great that there is no necessity for anyone to suffer want because they cannot sell their labour time. Moreover, this productive capacity arises from an economic system so socialised--so much the product of a "combined effort" occurring not just in workplaces but households, schools and general social intercourse-- that the allocation of income only to those who exert themselves at the immediate point of production is neither just nor even efficient. The social risks of people freeloading on a system of generalised income are now infinitely less than the problems created by consigning increasing masses to an income-less, because work-less, future.[30]

As Steve Wright notes, the institution of a universal guaranteed income "has long held an honoured place within . . . autonomist discourse."[31] In the 1960s and 70s, theorists such as Negri were already suggesting that the automation and socialisation of production had rendered labour theories of value anachronistic. They saw this as marking a crisis, not for Marxism, which has always seen wage labour as an historically transitory form of social organisation, but for capital, which depends on upholding the necessity and rationality of the wage relation. Groups in the midst of militant shop floor struggle argued that both rising technological productivity and the increasingly evident social nature of production should be recognised by the creation of a social wage, equal for all, tied to

needs rather than performance, and available to those outside the traditional realms of paid work, such as houseworkers and students. This is sometimes known as the "zerowork" position.[32]

Such ideas were subsequently elaborated, popularised and watered-down by Andre Gorz, whose provocative writings are informed by a considerable familiarity with autonomist thought.[33] One of the few left optimists about computerisation, Gorz in the mid 1980s suggested that the reductions in labour-time made possible by microelectronics were opening "paths to paradise."[34] The realisation of these prospects was, however, impeded by a "living dead" or "impossible" capitalism that preserved the wage and the market beyond the moment of their historical validity, retaining them merely as techniques of domination.[35] Gorz rejected the traditional left focus on dignity in work, which he believed that rationalised and deskilled technological production made unattainable. Instead, he argued that the cutting edge of social activism lay in the demand for freedom from work.

To this end, he proposed a program for a social income, distributed through life, based on the requirement to perform a (low) minimum amount of socially necessary labour; twenty thousand hours in a lifetime, or about ten years full-time, twenty years part-time, or forty-years of intermittent work).[36] If this was implemented, Gorz suggested, work would no longer be a full time occupation or the centre of social existence. A wide variety of rhythms and styles of activity would coexisting, creating rich opportunities for citizens to exercise their creative powers "autonomously," freed from the "heteronomous" constraints of work. "Let us work less," Gorz wrote, "so that we all may work and do more things by ourselves in our free time."[37]

Gorz's work has had an ambiguous legacy. By developing the autonomists' rather sketchy hints about a universal income, he pushed the frontiers of left imagination beyond the boundaries of `a fair day's wage for a fair day's work.' But he also partially discredited the idea of liberation of work by associating it with a sort of apolitical voluntarism. Whereas autonomists had always emphasised that freedom from work was something that had to be fought for against capital's tendency to reimpose the commodification of human activity, Gorz often seems to suggest that a general reduction of labour time could be realised simply by dropping-out from the wage economy. In his most notorious statement he suggested that we must say "farewell to the proletariat," as post-industrial socialism is quietly invented in do-it-yourself, back-yard experiments of the new "non-class of non - workers."[38] Because of this his work has been widely criticised from the left as simply a recipe for what Wright calls "self-managed poverty."[39]

An insistence on the <u>contested</u> nature of the guaranteed income project is critical because versions of the idea have in fact also been proposed from the right. Indeed, its advocates include such free-market champions as Milton Friedman.[40] During the Nixon administration, a legislative proposal in the US Senate for a form of Guaranteed Annual Income (GAI) was only narrowly defeated; in Canada in the 1980s a version of the idea was proposed by the Liberal MacDonald Commission.[41] As De Angelis points out, these plans "to separate access to income from the labour market" are in fact designed only "to make the latter function effectively."[42] In such proposals, GAI is set low (well below the poverty line) and delivered in terms of negative income tax; the minimum wage is also low; and other social wage programs (unemployment insurance, welfare, family allowance) are abolished. The aim is to use the GAI to rationalise state expenses, to

eliminate their universality, and to allow capital to pay inadequate wages, with the effect "not of eradicating poverty and unemployment, but of making them socially acceptable."[43] In the light of this "big business version" of a guaranteed annual income, some anti-poverty activists are now intensely sceptical of the entire concept, believing it has been fatally coopted.[44]

However, at the same time, the intensifying crisis of unemployment and social disintegration precipitated by computerisation and globalisation has made others on the left increasingly interested in the concept. A new generation of autonomists have taken up the task of going, as Wright puts it, "beyond Gorz," developing schemes for a guaranteed income that "do not just coexist with capital, but can be used as a means to challenge it."[45] Their line of thought intersects with work on the same topic from a very wide variety of left and liberal orientations. Examples include the sustained theoretical arguments for a universal income offered by Philippe Van Parijs in the Netherlands; the campaigns waged by the Basic Income group in the United Kingdom; and proposals from political economists such as Diane Elson in England, Adam Przeworski in France and Eric Shragge and Sally Lerner in Canada.[46]

Drawing on these sources, one can suggest some of the features of a guaranteed income scheme as it might figure in our commonwealth. Its level should be set high--very well above the official poverty line. To the degree that such an income coexists with wage labour, as it might in the early stages of its introduction, it should be adequate to free people from the necessity of selling their labour power, even if the possibility of supplementation by this means continues. Its level should expand as and if the productivity of society grows, and accompany a generalised and egalitarian reduction in waged work

time, to a point where guaranteed income eventually supersedes the wage as the main source of livelihood. Although receipt of such an income might initially be tied to some obligation to perform socially useful labour, this would not be construed in terms of participation in traditional paid productive employment (making it a `workfare') but of fulfilling responsibilities such as care for children, the sick and elderly. And it should be seen as an integral part of an expanding package of freely distributed services and use values, from housing and schooling to health, associated with the development of co-operative and collective forms of administration discussed later in this chapter, that would encourage forms of social solidarity going beyond the cash nexus.

Such an innovation would have multiple ramifications; I will comment on only three. First, the guaranteed income concept, while partly flowing from the technological crisis of paid jobs, also converges with feminist demands for the economic recognition of domestic labour. In the 1970s, Mariarosa Dalla Costa and Selma James integrated Marx's observations on the socialisation of labour with the direct experience of millions of women, and pointed out the vast amount of monetarily unacknowledged, invisible but economically essential household labour done for free. Their proposal--immensely controversial within the women's movement--was "wages for housework."[47] Although this has been criticised as an attempt to commodify domestic work, it is in fact clear that Dalla Costa and James intended "wages for housework" as a strategy to explode the wage form completely, undermining the attachment of income to a (male) job. Today, the drive to compensate domestic work is attracting widespread attention through the work of feminist economists such as Marilyn Waring.[48] A guaranteed annual income of the sort described here--perhaps tied to a requirement for men and women alike to participate in activities

such as raising children, caring for the sick and elderly--would effectively annihilate the hierarchical division of waged and non-waged labour which has so closely entwined capitalism and patriarchy.

Second, although the "zerowork" perspective focuses on reducing the overall amount of socially necessary labour, it should not be understood as precluding efforts to make what remains more enjoyable. Even in a society with a high level of technoscientific development, there will be tasks which, because of their inherent complexity, or their intrinsically satisfying nature, cannot or should not be automated. Although the commonwealth will abolish `work' as we know it--'work' as synonymous with `job,' `boss' and `wage'--there will still be labour to be performed. Contrary to Gorz's gloomier statements, I do not believe that even highly technological tasks have to be alienating. There is now a vast literature on the enrichment and the qualitative improvement of such labour. Mike Cooley, from a trades unionist perspective, has written on ways in which computer systems can be designed to re-skill, rather than de-skill workers.[49] More recently, Shoshona Zuboff, from an enlightened managerial position, has discussed the ways in which high -technologies can be used to "informate" workplaces rather than "automate"' them, expanding workers knowledge and control over operations rather than reducing and eliminating it.[50] The only (albeit very serious) problem with such analysis is that it usually represses the degree to which such humanising innovations contradict capitalist imperatives of labour control and cost-reduction. Outside of this context, trade-offs between productivity and gratification could become a matter of social choice rather than profit-driven imperative. When a guaranteed income frees people from the necessity of enduring degrading, monotonous jobs there is every prospect for a creative remaking of

labour. Thus, as Van Parijs suggests, the abolition of work should be seen as unfolding "along two converging routes: by giving work an ever-smaller place in life and by making it less and less like work."[51]

Third, freeing people from the compulsion to perform wage labour creates opportunities for more profound and creative involvement in other aspects of social life. One common and important objection to schemes for post-capitalist, self-organised societies is that they assume onerously high levels of political participation: Oscar Wilde's quip that "socialism is a good idea, but it requires too many evenings" springs to mind.[52] If one assumes a world like the present one, where most people are exhausted after eight, ten or twelve-hour days of waged labour--plus the longer hours of unwaged domestic duties and `double shifts' which are the indispensable accompaniments of the current job system-- this is a telling point. However, not the least important aspect of a guaranteed annual income and a drastically shortened and flexiblised work schedule is that they leave people with time and energy, some (though by no means all) of which can be devoted to collective discussion and decisions -and in ways that might even be rewarding and enjoyable. In other words, zerowork creates the communicative preconditions for other aspects of commonwealth. This potentiality can be enhanced by ensuring accessibility to the extraordinary communication systems that are, along with automation, the other major technological creation of information revolution. This is the prospect taken up in the next section.

Zero Commodity: Communication Commons

Under capital's direction, successive waves of electronic communication technologies--the radio, television, telecommunications and computer networks whose networks now girdle the planet--have served mainly as the basis of vast, vertically and horizontally integrated commercial media empires. The consequences barely need rehearsal: an envelopment of society in corporate speech; market censorship of news and artistic expression; increasing privatisation and stratification of access to information; and a relentless interpellation of audiences in the name, not of citizenship, but of consumerism.

The erosion of publicly owned media exacerbates these tendencies. Insofar as such institutions exist within advanced capital economies--and here conditions vary from the rudimentary services in the US to the more developed institutions of Canada and Europe-- the public ownership of media has largely centred around state-financed public broadcasting organisations. Always existing, like the other institutions of the welfare state, in an uneasy relationship to the market society that surrounds them, these organisations are now subjected to intensifying corporate encroachment. This proceeds under the watchwords of deregulation, the reduction of governmental limits on free enterprise activity, and privatisation, the conversion of state institutions into corporate property. It is associated both with the use of new technologies to outflank and fragment the audiences of public broadcast systems, and, even more importantly, with the ideological claim that the potential of new communicative technologies can only be realised by market forces. The net result is to deepen the communicative subsumption of society by capital.[53]

And yet, at the same time, electronic media display quite contrary tendencies that radically subvert the logic of the market. Because advanced communications networks can circulate information goods very fast and very widely, goods that are by their very nature

dependent on extensive availability of appropriate machines, skills and knowledge, imposing commodity exchange in this area has proven extraordinarily difficult. A wave of everyday media `piracy,' including photocopying, home taping, bootlegged videos, unpaid reception of satellite signals, copying of computer software and hacking is informally decommodifying information flows. These practices constitute a clandestine shadow-world that obstinately follows the attempt to enclose information in commodity form.[54] To give only one example, in the United States, where theft of satellite television signals was to be prevented by scrambling, it is estimated that half the descramblers are now used illegally.[55] Of course, much of this illicit activity is folded back into commodity form through black market industries. However, what is remarkable is that so much corporate effort --both in terms of technological design and legal activity--is today being exercised to restrict what the media corporations ostensibly promote, that is the, literally, `free' flow of information.[56]

To understand this dynamic, we can elaborate on a hint of Marx's. He argued that a crucial motive behind the capitalist development of communications was its drive to shorten the circulation time of commodities--to speed the passage from commodity-form to money-form and back again. But Marx also observed that there was a limit to this acceleration. If a product passes instantly, without barrier or impediment, from producer to consumer, it destroys the moment of exchange. A commodity must remain in the owner's hands long enough to be sold. Capital might wish to maintain the continuity of circulation by passing through its different phases "as it does in the mind, where one concept turns into the next at the speed of thought."[57] But this dream cannot be realised. For the commodity to retain it essential attribute--that of being bought and sold--its passage must be interrupted:

"it must spend some time as a cocoon before it can take off as a butterfly."[58] Today, electronic technologies are making a whole range of commodities central to the information economy--computer software, films, video, television programs, electronic music and games and a proliferation of digital goods--into instant butterflies. Disseminated at virtually "the speed of thought" through electronic and digital channels, they take on aerial and evanescent forms difficult to contain within the commodity-form.

Nowhere is this more apparent than on the computer networks which capital hopes to make the central technology in its new wave of accumulation. The famous hacker slogan "information wants to be free" displays a naive technological determinism, but its mystification contains a kernel of truth—namely, that many people want information to be free, and are finding in cyberspace the means to make it so. The Internet makes available a voluminous amount of information in uncommodified form. Vast banks of data are available for free. Creators who prefer to see their work used rather than sold have dropped large amounts of software into the Net gratis. Others have been electronically `liberated' from commercial owners and given instantaneous world-wide distribution.[59] Information society theorists have long pointed out that "ethereal goods" have qualities anomalous in a market economy: they can be used simultaneously by many people, be duplicated and transmitted cheaply and instantaneously, are not `consumed' or exhausted by use and may grow in use-value the more widely they are shared. These features have become increasingly problematic to those concerned with policing digital commodity transactions. For what has emerged in cyberspace are collectivities of users who, rather than being subordinated to the laws of commodification, are rather characterised by a persistent, indeed often gleefully overt, transgression of these rules. The massive confusion

that now reigns over copyright and patent law in the electronic domain suggests that the enforcement of property rights in this arena will be extraordinarily vexed.[60]

Just as capital's introduction of new technologies, by potentially freeing huge surpluses of time, have unintentionally opened up prospects of liberation from work, so its expansion of new communication technologies inadvertently opens up a world of counter-usage. As computerised automation, by reducing socially necessary labour time, makes possible either intensified exploitation or subversion of the wage form, so electronic communication, by reducing the necessary circulation time for information goods, opens onto two diametrically opposed options. It makes possible either a radical intensification of commodification--through pay-per services and consumer surveillance--or a fundamental attenuation of the commodity form, through the generalised transgression of electronic property rights.

Our commonwealth would build on and amplify this latter decommodifying tendency. Dorothy Kidd and others have referred to this process as the creation of a "communications commons"--a counter-project against capital's attempts to "enclose" the immaterial territories of airwaves, bandwidths and cyberspaces in the same way it once enclosed the collective lands of the rural commons.[61] However, this project would advance along lines different from the state-operated public broadcasting systems favoured by a previous generation of left media activists. While certain aspects of the public--service, state-financed model remain valuable, these need to be revitalised and transformed by combining them with the more decentralised and diffuse practices of alternative media, from microwatt radio to community cable to the Internet.

Advocates of state-financed public media often find it difficult to marshal support against privatisation, in part because of the frequent elitism, remoteness, over-professionalisation, and under-accountability of the institutions they defend. On the other hand, while the networks of autonomous media--the alternative press, community radio, public access TV, microwatt broadcasting and grassroots computer networking--have been the site of fertile experimentation in popular participation and public access, they have been stunted by the lack of resources which accompanies social and economic marginalisation. Recently, however, analysts from a variety of backgrounds have begun to rethink the democratisation of communication in terms, which blend elements of the public service and alternative mode. They propose the public financing of a multiplicity of decentralised but collectively or co-operatively operated media outlets, licensed on the basis of commitment to encouraging participatory involvement in all levels of their activity.

Thus for example John Keene, writing from a liberal position, has argued that the undermining of "both arcane state power and market power,"

. . requires the development of a dense network or "heterarchy" of

communications media that are controlled neither by the state nor by

commercial markets.[62]

Noting that "the new technologies strengthen the tendency whereby the element of rights to dispose of property privately becomes obsolete in the communications field," Keane argues for policies which would encourage the tendency for communication "to be seen as

flows among publics rather than as an exchange among discrete commodities which can be owned and controlled privately as things."[63] This would involve a democratisation of public broadcasting institutions, aimed at introducing greater accountability to and greater involvement of their various constituencies; creation of networks of leased-back broadcasting facilities made available for use by a wide variety of groups and collectivities; the support of cooperatively run publishers, community radio and public access television; publicly funded faxes, videotext systems and electronic mail facilities; and networks of media training and research institutions.

Somewhat similar suggestions have been made by Douglas Kellner. Drawing on his experience working on alternative television projects, Kellner suggests that the technological capacity for the multiplication of satellite and cable channels, often seen as a threat to public broadcasting, should be embraced as a offering the potential for a more diversified and decentralised version of such a service. He has urged the creation of a publicly funded satellite system, which, along with appropriate training and production facilities, would permit communities and movements from a wide variety of political and cultural orientations to broadcast their own programs.[64]

Popular support for decentralised and distributed public communications systems has been particularly strong in the field of computer networking. The development of the Internet arose, as we have seen, from a certain bizarre conjunction between publicly-funded institutions--the original military-research ARPA Net--and the autonomous activity of a host of hackers, techno-hobbyists and computer dissidents. In North America, the attempt to defend this unique experiment from commercial recolonisation by the `information highway' has evoked a wealth of proposals for more fully releasing the

democratic and participatory potential of digital technologies. Many of these come not from the usual centres of the left but rather from technoscientific workers most familiar with the radical potentialities of the new technologies. Couched in idioms that combine liberalism, libertarianism and undeniably communist impulses in an uncategorisable amalgam, the challenge of such initiatives to the prerogatives of corporate media empires is nevertheless unmistakable.

Thus, for example, a critique of the `information highway' put forward by Computer Professionals for Social Responsibility (CPSR) is predicated on "freedom to communicate," which it defines as having two essential features: first, freedom from censorship, and, second, "the opportunity to be heard in the first place."[65] This later is explicitly defined in terms of overcoming the condition so pithily defined by A.J. Leibling's aphorism that "the freedom of the press belongs to those who own one." CPSR suggests that the availability of increasingly cheap computer technology presents the possibility of breaking the corporate monopolies of communication established in print and broadcasting.[66] Recognising the importance of the Internet in establishing a model of open, participatory computer communication, CPSR also notes its disadvantages--difficulties of navigation, technological complexities, and limitations of access.

It then makes the following proposals for a public network. There should be universality of access, defined not only in terms of availability of connections (with full service to homes, workplaces and community centres), but also of low pricing, and the provision of subsidised hardware, software, and training. A basic feature of the network should be to enable all users to act as both producers and consumers; "every user . .. must have the option to generate new information as well as publish that information through the

network." While CPSR concedes commercial interests a major role in the construction of the networks, it insists on preservation of "diversity of content."[67] Common carrier status--preventing the control of content by the owners of the channels--is crucial. A central aspect of any information infrastructure must, CPSR says, be the development of a "vital civic sector," constituting "public spaces" for discussion, governmental interaction, distribution of free software, and "the spontaneous development of communities of all kinds " amongst "groups . . . of people who want to discuss issues concerning their neighbourhood, worksite, nation or planet."[68]

Other local branches of CPSR have gone further. The Berkeley chapter calls for a national computer network infrastructure to be publicly built and maintained; for the creation of a "public information treasury" specifically aimed to "ensure that the widest possible kinds of social information are collected; and for the abolition of intellectual property laws."[69] On this last point, it notes that the ostensible and traditional rationale for such property rights is to promote progress and creativity. However, current patent and copyright systems do not perform this function but rather lead to secrecy, duplication and litigation. As the CPSR activists observe, other models exist for organising and rewarding intellectual work in ways that do not require proprietary title to the results--such as grants, peer or public recognition. They therefore call for a moratorium on computer software patents, accompanied by social funding of research and development, and the implementation of new systems, such as public competitions, to spur development of "socially needed technology."[70]

Even partial implementation of these ideas would represent a significant collective inroad on the capitalist information economy. But the significance of such a socialisation of

media goes well beyond the immediate reappropriation of resources from corporate conglomerates. Every communicational node and link established outside the control of capital diminishes its ability to naturalise commodification, to impose its `class-ifying' grids of surveillance, to suppress news of struggles, to censor, mystify and deceive. Conversely, each instance of such counter-communication increases the possibility to explore variegated images of decommodified human identity, circulating struggles, and to discussing the reorganisation of society outside the parameters of the market. Because today's cultural industries take as their productive material forces basic to the constitution of individual and collective subjectivity, their liberation from capitalist control in turn enhances every other escape attempt.

Establishing a "communication commons" would both reinforce, and be reinforced by, the abolition of work proposed in the previous section. Diminishing the role of wage labour in society involves not just economic but cultural metamorphosis. This transformation would include lifting the cultural opprobrium attached to the sheer enjoyment of free time; validating the skill, difficulty and worth of undervalued or non-market activities--such as collective decision-making or domestic labour; and constructing forms of subjectivity other than those revolving around the image of the `consumer.' A diverse communication commons provides the matrix for such cultural experimentation, while the free time made available by the reduction of work creates the condition for the widespread involvement in cultural production necessary to give the new networks vivacity. Moreover, the establishment of such a commons creates unprecedented opportunities for co-operative organisation--not least in the sphere of social governance, to which it is now time to turn.

Zero State: Computerised Counter-Planning

To pose an alternative to advanced capital is, necessarily and centrally, to raise the issue of planning. In the socialist tradition, centralised state planning has been the alternative to the market. The years of the high technology revolution have also, and not coincidentally, been a period during which both the necessity and viability of the nation state as a central unit of social organisation has been seriously challenged. This challenge has, however, appeared simultaneously in two different and antagonistic forms: privatisation and socialisation.

Marx glimpsed both these tendencies a century ago. Writing of the roads, railways, and canals of his age he described "the production of the means of communication, of the physical conditions of circulation" as part of "communal, general conditions of social production as distinct from the conditions of particular capital and particular production process."[71] As capital expands in scope and scale, such systems become increasingly necessary for individuals to reproduce themselves as members of a social collectivity and "and hence to reproduce the community, which is itself a general condition of productive activity."[72] Marx noted that the enormous cost of investment in such infrastructures usually resulted in capital leaving their initial development to the state: only subsequently does business reclaim them from the realm of "public works" as sources of private profit— precisely what we know as `privatisation.'[73] This take-over of the means of communication and other public infrastructures represents "the highest development of capital" and "indicates the degree to which the real community has constituted itself in the form of capital." [74]

But Marx also saw a contrary tendency. For example, in <u>Grundrisse</u> he describes how institutions of information, such as the mails and telegraph, are established by capital in an attempt to overcome the "crises, etc." that arise from the contradiction between increasing global "interdependence" and the "indifference" of privatised production.[75] The new means of communication are instruments in the "autonomisation of the world market"-- the alienation of human powers to a vast transpersonal apparatus of monetary exchange.[76] Yet at the same time, they open "relations and connections" with the potential to overcome this alienation. They introduce the possibility of "suspending the old standpoint" and replacing it with a "real communality and generality" that affirms the "general bond" of planetary humanity[77]

Today, the privatising tendency is of course actualised the neoliberal program of marketisation and deregulation. Its essence is the reversion of the apparatus of government, which the era of the welfare state had (as a result of pressures from labour and other social movements) attained a certain `relative autonomy' from the immediate imperatives of business, back into direct instruments of capital accumulation. In some respects this involves a diminution in state functions: the erosion of welfare expenditures, reduction in social services, sale of public industries. In others, it expands these functions--most notably in the intensification of the state's security, surveillance and coercive role. Privatisation abolishes the state only insofar as it presses the interdependence of capital and state to the point of identity, making the latter, in effect, the direct administrative and coercive arm of the former. As Gilles Deleuze and Felix Guattari put it "Never before has a State lost so much of its power in order to enter with so much force into the service of the signs of economic power."[78]

This fusion of capital and state relates to the issue of information technology in several ways. It is increasingly through the state, by means of government-industry consortia, university-business partnerships, training and education schemes, military contracts, and business subsidies that capital mobilises the range of co-operative social activities necessary to generate the technological innovations on which it depends. Moreover, much of the drive to privatisation is aimed at expropriating technoscientific systems first developed as public utilities and now sufficiently advanced to become profitable for private operation; hence the selling off of telephone-systems, research institutes, library resources and so on.

At the same time, high technologies allow corporate power to exercise both the carrot and the stick in compelling privatisation and deregulation. The stick is the threat of capital flight into the global webs of investment and speculation. The carrot is the promise (to compliant regimes) of instrumentation for reducing costs--automating public service jobs, intensifying surveillance of welfare `cheats', deploying Robocop-like security forces to mop up social disintegration, and so on. And this technologically-aided reduction in social expenditures is itself one of several avenues to reduce the so-called tax burden on corporations, thus freeing funds for the gigantic investments required by new high technology systems. The emergent conditions of technoscientific production are thus profoundly connected--both as end and means--to the dynamic of privatisation.

Confronted by this onslaught, the usual response of social democratic parties and trades unions has been a defensive cry for the maintenance of the welfare state. But calls for a return to the era of Keynesian `big government' are as inadequate as the demand that unemployment be solved by `more jobs.' They forget the important critique of the welfare

state mounted by workers, feminists and anti-poverty movements during the 1960s and 1970s, which addressed not only the quantitative limits of social expenditures and programs but also the qualitative problems arising from their frequently demeaning and invasive administration.[79] It is important to recognise that neoliberal success in deregulation and privatisation rests in part on mobilising these real popular resentments against remote, bureaucratic and hierarchical forms of state power. Moreover, a purely defensive response to privatisation neglects the real possibilities for more responsive and participatory "governmentality" than that of the old Planner State.[80]

The `withering away of the state' was once viewed on the left as an occasion for jubilation rather than dismay. This perspective can be maintained without lapsing in to any sort of anarchist romanticism.[81] The response to neoliberal privatisation should not simply be a plea for return to the welfare state, but rather a project for destatification of a different kind--one which restores and increases social expenditures, but devolves administrative power towards a multiplicity of collective, democratic projects and agencies.[82] This project of "destatification downward" or "socialising without statifying," a long-standing element in the autonomist tradition, has recently been voiced from many other sections of the European left.[83] Broadly speaking, such proposals aim to relay financial and administrative control over publicly-funded governmental services away from the state apparatus towards a variety of other social loci--housing and medical co-operatives, social and cultural centres, research and innovation centres. The role of government is redefined as supporting collective initiatives rather than substituting for them, diffusing rather than concentrating control, nurturing social transformation from the bottom up rather than engineering it from the top down.

The potentiality for this diffusion arises from the proliferation of ecological, feminist, labour, educational, housing and public transport activism that has been such a marked feature of capitalist societies over the last twenty-five years. Such activism constitutes an already-existing tissue of agencies and organisations, many operating at sophisticated levels of administrative, technological and communicative practice. This can be seen as an arena of "counterplanning"-- a term autonomists have used to designate the ability of socialised labour to run things according to priorities different from those of capital, either on shop floor, or in the social factory as a whole.[84] Destatification downward rests on reinforcing and amplifying this nascent network of counterplanning agencies and institutions, so that they play an increasing role in the conception and administration of governmental regulation and spending in the workplace, welfare, education, health, and environment. Where privatisation dissolves the state into capital with the aim of better subordinating society to corporate will, "socialising without statifying" reabsorbs the functions of the state within myriad non-commercial collectivities with the aim of surrounding and encroaching on capital from a variety of directions.

The products of the information revolution can be put to serve this alternative at least as effectively as they are now being marshalled in the service of privatisation. Within the context of "communication commons" of the sort outlined in the previous section, computerisation and telecommunication could provide the channels for access to data and analysis, co-operative assistance, and easy-to-use accounting and administrative systems necessary for complex and decentralised systems of social self-organisation. Indeed, we are now witnessing, in embryonic form, the emergence of such capacities.

For example, in the US, agitation by green groups has resulted in the establishment of Right-to-Know Computer Network (RTK Net). This offers free, online access to the U.S. government's Toxics Release Inventory (TRI), with information on industrial releases of toxic chemicals from some 24,000 U.S. industrial facilities. Grassroots groups around the country have used TRI information to produce dozens of reports on pollution, garnering public attention and compelling industry cleanup efforts in a number of states.[85] In Canada, the Ottawa-based Rural Advancement Foundation International, which serves as a clearing-house and information source for movements of indigenous people and First and Third world farmers fighting biotechnological enclosures, uses electronic data-base searches to identify pending corporate patent claims. It disseminates its analysis via World Wide Web.[86] To these examples can be added others--feminists co-ordinating proposals for international conferences by email; unions establishing in-house electronic data-bases on health and safety practice; community networkers making available public information on health or recreational activities on free-nets. All these experiments are in various ways using the networks to accumulate and distribute knowledge and co-ordinate activities on a scope and scale that was previously the prerogative of state and business organisations.[87] Limited as these instances are, one can extrapolate from them to envisage the potential role of computers in providing the fibres for destatification from below.

Indeed, here it is possible that information technologies may help resolve a major dilemma of the left--that of large-scale economic co-ordination. It is widely held today that on this issue there exist only two options--the Free Market, or the Command State--and that the latter of these has been decisively discredited.[88] Neither, in my view, offers a desirable prospect, the former because it drives inexorably toward the commodification of human

life-time, the latter because of its tendencies--tragically demonstrated in previously-existing socialism --to official despotism. Reformist combinations of state and market in a mixed economy have revealed their extreme instability.[89] In this situation, attempts to envisage an emancipatory social order seem stymied between two unacceptable choices--command by money or bureaucracy: non tertium datur.

There is, however, a third way, periodically proposed by the anti-authoritarian left: decentralised democratic planning, sometimes known as participatory economics. The classic riposte to this suggestion is that the volume and complexity of information required to co-ordinate a modern economy could never be processed in time to allow any exercise of democracy or participation. However, the emergence of highly distributed, very fast information systems throws this rebuttal into question. Some radical economists are now asking whether the extreme sophistication of contemporary communications technologies does not make feasible highly decentralised forms of planning previously considered unwieldy, eliminating the need to chose between the "single brain" of the centralised state or the blind exchanges of the market.[90]

Proposals along these lines encompass varied, perhaps contradictory, possibilities. For example, the socialist-feminist Diane Elson envisages a crucial role for communication systems in her vision of a "socialised market."[91] Elson's economy assumes a guaranteed income--along the lines discussed earlier--and a situation where production is predominantly in the hands not of corporations, but co-operatives, the self-employed, or publicly-owned but worker-managed companies. Centralised economic planning would be limited to the setting of a guiding strategy by means of fiscal and monetary policy, with the daily co-ordination of supply and demand left to the market. However, the market would be

"socialised" by rendering it <u>transparent</u>. Enterprises would be obliged to divulge information about the design, production processes, price formation, wage conditions, and environmental consequences of the goods that they make. Publicly supported collectives-- "consumers unions"—analyse this data, and propose norms to govern various aspects of these practices. Information about actual production processes and proposed norms would then be disseminated via universal communication networks--something like the Internet or the information highway--publicly supported so that every individual, or at least every household, had easy access to telephones, photocopiers, fax machines, computers, and modems.

In this way, Elson says, people could know what enterprises offered, not merely in terms of price but of social and environmental costs of what was consumed. In a situation where it would be immediately apparent what goods had been produced in low-wage or environmentally dubious conditions, shopping would, she suggests, become a series of decisions about the collective, as well as individual, costs and benefits of goods selected. Collective control over information is thus interpreted in terms of democratisation rather than centralisation.[92] Arguing that "open access to information is the key to conscious control of the economy," Elson concludes by arguing for a strategy that aims to "attack capital's prerogatives over information, and to begin to develop networks which prefigure those a socialist economy would need."[93] Issues ranging through environmental and consumer protection, industrial democracy, and open government should be woven into a coherent campaign around access to information "appealing to a wide range of non-socialists as well as to socialists, while going to the heart of capital's ability to exploit labour."[94]

Michael Albert and Robin Hahnel propose an even more comprehensive model of decentralised planning.[95] They conceive a society in which production and consumption are entirely organised by decisions of workers' and consumers' co-operatives. Initial statements of needs, in the case of consumer councils, and capacities, in the case of workers councils, are matched and then adjusted one to another according to what emerges about the overall situation. This process proceeds by several rounds of discussion or "iterations," ascending and descending through various levels of neighbourhood, regional, national, and international organisation. Now, this is of course precisely the sort of scheme that might be suspected of taking so long nothing would ever get produced or consumed. However, Albert and Hahnel argue strongly that the rapidity of information-processing, speed and scope of communication and relative ease-of-use of contemporary computer technology would make involvement in the process no more complex or time consuming than the daily processes we take for granted in a market economy

These models are, as their authors admit, necessarily abstract and schematic. But the possibilities they raise of linking high-technology communications to non-statist planning models are important. If we consider the incredible sophistication of the electronic networks now used by global stock exchanges, or corporate just-in-time production, or military Star Wars systems, the prospect that these might be used to facilitate highly decentralised forms of collective negotiation, decision-making and resource-management does not seem far-flung. By facilitating economic co-ordination without commodity exchange or dependence on centralised state bureaucracies, the information technologies capital has created dissolve a major barrier to actualising a non-capitalist alternative.

Zero Technology? The Reconstitution of Machines

> Writing of technology, Marx observed that;

> Nature builds no machines, no locomotives, railways, electric telegraphs,
> self-acting mules etc. These are products of human industry: natural
> material transformed into organs of the human will over nature, or of human
> participation in nature.[96]

How far the author recognised the significance of this apparently casual distinction must remain unsure.[97] What is certain is that today the issue of whether technology is conceived as an organ of "will over" or "participation in" nature marks a momentous line of struggle.

For capitalism, the use of machines as organs of "will over nature" is an imperative. The great insight of the Frankfurt School--an insight subsequently improved and amplified by feminists and ecologists--was that capital's twin project of dominating both humanity and nature was intimately tied to the cultivation of "instrumental reason" that systematically objectifies, reduces, quantifies and fragments the world for the purposes of technological control.[98] Business's systemic need to cheapen labour, to cut the costs of raw materials, and expand consumer markets gives it an inherent bias toward the piling-up of technological power. This priority--enshrined in phrases such as `progress,' `efficiency,' `productivity,''modernisation,' and `growth'--assumes an automatism that is used to override any objection or alternative, regardless of the environmental and social

consequences. Today, we witness global vistas of toxification, deforestation, desertification, dying oceans, disappearing ozone layers and disintegrating immune systems, all interacting in ways which perhaps threaten the very existence of humanity and are undeniably inflicting social collapse, disease and immiseration across the planet. The degree to which this project of mastery has backfired is all too obvious.

Confronting this catastrophic scene, one understandable response is an outright refusal of technoscience. This, for example, is the position of the eco-feminist Maria Mies. Writing primarily in the context of a discussion of biotechnologies, but referring also to computerisation, Mies argues that high technology is so implacably stamped with a capitalist/patriarchal logic of domination that it can only be met by an act of absolute refusal. Marxism, because of its attachment to technological development, is rejected. Any leftist who uses a computer is "schizophrenic."[99] The project of oppositional politics is defined as the construction of a society based on "subsistence production" which largely repudiates machine production, and happily accepts voluntary frugality.[100] This type of perspective is now widespread in ecological, feminist and anarchist movements.

Contrary to the celebrants of pre-industrial conditions, I would argue that a return to such relative impoverishment sets the likely conditions for the reimposition of all the most unpleasant forms of parochial and patriarchal tyranny. Notwithstanding the enormous problems of environmental degradation that have accompanied their development, machines are a prerequisite for creating the surpluses that support human freedom. Moreover, the technological changes that have already been wrought on the natural and social habitat are often irreversible. Short of accepting the need for mass extinction of surplus peoples (as some misanthropic sections of the ecology movement do) the

sustainability of human society can no longer be predicated on reversion to a supposedly

natural, pre-industrial condition. Rather, it will require continuous levels of intervention

and management even in order to contain or undo the dangers already set in motion by

damage to the planetary ecology.[101]

This interpenetrating of `first 'and `second' natures is not <u>necessarily</u> terrible. As

capital has been compelled by labour struggles to develop technologies that could

<u>potentially </u>end the need for wage work, so it has been spurred by green activism to create

machines that <u>potentially </u>diminish the depletion of the natural world. Computer and

communications networks could (if used in conjunction with electricity sources other than

catastrophic megaprojects) be elements in a benign and careful planetary metabolism

which, rather than pillaging and defiling ecological systems, repaired and protected them.

Indeed, the experiments of many ecological movements--for example, in the satellite

mapping of endangered resources--demonstrate this capacity. However, just as capital

makes of automation a means to increase people's availability for work, so it deforms

resource-saving technologies into means to extend and intensify the reduction of nature to

raw materials. Undoing this paradox requires a governance of technology free from

capital's compulsion to convert the world into commodity-form.

Thus, rather than rejecting technological development <u>tout court</u> it seems more

useful to reconsider whether there is some possibility of breaking with the capitalist

project of technology as "will over nature" and of developing Marx's hint that machines

might instead be developed as organs of "participation in nature." This of course was the

issue raised by Herbert Marcuse nearly fifty years ago when he called for the possibility of

an alternative technology based on active partnership with nature rather than Promethean

conquest.[102] His suggestion was stingingly attacked by Jurgen Habermas, who, in a highly influential article, accused Marcuse of a romanticism that confused the proper domains of "communicative" and "instrumental" reason.[103] The natural world was mute and never could become a co-participant and interlocutor in the development of technology, but must always remain an object of human control.

In my view, however, Habermas's refutation is not definitive. Marcuse does not have to be understood as proposing a conversation with dolphins, owls and rain forests, but a dialogue among humans who perceive a more reflexive and participant relationship with such creatures than instrumental rationality acknowledges. The development of machines as "organs of participation in nature" means recognising that the human wielders of technology are embedded-in and dependent-on the world they transform, and intervening with an awareness of the limits and uncertainties that flow from this recursive situation.[104]

Moreover, as Andrew Feenberg has argued, since the time Marcuse issued his call, the project of developing a new science and technology has taken concrete social form. Social movements in conflict with the technoscientific agenda of capital ---feminists, ecologists, community health, and worker movements--have, at both theoretical and practical levels, challenged the characteristic methods, preoccupations, and institutional structures of corporate technoscience.[105]Such movements have attempted to develop modes of investigation and experimentation that do not align themselves with the assumptions of capitalist progress. In a field of workplace, medical and environmental settings they have challenged the rigid instrumental division between subjects and objects of knowledge, and investigated research practices emphasising holism, interaction, complexity and self-reflexivity. They have questioned the privileging of certain forms of theoretical inquiry

over others--for example, the adoption of physics rather than biology as model of scientific inquiry--and disputed the automatic dismissal of alternative knowledge-systems, such of those of indigenous people. They have experimented both with using the machines capital designed in ways differently from what was intended, and in intentionally designing machines in ways different from capitalism.[106]

Technoscientific innovation is a collective, social process. It is not so much something that capital creates as appropriates—an activity it must forcibly shape and twist to its purposes, by acts of exclusion, repression, and marginalisation. Moreover, scientific practices are manifold rather than monolithic. Thus, although reductionism, fragmentation and "will over nature" are elements in technoscientific endeavour to which the path of capitalist development has given precedence and emphasis, they are not the whole story. As Evelyn Fox Keller has argued from a feminist perspective, they are only part of a more complex and variegated bundle of impulses and approaches associated with scientific activity, which also includes very different tendencies toward holistic perspectives, reverence, curiosity etc.[107] If these aspects have been devalued in capital's expropriation of social knowledge, they have never been completely extinguished, and can be revived.

The commonwealth would create space for these emergent counter-knowledges and alternative ways of doing. It would not reject technological development, but broaden its scope, opening and creating institutions to allow the emergence of experiments, innovations and logics other than those which have hitherto been admitted, and assessing them not according to the needs and priorities of capital, but by far more widely-determined criteria. As the many movements and theorists now arguing for a "democratisation of technology" point out,

. . . a democracy deep enough to function even at the level at which the machines are shaped--from the uses to which those machines are applied to their design and construction and use."[108]

Theorists such as Andrew Feenberg, Richard Sclove, Michael Goldhaber and Hilary Wainwright have done valuable work in suggesting non-capitalist criteria which might be applied in evaluating technologies for collective adoption--for example, the degree to which they support ecological sustainability, local economic self reliance, satisfying work experiences, flexible life scheduling, and equalitarian and diverse social relations.[109]

They have also suggested the array of new institutions necessary to make application of these criteria feasible. These include the creation of extensive opportunities for citizen involvement in technological research, development, design and strategic; publicly funded organisations to assist communities research and develop technologies shaped to their needs; public programs to overcome traditional patterns of marginalisation and exclusion in the institutions of science and technology; and a wide array of collective bodies to monitor, test, evaluate and debate the consequences of specific lines of research and determine the level of funding for their development, possible redirections, or termination. As Douglas Schuller observes, while these approaches could not and should not control technoscientific innovation, which indeed depends on the surprising and unpredictable, it could shape its trajectory--just as capitalist control today channels it, but in very different directions.[110]

The only shortfall of this approach is the apparent reluctance of many of its advocates to recognise that the adoption of such arrangements, on any large scale, is incompatible with capitalism. For the liberal-sounding slogan "democratisation of technology" is, if taken seriously, tantamount to a call for the reappropriation of the means of production, and will be resisted by established power accordingly. Such a "democratisation" is, however, consistent with a non-capitalist commonwealth characterised by decentralised, networked collective planning and an abundance of free time. Moreover, the advance of such initiatives for the collective control of machine-development is itself a way of struggling for the institution of such a commonwealth.

The commonwealth outlined here is clearly not a primitivist one based on the abolition of machines. But it does imply a very different relation between machines and people from that which exists under capital--to a degree that perhaps subverts commonly accepted notions of `technology.' Historically, machines have incarnated expropriation from the means of production. In their fixity of design, industrial technologies embodied -- or metallised--the alien will of their owner, so much so that sayings like a `cog in the machine' summon up a world of dispossession and powerlessness. Indeed--as Marx often pointed out--in a certain sense this association with dominative power became definitive of what a machine is.

There are in play today, in social struggles and in everyday experimentations like hacking, tendencies to erode this situation. The commonwealth envisaged here would accelerate this dissolution. In particular, it would undo the line of machine development (dynamic in some respects, narrow and constrained in others) that in the name of progress and efficiency assumes the status of a natural law, repressing question or deviation and

cancelling the autonomy of the humans it ostensibly serves. Instead, the selection or refusal of particular paths of innovation would be the outcome of collective reflection and discussion.

This collective decision-making might well lead to the phasing out of certain machines which the capitalist structuring of everyday life has made indispensable (such as the private automobile) or the rapid development of others (such as the universal provision of adequate cooking and clean drinking-water facilities on a global scale) to which it has paid little or no attention. In the absence of capital's compulsion to accumulate, any number of more, less or differently technologised futures, currently ruled out of play as inefficient or non-economic, become available. This would not be because of any magical translation to some realm of infinite abundance, but because a self-organised society is empowered to make the difficult decisions as to how to allocate its resources.

If the commonwealth itself has any technological imperative, it is a paradoxical and self-reflexive one--namely, that there shall be enough machines to permit choice about whether to develop more machines. Sufficient automation to free ample time from work, a communications infrastructure capable of acting as an organ of democratic debate and planning enable collective decision and reflection. The aim is to subordinate the imperative aspects of technology to the collective, communicative determination of social directions.

Future Seed

I have pointed to various ingredients for the creation of a social order different from capital. The elements for this alternative are to hand, but not combined. They exist,

here-and-now, but only here-and-there, just as at certain point in the pre-history of capital

its various ingredients--wage labour, market exchange, new machinery--all existed in

scattered form but had not cohered--or been violently welded--into a new order.

Under what conditions, and through what pressures, the new ensemble might come

into being is uncertain. I do not believe its emergence is inevitable. It is, however, obvious

that capitalism is experiencing serious difficulties in managing the world-transforming

technologies it has itself bought into being. The problems of sustaining employment in the

face of blisteringly-fast automation; the consequent contrast between restricted

consumption power and endlessly expanding production; the tendencies of social spending

cuts to erode the very public infrastructures on which technological development depends;

the repeated failures to restrain the depredation of the planet's ecology; and the manifest

instabilities introduced by the lightening-fast transactions of global financial markets

(recently dramatically revealed by the melt-down of the South East Asian economies) all

suggest that maintenance of the existing order may be a project no less utopian (in the

negative sense of inviting incredulity) than the creation of an alternative.

What is offered here is not so much a blueprint as a battlefield map. It does not

identify an agenda to be implemented `after the revolution,' but a series of initiatives whose

advancement would contaminate and overload the circuitry of capital with demands and

requirements contradictory to the imperatives of profit. Pursuit of these interrelated

measures would cumulatively undermine the logic that binds society around market

exchange, and increasingly require the reassembly of everyday activities into a new

configuration.

The actualisation of such an alternative will, however, be contested. While the recent disintegration of Soviet state-socialism presents the historically unusual case of a system so demoralised and undermined that it collapsed without major exercise of force, a repetition of this pattern should not be assumed: "present policies are not accidental: capital will put up a fight."[111] Insurrectionary concepts of revolution--the storming of the Winter Palace--are today a dead letter. But capital's capacity to unleash violence against any serious challenge is undiminished. To agitate for social change while ignoring this would be to act in bad faith.

I can imagine a commonwealth born in extreme tumult. It could come out of mounting civil disorder arising from intensifying unemployment and social disintegration, accompanied by increased activity of proto-fascist militias and extreme-right parties, and resistance against them. A social democratic government elected to implement part of the commonwealth program--say, a guaranteed annual income—might face a reactionary coup, whose defeat in turn propels deeper social transformation. A region or nation attempting to secede from the world-market by debt-repudiation might actualise some parts of the program, at the risk of invasion or intervention. At worst, the alternative may emerge in the wake of ecological catastrophe or the devastation of inter-capitalist war.

Whatever path their actualisation might take, the measures suggested here, combined in some concerted society-wide ensemble, would make up a world very different from that which we today accept as normal. It would be a world where wage-work would have a steadily decreasing importance or vanish entirely; where, although there would be labour to be done, livelihood would not be dependent on a job; where, consequently, people would have more time to think about and participate in decisions

about organising life in association with others; where they would have access to a very wide variety of communication channels, with a very wide diversity of representations and images about different possibilities of being; where these channels served also as routes for a flow of participatory decision making about the production and distribution of goods--and also about the directions taken and not taken in technological development. Distant as these prospects may seem, they are potentialities germinating in the soil of our everyday lives, today.

Notes

[1] Frederick Engels, Socialism: Utopian and Scientific.(Peking: Foreign Languages Press,1975) 88.

[2] Karl Marx and Frederick Engels, The German Ideology (London: Lawrence &Wishart, 1963) n.p. There is of course an enormous literature on the relation of Marxism to utopian thought: two of the sources we have found most stimulating are Krishan Kumar, Utopia and Anti-Utopia in Modern Times (Oxford: Blackwell, 1987) 48-65, and E.P. Thompson, William Morris: Romantic to Revolutionary (London: Merlin, 1977).

[3] Pierre Bordieu, Liberation, 14 December 1995, cited in Massimo De Angelis, "The Autonomy of the Economy and Globalisation," Vis-A-Vis,Winter 1996, online, available from http:// jefferson.village.Virginia.EDU/~spoons/aut_html/glob.html

[4] De Angelis, ""The Autonomy of the Economy."

[5] De Angelis, ""The Autonomy of the Economy."

[6] De Angelis, ""The Autonomy of the Economy."

[7] De Angelis, email, online, autop_sys discussion group.

[8] De Angelis, email, online, autop_sys discussion group.

[9] The most accessible English-language discussion of 'self-valorisation' is Harry Cleaver, The Inversion of Class Perspective in Marxian Theory: From Valorisation to Self Valorisation," Open Marxism, vol. 2, ed. Werner Bonefeld, Richard Gunn and Kosmas Psychopedis (London: Pluto 1992) 106-144. See also "An Interview With Harry Cleaver," Vis-A-Vis 1 (1993) online, available from

http://www.eco.utexas.edu.80/Homepages/aculty/Cleaver/index2.html.

[10] Amongst works that have influenced this account but are not mentioned in the body of the text are Tessa-Morris Suzuki's sketch of "information democracy" in <u>Beyond Computopia: Information, Automation and Democracy in Japan.</u> (London: Kegan Paul, 1988), Rudolf Bahro, <u>The Alternative in Eastern Europe</u>. (London: New Left, 1978); and Raymond Williams, <u>Towards 2000</u> (London: Chatto and Windus, 1983). Since writing the main part of this book, two other valuable sources have come to my attention--a long essay by Brian Milani, "Beyond Globalisation: The Struggle to Redefine Wealth," available on the World Wide Web at http://www.web.net/~bmilani/MAI.htm, and Thad Williamson's survey of contemporary anti-capitalist visions, <u>What Comes Next?: Proposals for a Different Society</u>. National Center for Economic Security Alternatives: Washington, 1998.

[11] Karl Marx, <u>Grundrisse</u> (Harmondsworth: Penguin, 1973) 699-700.

[12] For a collection of essays from diverse perspectives but within this broad orientation, see Wolfgang Sachs, <u>The Development Dictionary: A Guide to Knowledge as Power</u>. (London: Zed Books, 1992)ed.

[13] For discussion of this type of problem see Maurisio Viano and Vincenzo Binnetti, "What Is toBe Done?: Marxism and the Academy," <u>Marxism Beyond Marxism</u>, ed. Saree Makdisi, Cesare Casarino, & Rebecca E. Karl (London: Routledge, 1996) 243-254.

[14] See for example Harry Cleaver, "Socialism," <u>The Development Dictionary: A Guide to Knowledge as Power</u>, ed. Wolfgang Sachs.(London: Zed Books, 1992) 233-249.

[15] Cornelius Castoriadis, <u>Political and Social Writings. Volume 3, 1961-1979: Recommencing the Revolution: From Socialism to the Autonomous Society</u> (Minneapolis: University of Minnesota, 1993).

[16] Christopher Hill, <u>The World Turned Upside Down: Radical Ideas During the English Revolution</u>.(New York: Viking, 1973).

[17] Karl Marx, <u>Capital: A Critique of Political Economy</u>. vol. 3 (New York: Vintage Books, 1981) 958.

[18] See Norbert Weiner, "A Letter to Walther Reuther, UAW President," 13 Aug. 1949, in David Noble, <u>Progress Without People</u> (Toronto: Between the Lines, 1995): 161-163.

[19] David Noble, "The Truth About the Information Highway," <u>CPU: Working in the Computer Industry</u> 13, online, Internet, ACTIVE-L, 15 Feb.1995.

[20] On this point see Jim Davis and Michael Stack, "The Digital Advantage," in <u>Cutting Edge: Technology, Information, Capitalism and Social Revolution</u>, eds. Jim Davis, Thomas Hirschl and Michael Stack (London: Verso, 1997), 121-144.

[21] See for example Ethan. B Kaplan, "Workers and the World Economy," <u>Foreign Affairs</u> 75.3 (1996) 16-63, and Barrie Sherman and Phil Judkins, <u>Licensed to Work</u> (London: Cassell, 1995).

[22] Stanley Aronowitz and William DiFazio, <u>The Jobless Future: Sci-Tech and the Dogma of Work</u> (Minneapolis: University of Minnesota Press, 1994); Stanley Aronowitz and Jonathan Cutler, eds., <u>Post-Work: The Wages of Cybernation</u> (Routledge: New York, 1998); Jeremy Rifkin, <u>The End of Work: The Decline of the Global Labor Force and the Dawn of the Post-Market Era</u> (New York: Putnam, 1995). For an important collection of essays dealing centrally with the crisis of automation see the collection edited by Davis, Hirschl and Stack.

[23] Paolo Virno, "Quelques notes a propos du 'General Intellect,'" <u>Futur Antérieur</u>. 10. (1992): 47.

[24] Virno, 47.

[25] Marx, <u>Capital</u> vol. 1 (New York: Vintage Books, 1977) 781-802. For further discussion on the issue of technological unemployment, see Chapter 8 of this book.

[26] Adam.Przeworski, "Less is More: In France the Future of Unemployment Lies in Leisure." <u>Dollars & Sense</u>. July/August.1995 12,15.

[27] See Juliet Schor, <u>The Overworked American: The Unexpected Decline of Leisure</u> (USA: Harper,1991) and Benjamin Hunnicutt, <u>Work Without End: Abandoning Shorter Hours for the Right to Work</u> (Philadelphia: Temple University Press, 1988).

[28] For example, a shortened work week is a proposal of the Labor Notes group--see the pamphlet by Kim Moody and Simone Sagovac, "Time Out: The Case for a Shorter Work Week" (Detroit: Labor Notes, 1995)

[29] Berardi, Franco ("Bifo"), <u>Le Ciel Est Enfin Tombe Sur La Terre</u> (Paris: Seuil, 1978) 27, my trans.

[30] For exposition and discussion of these arguments, see the collection <u>Arguing for Basic Income: Ethical Foundations for a Radical Reform</u>, ed. Phillipe Van Parijs (London: Verso, 1992).

[31] Steve Wright, "Confronting the crisis of Fordism: Italian Debates Around Guaranteed Income," manuscript 1995, forthcoming in <u>Capital & Class</u>.

[32] Zerowork Collective, "Introduction," <u>Zerowork: Political Materials</u> 1 (1975): 3.

[33] Gorz, as editor of "Les Tempes Moderne," ran a special issue on the Italian New left, and approvingly cites Negri in several of his works.

[34] Andre Gorz, <u>Paths to Paradise: On the Liberation From Work</u> (London: Pluto, 1985). For a more recent statement of Gorz's position, see his <u>Critique of Economic Reason</u> (London: Verso, 1989), and <u>Capitalism, Socialism, Ecology</u> (London: Verso, 1994).

[35] Gorz, <u>Paths to Paradise</u> 41.

[36] Gorz, <u>Paths to Paradise</u> 41.

[37] Gorz, <u>Paths to Paradise</u> 41.

[38] Gorz 1982. <u>Farewell to the Working Class</u> (London: Pluto, 1982).

[39] Wright, "Confronting the crisis of Fordism." For a scathing critique of Gorz by some North American autonomists, see Midnight Notes Collective. "The Working Class Waves Bye-Bye," <u>Midnight Notes</u> 7 (1984): 12-18. David Byrne, "Just haad on a minute there: a rejection of Andre Gorz's 'Farewell to the Working Class'." <u>Capital and Class</u> 24 (1985): 74-98, and R. Hyman, "Andre Gorz and His Disappearing Proletariat," <u>Socialist Register</u>, ed. Ralph Miliband and John Saville.(London: Merlin, 1983) 272-295.

[40] Milton Friedman, "The Case For the Negative Income Tax: A View From the Right," <u>Issues in American Public Policy</u>, ed. J.H. Bunzel (Englewood: New Jersy, 1968) 111-120.

[41] Jean Swanson, "GAI: Guaranteed Disaster," <u>Canadian Dimension</u>. December/January 1994/95, 24.

[42] De Angelis, "'Crisi dell'occupazione', strategie del capitale e ipotesi strategiche per l'autonomia," Vis-A-Vis 2 (1994), cited in Wright.

[43] De Angelis, "'Crisi dell'occupazione.'"

[44] See Swanson, "GAI: Guaranteed Disaster." and her debate with Eric Shragge in the same issue of Canadian Dimension.

[45] Wright, "Confronting the crisis of Fordism."

[46] In addition to works already cited see Philippe Van Parijs, Marxism Recycled (Cambridge: Cambridge University Press, 1993) and Real Freedom For All. (Oxford: Clarendon, 1995); Dianne Elson, "Market Socialism or Socialising the Market?" New Left Review 172 (1987): 3-44; David Purdy, "Citisenship, Basic Income and the State," New Left Review 208 (1994) 30-48; Sally Lerner, "How Will North America Work in the Twenty-First Century?" in Davis, Hirschl and Stack, 177-194.

[47] Mariarosa Dalla Costa and Selma James, The Power of Women and the Subversion of the Community. Bristol: Falling Wall Press, 1972.

[48] Marilyn Waring, If Women Counted: A New Feminist Economics (San Francisco: Harper & Row, 1988).

[49] Mike Cooley, Architect or Bee? The Human Price of Technology (London: Hogarth, 1987).

[50] Shosana Zuboff, In the Age of the Smart Machine: The Future of Work and Power (New York: Basic, 1988).

[51] Van Parjis, Marxism Recycled 236.

[52] Oscar Wilde, The Portrait of Dorian Grey (?)

[53] On these developments see Vincent Mosco The Pay-Per Society: Computers and Communication in the Information Age: Essays in Critical Theory and Public Policy.

(Toronto: Garamond, 1989); Nicholas Garnham, <u>Capitalism and Communication: Global Culture and the Economics of Information</u> (London: Sage, 1990); W.D. Rowland Jr. and M. Tracey, "Worldwide Challenges to Public Service Broadcasting," <u>Journal of Communication</u> 40.2 (1990) 8-27; Marc Raboy, Ivan Bernier, Florian Sauvageau, Dave Atkinson. "Cultural Development and the Open Economy: A Democratic Issue and a Challenge to Public Policy," <u>Canadian Journal of Communication</u> 19 (1994): 291-315; and Edward Comor, ed., <u>The Global Political Economy of Communications: Hegemony, Telecommunications and the Information Economy</u> (New York: St Martins, 1994).

[54] For a handy sketch of this spectrum of activity see John Chesterman and Andy Lipman, <u>The Electronic Pirates</u> (London: Comedia, 1988).

[55] John Keane, <u>Media and Democracy</u> (Oxford: Blackwell, 1990) 159.

[56] As Nicholas Garnham observes in <u>Capitalism and Communication</u>, there is a contradiction at the heart of the communication commodity, arising from media business's need to simultaneously maximise and restrict istribution. On the one hand, they want to sell as *much* as they can. Therfore they increase the speed and efficiency of communication methods to reach more people, more of the time, in more and more various ways. But on the other hand, media corporations want to *sell* as much they can; they are interested not just in getting out messages, but in getting back money. So they confront a paradoxical requirement to expand and restrict comunication at the same time--simultaneously creating plenty and imposing scarcity.

[57] Marx, <u>Grundrisse</u> 548.

[58] Marx, <u>Grundrisse</u> 548-549.

[59] See Mark Chen, "Pandora's Mialbox," Z Magazine, Dec. 1994, 39-41.

[60] See John P. Barlow, "The Economy of Ideas: A Framework for Rethinking Patents and Copyrights in the Digital Age," Wired 2.3 (1994) 85-129, and Anne Branscombe, Who Owns Information?: From Privacy to Public Access (Harper Collins: New York, 1994).

[61] Dorothy Kidd,"Taking the walk: The Communication Commons Amidst the Media Enclosures," Ph. D. Dissertation, Simn Fraser University: Canada, 1998.

[62] John Keane, Media and Democracy (Oxford: Blackwell, 1990. 159.

[63] Keane 161.

[64] Douglas.Kellner, Television and the Crisis of Democracy (Boulder: Westview, 1990).

[65] Computer Professionals for Social Responsibility, "A Public Interest Vision of the National Information Infrastructure," online, Internet, ACTIVE-L, 11 Mar. 1994.

[66] Computer Professionals for Social Responsibility, "A Public Interest Vision."

[67] Computer Professionals for Social Responsibility, "A Public Interest Vision."

[68] Computer Professionals for Social Responsibility, "A Public Interest Vision."

[69] Computer Professionals for Social Responsibility, Berkeley Chapter Peace and Justice Working Group. "A Computer and Information Technologies Platform." Online, Internet, ACTIVE-L, 19 Sep. 1992.

[70] This suggestion is also made by Tessa Morris Suzuki, Beyond Computopia. This call for the elimination of property rights will seem problematic for many artists, researchers and cultural workers. For people in these areas the propensity to piracy inherent in electronic technologies threatens their livelihood. They would like to see intellectual property rights in this area revised to strengthen the rights of the immediate producers against the large

enterprises publishing houses, music businesses, software giants who purchase and dispose

of their work. And they would be aghast at the prospect of forgoing royalties and other

revenues on which their activities depend. Within the current, capitalist, context, legal

protection for these producers is appropriatea and necessary. The dismantling of

intellectual property rights should start from an assault on the legal fortifications of the

corporations who are the beneficiaries of the current system, not of individuals and small

organisations. Its full realisation could only be part of the overall constititution of a

commonwealth aimed to break fundamentally with market logic, as part of an entire

'package' which includes measures such as a guaranteed income which fundamentally

undercut the need for people to worry about selling their intellectual or physical labour

power.

[71] Marx, Grundrisse 533.

[72] Marx, Grundrisse 526.

[73] Marx, Grundrisse 531.

[74] Marx, Grundrisse 531.

[75] Marx, Grundrisse 161.

[76] Marx, Grundrisse 160.

[77] Marx, Grundrisse 161.

[78] Gilles Deleuze and Felix Guattari, Anti-Oedipus: Capitalism and Schisophrenia. (New

York: Viking,1983), 252.

[79] See, for example, the London Edinburgh Weekend Return Group, In And Against the

State (London: Pluto, 1980).

[80] I use this term of Foucault's to designate the operations of public administration, without necessarily identifying such activities with the functions of the centralised state. See Michel Foucault, "Governmentality," The Foucault Effect, Graham Burchell, Colin Gordon, Peter Miller (London: Harvester 1991) 87-104.

[81] See Kenneth Surin, "Marxism(s) and "The Withering Away of the State." Social Text 27(1990): 35-54.

[82] I agree with Joachim Hirsch, who in "The New Leviathan & The Struggle for Democratic Rights." Telos 48.(1981) 79-89, argues that what is necessary is "reduction of the role of the state" in the sense of "a collective reappropriation of responsibilities, self-management, autonomous interest organisation, debureaucratisation and decentralisation;" this program is valid even though it will necessarily conflcit with attempts "to exploit anti-state and and anti-bureaucratic resentments for quasi-populist, reactionary mobilisation and social-political austerity strategies."

[83] Wright, "Confronting the Crisis of Fordism," describes how some Italian autonomists now argue a guaranteed income based upon the free distribution of selected social services could provide a starting point from which to build for the further extension of a self-managed sector where need takes priority over profit and provide a "motor of a process of reappropriation of the welfare state's institutions and services, based upon the expansion of self-managed social labour and cooperation.'He also shows how the idea of reappropriation of the welfare state 'from below' has been expounded by Marco Revelli, a member of the more traditional left with autonomist affinities, who believes that "the welfare state has finally run its course:" " Since it is now both 'useless to the bosses [and]

alienating to workers', a political strategy based upon an unconditional defence of the welfare state would be 'suicidal'. Its current crisis can only lead to two outcomes: either towards a social 'free-for-all' such as can be found in the United States, where each must fend as best they can, or else 'a more mature "sociality"' based upon mutual aid. Many examples of the latter, he points out, already exist in Italy: above all, the thousands of cooperatives and mutual societies which provide health care and other social benefits to their members." The left's aim, Revelli suggests, should be to expand this area of welfare from below, and "to reconstruct those autonomies that the inevitably bureaucratic apparatuses of the parties, unions and state have dispersed." For an example of such thinking from an Anglo-Saxon perspective, see Hilary Wainwright, <u>Arguments For a New Left: Answering the Free Market Right</u> (London: Blackwell, 1994).

[84] See Nicole Cox and Silvia Federici, <u>Counterplanning From the Kitchen -- Wages for Housework: A Perspective on Capital and the Left</u> (Bristol: Falling Wall, 1975); Craig Benjamin and Teresa Turner "Counterplanning from the Commons: Labour, Capital and the `New Social Movements'. <u>Labour, Capital and Society</u> 25:2 (1992): 218-248; and Kidd and Witheford, "Counterplanning from Cyberspace and Videoland."

[85] Douglas Schuler, <u>New Community Networks: Wired for Change</u> (Reading: Addison Wesley, 1996); Benjamin Goldman, "The Environment and Community Right to Know: Information for Participation," <u>Computers in Human Services</u> 8.1 (1991) 19-40.

[86] RAFI can be reached at http://www.charm.net/~rafi/rafihome.html

[87] For an extensive discussion of this activity see Schuler; Eric Lee, <u>The Labor Movement and the Internet</u> (London: Pluto, 1997) and Jay Weston,."Old Freedoms and New

Technologies:The Evolution of Community Networking," Free Speech and Privacy in The Information Age Symposium," U. of Waterloo, Canada, 26 Nov. 1994, online, Internet, Red Rock Eater news group.

[88] The classic statement of this view remains F.A.Hayek, "The Use of Knowledge in Society." <u>American Economic Review</u> 35 (1945): 519-30. For a fascination discussion of and rebuttal of Hayek, see Wainwright.

[89] For discussion of these issues see the debate between Alex Nove, the champion and of "market socialism" and Ernest Mandel, an advocate of state planning. Alec Nove, <u>The Economics of Feasible Socialism</u>, (London: Allen and Unwin, 1985), and "Markets and Socialism," <u>New Left Review </u>161 (1987): 98-104. Ernest Mandel, "In Defence of Socialist Planning," <u>New Left Review</u> 159 (1986): 5-39, "The Myth of Market Socialism," <u>New Left Review</u> 169: (1988) 108-121. See also Boris Frankel, Beyond the State?: Dominant Theories and Socialist Strategies, (London: Macmillan, 1983).and "The Historical Obsolescence of Market Socialism--A Reply to Alec Nove," <u>Radical Philosophy</u>, 39 (1985): 28-33; Hans Breitenbach, Tom Burden, and David Coates, <u>Features of a Viable Socialism</u>.(New York, Harvester 1990); Pat Devine, <u>Democracy and Economic Planning</u>.(Cambridge: Polity, 1988).

[90] Hayek.n.p.

[91] Elson, "Market Socialism or Socialising the Market?"

[92] Elson writes, "There has been a tendency among Marxists (beginning with Marx) to interpret conscious control in terms of gathering all relevant information at one decision-making point and of taking decisions with full knowledge of all inter-connections and

ramifications. That is an impossible, and an undesirable, goal. Conscious control is better

interpreted as open access to all available information concerning the product and its

price, so that any decision-maker has access to the same information as any other . . . Such

a system of coordination does not require simultaneous processing of large amounts of

information, of the kind necessary for effective central planning (which, even with the

latest computer technology is argued to be unfeasible). Rather it requires the gathering and

processing, at discrete intervals, in separate bundles, of information already generated by

enterprises for their own use, such as unit costs and levels of inventories, and process and

product specifications. The barrier to this is not technical: current levels of micro-

processor technology can certainly handle this kind of information processing very rapidly

. . . The barrier is not technical: it is social and political" (1988, 43).

[93] Elson, "Market Socialism or Socialising the Market?" 43.

[94] Elson, "Market Socialism or Socialising the Market?" 44.

[95] Michael Albertand Robin Hahnel, <u>The Political Economy of Participatory Economics</u>

Princeton: (Princeton University Press, 1991) and <u>Looking Forward: Participatory</u>

<u>Economics for the Twenty First Century</u> (Boston: South End Press, 1991).

[96] Marx, <u>Grundrisse</u> 706.

[97] Marx's other writings contain elements both of the frank scientific triumphalism common

to his age (elements later amplified in scientific socialism) and also insights into the

metabolic interconnection of humanity and nature which prefigure contemporary ecological

thought.For discussions of the 'green' Marx see the journal <u>Capitalism, Nature, Socialism</u>,

edited by James O'Connor, and David Pepper, <u>Eco-Socialism: From Deep Ecology To Social Justice</u> (London: Routledge, 1993).

[98] Theodor,Adorno and Max Horkheimer,. <u>Dialectic of Enlightenment</u> (New York: Herder and Herder, 1972).

[99] Maria Mies, "Why Do We Need All This? A Call Against Genetic Engineering & Reproductive Technology," Patricia Spallone and Deborah Lynn Steinberg, <u>Made to Order: The Myth of Reproductive and Genetic Progrss</u> (Oxford: Pergamon, 1987) 46. Despite the title of the paper, Mies addresses issues across the span of high-technology development, including what she terms "indundation with 'technical means of communication.'" See also her <u>Patriarchy and Accumulation on a World Scale: Women in the International Division of Labour</u> (London: Zed Books, 1986).

[100] Mies, "Why Do We Need All This?" 46.

[101] On this point see Felix Guattari, "The Three Ecologies," <u>New Formations</u> 8 (1989) 146-147: "Increasingly in the future, the maintenance of natural equilibrium will be dependent upon human intervention; the time will come, for example, when massive programs will have to be set in train to regulate the relationship between oxygen, ozone, and carbon dioxide in the earth's atmosphere .. . What is required for the future is more than the mere defence of nature. If the Amazonian 'lung' is to be regenerated, the Sahara desert made fertile again, we need, immediately, to go on the offensive. Even the human creation of new plant and animal species looms unavoidably on the horizon; the urgent task we face is, then, to fashion an ethics appropriate to a scenario that is both terrifying and fascinating, and, more importantly, a politics appropriate to the general destiny of humanity."

[102] Herbert Marcuse, <u>One Dimensional Man</u> (Boston: Beacon, 1964), 156-169.

[103] Jurgen Habermas, <u>Towards a Rational Society</u> (Boston: Beacon, 1977).

[104] For discussions of the debate which tend toward this view point see Steven Vogel, "New Science, New Nature: The Habermas-Marcuse Debate Revisited," <u>Research in Philosophy and Technology</u> 11 (1991): 157-78, and Andrew Feenberg <u>Critical Theory of Technology</u> (Oxford: Oxford University Press, 1991).

[105] Andrew Feenberg, "Marcuse and the Critique of Technology," in his <u>Alternative Modernity: The Technical Turn in Philosophy and Social Theory</u> (Berkeley: University of California, 1995). 19-40.

[106] On these tendencies see Richard Levins, "Toward the Renewal of Science," <u>Rethinking Marxism</u> 3: 3/4 (1990): 102-125; David Dickson, <u>The New Politics of Science</u> (Chicago: University of Chicago, 1988); Cooley, <u>Architect or Bee?</u>; Sandra Harding,ed., <u>The "Racial" Economy of Science: Toward a Democratic Future</u> (Bloomington: Indiana University Press, 1993): Richard Hofrichter, ed., <u>Toxic Struggles: The Theory and Practice of Environmental Justice</u> (Philadelphia: new Society, 1993).

[107] Evelyn Fox Keller, <u>Reflections on Gender and Science</u> (London: New Haven, 1985).

[108] Tom.Athanasiou,. "Greenwashing Agricultural Biotechnology." <u>Processed World</u>.28 (1991/2): 21.

[109] Feenberg, <u>Critical Theory of Technology</u>; Wainright,<u>Arguments for a New Left</u>; Richard Sclove <u>Democracy and Technology</u> (New York: Gilford, 1995); Michael Goldhaber, <u>Reinventing Technology: Policies for Democratic Values</u> (New York: Routledge and Kegan Paul, 1986).

[110] Schuller 383.

[111] From a wall poster seen on the streets of Vancouver.