

Chapter 5

Circuits

The Circuit of Capital

The previous chapter traced the history that led class war onto the terrain of the information revolution. This one makes a map of the contemporary battleground. To do so, it uses one of Marx's central concepts, that of the circuit of capital.¹ Put simply, this shows how capital depends for its operations not just on exploitation in the immediate workplace, but on the continuous integration of a whole series of social sites and activities--sites and activities which, however, may also become scenes of subversion and insurgency. Today, this circuit of accumulation and resistance passes through robotised factories, interactive media, virtual classrooms, biotechnological laboratories, in vitro fertilisation clinics, hazardous waste sites and out into the global networks of cyberspace.

Marx's original account describes only two moments in the circuit of capital. In production, labour power and means of production (machinery and raw materials) are combined to create commodities. In circulation, commodities are bought and sold; capital must both sell the goods it has produced, realising the surplus value extracted in production, and purchase the labour power and means of production necessary to restart the process over again.

Since Marx proposed this model, however, capital has prodigiously expanded the scope of its social organisation. This expansion, and the resistances it has provoked, has made visible aspects of its circuit that he largely overlooked, but which are identified in the autonomist analysis of the social factory.² In the 1970s Mariarosa Dalla Costa and Selma James made a crucial revision when they insisted that a vital moment in capital's

circuit was the reproduction of labour power--that is, the activities in which workers are prepared and repaired for work.³ These are processes conducted not in the factory, but in the community at large, in schools, hospitals, and, above all, in households, where they have traditionally been the task of unwaged female labour.

More recently, another round of struggles has called attention to further aspects of capital's circuits, previously largely overlooked by Marxists--the reproduction of nature. Capital must not only constantly find the labour power to throw into production, but also the raw materials this labour power converts into commodities. As mounting ecological catastrophe catalyzes intensifying protests by green movements and aboriginal peoples, it has become apparent that faith in the limitlessness of such resources is profoundly mistaken. Whether raw materials are in fact available for accumulation depends on the extent of capital's territorial and technological reach, on the degree to which ecosystems have been depleted and defiled, and on the level of resistance this devastation arouses. The reproduction (or non-reproduction) of nature increasingly becomes a problem for capital and a terrain of conflict for those who oppose it.⁴

Taking account of the insights won not just by workers' struggles but also by feminist and environmental movements this chapter posits a modified version of Marx's circuit of capital, constituted by four moments--production, the reproduction of labour power (which is in turn examined under three sub-headings dealing with welfare, schooling and medical services respectively), the reproduction of nature and, finally, circulation. At each point we will see how capital uses high-technologies to enforce command, by imposing increased levels of workplace exploitation, expanding its subsumption of various social domains, deepening its penetration of the environment,

intensifying market relations, and establishing an overarching, panoptic system of measurement, surveillance and control through digital networks.

However--and this is crucial--the cartography of capital's circuit maps not just its strengths but also its weaknesses. In plotting the nodes and links necessary to capital's flow, it also charts the points where those continuities can be ruptured. At every moment we will see how people oppose capital's technological discipline by refusal or reappropriation; how these struggles multiply throughout capital's orbit; how conflicts at one point precipitate crises in another; and how activists are using the very machines with which capital integrates its operations to connect their diverse rebellions. In particular, I argue that the development of new means of communication vital for the smooth flow of capital's circuit--fax, video, cable television, new broadcast technologies and especially computer networks--also create the opportunity for otherwise isolated and dispersed points of insurgency to connect and combine with one another. The circuit of high technology capital thus also provides the pathways for the circulation of struggles. I draw examples primarily from a North American context, perhaps one of the most inauspicious of current contexts for class struggle and, consequently, an acid test for the contention that such conflict has not vanished from the horizons of the information era.

Production: Automatic Systems

Let us start (though not stay) at the traditional heart of Marxist theory, the immediate point of production, the site of work. Here, the information revolution has meant, first and foremost, a leap towards a new, digitised level of automation--an extraordinary

intensification of capitals' perennial drive to eliminate its dependence on labour by transferring workers' knowledge into machines. Over the last twenty five years management has invested massively in computerised production technologies-- numerically-controlled machine tools, robots, automatic delivery devices, and just-in time inventory systems.

These cybernetic devices first appeared in the workplace shortly after the end of the Second World War, primarily in manufacturing and petro-chemical industries.⁵ At first, their components were introduced in a piecemeal fashion, and only gradually connected in increasingly self-regulating complexes. This process was, however, accelerated by the industrial revolts of the 1960s and 1970s. Advanced versions of the new systems, aimed at a maximum reduction of the workforce and seamless, centralised control from managerially-controlled command centers were brought into the car factories, chemical plants, and steel mills where mass worker militancy had been strongest. Even where these experimental systems were so expensive as to be, in strictly economic terms, inefficient, their labour-eliminating capacity was frequently critical in crushing the most advanced elements of working class organisation.⁶ Today, however, such systems are being experimented with throughout all sectors of work, from nursing to pizza-making to lighthouse-keeping; while the fully implemented versions are still futuristic islands in a sea of more traditional work methods, their discrete elements are widely disseminated, and the tendency toward integration evident.

The labour-reducing capacities of these 'new production systems,' in their advanced forms, are truly remarkable. The most sophisticated Japanese automated factories claim to have nearly halved their workforce, while simultaneously tripling

production: in California, a plant capable of manufacturing a billion dollars worth of computers a year requires only five manual-assembly workers and fewer than one-hundred other workers, mostly engineers.⁷ Although such levels of automation are only the latest step in capital's long-protracted substitution of technology for people, it nonetheless seems that computerisation does mark a watershed in the relation between worker and machine--a quantum leap in the predominance of fixed over variable capital, dead labour over living. Indeed, with the advent of new production systems we surely reach that horizon long-ago foreseen by Marx where capital attains its "full development" with the creation of,

. . . an automatic system of machinery . . . a moving power that moves itself . . . consisting of numerous mechanical and intellectual organs, so that the workers themselves are cast merely as its conscious linkages.⁸

When he wrote these lines Marx undoubtedly had in mind the smoky clangor of a nineteenth century industrial site. Yet they apply with redoubled accuracy to the sterile, silent informational systems with which twenty-first century capital is now attempting to solve its long-standing 'labour problem.'

In North America, this solution for many years seemed to be succeeding remarkably well. Throughout the 1980s, capital's massive investments in advanced technology played a vital role in crushing strikes. From airports, where the availability of new levels of automation was a critical to the success of the Reagan administration in firing air-traffic controllers, to the meatpacking industry, where extensive technological restructuring

reached a climax with the defeat of the two-year long strike at Hormel, new production systems repeatedly helped capital prevail in workplace conflict.⁹ In other sectors, such as the auto industry, fear of losing jobs to new technology quelled militancy and contributed to a climate of demoralisation and defeat in which once-defiant industrial unions acquiesced to concession bargaining and co-operation with management. Capital's technological superiority appeared to be absolute.

Yet although robotised systems have significantly depleted the ranks of the industrial working class, it is clearly false to suggest that cybernetic systems entirely eliminate capital's need for labour. Despite the dreams of wide-eyed digital futurists, the total liquidation of human intelligence from the production process has proven a singularly intractable project. In many manufacturing sectors computerised automation has made production dramatically 'leaner.' Yet the full 'lights out' scenario--in which the final worker replaced by a robot exits the building and turns out the lights, leaving behind a smoothly running automated darkness--remains an unattained goal. And even in the rare plants which approach such scenarios, the operations of such so-called `workerless factories' in fact rest on a surrounding infrastructure of activities--from maintenance to marketing--still dependent on myriad human agents.

Indeed, if one examines the last quarter century of high-technology innovation, a paradox appears. While in the factory wage-labour has been relatively reduced, in the larger social arena it has, if anything, expanded. Ever-wider areas of human activity--from education to meal-making--being more widely and intensively subsumed within the capitalist organisation of work. This is what is usually described as the rise of the `service sector.' As we saw in Chapter 2, this phenomenon has long been central to the analysis of

information society theorists like Daniel Bell and Alvin Toffler. In their hands, however, the process has been so mythologised--as a sublimation of sweaty blue-collared proletarians into suave white-collared professionals--to amount to a near-total mystification the actual recomposition of the post-industrial workforce.¹⁰

For a more penetrating analysis, it is useful to look back for a moment to Marx. In the Grundrisse, while emphasising capital's relentless drive to replace humans with machines--a trajectory that is of course central to his whole vision of crisis and revolution--Marx nonetheless does not speak of the total elimination of labour by automation. Rather, he refers to its transformation into the "conscious linkage" within a technological system. "Direct production"--the 'hands-on' transformation of raw materials into finished products--would be increasingly automated. Living labour would be not so much "included within the production process" but relate to it "more as watchman and regulator"--a description which neatly covers the sort of invigilating and trouble-shooting functions for which human beings are still found indispensable, even in the most sophisticated of new production systems.¹¹ Moreover, Marx implies, there would remain a field of activities indirectly necessary for production, in which human involvement would remain--or indeed become increasingly--crucial. This indirect labour would entail two main types of activity: on the one hand "scientific labour" and on the other "social combination."¹²

Later, in Chapters 8 and 9, I will discuss the problems that Marx saw these developments creating for capital. But at the moment I simply want only to suggest that in these cryptic phrases, "scientific labour" and "social combination," he offers some orientation towards analyzing the notoriously amorphous service sector. Applying his lens, we can discern within the category two distinct groups, both of whom are now being

systematically assimilated into the capitalist organisation of work. On the one hand, there is “scientific labour”—the scientists, programmers, engineers and designers celebrated in information society theorists portrayals of the ‘knowledge workers’ of the future. But on the other, there are the multifarious workers concerned with the tasks of “social combination,” involved in facilitating and sustaining the matrix of everyday human intercourse and interaction within which even the most automated production remains obdurately embedded. These tasks of “social combination” comprise some relatively well paid, creative and prestigious jobs, especially in the media and communications sectors. But they also include the legions of retail clerks, cleaners, janitors, security guards, and fast-food servers who, in fact, make up the bulk of employment in the information economy.¹³ Numerically much more significant than the “scientific labour” they support, but enjoying only a fraction of the rewards, these latter workers constitute the new high-technology proletariat.

Relative to the old industrial working class, concentrated in its factory bastions, these new forms of “social” and “scientific” labour-power might appear unlikely contenders in class struggle. They are disorganised, insofar as they come into being outside the orbit of the traditional workers’ movement, towards whose symbols and institutions they are often indifferent or hostile. They are dispersed, across an enormous variety of spatially separated and qualitatively diverse sites. And they are divided, in a multitude of ways, but particularly by the lines separating the relatively privileged cadres of “scientific labour” from the super-exploited “social” labour that sustains it—a division frequently reinforced by ethnicity and gender. Nevertheless, the presence of these post-industrial labouring subjects, even in the midst of a world of artificial intelligences and information

highways, constitutes an ominous spot on management's' dream of an immaculate technosystem freed from the insubordinate possibilities of human presence.

Indeed, in the last few years there have been signs that the post-industrialists' requiem mass for class struggle was premature. Since the early 1990s a series of strikes and organising drives in both the US and Canada have seemed to signal an unexpected revival of labour militancy. In 1996, the number of hours lost to strike action in the US, after dropping precipitously for decades, began to rise again, although only very slightly.¹⁴ More significant than such quantitative measure, however, were certain qualitative aspects of the new insurgencies. For they were no longer predominantly "mass worker" actions, situated in the classic industrial centres of working class power, but frequently arose outside the factory, in the diffuse, social labour of the service sector. The continuing militancy of many traditional industrial communities--one thinks of the three-way strike by rubber, sugar and vehicle-manufacturing workers in Illinois `class war-zone'-- cautions against any quick farewell to traditional terrains of class war.¹⁵ But the wave of labour restiveness also passes through new territories. Often it involves workers at the bottom of the hierarchy of labour power, whose networks of support are founded as much in gender and ethnicity as in the traditions of the labour movement. While established trades unions may provide the organisational form, and sometimes real support and leadership, for these insurgencies, such rebellions constantly bubbled up at a local level below and sometimes in opposition to the upper levels of union bureaucracies, challenging established structures and strategies, and reshaping them from below.¹⁶

For an example, one need look no farther than Silicon Valley, historic centre of the US computer industry.¹⁷ The most well known aspect of the Valley's labour-history is the

emergence of the new strata of highly skilled technical workers--engineers, software designers and programmers--central to the making of digital technology. Mostly male, mostly white, very highly educated (the Valley has largest concentration of Ph.D.'s and engineers in the world) these are the quintessential 'knowledge workers' needed by an industry whose profit depends on a constant stream of innovation. Highly-paid, frenetically creative, technologically compulsive, often enjoying substantial entrepreneurial opportunities, this elite workforce has been the subject of innumerable adulatory media reports, making their exploits an important part of the information revolution's romantic mythology.

There is, however, another, far less glamorous, face to work in Silicon Valley--that of the janitors, landscapers, cafeteria staff, and microchip assemblers who provide the indispensable support for this technological creativity. Drawn largely from often immigrant or ethnic minority communities, these workers--many of them women--are employed at low or minimum pay, outside union organisation, without health insurance, maternity benefits or recourse against sexual harassment. The Valley's prestigious high-tech companies, such as Apple, Intel, Hewlitt Packard, Oracle and IBM, could not function without this labour force. But the major corporations try to distance themselves from unsightly super-exploitation by a system of contracting-out that allows disavowal of responsibility for working conditions and wages. The workplace segregation between the high-end knowledge workers and low-end service labour is reinforced by residential patterns that divide the Valley into ethnically sorted zones. Although Silicon Valley is situated in the most prosperous county in the US, aggregate wealth on closer examination decomposes

into a scene of postindustrial segmentation where "the First World meets the Third in a weird melange of high technology and misery."¹⁸

For many years, the dispersed nature of the Silicon Valley service workforce, its high turnover, and divided ethnic composition, led the US labour movement to deem it unorganisable. In the early 1990s, however, following a wave of worker complaints, Justice for Janitors, an organisation of Services Employees International Union, began a series of campaigns fighting for union recognition, pay raises, and settlement of sexual harassment grievances.¹⁹ These campaigns used a wide variety of tactics--strikes, picket lines, demonstrations, advertisements, leafleting campaigns, hunger strikes---which, although all part of the historic repertoire of the American labour movement, were conducted with an energy and determination that contrasted sharply with the submissive defeatism prevailing in many major trades unions.

Moreover, in some respects the Justice for Janitors campaigns went beyond familiar models of shopfloor activism. They made connections between workplace conditions and issues of race and gender discrimination, and forged alliances with feminist and ethnic community organisations. Because Silicon Valley workers are often directly or indirectly exposed to the highly toxic chemicals used in microchip manufacture, they were also on occasion able to link labour struggles with those of environmental and housing activists challenging the computer industry's poisoning of the local environment through ground, air and water pollution.²⁰

The scope of the Justice for Janitors campaign took employers aback. The turning point in the mobilising drive at Apple, for example, came when workers threatened to take their campaign into the classrooms of California schools and universities--a major market

for Macintosh computers. The result was small but significant victories at a number of high-tech companies--union certifications, pay raises, settlements of harassment cases. Labour councils in Silicon Valley are now speaking in terms of more extensive campaigns that will address not only the terrible conditions of 'service' workers, but also some of the grievances of the 'scientific' workforce, such as maniacal schedules and lack of job security. These new campaigns will, one organiser says, involve "everybody from janitors to technical writers to software gypsies and testers to quality assurance engineers":

The janitors were just the first among the contingent workforce . . . When we talk about doing windows in this valley, we're not just talking about the janitors who clean them, but the software engineers who write them.²¹

The revolt in Silicon Valley--Mecca of an industry whose products are specifically intended to free capital from dependence on troublesome humanity--presents an extreme irony. But it is by no means exceptional. During the 1990s, North America's restructured, post-Fordist, informational capitalism has been riddled with unanticipated conflicts. The battle in the computer industry has spread to other areas in the US, and now involves organisations such as the Southwest Network for Environmental Economic Justice, a coalition of over fifty grassroots organisations from Texas, Oklahoma, New Mexico, Colorado, Arizona, Nevada and California fighting toxic pollution and poor working conditions.²² In Los Angeles, the same communities that rose up in the 1992 riots generated a surge of labour militancy sweeping the hotels, fast foods, restaurants and dry-walling sectors.²³ In Las Vegas janitors and cleaners took on the giant high-technology gambling

and entertainment complexes of MGM.²⁴ Along the US/Mexico line, women workers fought a mobile garment industry that migrated sweatshop operations across borders.²⁵ Delivery workers of a partially-reformed Teamsters' union won a historic victory against United Parcels, at the heart of the increasingly important high-tech communication/transportation industry. In Canada, protests against labor legislation and austerity programs from the Ontario provincial government produced an unprecedented series of rolling one-day general strikes in urban centres, while Quebec unions opened a major drive to organise the youth labour in the McDonald's fast-food chain. Elsewhere, the decade saw major workplace battles waged by airline attendants from Alaska to Miami; newspaper workers in San Francisco and Detroit; teaching assistants at Yale and other universities, and nurses and education workers resisting public spending cutbacks from New York to Vancouver.²⁶

These movements are, in terms of the types of workers involved, extraordinarily diverse--so much so that they at first seem to defy generalisation. But this diversity is, in itself, an important defining feature. For these are the revolts of a collective labouring subject which is no longer an homogenous and concentrated industrial proletariat, but rather heterogeneous and connective, performing the innumerable social activities necessary to maintain the flow of production within capital's increasingly complex and extended techno-systems. And this new positioning of labour gives new organisational form to its uprisings. Situated as the interstitial "conscious linkages" within capital's automated and elaborated chains of production, rebellious workers have been compelled to increasingly seek "conscious linkages" with one another. Recognising the extreme vulnerability of isolated fights, the new labour movements are frequently to be found expanding the scope of struggle beyond the immediate site of conflict, following the

increasingly comprehensive and social scope of capital's own circuits. This tendency takes a variety of forms: increased efforts to organise sectorially, rather than in single plants; cross-sectorial connections, such as linkages between striking workers in the telecommunications and garment industries, or the mutual support between airline attendants, construction workers and bus drivers; and increased resort to consumer boycotts and 'corporate campaigns' hitting at every aspect of an employer's investments.²⁷

Even more importantly, workers' organisations have entered into experimental coalitions with other social movements also in collision with corporate order, such as welfare, anti-poverty, students, consumer and environmental groups. The result has been new oppositional combinations. Thus, striking telephone workers join seniors, minorities and consumer groups to beat back rate hike, or unionising drives in the ghettos of the fast food and clothing industries intertwine with campaigns against racism and the persecution of immigrants.²⁸ Such alliances are fraught with difficulties, and can easily disintegrate. But they expand the boundaries of official 'labour' politics, so that the agency of countermobilisation against capital begins to become, not so much the trades union, defined as a purely workplace organisation, but rather the "labour/community alliance," with a broader, social sphere of demands and interests.²⁹

Discussing these developments, Kim Moody (who is connected to the Detroit journal Labor Notes, an important node in the US circuits of labour dissidence) suggests that the North American labour movement in the this century has gone through three phases of organisation--from "craft" unions, to "industrial" unions, to an emergent "social movement unionism."³⁰ For Moody, "social movement unionism, " the vital current of today's struggles, is an activism whose scope expands beyond the factory gate into a wider

arena, overflowing the limits of strictly workplace struggle to include demands for broad social and economic change and alliance with other movements. It is a form of struggle in which “unions provide much of the economic leverage and organisational resources, while social-movement organisations . . . provide greater numbers and a connection to the less well organised or positioned sections of the working class.”³¹

This revival of worker militancy in North America coincides with similar, but stronger, tendencies in Europe during the 1990s--the French general strikes of 1995-1996, the Italian ‘Coba’ movement and wave of labour unrest in Britain and Germany.³² As we have seen, Negri and other autonomist Marxists, writing predominantly in this European context, have also theorised three cycles of class struggle and recomposition; from the “professional” worker of the late 19th century, to the “mass” worker of capital’s Fordist era, to the emergent “socialised” worker of the current, post-Fordist, informational period.

What Negri and Moody are both suggesting, in different idioms and from different national settings, is that capital’s high-technology decimation of the industrial working class does not amount to the end of class struggle. The new production systems have partially chased waged-labour out of the factory. In doing so, however, capital has diffused its organisation of labour-power through society at large. These conditions of dispersal initially appear as the depletion and fragmentation of traditional class solidarities. But they can be reconstituted as conditions of new scope and interconnection. Contrary to postindustrial fantasy, workplace conflicts are not dissolved in the new digital environment; but they are decentred and recomposed with other arenas of activism. However, to understand this dynamic more deeply, we must go beyond the workplace and into the proliferating confrontations between popular movements and the capitalist state.

Reproduction of Labour Power I: The Panoptic State

If labour-power is to be available for exploitation it must constantly be reproduced. That is to say, people must be socialised, schooled, trained, prepared and held in readiness for work, in the quantities and qualities required by capital. Marx noted that "the maintenance and reproduction of the working class remains a necessary condition for the reproduction of capital," but, reflecting both the laissez-faire political economy of his era and the blindspots of his gender, omitted this process from his detailed analysis of capital's circuits, declaring that "the capitalist may safely leave this to the worker's drives for self-preservation and propagation."³³ Over the course of the twentieth century, however, other Marxists, and particularly those within the autonomist tradition, have pointed out that in the course of its development capital has increasingly been unwilling, and unable, to take this reproductive activity for granted. To ensure the proper supply and disciplining of the minds and bodies required for work, it has been compelled to systematically extend its control over society as a whole--a control mediated through the Leviathan-like structures of the state.³⁴

Thus the first half of the twentieth century saw all advanced capitalist societies, to varying degrees, respond to the threat of militant working class movements with a shift from the "Rights State"--where the activity of government was restricted to securing the conditions for the free-market--to the "Planner State"--in which the state managed the reproduction of labour power through a vast array of schools, hospitals, welfare offices, and other institutions. Although this transition was set in motion to ward off revolutionary dangers, it also laid the basis for a new stage in capitalist growth. For the schools, health

care systems and various forms of social payments of the Planner State cultivated the increasingly healthy, educated and peaceful forms of 'human capital' necessary for intensive technoscientific development of the Fordist era. The advent of what is generally known as the welfare state represented an ingenious social compromise crafted by reformist business interests, social-democratic politicians and trades-union leaders, which constituted both a real victory for workers--in terms of a general betterment of living conditions--and a careful containment of that victory within the overall parameters of continuing capitalist accumulation.

In the 1960s and 70s, however, this uneasy settlement began to disintegrate. Movements of workers, the unemployed, welfare recipients, students and minority groups began to make demands on the vast system of social administration that transgressed the limits set by capitalist logic. They demanded, and sometimes won, increases in social expenditures going beyond those compatible with business's strictly rationed plans for improving its workforce. In certain cases, such movements were also able to gain a degree of local control over the administration of social programs so they were, in effect, running the state apparatus from below.³⁵ These encroachments were intolerable for North American and European capital, whose rate of profit was already being squeezed by shopfloor militancy and international competition. Its response--part of the larger neoliberal restructuring offensive--was to repudiate the post-war social contract and dismantle the Planner State, destroying what it could no longer control.

The new regime of governance, whose full appearance is usually identified with the electoral victories of Reagan and Thatcher, has a double face. On the one hand, privatisation, deregulation and cutbacks systematically subvert the welfare state, slashing

the social wage, weeding out enclaves of popular control, and attacking any of labour's protections from the disciplinary force of the market. The costs of reproducing labour power are increasingly devolved back onto individuals and households. This shift becomes ever more important to capital as corporate downsizing and automation ejects more and more workers from production, thereby swelling the ranks of the unemployed and impoverished, increasing welfare roles and diminishing tax revenues. On the other, those aspects of the state necessary to the protection of accumulation--such as the security apparatus or subsidisation of high technology investment--are strengthened. There thus appears the paradoxical neoliberal combination of what Andrew Gamble terms "the free market and the strong state."³⁶ In what autonomists term the "Crisis State," the governmental apparatus is dissolved in so far as it serves popular purposes, but maintained or enlarged as the coercive and administrative arm of capital.

Computers, telecommunications and biotechnologies are embedded at the very core of the Crisis State, as both means and end. Social programs are cut to free revenues for assistance to corporations make huge investments in high technology, public channeled to private purposes either directly through subsidisation or indirectly through tax breaks. High technology is, in turn, used to effect cuts to welfare programs that start to be administered through increasingly precise and omnipresent digitised systems. The delivery of social services is increasingly automated--for example, by computerising the making of welfare or unemployment insurance claims. This process not only cuts staff costs, but also reduces payments by imposing daunting electronic hurdles which have to be surmounted by precisely that sector of the population least equipped to handle them, and allowing the digitalised or biometric monitoring of claimants.

As whole strata of the population are cut off from support, potential social disorder is kept in check by the technologically intensive policing applied against the poor, indigent and ghettoised. Around those convicted of transgression, the web of informational control tightens inexorably. Prisons, as Foucault so forcefully pointed out, have long been cutting-edge sites for the development of surveillance techniques. What is not always remembered is that the original panoptic apparatus that Foucault discussed in a carceral setting was at first designed for use in a factory setting, as an instrument of capitalist work discipline.³⁷ In today's high-technology penitentiaries, however, carceral and the capitalist logic come together. In an increasing number of privatised or semi-privatised US prisons, inmates are put to work for private corporations, often on electronic data-entry jobs or other forms of telework, in a process that uses high-technology to neatly fuses the Crisis State's drive to minimise social expenditures with the corporate imperative to cut labour costs to the bone.³⁸

The net tendency is toward a return to the social conditions of the 19th century overseen by the technologies of the 21st. However, this regression, bringing with it huge increases in poverty rates, social polarisation and general human suffering, has catalyzed opposition. In North America, immiseration erupted into rage in the Los Angeles rebellion of 1992, the most violent urban insurrection in the US since the mid-19th century. As Mike Davis notes, Southcentral LA, a "housing/jobs ghetto in the early twentieth century industrial city," is now "an electronic ghetto within the emerging information city"-- a "data and media black hole, without local cable programming or links to major data systems."³⁹ The rioters came from the ranks of the un- and under-employed, in a community whose traditional sources of employment in the aerospace and automobile industries had

been gutted through automation and global relocation. This population, dependent on the scanty welfare, casualised service work or criminal industries which constitute the underside of the information economy, was on an everyday basis was subject to a regime of draconian police surveillance and brutalisation--a regime whose systemic violence, publicly exposed in the videotaped beating of Rodney King, finally triggered a mass explosion.

Its outbreak, in the same city that saw the Watts riot of 1965, was a stunning testimonial to the collapse of a quarter century of capitalist reformism. Framed by the mainstream media simply as an issue of race, the uprising was in fact, as Mike Davis observed, a "multicultural bread riot" involving Latinos, blacks and whites.⁴⁰ Moreover, although the riot was a spontaneous eruption of despair and anger, it was by no means the blind, mindless event which authorities attempted to represent it as. A few days after the uprising, there appeared the "Bloods/Crips Proposal for LA's Face-Lift," a radical, visionary plan for the renewal of the city produced by the infamous street gangs.⁴¹ This document, almost entirely ignored by mainstream media made extensive proposals for reconstructing the urban environment, and for the introduction of governmentally funded educational, health, employment and even law enforcement measures to reverse the disintegration of community.

Although the conditions of South Central Los Angeles gave the 1992 rebellion its singularity, it would be wrong to see it simply as a 'one-off' event. From the late 1980s to today the intensifying destruction of social safety nets has brought into being a variety of new "poor people's movements," ranging from the squatters of Homes not Jails, to End Legislated Poverty in Vancouver, to the encampments of homeless in New York.⁴² For

example, Food Not Bombs is a group whose activities in San Francisco led to over seven hundred arrests from 1988 to 1994. In addition to running the on-street soup kitchens which have aroused the ire of municipal government, it operates its own radio network, based largely on low-watt broadcasting, produces its own audio tapes and has a World Wide Web site. Through these channels it disseminates information excluded from the mainstream press about the police harassment of its programs and the structural causes of poverty.⁴³

In Toronto, a coalition of trades unionists and anti-poverty groups have taken aim at a contract between the Ontario government and a private company, Andersen Consulting, to automate the delivery of welfare services. The coalition argues that this contract aims to simultaneously eliminate social services staff (Andersen gets a 'bounty' for each job cut) and to make the system increasingly inaccessible to claimants. The coalition has publicised Andersen's record of cost overruns and unfulfilled promises on similar contracts elsewhere in North America, traced its involvement in the privatisation schemes of authoritarian governments from Russia to Nigeria, and its links to the military industrial complex. In addition to holding marches, pickets and civil disobedience actions at the corporation's offices, the "Andersen Conversion Project" is also bringing forward proposals for the transformation of the high-tech company to more socially constructive purposes.⁴⁴ In such movements, anti-poverty groups, trades unionists and other social movements take the first steps to turn the technologies developed at public expense back against the panoptic alliance of state and corporate power.

Reproduction of Labour II: Capital's Biopolitics

The Crisis State's regime of high-technology control is not restricted to the policing of welfare lines and inner city streets. It extends further, into homes and hospitals, where the informational restructuring of capital has been intimately associated with new interventions into the reproduction of labour power at its most basic levels--motherhood, birth, and, indeed, the basic biological constitution of human beings.

As was discussed in Chapter 4, autonomist Marxist's have since the 1970s argued that capital benefits from the unpaid reproductive work of women. The classic nuclear family paired the waged male worker and unwaged female housewife in a relation where role of the latter was to maintain, repair and reproduce the labour power of the former. The male worker's wage thus commanded unrewarded labour time not only in the factory but also in the home. This conjunction of masculine domination and capitalist exploitation was challenged by the feminist revolt of the 1960s and 70s on a multitude of fronts; in the exodus of women from unpaid domestic labour in search of waged work, in demands for "wages for housework," in the rejection of the various medical and psychiatric controls placed over housewives. Amongst the most important of these struggles was that over abortion rights. Women asserted control over their own fertility and repudiated a 'natural' fate as the unwaged reproductive laborers of the social factory.

The reconsolidating of 'family values' and the discrediting of feminism were thus a logical part in the neoliberal offensive of the 1980s. Limitations on and recriminalisations of abortion services; legal regulation of the pre-natal conduct of 'unfit' mothers; experiments in the sterilisation of welfare mothers by mandatory Norplant implants were all crucial aspects of Reaganite and Thatcherite regimes.⁴⁵ What is often not fully recognised is how

closely these apparently 'cultural' or 'ideological' aspects of the Crisis State were, in fact, closely bound up with its economic policies. For as welfare services are degraded under the austerity regime of the Crisis State, the resumption of the traditional female role as a 'voluntary' caregiver for the young, sick, and elderly becomes critical to prevent total social disintegration. Although the means to this end include both 'pro' and 'anti-natalist' tendencies, the common theme of these interventions is enhanced state control over maternity--control exercised to ensure the 'proper' management of procreation and to reconstruct the household as a costless, reliable site for the reproduction of labour power.

At the same time, however, the most advanced sectors of knowledge-based capital have been experimenting with an alternative system of maternal control--one based on biotechnologies. Already, in vitro fertilisation, amniocentesis, embryo selection, and artificial insemination are becoming the instruments for an extraordinary experiment--the conversion of motherhood into a domain for the direct extraction of surplus value. As feminists such as Maria Meis and Kathryn Russell have argued, the commercial application of such techniques drives female 'labour power'--in the procreative sense-- towards the condition of abstraction, divisibility and alienation traditionally experienced in industrial work.⁴⁶ Reproductive engineering applies a technological deskilling strategy, classic in form but unprecedented in intensity, comprehending both conscious knowledge and corporeal capacity, detaching, permutating and recombining the various moments of pregnancy until the unifying factor governing the conception, gestation and delivery of a child is no longer maternal but managerial.

This is clearest in the so-called 'surrogate mother' business--the ultimate in female service sector labour--in which poor women are, through an entrepreneurial intermediary,

paid by rich clients to undergo either artificial insemination or in vitro fertilisation and carry and bear children.⁴⁷ But such obviously exploitative repro-tech arrangements only represent the extreme of tendencies evident even in more seemingly benign uses. For example, women who voluntarily attempt in vitro fertilisation not only pay for the service, but also, in a complex and painful process of self-surveillance and constant testing often knowingly or unknowingly providing the surplus material --'excess eggs'-- required for further commercial experimentation.⁴⁸

Anti-abortion crusades and reproductive technology businesses seem antithetical, one resting on a sacralisation of procreation, the other on its utilitarian industrialisation. And there are indeed real contradictions between these strategies, and between the factions of capital which promote them. But the two strategies of control are also intimately connected. Both counter the reproductive autonomy fought for by women. The 'family values' campaign cancels 'choice' in an outrightly reactionary manner. But the corporate biotechnologists coopt it as the watchword for the commodification of procreation. Just as in production capital combines sweated labour and robotics, so 'family values' and genetic engineering are poles in a single overarching regime of reproductive control, with biotechnological options commercially available to the rich, and surrogate mothers drawn from the ranks of the poor.

In the very near future, moreover, reproductive technologies promise a spectacular convergence with genetic engineering--the splicing, cutting and recombination of the genetic code. After a gradual postwar development, founded in North America upon heavy state investment in basic research, these technologies have since the crisis of Fordism in

the 1970s undergone an extraordinary acceleration in commercial development as part of capital's overall search for post-industrial sources of investment.⁴⁹

The capacity to rewrite the 'code of life' has been applied to agricultural, food production and plant breeding to produce new strains of plants, new forms of food and new types of fertiliser.⁵⁰ Increasingly, however, genetic engineering has in its sights direct, control over human behavior. As Gottweiss argues, the burst of state and corporate interest in biotechnologies during the crisis of the social factory arose because in addition to yielding traditional economic benefits, it was conceptualised as "a potential contribution to a broader social stabilisation, mainly by its expanded capacity to control behavior and bodies."⁵¹

Today, these ambitions crystallise around the Human Genome Project, the US state sponsored attempt to map and sequence all the DNA of a 'normal' human prototype--a project comparable in cost and scope to the space program of earlier decades.⁵² This project is generally promoted as a means of curing hereditary diseases. Eventually, this dream may be realised, and, if it is, the biotechnology industry anticipates lavish profits from the creation of new ways to improve health, longevity and pleasure for those who can afford them. However, it is important to recognise that currently, genetic engineering's main achievements are neither therapeutic nor even diagnostic but predictive, allowing the probabilistic identification of conditions for which no known remedy presently or forseeably exist.⁵³

Such techniques offer corporate and state managers a way, not of healing, but of targeting subjects with an alleged predisposition to costly disease.⁵⁴ The identification of 'hypersusceptible' workers with supposed genetic sensitivity towards toxic chemicals or

radiation has in the US already become a significant source both of employment discrimination and of exclusion from health insurance coverage.⁵⁵ It also provides an alibi for failure to eliminate such pollutants, which become redefined not as social hazards, but as problems of individual predisposition, capable of being handled by genetically 'sub-sensitive' labour. Extensive genetic screening holds out the promise of comprehensive, DNA-level quality control over the reproduction of labour power, control aimed not at the cure of disease put at the discarding of potentially unproductive, oversensitive or expensive units.⁵⁶

As the Human Genome Project generates the raw data necessary for new 'breakthroughs' to enhance the human body, the combination of genetic screening with reproductive technologies offers prospects for the renewal of a eugenic agenda once thought to have been discredited with the fall of fascism. However, the commercial thrust behind the biorevolution means that such a program would probably have a different 'feel' from its historical predecessors. As employment possibilities become increasingly dependent on a clean genetic profile, or even on possession of certain bioengineered enhancements, positive and negative selection will be left to the survival instincts and pocket book of individuals. People may bio-technologically reproduce the labour power of themselves and their children in the most saleable form affordable, in the context of an increasingly stratified, privatised and expensive medical system-- a development whose potential is already apparent in the burgeoning market for synthesised human growth hormones, silicon breast implants, cosmetic surgeries, performance enhancing drugs and transplantable hearts, livers, kidneys and corneas.⁵⁷ Capital will thus move towards establishing a hierarchy of labour powers in which the various classificatory grades are

distinguished not simply by education and training, or according to traditional discriminations of gender and race, but according to fundamental bodily modifications.⁵⁸ As Peter Linebaugh has pointed out, in origin, the term "proletarian" designated someone who has no function but to reproduce themselves.⁵⁹ In Marxist usage, this has conventionally been understood as a person who has nothing to sell but their labour power. Soon, however, it may be applied to someone whose only economic asset is their gestational capacity and their genetic heritage.

However, the emergent neoliberal biopolitics has encountered widespread resistance. In North America, much of this has centred on the revival of the women's reproductive-rights movements. In many cases, its nucleus is the network of abortion clinics and women's' health centres, whose defence, both from the harassment, firebombings and assassinations of the right-to-life movement and from the cut-backs of neoliberal governments, has formed a focus of activism. Women have also attempted to enlarge their own technological control over procreation, through campaigns such as that waged in the US for access to the abortion drug, RU 486. However, largely through the influence of poor women and women of colour, the anti-abortion movement has undergone a strategic reorientation, sometimes described as a shift "from abortion to reproductive freedom."⁶⁰ An earlier emphasis on individual choice has, at least in some sectors of the movement, been gradually replaced by an emphasis on securing the "social conditions necessary for autonomous choice," on the provision of adequate health services, housing, and wages and welfare for women, and on winning control over the research and availability of medical technologies, including opposition to both compulsory fertility and eugenic sterilisation,⁶¹

One aspect of this expanded agenda has been an intensive critique of the repro-tech industry. International feminist alliances such as the Feminist International Network of Resistance to Reproductive & Genetic Engineering have exposed the deceptive success rate claimed by the in vitro fertilisation industry, its exploitation of female labour, the misogyny of sex selection amniocentesis, and the eugenic potential of the new technologies.⁶² They have argued that the 'choices' offered by the biotechnologists in fact erode female freedom because they, as Sue Cox puts it, "close off women's abilities to refuse various kinds of technological intervention."⁶³ In Canada, the attempt by the Royal Commission on New Reproductive Technologies to suppress such lines of critique exploded into public scandal.⁶⁴ Other points of struggle have involved indigenous people, in both North and South America, concerned with the ramifications of Human Genome Diversity Project (known as the 'vampire project') which has sampled and patented human cell lines from endangered aboriginal communities.⁶⁵

Other groups, with different concerns, have found themselves on a similar collision course with the neoliberal administration of health. In the face of alliance between a state apparatus committed to the reduction and rationing of health care, and a burgeoning, profit-oriented medical-industrial complex formed at the intersection transnational medical, pharmaceutical, agricultural, insurance and computer corporations, there have appeared what Patrick Novotny, writing of the environmental justice activism, calls movements of "popular epidemiology."⁶⁶ These movements often involve groups marginalised by the industrial-medical complex--people of colour, women, gays and lesbians. They challenge established expertise, demand additional allocations of funding,

question the priority of profits over people, reappropriate popular capacities for research, and often seek systemic rather than palliative answers to the causes of ill-health.

A striking example is the extraordinary self-organisation of the anti-AIDS movement. In the face of initially inept and callous governmental responses to the HIV epidemic, organisations such as ACT UP and Project Inform attacked the state's underfunding of research, and its subordination to commercial purposes. They also reshaped research agendas; amassed and circulated immunological and virological information, both by computer networks and other means; investigated 'alternative' treatments; set up guerrilla clinics, smuggling rings and buyers clubs; clandestinely manufactured commercially-patented drugs; and showed enormous sophistication in video-activism and other forms of cultural agitation.⁶⁷ Although these movements on occasion cooperated with pharmaceutical companies, they simultaneously criticised these companies unsparingly for either ignoring AIDS research, or attempting to extract superprofits from new treatments. These points were underlined by dramatic demonstrations and occupations against companies such as Hoffman Larouche, Boroughs Welcome, Kowa Pharmaceuticals, and Astra. Peter Arno and Karen Felden describes the most famous of such actions, the ACT-UP invasion the New York Stock Exchange protesting AZT price gouging:

Seconds before the 9:30 am opening bell, the activists began to blare portable foghorns . . . Fake \$100 bills imprinted with the words 'Fuck your profiteering. We die while you play business' were tossed to the traders below.⁶⁸

Over the history of the anti-AIDS movement, these forms of activism, initially concentrated in the white, male gay community, have become increasingly prominent in movements of people of colour and women. In the process, AIDS has been recognised as a disease of poverty, primarily afflicting those whom the disintegration of social infrastructures, community networks, health-care and education render vulnerable. Anti-AIDS struggles have thus been connected to campaigns for improved public health funding, comprehensive medical insurance, and the reallocation of military spending.⁶⁹

As Steven Epstein points out, anti-AIDS activism, which itself draws on the earlier example of the women's health movement, is part of a widening circle of popular mobilisations for the "democratisation" of medical technoscience.⁷⁰ These movements include those of women seeking to establish causal links between breast cancer and industrial pollution; unions opposed to genetic screening and drug testing in the workplace; and green activists, farmers and consumer groups concerned about the implications of artificially mutated foodstuffs. Alongside these single-issue movements, and sometimes intertwining with them in complex ways, are broader movements. These aim at preserving the medical services once guaranteed by the welfare state, as in various Canadian coalitions of hospital workers and community groups defending hospitals and clinics against cuts, or at actively extending the socialisation of health care, as in the struggle over health insurance in the US. All of these efforts run athwart the priorities of a state committed primarily to containing social costs, and a corporate logic focused purely on the profitability of life and death.

Reproduction of Labour III: The Corporate-Academic Complex

At the same time as the Crisis State dismantles the social welfare system, it continues to maintain and enlarge the functions of government as a funding and coordinating agency for capital's technoscientific development. The demands of the information era mean that even as schools, hospitals and social services deteriorate, business still—indeed more than ever—demands literate workers, carefully socialised technicians and world-class molecular biologists and software engineers. An integral part of the transition to a post-Fordist model of accumulation has therefore been a major restructuring of public education, a restructuring which has nowhere been more dramatic than in North American universities.

Just as in the workplace, the restructuring of academia has unfolded through a process of revolt and recuperation. Thirty years ago, campuses from California to Paris were in tumult as the post-war generation of students-- the first mass draft of the intellectually trained labour-power required by an ever-more socially-organised and scientifically-oriented capitalism-- rose against the rigidities and atrocities of the Fordist regime. After the tear gas, the shootings and academic purges, the neoliberal response was radical restructuring. Over the late 1970s and 1980s rates of funding for university education in most capitalist economies were cut. Tuition fees and student debt were sharply raised, measures which, alongside a climbing unemployment rate and general economic austerity, chilled student protest, while programs seen as subversive, or simply as inutile to industry, were cut.

With campus unrest apparently quashed, conditions were set for a new, deeper integration of universities and business, one vital to the development of high-technology 'knowledge industries.'⁷¹ The watchword was "corporate-university partnership." In this new academic order, basic research is sacrificed to applied programs of immediate benefit to the corporate sector. Research parks, private sector liaisons, consultancies and cross-appointments with industry, and academic-corporate consortiums burgeon. Moneys subtracted from base operating budgets are reinjected back into programs of direct utility to high technology capital, such as schools of communication, engineering and business administration, and special institutes for computer, biotechnology and space research. University administrators move effortlessly between interlocking corporate and academic boards. Enabled by changes in intellectual property laws to exercise ownership rights over patents resulting from government funded grants, universities become active players in the merchandising of research results. Amidst this intensifying commercial ethos, the internal operations of academia become steadily more corporatised, with management practices mirroring those of the private sector.

This new rapprochement with academia has performed two purposes for capital. First, it has provided business with the facilities to socialise the costs and risks of extraordinarily expensive high-technology research, while privatising the benefits of the innovations.⁷² Second, it has subsidised capital's retraining of its post-Fordist labour-force. Rising tuition fees devolve an ever increasing part of the costs of education onto students and their families, effectively excluding from the universities those sectors of the population whose intellectual advancement is considered irrelevant to accumulation. Those that can pay for entry are trained, sorted and socialised for the new information economy

by increasingly vocational and technically oriented curricula that stress proficiencies in computer literacy at the expense of critical social analysis.

However, the belief that campuses were pacified now appears premature. Rather, the late 1980s and 1990s have seen the emergence of a new cycle of university struggles.⁷³

As Robert Ovetz notes, this wave of unrest stems from numerous different but interanimating sources.⁷⁴ Of central importance is the mounting economic jeopardy in which many students now find themselves. Higher education, rather than guaranteeing personal success, serves to create a standing reserve army of intellectual labour, from whom capital can cull the relatively small number of full-time employees required by the 'knowledge economy.' With rates of unemployment for college and university graduates high, many find that years of study ensure only life-long and unpayable debt. These grim prospects have led to a spate of protests against tuition increases, student aid cuts, and skyrocketing debt loads.

These concerns interweave with a web of other campus protests: against program closures; against commercial development of university lands; against involvement with corporate investment in authoritarian regimes such as those of China or Indonesia.

Alongside these run demands by minorities and women for campus centres, daycares and programs of multicultural and feminist studies. The net result has been a slowly mounting campus turbulence, involving picket lines, demonstrations, occupations, national student strikes in Canada and major confrontations between police and students on several North American campuses. Indeed, as James Laxer observes, it is likely that in Canada more students were actually 'on the streets' in political protest in the mid-1990s than in the 1960s and 70s.⁷⁵

These student protests further overlap with an outburst of campus labour conflicts. Following the overall downsizing logic of post-Fordist capital, academic administrators demand that workers must do more with--and for-- less. The one-time ivory tower witnesses an intensification in the rate of exploitation. This logic is usually visited first, and most severely, on the service workers--the clerical, administrative, janitorial and cafeteria staff--who provide the indispensable infrastructure for the accumulation of intellectual capital. But it eventually arrives at the door of university instructors. Teachers experience increases in the pace and volume of work. A classic strategy of casualisation decreases permanent hiring in favour of reliance on pools of sessional instructors and graduate students who form a contingent academic labour force subjected to chronic insecurity and lack of benefits, and required to exercise mind-bending flexibility in pedagogic preparation.

This speed-up of academic production has produced a response that, while shocking to academic traditionalists, would come as no surprise at all to workers in, say, the auto industry. On many North American campuses, including some of the most prestigious, regular university faculty are now unionised--something that would have been largely unthinkable even a decade ago. Strikes by college instructors are no rarity. Graduate students are now an important constituency for labour organising. Teaching assistants' strikes have spread across North American campuses, involving institutions as famous as Yale and scores of others.⁷⁶

The campus activism arising from this combination of factors has a very different flavour from that of the 1960s and 70s--which for most of the participants in today's rebellions belongs to a barely known and faintly mythic past. The revolts of thirty years ago

recognised and resisted the movement towards integration of the university "knowledge factory" into advanced capitalism's military-industrial complex. But the fact that this assimilation was only partially completed, together with the relative affluence of the period, gave these uprisings a certain removal from the world of the labour market. Campuses could become temporary red ghettos or autonomous zones; but there was a fundamental divorce between what was experienced in these enclaves and the more general conditions of work and exploitation.

Today, the near-total fusion of academia with business, and the manifest subordination of education to the imperatives of the job-market, removes such relative freedom. But it opens the way for connections between both students and instructors and other waged and unwaged workers, making their conditions far closer to that of the rest of the labour force. The conventional distinction so often made between university and the 'real' world, at once self-deprecating and self-protective, becomes less and less relevant. If students and teachers consequently lose some of the latitude of action relative privilege once afforded, they also become potentially participant in and connected to movements outside the university, movements for whom academia can therefore also become a node within the overall circulation of struggles.

Reproduction of Nature: Hazardous Wastes

To grasp the full scope of the opposition running around capital's circuits, however, it is necessary to look beyond struggles over work and wages, or and even over welfare, health care and education. Capital mobilises technology to control not only

labour, nor society as a whole, but also nature itself. It needs not just workers but also raw materials. As it reduces people to labour power, so it reduces nature to a resource: both exist to be used up. And as capital as far as possible avoids paying for the reproduction of labour power it exploits by devolving these costs onto households and communities, so to it minimises its costs for the repair and restoration of the natural world by assuming that these processes can be left to the regenerative powers of nature. For all that Marx often participated in the scientific triumphalism of his century, he nonetheless clearly recognised the dangers of this trajectory when he spoke of capitalism "simultaneously undermining the original sources of all wealth--the soil and the worker."⁷⁷ Today, amidst a global vista of deforestation, desertification, dying oceans, disappearing ozone, and disintegrating immune systems, the cost of this exhaustive process has become all too apparent, and ecological issues constitute one of the main arenas in which popular movements confront corporate power.

Indeed, an eruption of such green movements was one aspect of the general crisis of the Fordist social factory in the late 1960s and 1970s. As public awareness of the damage wrought by radioactive emissions, industrial wastes and pesticide poisoning mounted, capital found its freedom to 'externalise' costs by dumping poisons onto the surrounding communities challenged by unfamiliar forms of resistance. At sites from Diablo Canyon to Love Canal, environmental activists stormed fences and blockaded gates, disrupting industrial mega-projects as effectively as labour unrest on the assembly line.⁷⁸ In one of the most notable large scale reverses inflicted on a large-scale capitalist enterprise, development of the North American nuclear power industry was effectively stalled by the ever rising costs of safety measures demanded by an anxious and angry

public.⁷⁹ Across many other sectors of Fordist capital both the sheer depletion of easily accessible natural resources and the growing resistance to corporate despoliation began to constitute a serious barrier to accumulation.

The post-industrial leap into the world of computers, telecommunications and biotechnologies was in part a response to this threat. As the arrival of high-technology on the shop floor was accompanied by promises of liberation from work, so too was it celebrated as the answer to the evils of pollution. Clean information systems would replace industrial smokestacks, recycle wastes, reduce the use of fossil fuels, eliminate paper from offices, replace motorcars with telecommuting, allow for better planning and preservation of natural resources and dematerialise production into an innocuous flow of bits and bytes. These promises became integral to a succession of strategies--`sustainable development,' `Third Wave environmentalism,' `ecological modernisation.'⁸⁰ All these announce that technological surveillance, substitution and surrogacy will deflect ecological apocalypse, enabling capital to manage the continued reproduction of nature by making a move from mining nature to remodeling it-- shifting from stripping of nature to synthesising it, recreating a world of artificially-generated resources to substitute for the gutted planet left in the aftermath of industrialism.⁸¹

The problem with such plans, however, is that they do nothing to touch the relentless corporate drive to expand the circle of production and consumption. A system in which the survival of each individual firm depends on its ability to enlarge its market, regardless of collective consequences, capital remains committed to, as Marx put it, "production for production's sake."⁸² In practice, therefore, high technology has been used not so much to halt the destruction of nature but to increase the efficiency of the destroying

agencies, and circumvent opposition to their activities. Automobile factories, petrochemical plants, and pulp mills have, amidst fanfare about green business, been made more energy-efficient (and hence more profitable)-- but have not slackened their search for expanded (and hence more ecologically punishing) global markets. The advanced synthesis of substitutes for scarce natural materials has become a license for the anxiety-free liquidation of vanishing animals, minerals and vegetables. Telecommunications and transport networks have dispersed pollution away from centres of activism and regulation onto the doorstep of those least likely to resist, making the shipment of toxic residues to urban ghettos, native reservations or the Third World a post-Fordist sunrise industry. Moreover, in many cases, the capitalist development of so-called clean technologies, pursued under the same cost-cutting, profit-maximising logic that produced enormities of industrial pollution, replicate the very patterns of ecological destruction they purportedly eliminate. The computer industry's use of toxic substances in microchip assembly, for example, has made Silicon Valley home to the highest concentration of hazardous-waste sites in the United States.⁸³

Since the new technologies do not, of themselves, halt the devastation of the environment, they also fail to stop green counter-movements. While schemes of high-technocratic resource management have played a part in coopting mainstream environmentalism, they have also unintentionally provoked new and radical opposition. Thus in the US the intensification in the long-standing practice of dumping hazardous wastes -- including postindustrial toxins -- on the most impoverished and vulnerable sectors of labour has catalyzed the rise of an 'environmental justice' movement in communities of colour, traditional working class neighborhoods, Native Indian Lands, and

regions of the rural poor.⁸⁴ Puerto Rican farm workers opposing pesticide poisoning, tenants associations fighting oil and petrochemical industries in Louisiana's 'Cancer Alley,' mothers battling incinerators in Latino neighborhoods of East Los Angeles, and Latino and African American students of the Toxic Avengers coalition fighting the transportation of nuclear waste in Brooklyn have bought into being a new round of ecological struggles.⁸⁵ Often led by women--whose unwaged reproductive labour deals with the miscarriages, birth defects, and slow deaths created by corporate poisoning--and characterised by strategies which unites class, gender and race issues, these groups have dramatically challenged the elitism of traditional environmentalism, and engaged in a series of head-on confrontations with corporate power.

Generating its own programs of self-education, community research, and communication the environmental justice movement represents an astounding flowering of popular science amongst the excluded and dispossessed. In many cases, sectors of the movement pursues objectives going far beyond the established limits of regulation. Their proposals for funds to support workers unemployed by the closing of ecologically destructive enterprises, restrictions on capital flight, elimination of the production of toxic substances, the development of a less polluting transport system, community economic development, equitable distribution of cleanup costs, and international laws that protect the environment and workers are, in fact, tantamount to demands for a radically new economic system.⁸⁶.

One of the most important aspects of this movement has been its efforts to overcome of the rifts between working class and ecological activism. Since the 1970s capital, by playing-off 'jobs versus the environment,' has constantly counterpoised labour

and ecological concerns, often successfully dividing red from green. However, as it becomes clear that high-tech business destroys livelihoods at the same rate as it destroys ecosystems, the falsity of this choice has become increasingly apparent. While the worker-green split remains virulent, in some sectors groupings of industrial and resource workers have developed their own environmental projects and entered into dialogue with ecological activists.⁸⁷

One notable instance involves workers in that most unlikely of industries, automobile manufacturing. Throughout the 1980s an extraordinary coalition of black and Latino trades unionists and community groups in Van Nuys, California, successfully opposed General Motors's plan to close its local car plant by threatening a boycott in the lucrative Los Angeles auto market.⁸⁸ In 1992, the "Save GM Van Nuys" campaign was finally defeated. However, it then underwent a dramatic metamorphosis, providing the nucleus for the WATCHDOG Organising Committee -- a group combating corporate air pollution of working class neighborhoods, and seeking the conversion of the auto industry to clean, ecologically viable forms of production.⁸⁹

These activists made connections with workers from the Caterpillar vehicle plant in Toronto, who, following an unsuccessful attempt to prevent closure of their plant by occupation, had entered into dialogue with environmental and anti-poverty groups to devise a "greenworks" conversion campaign.⁹⁰ This alliance has in turn linked with Japanese workers from a joint Toshiba--Amplex high-technology enterprise, where resistance to plant closure led to an eight-year factory occupation.⁹¹ During this time the workers not only continued to manufacture and market high-tech media, educational, medical, and industrial operation systems, but ultimately started to redesign these products

in order to meet their own criteria of social and ecological environmental responsibility.⁹²

They were supported in these efforts by the Japanese peace and anti-nuclear movements, for whom they produced portable loudspeakers for demonstrations, a citizens' Geiger-counter, and another special radiation detector, funded by popular contribution, made for the victims of the Chernobyl disaster at half the cost of commercial systems.

Taken in conjunction with the movements against genetic commodification described earlier, such worker-green alliances introduce an extraordinary dimension to struggles against information capital. For what is at stake in such initiatives is nothing less than what Marx termed humanity's "species being"--its capacity to consciously direct its own development as a biological collectivity.⁹³ The issue today is whether this shaping will be determined by capitalist command and market forces, or by broader social logics. In this sense, proletarian struggles, which have, today, become struggles in which people strive to collectively assert a self-determining power over the development of the human species and its natural environment, potentially resume all the universalistic significance that Marx once attributed to them.

Movements fighting at different points on capital's circuit--against workplace exploitation, dissolution of the welfare state, or ecological despoliation--have begun to enter into alliances with each other, creating radical new combinations. The great difficulty facing these struggles, however, remains their fragmentation and separation. Occurring at different points within a vast social factory, and facing different facets of capitalist power, the obstacles confronting the coordination of demands and actions are often prodigious. Moreover, while these movements have a deep-level underlying interest in contesting the corporate subsumption of society, this common ground can easily be obscured by more

local, but more apparent contradictions between them--conflicts between unionists and welfare recipients, workers and environmentalists. Since capital constantly incorporates these local contradictions its hierarchical organisations of control, both in and beyond the workplace, its capacity to divide and conquer, isolating points of opposition and turning them one against another is truly formidable. Paradoxically, however, although informational capital enjoys extraordinary opportunities to overwhelm and disperse its opponents, some of the very technological instruments it deploys to these ends also assist counter-movements to overcome this fragmentation. It is to this process that we now turn.

Circulation I: Interactive Media

An explosive proliferation of technologies of communication, from telephone, radio and broadcast television, through fax, video camera, VCRs, cell phones, cable and satellite television to computer networks, is one of--some would say the—most prominent features of advanced capitalism today. As Fredric Jameson has observed, there is a tendency to identify the benefits of the new media and the virtues of the free market, with each legitimating the other—new communications technologies being praised for accelerating economic growth, and the market exalted for promoting the free flow of information.⁹⁴ Yet there is another side to this dynamic. For amongst the new oppositional movements whose emergence we are charting, alternative uses of all types of advanced communication technologies are becoming a widespread and important element.

To examine this dialectic, it is necessary to move beyond analysis of the production of commodities, the reproduction of labour-power, or the destruction of the environment,

and look at how capital circulates in the marketplace. If it is in the workplace that capital extracts surplus value, it is in the market that this value must be realised through the sale of commodities.⁹⁵ Marx repeatedly emphasised that capital had a tendency to integrate these two moments in its circuit, expanding the circle of consumption to match the growing volume of goods it produced, and decreasing the turnover time by accelerating the speed with which goods passed from production to consumption.⁹⁶

In the course of the twentieth century, these requirements have become the basis for a massive project of social engineering--the creation of a consumer society. Capital discovered that, as work requires a labouring subject, so the market requires a consuming subject, a subject that needs what capital produces and believes that these needs can and must be satisfied in commodity form. And as in production it develops automatic machinery to reduce and control subjects in their tasks as workers, so in the market it also finds instruments to target and direct subjects in their tasks as consumers--a task performed by ever more sophisticated waves of media technology.

As so many commentators have pointed out, this commercial development of the means of communication has momentous consequences for public speech.⁹⁷ Whether through explicit editorial intervention, journalistic self-censorship, or the demographic imperatives of advertising, market-driven media tend to filter out news and analysis critical of capitalism. This filtration is done with a gross mesh, not a fine one, and is less absolute than the more monolithic models of capital's "media monopoly" sometimes suggest.⁹⁸ Competition amongst various media capitals, or frictions between media empires and other factions of capital, not to mention the occasional refusal of individual journalists or artists to submit to managerial control, mean that something usually escapes.

Nevertheless, the corporate ownership of the major organs of societal communication tends towards a situation in which, in Marx's classic formulation, "the ruling ideas are nothing more than the ideal expression of the dominant material relationships"--in this case, an air-brushed affirmation of the rightness and normality of omnipresent commodity exchange.⁹⁹

This integration of media into capital's subsumption of society first reached a high level of consolidation in the era of the mass worker. Mass production and mass consumption met in the virtuous circle of Fordism. Broadcast media became indispensable components of this regime, deluging society with the advertising that trained the populace in widespread consumption of standardised commodity goods. In the living rooms of North America the radio and then the television set became the domestic entry point for the same commodifying and conforming capitalist logic that in the factory drove the assembly line and the time-and-motion study.¹⁰⁰

However, the revolts of the 1960s and 1970s shattered the stability of this arrangement. The rejection of the Fordist factory regime manifested in movements which, as well as demanding better standards of living, asserted diverse needs for self-expression. Social rebellion went hand in hand with experimentation in music, dress, drugs and art. The cultural tumult of the era exploded the homogeneity of the mass market. When capital reimposed social discipline through austerity, driving down wages and polarising incomes, not only work but also consumption had to be restructured. One crucial element in this was a major expansion of media industries.

From the late 1970s to the present there have appeared on the market a profusion of new communications devices--cable and satellite TV, VCR's, camcorders, and personal computers. Deployed beneath the mantle of increasingly concentrated, vertically and

horizontally integrated media empires, these technologies have been announced as marking a new era of choice, liberation, and personal fulfillment.¹⁰¹ In practice, they have accomplished two corporate purposes. First, they have provided the channels for an explosive growth of markets for entertainment and information. Here, as on the shopfloor, capital has advanced by harnessing the energy unleashed against it. The desire for cultural diversity, subversively expressed in the 1960s, has over the subsequent decades been subjected to an unrelenting commodification, converting rock music, fashion, style, personal growth and popular culture into highly variegated zones of vertiginous commercial development.¹⁰²

This skyrocketing commodification of culture has been vital as a compensation for a flagging growth in other sectors. In the polarised post-Fordist economy, even those who can no longer look forward to buy a house or car can still pay for a CD or cable, while those who already have more residences and vehicles than they need can be persuaded to spend on computers and electronic goods. Moreover, the high rates of obsolescence that obtain in these fields--almost instantaneous in cases of evanescent soft goods songs, films and video, scarcely less so in the ever changing electronic equipment--means that there is little risk of saturating markets.

Second, the new media not only create fresh cultural commodities, but also permit extraordinary refinements in marketing other products. Here a central element in the restructuring of capital has been a huge increase in expenditures on advertising, sales promotions and direct marketing.¹⁰³ As the Fordist mass market was fragmented by falling wages and social polarisation, corporations sought both to internationalise sales, and to segment them, stimulating hyper-consumption amongst the relatively thin strata of well-paid

workers to compensate for the limited consumption capacity of the poor and unemployed. New media systems, such as cable and satellite television channels are eminently suited to this purpose. They both enlarge audiences (sometimes on a potentially global basis) and make possible this ever more precise targeting of consumers differentiated by taste and income.

This prospect is enhanced by the promise of various kinds of 'interactive' media--systems such as computerised video-on-demand or teleshopping, which, unlike unidirectional broadcasting, involve some degree of two-way transaction between receiver and transmitter. One common but under-publicised feature of such systems is their capacity to transmit back to the corporate provider detailed information about consumers' identities, location, consumption habits, and daily schedule.¹⁰⁴ Integrated with other electronic traces left by point-of-sale devices, credit card scanning, billing and subscription records and direct polling, this allows the compilation of comprehensive profiles of consumer behavior. Such data then forms the basis for the highly targeted, demo- and psycho-graphic micro-marketing required by the increasingly stratified and hierarchical organisation of consumption. Furthermore, this data can be fed back into systems of flexibly-specialised production and just-in-time inventory control designed for rapid response to shifting market conditions. Interactive media thus hold out the promise of what Kevin Wilson terms "a truly cybernetic cycle of production and consumption."¹⁰⁵

The implications of this situation were perhaps best recognised two decades ago when Dallas Smythe suggested that the watchers of TV, in "learning to buy," effectively "worked" for advertisers.¹⁰⁶ Electronic capital's expanding media reach meant it exploited not just labour power in the factory but also "audience power" in the home.¹⁰⁷ As the home

entertainment centre becomes the conduit not only for an incoming flow of corporate propaganda but also for an outgoing stream of information about its viewers, this analysis grows in credibility. The level of surveillance in the home tends toward that already experienced in the workplace, and the activity of the waged "watchman" in the automatic factory, described by Marx, becomes integrally linked with the unpaid "watching time" which s/he passes in front of the television.¹⁰⁸ The rate of surplus value extraction, dependent on the exploitation of labour power, and the velocity of circulation, dependent on the carefully targeted consumption capacity of the media audience, merely measure different moments in a continuous, overarching, internally differentiated but increasingly unified process of valorisation.

However, analyses such as Smythe's often assume capital's intended exploitation of audience-power is fully successful. From my perspective, the more interesting question is how it fails. If audience power is today analogous to labour power, then it too is a disobedient subjectivity that evades, resists, and reshapes technological controls. There is now extensive evidence that viewers, listeners and readers do not passively accept hypodermic injection with narcotic messages, but are rather active agents who engage in thousands of little lines of flight and fight--from turning off advertisements to the oppositional reinterpretation of programs and the creation of micro-networks of decommodified cultural activity.¹⁰⁹

At the very time when innovations in communication are becoming the basis for vast commercial empires, there is apparent an opposite tendency that flouts the logic of the market. People are using the new technologies to get or give out information for free: reproducing, transmitting, sampling and reconfiguring without respect for commercial

property rights. This is known as 'piracy.' And it is prevalent. As access to the new communication machines becomes more and more thoroughly socialised, we see a wave of photocopying, home taping, bootlegged videos, copied software, zapping, surfing, descrambling, and culture jamming. Moreover, an increasingly wide variety of groups and movements are using this generalised availability of communication technologies not simply for individual but for collective purposes.

This manifests in the development of 'alternative' or 'autonomous' media.¹¹⁰ Such experiments first blossomed during the 1960s and 1970s in a wave of radio-activism, guerrilla video, and public access cable movements.¹¹¹ Despite enormous difficulties they have persisted. Radio-activism has continued and spread, reinvigorating itself in North America by the proliferation of inexpensive, low power, and usually illegal microwatt FM broadcasting by ghetto communities, squatters and the homeless.¹¹² Oppositional video-making has passed from the avant-garde to common practice amongst social movements.¹¹³ New areas of activism have opened around television, with the attempts in the US and Canada to create and sustain public access cable--a medium whose political potential has been developed by the Paper Tiger Television collective and its satellite broadcasting Deep Dish project.¹¹⁴ Lack of resources mean that in most cases the reach of such experiments is limited and their aspirations only very partially realised. But, however raggedly, alternative media do posit something different from, and opposed to, capital's mobilisation of "audience power."

Corporate interactivity is ratificatory: it posits dialogue only within the preset limits of profitability. Autonomous media, on the other hand, are, as Rafael Roncaglio puts it, "alterative"--probing the limits of established order.¹¹⁵ Their practice often includes

projects of self-representation, involving subjects in the definition and documentation of their own social experience. They attempt to overcome the restrictions of technical expertise characteristic of capital's division of labour. They experiment with forms of collective ownership. Above all, alternative media often give a voice to precisely those who are excluded or silenced by the commercial logic of market-driven information industries--either because they are not demographically desirable or because they are politically suspect.

Thus, looking back for a moment at the Los Angeles riots of 1992, one remarkable aspect of the uprising was the degree to which the insurrectionaries were able to turn some elements of capital's high technology surveillance and media apparatus to their own advantage.¹¹⁶ The uprising was, of course, ignited precisely by a classic instance of counter-surveillance --George Halliday's videotaping of Rodney King's beating, and the recording of incriminating police radio conversations. But even before the rebellion, its idiom of anger had already been disseminated by the high-tech cultural inventions of the ghettoised community--hip hop and rap, music whose political significance was neatly demonstrated by President Clinton's subsequent public attack on rap artist Sister Souljah.¹¹⁷

During the riot, the omnipresence of the corporate media, covering the most televised urban uprising in history, had an ambiguous effect: although its representations frequently demonised and distorted the motives of the insurrectionaries, it could not entirely avoid giving voice to their outrage.¹¹⁸ Simultaneously, a variety of autonomous media, ranging from microwatt radio stations in ghettoised neighborhoods--such as the famous Zoom Black Magic Liberation Radio--to computer networks connecting activists in

North America to others in Europe, spread a wider range of news, analysis and debate ignored by mainstream media.¹¹⁹ All this contributed to the circulation of supporting riots and demonstrations in Atlanta, Cleveland, Newark, San Francisco, Seattle, St. Louis, and Toronto, and to the perception of the riot as an indictment of the social policies of the Bush administration.¹²⁰

Autonomous media have also played a significant part in less explosive but more protracted forms of struggle, such as the new waves of labour activism. In Los Angeles again, in an episode sometimes referred to as "the riot that didn't happen," Latino and Chicano janitors and maids fighting for a first contract in the hotel industry won a significant victory by threatening to circulate video evidence of abysmal working conditions to potential convention guests.¹²¹ In Las Vegas, workers involved in struggle with the entertainment giant MGM used similar "guerrilla media" tactics.¹²² The use by trades unions of video and film for activist training, worker self-education and public campaigning has become commonplace. In various US and Canadian cities, this media activism has led to the establishment of regular labour programming on community cable and radio stations.¹²³ This sort of activity is systematically fostered by organisations such as the Labor Video Project, which also works to connect North American efforts in this field to similar initiatives globally.¹²⁴

These examples are only a part of a much wider circle of oppositional media activities. Other instances that could be cited, some of which will be examined in later chapters of this book, include the efforts of alternative media during the Persian Gulf War; the mobilisation of support for political-activist prisoner Mumia Abu Jamal, accomplished almost entirely through alternative radio, press, video and computer links; the Vancouver-

based 'Adbusters' attempt to infiltrate commercial channels with "subvertisments"; and the international computer networking associated with the transcontinental opposition to the North American Free Trade Agreement, the Zapatista revolution and the campaign against the Multilateral Agreement on Investment.¹²⁵

Indeed, surveying the scope of this dissident media activity, it appears that capital, in developing its media apparatus, has let the genie out of the bottle. Just as, by computerising the factory, capital has not so much destroyed labour as dispersed it out into the wider social sphere, so by wiring the household it has not necessarily consolidated control over audiences. Rather, in its drive to extend the scope of the market, it has so thoroughly disseminated and made familiar the technical means of communication as to open the door to a series of individual and collective reappropriations. This means that on occasion corporate control can be interrupted, and spaces opened within which a multiplicity of social movements, all in different ways contesting the dominance of the market, can be connected and made visible to each other. New information technologies therefore appear not just as instruments for the circulation of commodities, but simultaneously as channels for the circulation of struggles.

Circulation II: Struggles in Cyberspace

Today, some of the most dramatic manifestations of this contradiction appear in cyberspace, that notional dimension constituted by flows of electronic data within computer networks. In post-Fordist capital, these digital flows are used by "virtual corporations" to link automated machines to just-in-time inventory systems, connect dispersed production sites, accumulate and mine data about consumer tastes and habits, and

forge new marketing opportunities, coordinating these activities on a global scale and as swiftly dispersing them.¹²⁶ Indeed, it is in cyberspace that capital is now attempting to acquire a comprehensive command, control and communications capacity allowing it to "appropriate, along with labour, the entire network of social relations."¹²⁷ And yet at the same time it is also in this virtual realm that some of the most remarkable experiments in communicational counter-power are being conducted.

Computer-mediated-communications, created by the linking of computers and telecommunications, were originally designed under military auspices, initially as part of the US nuclear war fighting preparations, and later to connect the supercomputing centres vital to Pentagon research. These origins have led many on the left to see the development of such networks simply as a quintessential expression of capital's technological domination. However, there is another side to this process. In an entirely unforeseen development, the technoscientific labour employed in the sites of the military-academic-industrial complex--faculty, systems managers, and especially graduate students--extended the network far beyond its original scope, using it for non-military research, designing successive layers of alternative systems which connected into the main backbone. This accretion of self-organised services proceeded, with the complicity of systems managers enchanted by the technological 'sweetness' of the results, until, as Peter Childers and Paul Delany put it "the parasites had all but taken over the host."¹²⁸

Strangely, in the era of that supposedly marked the triumph of the free market, the most technologically advanced medium for planet-wide communication was in fact created on the basis of state support, open usage and cooperative self-organisation. A proliferation of autonomous activity transformed a military-industrial network into a system that in many

ways realises radical dreams of a democratic communication system: omni-purpose, multi-centred, with participants transmitting as well as receiving, near real-time dialogue, a highly devolved management structure, and-- since universities and other big institutions have so far paid a flat rate for connection--offering relatively large numbers of people access for little or no cost. On this basis there emerged the unplanned explosion of popular interest in computer networking which by the late 1980s had catapulted the Internet on a trajectory of exponential growth totally unforeseen by corporate planners.

Capital is now of course attempting to contain this outbreak of unanticipated popular inventiveness—most significantly through the US government's National Information Infrastructure initiative, with its plan for a publicly subsidised but corporately owned and operated information superhighway. Such a system would rationalise the already-existing but tangled web of fibre optic, cooper wires, cable radio waves and satellites that provide the basis for telecommunications, cellular technologies and cable television into a comprehensive, integrated network. Many companies are interested in this highway for internal purposes: to connect customers with suppliers, improve monitoring of employees, eliminate jobs, cut travel costs and gather competitive data. The giants of the information and entertainments sector, however, see unprecedented market opportunities. Telephone, cable, video and software companies a preparing to colonise cyberspace with their 'killer' applications--video-on-demand, tele-gambling, pay-per-computer games and info-mercials. To many, the so-called highway running across the electronic frontier seems closer to the late nineteenth century US railway development, complete with informational 'robber barons.'

However, cyberspace remains an arena of contradictions, in which capital's development is both opposed and spurred by alternative initiatives. To create and operate computer systems, commerce has had to summon up whole new strata of labour power, ranging from computer scientists and software engineers, through programmers and technicians, to computer-literate line and office workers, and ultimately to whole populations relegated to tedious, mundane jobs yet required to be sufficiently computer-literate to function in a system of on-line services and electronic goods. As this virtual proletariat emerges, there also appears a tension between the potential interest and abundance it sees in its technological environment, and the actual banality of cybernetic control and commodification.

As so often before, new forms of conflict appear first under the guise of criminality and delinquency--in this case, as 'hacking.' If, following Andrew Ross, we define hacking simply as the "unauthorised use of computers," then the term embraces computerised sabotage; the reappropriation of work time to play games or write novels, or exchange unauthorised email; so-called crimes of data copying, electronic trespass and information dissemination; and unofficial experimentation with and alteration of systems up to and including the invention of new machines and of alternative electronic institutions.¹²⁹ These activities are now giving capital's managers multiple headaches over loss of productivity, theft of trade secrets, cybernetic revenge by terminated workers, and violations of intellectual property laws.¹³⁰

Moreover, the networks are now the site for an array of "virtual communities."¹³¹ These experiments in on-line social relations vary enormously; staggering diversity is perhaps their preeminent feature. However, in many cases participants see such

communities as offering escape from the everyday logic of capital. In some cases, they are consciously conceived as constituting a new, electronic form of civil society in which many-to-many cybercommunications undermines the control of established societal gatekeepers--including the giant media corporations--over flows of information. Indeed, amongst libertarian technophiles these prospects sometimes inspire a populist version of technologically-determinist information-revolution theory, with computer networks being seen as the solvent that will spontaneously melt the hierarchies of capital into participatory democracy.¹³²

Faced with such propositions, many on the left have responded with buckets of cold water. Marxian critics not only stress the Internet's military-industrial roots (the sure mark of original sin) but point to the real demographic limitations on access to personal computers, modems and technical expertise which sharply segregate computer access, partly by gender, race, and age, but most sharply by income.¹³³ Feminists, noting the obstacles of time, money, socialisation, education and harassment that discourage the involvement of women with the Internet, have also often been skeptical about its emancipatory potential.¹³⁴ Noting that the most likely owner of a personal computer and modem is male, white, middle aged and affluent, such critics characterise "virtual communities" as little more than elitist playgrounds of the privileged --the cyberspatial equivalent of walled suburban communities. Observing the corporate drive to market on-line, pay-per services these commentators anticipate the overrunning of free cyber-spaces by commercial development, increasing stratification of information rich and information poor, and relentless state and corporate surveillance. Confronting these prospects, they write-off the alleged radical potentials of virtuality as rampant cyber-idealism.¹³⁵

The actual dynamics of cyberspace are, however, more complex than either the virtual communitarians or their critics allow. The relatively privileged status of most (though by no means all) regular inhabitants of cyberspace undoubtedly limits the likelihood of mass subversive uses. There are, however, countervailing factors. Capital's omnipresent deployment of computers as work-tools and consumer goods, and the extraordinary pace of planned obsolescence in this field, is making some of the basic equipment for networking quite easily available. Significant numbers of people still have free or cheap access via universities, schools and businesses. Moreover, in a political context organisational access--the ability of a movement or group to receive and send networked information, which can then be further distributed via more traditional methods--may be a more critical factor than individual ownership of computers.

Even a rapid survey of the Internet reveals that today it is used by a remarkably wide variety of oppositional groups to by-pass the filters of the information industries, speed internal communication, send out 'action alerts,' and connect with potential allies. Looking for the moment just at North America, we see diverse forms of network activism: mailing lists such as ACTIV-L, LEFT-L, PEN-L (the Progressive Economists Network), news groups such as P-NEWS, and World Wide Web sites for a wide variety of social movements. This cyber-organising has included the construction of independent networks which interface with the Internet but are entirely devoted to social activism, like the Association for Progressive Communications, which arose in the mid-1980s from the coalition of Peace-Net, Eco-Net and Conflict-Net and now constitutes a global computer system dedicated to peace, human rights, labour and environmental issues.

Such networks mark the latest phase in the emergence of the autonomous media that described earlier. Some social movements have been far swifter to establish a presence in cyberspace others. Environmental groups, some of which contain many relatively affluent professionals familiar with computers, and student campaigns, which often benefit from their members' free access to the Internet, have been early and frequent users. Women remain significantly underrepresented, but there are nevertheless numerous feminist lists and newsletters. Even if on the left the networks remain to some a degree a boy-toy, they nevertheless frequently carries messages mobilising support for the protection of abortion clinics, the defence of lesbian activists threatened by right wing violence, the prevention of domestic violence, and the struggles of women workers. Organisations such as the APC have launched projects specifically aimed at supporting the use of computer networking by women from the popular sectors.¹³⁶

It is impossible here to survey the entire range of this cyberspatial activism. But we can get some sense of its growing importance by briefly looking at trades unions developing involvement in this sphere. So-called 'organised' labour has been relatively slow to enter cyberspace, perhaps because of an abiding view of technology as a managerial domain. Nonetheless, as Eric Lee has recently made clear in his study, The Labour Movement and the Internet, this picture has been changing rapidly.¹³⁷ The early 1980s saw the establishment of the first local North American "labournet," in Canada, by the British Columbia Teachers' Federation.¹³⁸ The subsequent decades have seen major 'Labortech' conferences; the initiation of lists such as LABOR-L and networks such as Labour Net; and a burgeoning of North American union-affiliated bulletin boards, run by teachers, firefighters, plumbers, communication and public service workers, musicians,

and journalists.¹³⁹ Some, such as the Canadian Union of Public Employee's Solinet, are now well established. Several have connection to similar networks outside North America -- Glasnet in Russia, WorkNet in South Africa, Geonet in Germany, and Poptel in the United Kingdom.¹⁴⁰

The relation of these networks to the internal organisation of trades unions varies. In many cases, computer communications are used simply to speed and make more efficient traditional trades union industrial relations practices. Sometimes, access to networked information has clearly been structured to reinforce internal bureaucracy and hierarchies. But on occasion, debates in the networks have in fact become forums for unexpected debate, dissent or rank and file initiatives.¹⁴¹

Moreover, in some recent struggles net-workers have taken the offensive on-line in highly original ways. For example, in the Justice for Janitors campaign in Silicon, strikers attempted to build links across the divide separating the 'service' and 'scientific' strata of Silicon Valley, using the very means of communication produced by the companies with whom they were locked in struggle. With the help of a small number of sympathisers amongst the core professional staff, they found the email addresses of employees at Oracle corporation, posted information about the exploitation of contract workers, and encouraged their readers to protest the issue to management. They also disseminated news of the strike through the Internet, inviting 'netizens' to complain to senior company officers and providing email addresses. This was severely embarrassing to firms such as Apple whose profitability substantially depends on maintaining a benign public image amongst computer-users. One participant in this email campaign describes it as follows;

They had no idea how many people we were sending to . . . They started answering, "We are not beating our janitors" and it turned out they were beating them, really. Once they started with those answers then people started to ask questions and it created a climate of heightened awareness of what the janitors were doing, though it was not easily visible . . . The costs of bad publicity, of morale being influenced by email are major. . for people like us who live in that world to sense the communications opportunity that exists right now--that email can be used to penetrate barriers that exist for more conventional communications--was rather exciting. Maybe after a while they'll set up filters and they'll get to keep all of our messages out, but we'll be engaged in a lot of measures and counter measures to keep communicating in that fashion . . . I think it's a creative way to use the technology of the industry to undermine the social relationships that have been built into it.¹⁴²

A similar incident involves the newspaper industry, a business that has felt the full weight of capital's drive to deskill, automate and shed labour. In 1994, some 2,600 workers from eight unions struck San Francisco's two daily papers. During the strike they produced their own paper --the San Francisco Free Press. This was not only distributed within the city, but was also made electronically accessible via World Wide Web, thus making it probably the most widely circulated strike bulletin in the history of civilisation. At the same time, the strikers initiated a boycott of companies that continued advertising

with newspapers behind picket lines. A computer list, Left-L, posted daily lists of "scab advertisers," and encouraged subscribers to call these corporations' 1-800 phone numbers with complaints. This boycott call appears to have been successful, with many companies discontinuing advertising, and others having their advertisements run for free as the newspaper proprietor's desperately attempted to save face. The eventual settlement was widely seen as a victory for the strikers - an unusual moment in recent US labour history.¹⁴³

Subsequently other labour struggles have pursued similar tactics.¹⁴⁴ However, perhaps of even greater importance than this use of the nets as a weapon against employers is the potential they open for connection and dialogue amongst movements. Sharing a common cyberspace--such as the widely used Canadian Solinet network--enables participant from different sectors of the labour movement to familiarise themselves with each other concerns. But this process extends beyond the scope of the labour movement. Lists like ACTIVE-L, the major North American activist forum, carry messages from labour, environmental, feminist, indigenous groups. Sharing such an electronic forum implicitly asserts these movements' interconnections even while participants may still be searching for the explicit formulation of such links. One of the main trade union networks, LaborNet, is housed by the same organisation, the Institute for Global Communication, which supports major environmental, human rights and peace networks, a situation which encourages shared initiatives and informational cross-overs.

Indeed, just as by creating a common medium for capitalist transactions digitalisation drives toward the merging of once distinct industries, so it creates a momentum for what Jim Davis terms a "popular digital convergence" amongst different sectors of social labour.¹⁴⁵ Organisations that fought separately for community access to

cable television or the employment conditions of phone workers or the artistic rights of musicians and writers now find in their common concern around the "highway" a "new, practical basis for working together."¹⁴⁶ In combination with other autonomous media, such networks provide a channel within which a multiplicity of oppositional forces, diverse in goals, varied in constituency, specific in organisation, can, through dialogue, criticism and debate, discover a new language of autonomy and alliance. In this sense, cyberspace is a potentially recompositional space in which the atomisation that information capital inflicts on socialised labour can be counteracted.

Of course, capital is now trying to reabsorb the unruliness of the networks through the corporate information highway drive, an electronic law and order crackdown, and a vast moral panic over pornography, terrorism and other evils on the Net.¹⁴⁷ The brief blossoming of the Internet may well, as Herbert Schiller prophesies, be swiftly "paved over", like the populist initiatives that marked the early days of radio, cable television and earlier generations of communication technologies.¹⁴⁸ However, it is also possible that this familiar pattern of capitalist recuperation may encounter unexpected problems in the case of computer communication. There are real questions as to whether there is actually sufficient popular demand for commercial projects such as video-on-demand or teleshopping to warrant the enormous investments that the highway demands. All indications are that what people want from the on-line environment is global, communal conversation rather than digital consumer services--in Negri's terms, "communication" rather than "information."¹⁴⁹ To the degree that capital stifles or excludes this possibility, it risks killing the digital goose whose golden eggs it is already counting.

The most adventurous sections of information age business--such the cyber-libertarians of the Electronic Frontier Foundation--gamble that they can avoid this impasse by entering into a symbiotic relation with Internet culture, benefiting from the experiments of virtual community constructors, the challenges of hackers, and the widespread interest in two-way communication to spur technological development and perfect a new round of digitally based accumulation. However, such a strategy requires corporate capital to preserve a degree of openness within the networks, and to allow at least some continued spaces for alternate digital institutions and experiments. In this case, the networks will continue to serve as a medium not simply for the circulation of commodities, but also for the circulation of struggles.

Cyberspace is important as a political arena, not, as some postmodern theorists suggest, because it is a sphere where virtual conflicts replace struggles `on the ground,' but because it is a medium within which terrestrial struggles can be made visible to and linked with one another.¹⁵⁰ Of course, this process is fraught with pitfalls. The European Counter-Network, an autonomist network circulating news of struggles by workers, refugees, and anti-fascists within the EEC notes the potential hazards of such computer activism:

. . . a simulated international radical network in which all communication is mediated by modems and in which information circulates endlessly between computers without being put back into a human context.¹⁵¹

As Dorothy Kidd and I have written elsewhere,

Attempts to use computers . . . in the struggle require constant, collective reevaluation, to determine which strategies are effective, and which dangerously compromised.¹⁵²

Given such ongoing reassessment, however, there is plausible hope that computer networking can help constitute new forms of anti-capitalist combination that do not rest on the directives of a vanguard party, but rather arise out of the transverse, transnational connections of oppositional groupings.¹⁵³

Virtual Commune

It is widely known that in the aftermath of the 1848 proletarian uprisings in Paris, the Emperor Napoleon III ordered Baron von Haussmann to redesign the city, and that a centerpiece of this urban reconstruction was the widening of streets to allow the passage of artillery for the suppression of any future insurrections. What is less well known is that workers employed on this highway development project, impoverished masons and builders housed in squalid Parisian slums, were leading participants in the next revolutionary outbreak--the 1871 Paris Commune that seized the city in its entirety, rocking the stability of capitalist Europe, and giving Marx a blazing, prefigurative glimpse of communist society.¹⁵⁴

Today, in the era of the information highway, capital is constructing its cyberspatial thoroughfares to circumvent or overwhelm the industrial conflicts that once brought it to

crisis. Proceeding through its circuit we have seen it deploying high technologies to crush all traces of opposition-- enforcing availability for work, commodifying ever-larger areas of experience, deepening social controls and intensifying the depletion of ecosystems.

Capital has not, however, succeeded in technologically terminating the cycle of struggles. Our travels along capital's data highways have discovered rebellions at every point: people fighting for freedom from dependence on the wage, creating a "communication commons," experimenting with new forms of self-organisation, and new relations to the natural world.¹⁵⁵ Such movements are incipient and embattled, yet undeniable. Indeed, without in any way diminishing the magnitude of the defeats and disarray suffered by counter-movements over the last twenty years, I suggest that there are now visible across the siliconised, bioengineered, post-Fordist landscape the signs of a strange new class recomposition. This is proceeding on a much wider basis than that traditionally conceived by Marxism. In virtual capitalism, the immediate point of production cannot be considered the 'privileged' site of struggle. Rather, the whole of society becomes a wired workplace--but also a potential site for the interruption of capital's integrated circuit.

There is no need to emphasise the present fragility and uncertainty of the various reappropriations, counter-plans and alternative logics whose sinuous course we have traced. In their isolation, each provides only a minor problem to corporate power. But in their proliferation and interconnection they constitute a challenge to its dominion. It is precisely the breadth and variety of such subversions that makes the fields of information and communication so crucial today. For it is by a process of mutual discovery, recognition and reinforcement--by an accelerating circulation of struggles--that such insurgencies could

attain a strength capable of prising apart the coils with which capital now encircles society. However, an assessment of such possibilities cannot limit itself to the most technologically-advanced sectors of development, but must rather take a perspective embracing the truly global scope of information capital--a window that is opened in the next chapter.

Notes

¹ This concept of the circuit of capital recurs throughout Marx's work, but perhaps finds its most systematic exposition in vol. 2 of Capital (London: Vintage, 1978) and, in a somewhat different form, in the Introduction to Grundrisse (Harmondsworth: Penguin, 1973) 81-114.

² The autonomist development of the concept can be found in Mario Tronti "Social Capital," Telos 17 (1973): 105. Tronti elsewhere writes: "The more capitalist development advances, that is to say the more the production of relative surplus value penetrates everywhere, the more the circuit production-distribution-exchange-consumption inevitably develops; that is to say that the relationship between capitalists production and bourgeois society, between the factory and society, between society and the state, become more and more organic. At the highest level of capitalist development social relations become moments of the relations of production, and the whole society becomes an articulation of production. In short, all of society lives as a function of the factory and the factory extends its exclusive domination over all of society." (Tronti, Operai e Capitale, cited & trans Cleaver, "The Inversion of Class Perspective" 137). See also Panzieri, "The factory is becoming generalised. The factory is tending to pervade, to permeate the entire arena of civil society ("Lotte Operaie Nello Sviluppo Capitalistico," Quaderni Piacentini (1967), cited James O'Connor, Accumulation Crisis (Blackwell: Oxford, 1984) 151.). For a very clear exposition of the concept of the social factory see Harry Cleaver, "Malaria, the Politics of Public Health and the International Crisis," Review of Radical Political Economics 9.1 (1977): 81-103, and Peter F. Bell and Harry Cleaver, "Marx's Crisis

Theory as a Theory of Class Struggle" Research in Political Economy 5 (1982): 189-261, to which this chapter owes a considerable debt.

³ Mariarosa Dalla Costa and Selma James, The Power of Women and the Subversion of the Community, (Bristol: Falling Wall Press, 1972).

⁴ For important recent Marxist theoretical perspectives on ecological issues see the journal Capitalism, Nature, Socialism.

⁵ On new production systems see Stanley Aronowitz and William DiFazio, The Jobless Future: Sci-Tech and the Dogma of Work (Minneapolis: University of Minnesota Press, 1994); Benjamin Coriat, L'Atelier et Le Robot (Paris: Christian Bourgeois, 1990); Jean Paul de Gaudemar, ed., Usines et Ouvriers: Figures du Nouvel Ordre Productif (Paris; Francois Maspero, 1980); David Noble, Forces of Production (New York: Knopf, 1984); Stephen Wood, ed., The Transformation of Work?: Skill, Flexibility and the Labour Process (London: Unwin Hyman, 1989).

⁶ See G. Santilli, "Peau de Leopard: L'Automatisation Comme Forme de Controle Social." Travail 8 (1985): 20-28.

⁷ Paul Kennedy, Preparing For the Twenty-First Century (New York: Random House, 1993) 88; Jim Davis and Michael Stack, "Knowledge in Production." Race & Class, 34.3 (1992): 8.

⁸ Marx, Grundrisse 692.

⁹ On Hormel, see Peter Rachleef, Hard Pressed in the Heartland: The Hormel Strike and the Future of Labour (Boston: South End 1992).

¹⁰ An early, and brilliant, critique of Bell's concept the service sector is to be found in is Krishan Kumar, Prophecy and Progress (Penguin: Harmondsworth, 1978).

¹¹ Marx, Grundrisse 705.

¹² Marx, Grundrisse 705.

¹³ On this point, see Doug Henwood, "Info Fetishism," Resisting the Virtual Life: The Culture and Politics of Information, ed. James Brook and Iain Boal (San Francisco: City Lights, 1995), 163-172.

¹⁴ Kim Moody, Workers In A Lean World: Unions in the International Economy (London: Verso, 1997), 193-194.

¹⁵ For events in the Illinois 'war zone,' see Marc Cooper, "Harley-Riding, Picket-Walking Socialism Haunts Decatur," Nation, April 8, 1996, 23-25.

¹⁶ On recent developments in the AFL-CIO, see Jeremy Brecher and Tim Costello, "A New Labor Movement in the Shell of the Old," Z Magazine April (1996) 45-49.

¹⁷ Dennis Hayes, Behind the Silicon Curtain: The Seductions of Work in a Lonely Era (Boston: South End, 1989); Michael Hardesty and Nina Wurgafit, "Silicon Valley: A Tale of Two Classes," Z Magazine. Sept. 1992, 63-65; Navid Mohseni, "The Labor Process and Control of Labor in the U.S. Computer Industry," The Labor Process and Control of Labor: The Changing Nature of Work Relations in the Late Twentieth Century, Berch.Berberoglu (Westport: Praeger, 1993) 59-77; Andrew Gorry, "Silicon Valley: A Divided Workforce." CPU: Working in the Computer Industry 3 (1993) online, Internet.

¹⁸ Hardesty and Wurgafit, 62.

¹⁹ Lenny Siegel, "New Chips in Old Skins: Work, Labor and Silicon Valley." CPU: Working in the Computer Industry. 6 (1993), online, Internet; Lisa Hoyos and Mai Hoang, "Workers at the Centre: Silicon Valley Campaign for Justice," CrossRoads. 43 (1994): 24-27; David Bacon, "Silicon Valley on Strike," CPU: Working in the Computer Industry 3 (1993) online, Internet.

²⁰ Lisa Hoyos and Mai Hoang, "Workers at the Centre: Silicon Valley Campaign for Justice," CrossRoads. 43 (1994): 24-27.

²¹ Nathan Newman, "'Third Wave Unionism' Takes to the Net," online, Internet, Red Rock Eater News Service, 22 Aug. 1996.

²² See Paul Almeida, "The Network for Environmental and Economic Justice for the Southwest: Interview with Richard Moore," Capital, Nature and Socialism 5.1 (1994): 21-54, and Richard Moore and Louis Head, "Acknowledging the Past, Confronting the Present," Toxic Struggles: The Theory and Practice of Environmental Justice, ed. Richard Hofrichter.(Philadelphia: New Society, 1993

²³ David Bacon, "L.A. Labor--A New Militancy," Nation 27 Feb. 1995: 273-276.

²⁴ Mike Davis, "Armageddon at the Emerald City: Local 226 vs MGM Grand." Nation 11 July 1994: 46-49.

²⁵ Pamela Chiang, "501 Blues," Breakthrough 18:2 (1994): 3-7.

²⁶ The best single source for reporting the unfolding of these movements is the US dissident trades union journal Labor Notes. Other interesting discussion can be found in Jeremy Brecher and Tim Costello, eds. Building Bridges: The Emerging Grassroots Coalition of

Labour and Community (New York: Monthly Review, 1990); Collective Action Notes, "The U.S.A. A Transitional Period-But to Where?" Collective Action Notes 9 (1996) 1-4; Peter Rachleef, "Seeds of a Labor Resurgence," Nation 21 Feb. 1994: 226-229.

²⁷ See Chiang, and Andrew Banks, "Jobs With Justice: Florida's Fight Against Worker Abuse," Building Bridges: The Emerging Grassroots Coalition of Labour and Community, ed. Jeremy Brecher and Tim Costello (New York: Monthly Review, 1990) 25-37.

²⁸ Labour Resource Center, Holding the Line in '89: Lessons of the NYNEX Strike (Somerville: Labour Resource Center, 1990; David Kallick, "Toward a New Unionism," Social Policy 25.2 (1994): 2-6.

²⁹ Brecher and Costello.

³⁰ Kim Moody, Workers In A Lean World: Unions in the International Economy (London: Verso, 1997).

³¹ Moody, Workers In A Lean World 277.

³² For developments in Italy, see Gregor Gall, "The Emergence of a Rank and File Movement: The Comitati du Base in the Italian Workers' Movement," Capital and Class 55 (1995): 1-21, and in France, Steve Jefferys, "France 1995: The Backwards March of Labour Halted?" Capital and Class 59 (1996): 7-22.

³³ Karl Marx, Capital: A Critique of Political Economy vol. 1 (New York: Vintage Books, 1977) 718.

³⁴.See Michael Hardt and Antonio Negri, Labor of Dionysus: A Critique of the State Form (London: Minneapolis, 1994).

³⁵ James O'Connor, The Fiscal Crisis of the State (New York: St Martins, 1973).

³⁶ Andrew Gamble, The Free Market and the Strong State, (Basingstoke: Macmillan, 1988).

³⁷ Michel Foucault, Discipline and Punish: The Birth of the Prison (Harmondsworth: Penguin, 1979).

³⁸ On contemporary prison labour, see 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, and Paul Wright, "Slaves of the State," Z Magazine, July-August (1994). For an account of the automated security systems now in use in the US "prison-industrial complex," see Mike Davis, "Hell Factories in the Fields," Nation, 20 Feb., 1995, 229-234.

³⁹ Cindi Katz and Neil Smith, "L.A. Intifada: Interview with Mike Davis," Social Text 33 (1992): 16.

⁴⁰ Mike Davis, "Los Angeles Was Just the Beginning: Urban Revolt in the United States: A Thousand Points of Light," Open Magazine Pamphlet Series (New York: New Press, 1993).

⁴¹ Reprinted in Haki R. Madhubuti, ed., Why L.A. Happened: Implications of the '92 Los Angeles Rebellion. (Chicago: Third World, 1993).

⁴² The classic study of "poor people's movements" is, of course, Frances Fox Piven and Richard Cloward, Poor People's Movements: Why They Succeed, How They Fail (New York: Pantheon, 1977).

⁴³ Alex Vitale and Keith McHenry, "Food Not Bombs," Z Magazine, Sep. (1994)19-21.

⁴⁴ Information on the "Andersen Conversion Project" is available from Toronto Action for Social Change, P.O. Box 73620, 509 St. Clai Ave. West, Toronto, ON M6C 1C0; email burch@web.net

⁴⁵ On this point see Rosalind Petchesky, Abortion and Woman's Choice: The State, Sexuality and Reproductive Freedom (Northeastern University Press: Boston, 1990) 241-252.

⁴⁶ Maria Mies, "Why do we Need all this? A Call Against Genetic Engineering & Reproductive Technology," Made to Order: The Myth of Reproductive and Genetic Progrss, ed. Patricia Spallone and Deborah Steinberg (Oxford: Pergamon, 1987) 34-47, and Kathryn Russell, "A Value-Theoretic Approach to Childbirth and Reproductive Engineering," Science and Society 58.3 (1994): 287-314.

⁴⁷ According to Andrew Kimbrell, The Human Body Shop (Harper: San Francisco, 1993), 101, such agreements,

. . . routinely require that the prospective mother submit to massive doses of fertility drugs, hormone injections, amniocentesis and an array of genetic probes and tests at the discretion of the client; require that the mother agrees to abort the fetus on demand, and is all liable for all 'risks' associated with conception, pregnancy and childbirth.

Payment is in the region of \$10,000--\$1,000 if the child is still-born.

⁴⁸See Spallone.

⁴⁹ On the relation of biotechnological investment to post-Fordist restructuring, see Edward Xoxen, "Life as a Productive Force: Capitalising the Science and Technology of Molecular Biology," Science, Technology and the Labour Process: Marxist Studies, vol. 1, ed. Les Levidow and Bob Young. (New Jersey: Humanities, 1981) 66-123; Herbert Gottweis, "Genetic Engineering, Democracy, and the Politics of Identity." Social Text 42 (1995): 127-152.

⁵⁰ As in other areas of capitalist technological development, these innovations have to be understood not simply as means to increase productivity, but as tools to change social relations. For example, many of the developments in biotechnology have been central to the extension of large scale capitalist techniques to farming--agribusiness. In his classic essay, "Technology as Political Weaponry," Science, Politics and the Agricultural Revolution in Asia, ed. Robert Anderson (Boulder: Westview, 1981) 261-276, Harry Cleaver has described how the 'Green Revolution' was used to break down forms of rural community resistant to capitalist modernisation. The same process is now enacted on a multitude of fronts: through the establishment of patent-rights over food sources cultivated in the wild by peasant and indigenous communities; the creation of herbicide-resistant plant strains tied to the products of particular chemical companies; the ability to bypass rural and Third World producers by artificial synthesis of naturally occurring substances; and the institution of methods--such as pharmacological augmentation of cows by the use of bovine growth hormone--which favour large scale enterprises. For recent developments on this front, see Tom Athanasiou, "Greenwashing Agricultural Biotechnology," Processed

World.28 (1991/2) 16-21; Cary Fowler and Pat Mooney Shattering: Food, Politic and the Loss of Genetic Diversity (Tucson: University of Arizona, 1990); Vandana Shiva, The Violence of the Green Revolution: Third World Agriculture, Ecology and Politics (London: Zed Books, 1991); Jeremy Seabrook, "Biotechnology an Genetic Diversity," Race & Class 34.3 (1993) 15-30; Brian Tokar, "The False Promise of Biotechnology," Z Magazine Feb.

⁵¹ Gottweis 137.

⁵²For a multi-perceptival collection of readings on the Genome Project see Daniel Kevles and Leroy Hood, eds., The Code of Codes: Scientific and Social Issues in the Human Genome Project (Cambridge: Harvard University Press, 1992).

⁵³ Ruth Hubbard and Elijah Ward, Exploding the Gene Myth (Boston: Beacon, 1993).

⁵⁴ Henry Greely, "Health Insurance, Employment Discrimination, and the Genetics Revolution," The Code of Codes, ed. Daniel Kevles and Leroy Hood (Cambridge: Harvard University Press, 1992) 264-280.

⁵⁵ Seth Shulmann, "Preventing Genetic Discrimination," Technology Review, July (1995): 16-18.

⁵⁶.The implications are most immediately apparent in the US where many employers directly carry the costs of workers health insurance, and thus have a powerful incentive not to hire workers who can be expected to get sick. Although the peculiar atavism c of the US health care system makes these issues surfaced very rapidly, the implications are far wider.

For even where capital only bears the costs of labourers ill health indirectly--through the welfare state programs--genetic screening offers the potential for lowering this expense,

⁵⁷ See Kimbrell, and Giovanni Berlinguer, "The Body as Commodity and Value," Capital, Nature & Socialism 5.3 (1994): 35-49.

⁵⁸ For speculations along this line by an elite "Eurocrat," see Jacques Attali, Millennium: Winners and Losers in the Coming World Order (New York: Random House, 1991).

⁵⁹ Peter Linebaugh, The London Hanged (London: Penguin, 1991) 121-122.

⁶⁰ Marlene Fried, ed., From Abortion to Reproductive Freedom: Transforming a Movement (Boston: South End Press, 1990)

⁶¹ Rosalind Copelon, "From Privacy to Autonomy: The Conditions for Sexual and Reproductive Freedom," Marlene Fried, ed., From Abortion to Reproductive Freedom: Transforming a Movement (Boston: South End Press, 1990), 39. In the same anthology see also the essay by Angela Davis, "Racism, Birth Control, and Reproductive Rights," 15-26.

⁶² For a collection stating the FINRAGE position see Spallone and Steinberg. FINRAGE takes the position that such technologies are inherently dominative, and aims at an outright ban on their development and new research agendas to discover different remedies for the problems which the repro-tech industries complex purport to 'fix' technologically--for example, the investigation of social and environmental causes of infertility. Other feminist groups believe that although currently patriarchal and corporate control make these technologies inimical to women, it may be possible to bend their trajectory in positive directions. They therefore call not for the halting of development, but for free and non-

discriminatory access--for example, making new reproductive possibilities available to lesbians and gays. There have also been concerns that the FINRAGE position fails to build links with the women participants in in vitro programs, who constitute not only the consumers but also the unwaged, experimental labour force of the repro-tech industry. There are real contradictions, and heated controversy, between these different positions. But both dissent strongly from the trajectory toward reproductive commodification.

⁶³ Sue Cox, "Strategies For the Present, Strategies For the Future: Feminist Resistance to New Reproductive Technologies." Canadian Woman Studies 13.2 (1993) 87.

⁶⁴ On the Canadian events see Gwynne Basen, Margaret Eichler, and Abby Lippman. eds., Misconceptions: The Social Construction of Choice and the New Reproductive and Genetic Technologies (Quebec: Voyageur, 1993).

⁶⁵ Debra Harry, "The Human Genome Diversity Project and Its Implications For Indigenous Peoples," Information About Intellectual Property Rights No. 6, Jan. 1995, Institute for Agriculture and Trade Policy, Minneapolis: Minnesota, available by email from iatp@iatp.org.; Pat Mooney, The Conservation and Development of Indigenous Knowledge in the Context of Intellectual Property Systems (Ottawa: Rural Advancement Foundation International, 1993). The Ottawa-based Rural Advancement Foundation International has served as a clearinghouse and information source both for these efforts and for First and Third world farmers fighting agribusinesses biotechnological enclosures.

⁶⁶ Patrick Novotny, "Popular Epidemiology and the Struggle for Community Health: Alternative Perspectives from the Environmental Justice Movement," Capital, Nature,

Socialism 5.2 (1994): 29-50. On other aspects of the crisis of health care under neoliberal regimes, see Donald Lowe, The Body in Late Capitalist USA. (Duke University Press, 1995), and Vicente Navarro, Crisis, Health and Medicine: A Social Critique (New York: Tavistock, 1986) and Dangerous To Your Health (New York: Monthly Review, 1993).

⁶⁷ See Peter Arno and Karyn Feiden, Against the Odds: The Story of AIDS Drug Development, Politics and Profits (NY: Harper Collins, 1992); Steven Epstein, "Democratic Science? AIDS Activism and the Contested Construction of Knowledge," Socialist Review 21.2 (1991): 35-61. Paula A Treichler, "How to Have Theory in an Epidemic: The Evolution of AIDS Treatment Activism," Technoculture, ed. Constance Penley & Andrew Ross (Minneapolis: University of Minnesota, 1991) 57-156.

⁶⁸ Arno and Felden 137.

⁶⁹ See George Carter, "ACT UP, the AIDS War, and Activism," Open Fire: The Open Magazine Pamphlet Series Anthology, ed. Greg Ruggiero and Stuart Sahulka (New York: New Press, 1993) 123-150.

⁷⁰ Epstein 37.

⁷¹ My analysis of this process draws on the following David Noble, "Insider Trading: University Style," Our Schools/Our Selves 4: 3 (1993): 45-52; Martin Kenney, Biotechnology: The University Industrial Complex (New Haven: Yale University Press, 1986); Janice Newson and Howard Buchbinder, The University Means Business: Universities, Corporations and Academic Work (Toronto: Garamond, 1988); Sheldon

Krimsky, "The New Corporate Identity of the American University," Alternatives 14.2 (1987) 20-29.

⁷² On this point, see Noble.

⁷³ See Tony Vellela, New Voices: Student Activism in the 80s and 90s (Boston: South End Press, 1988); Paul Loeb, Generation At The Crossroads: Apathy and Action on the American Campus (New Jersey: Westview, 1994).

⁷⁴ Robert Ovetz, "Assailing the Ivory Tower: Student Struggles and the Entrepreneurialization of the University," Our Generation 24.1 (1993): 70-95.

⁷⁵ James Laxer, speech at the Annual General meeting, Council of Canadians, 17 Oct. 1996, Vancouver.

⁷⁶ On these developments, see Stanley Aronowitz, "The Last Good Job in America," in Post-Work: The Wages of Cybernation, ed. Stanley Aronowitz and Jonathan Cutler (New York: Routledge, 1998), 216 and 213, and also Cary Nelson, ed., Will Teach for Food: Academic Labor in Crisis (Minneapolis: University of Minnesota, 1998).

⁷⁷ Marx, Capital vol. 1 638.

⁷⁸ See Robert Gottlieb, Forcing the Spring: The Transformation of the American Environmental Movement. (Washington: Island, 1993).

⁷⁹ For an autonomist analysis of the class composition of the anti-nuclear movement, see p.m., "Strange Victories," in Midnight Notes Collective, Midnight Oil: Work, Energy, War, 1973-1992 (Brooklyn: Autonomedia, 1992) 193-215.

⁸⁰ See Joseph Boland, "Ecological Modernisation," Capital, Nature, Socialism 52 (1994): 135-141, and Tim Luke, "Informationalism and Ecology," Telos 56 (1983): 59-73.

⁸¹ This shift follows a path, which, as Harry Cleaver points out, Marx appears to have foreseen. In volume 1 of Capital 'nature' appears as an object outside of and opposed to humans. But in its later volumes, Marx suggests that as capital increases the scope of its organisation, nature is englobed by technology to a degree that that its original features become largely unidentifiable. Harry Cleaver, Reading Capital Politically (Brighton: Harvester 1979) 134.

⁸² Marx (1977), 1037.

⁸³ See Dennis Hayes, Behind the Silicon Curtain: The Seductions of Work in a Lonely Era (Boston: South End, 1989) and Robert Howard, Brave New Workplace (New York: Viking, 1985).

⁸⁴ See Richard Hofrichter, ed., Toxic Struggles: The Theory and Practice of Environmental Justice. (Philadelphia: New Society, 1993).

⁸⁵ See Hofrichter.

⁸⁶ See Hofrichter.

⁸⁷ In addition to the example offered below, the Oil, Chemical and Atomic Workers Union are fighting for a superfund to clean up hazardous waste sites; organisations such as The Network for Environmental and Economic Justice for the Southwest ally community and workplace fights against high-tech wastes; striking paperworkers in Jay, Maine put control of plant effluents on their agenda; and Judith Bari's wing of Earth First has built links with

forestry workers whose jobs are threatened by super-mechanised logging. For these and other instances, see Gottlieb; Hofrichter, and Almeida.

⁸⁸ Eric Mann, Taking On General Motors: A Case Study of the UAW Campaign to Keep GM Van Nuys Open (University of California: Center for Labor Research, 1987).

⁸⁹ See Eric Mann, "Labor-Community Coalitions as a Tactic for Labour Insurgency." Building Bridges: The Emerging Grassroots Coalition of Labour and Community, eds. Jeremy Brecher and Tim Costello (New York: Monthly Review, 1990) 113-134, and "Labor's Environmental Agenda in the New Corporate Climate," in Hofrichter, 179-185; and Mann, with the WATCHDOG Organizing Committee, L.A.'s Lethal Air: New Strategies for Policy, Organizing and Action (Los Angeles: Labour/Community Strategy Center, 1991); also R. Bloch and R. Keil, "Planning for a Fragrant Future: Air Pollution Control, Restructuring and Popular Alternatives in Los Angeles," Capitalism, Nature, Socialism 2.1 (1991).

⁹⁰ Steven Gray, "Ontario's 'Green Work Alliance' Hopes Environmentally-Friendly Projects Can Reopen Plants," Labor Notes, Nov. 1992: 15-17; Roger Keil, "Green Work Alliances: The Political Economy of Social Ecology," Studies in Political Economy. 44 (1994): 7-38.

⁹¹ Ken Tsuzuku, "Presentation to the 1991 Labor Notes Conference," in "A Conference on Labour and Team Concepts." Proc. of a Conference Co-Sponsored by Capilano College Labour Studies Programme and Vancouver & District Labour Council. Vancouver, 18-19 Oct. 1991.

⁹² As Tsuzuku, 266, notes, this strategy was initially a matter of financial necessity, but it lead onto broader perspectives: --"we could not but ask ourselves whether or not the system as ordered would really promote the interests of the workers of the client company, and if not how the design concept could be improved.".

⁹³ Karl Marx, Economic and Philosophical Manuscripts (New York: International Publishers, 1964) 112.

⁹⁴ Fredric Jameson, "Postmodernism and the Market," Socialist Register, ed. R. Miliband, L. Panitch and J. Saville (London: Merlin, 1990) 95-110.

⁹⁵ The treatment of the sphere of consumption offered in this section is truncated, in that it deals only with struggles surrounding capital's attempt to sell commodities, and not with its activities as a purchaser of the labour power and raw materials required for "productive consumption.". This issue is, however, later picked up, in regard to raw materials in the section on the "The Reproduction of Nature," and in the next chapter, which discusses capital's global cheap-labour strategy. Although Marx distinguished the extraction of surplus value in the workplace from its realisation in the market, he also noted that the faster capital circulates, the more often in a given period it can flow through the production process and be augmented by the addition of surplus value. Increasing the speed with which commodities are brought and sold can thus have the same consequence as increasing the productivity of labour: more profits. See Marx, Grundrisse 539.

⁹⁶ For just one of many possible examples see Marx, Grundrisse 516-544.

⁹⁷ See the discussion of the work of Herbert Schiller in Chapter 3 of this dissertation.

⁹⁸ Ben Bagdikian, The Media Monopoly (Boston: Beacon, 1990). See also Noam Chomsky and Edward S. Herman, Manufacturing Consent: The Political Economy of the Mass Media (New York: Pantheon, 1988);

⁹⁹ Karl Marx and Frederick Engels, The German Ideology (London: Lawrence & Wishart, 1963) 3.

¹⁰⁰ The classic study of this process is Stuart Ewen, Captains of Consciousness (New York: McGraw Hill, 1976).

¹⁰¹ This section draws on Robert McChesney, "The Global Struggle for Democratic Communication," Monthly Review, 48.3 (1996): 1-20; Nicholas Garnham, Capitalism and Communication: Global Culture and the Economics of Information (London: Sage, 1990); Vincent Mosco, Computers and Communication in the Information Age: Essays in Critical Theory and Public Policy (Toronto: Garamond, 1989).

¹⁰² On this point see Giuseppe Cocco and Carlo Vercellone, "Les Paradigmes Sociaux du Post-Fordisme," Futur Antérieur 4 (1990): 71-94.

¹⁰³ According to Michael Dawson and John Bellamy Foster, "Virtual Capitalism: The Political Economy of the Information Society." Monthly Review, 48.3 (1995): 47, in 1992 US business spent \$1 trillion dollars--one-sixth of the Gross Domestic Product--on marketing.

¹⁰⁴ See Eileen Meehan, "Technical Capability vs. Corporate Imperatives: Towards a Political Economy of Cable Television and Information Diversity," The Political Economy

of Information, ed. Vincent Mosco and Janet Wasko (Madison: University of Wisconsin Press, 1988)

¹⁰⁵ Kevin Wilson, Technologies of Control: The New Interactive Media for the Home (Madison: University of Wisconsin, 1988) 36. See also Oscar Gandy, The Panoptic Sort: Towards a Political Economy of Information (Boulder: Westview, 1993), and David Lyon, The Electronic Eye: The Rise of Surveillance Society (Cambridge: Polity, 1994).

¹⁰⁶ Dallas Smythe, "Communications: Blindspot of Western Marxism," Canadian Journal of Political and Social Theory 1.3 (1977): 6. See also his Dependency Road: Communications, Capitalism, Consciousness and Canada (Norwood: Ablex, 1981). This line of thought has subsequently been developed by Sut Jhally, The Codes of Advertising: Fetishism and the Political Economy of Meaning in the Consumer Society (New York: St. Martin's Press, 1987). In a personal conversation shortly before his death Smythe agreed that his perspective converged with the autonomist's "social factory" analysis.

¹⁰⁷ Smythe, "Communications: Blindspot of Western Marxism" 4.

¹⁰⁸ Smythe, "Communications: Blindspot of Western Marxism" 4.

¹⁰⁹ Such 'active audience' analysis has been particularly developed in 'cultural studies' perspectives from such as John Fiske, Understanding Popular Culture (London: Unwin Hyman, 1989).

¹¹⁰ For discussion of these terms see John Downing, Radical Media: The Political Experience of Alternative Communication (Boston: South End Press, 1984).

¹¹¹ The seminal essay on alternative media in this period is Hans Magnus Enzensberger, "Constituents of a Theory of the Media," The Consciousness Industry. New York Seabury Press, 95-128. For a contemporary survey see Jesse Drews "Media Activism and Radical Democracy," Resisting the Virtual Life: The Culture and Politics of Information., ed. James Brook and Iain A. Boal.(San Francisco: City Lights, 1995) 71-84, and David Trend, "Rethinking Media Activism: Why the Left is Losing the Culture War," Socialist Review 93/2 (1993): 5-34.

¹¹² See Bruce Girard,.ed., A Passion for Radio (Montreal: Black Rose, 1992); Greg Boozell, "The Revolution Will Be Microwaved: The FCC, Microwatt Radio, and Telecommunication Networks," Afterimage 22.1 (1994): 12-14; Wes Thomas, "Hyperwebs: Pirate Radio," Mondo 2000 11 (1993): 26-39.

¹¹³ See the excellent discussions in Nancy Thede and Alain Ambrosi, eds., Video the Changing World. (Montreal: Black Rose, 1991) and Dee Dee Halleck,"Watch Out, Dick Tracy! Popular Video in the Wake of the Exxon Valdez," Technoculture, ed. Constance Penley & Andrew Ross (Minneapolis: University of Minnesota, 1991).

¹¹⁴ See Patricia Aufderheide, "Underground Cable: A Survey of Public Acess Programming," Afterimage. 22:1 (1994) 5-7; Douglas Kahn, "Satellite Skirmishes: An Interview With Paper Tiger West's Jesse Drew," Afterimage 20.10 (1993): 9-11; Douglas Kellner, Television and the Crisis of Democracy (Boulder: Westview, 1990); Martin Lucas and Martha Wallner, "Resistance by Satellite: The Gulf Crisis and Deep Dish Satellite TV Network," Channels of Resistance, ed. Tony Dowmunt (London: British Film

Institute 1993) 176-194; Dot Tuer, "All in the Family: An Examination of Community Access Cable in Canada." Fuse. 17. 3 (1994): 23-29.

¹¹⁵ Rafael Roncaglio, "Notes On the Alternative," Video: The Changing World. Montreal, ed. Nancy Thede and Alain Ambrosi (Montreal: Black Rose, 1991) 207.

¹¹⁶ For some fascinating analysis of media politics surrounding the LA rebellion, on which I draw heavily here, see John Fiske, Media Matters: Everyday Culture and Political Change (Minneapolis: University of Minnesota, 1994).

¹¹⁷ As Clarence Lusane, "Rap, Race, and Rebellion," Z Magazine Sep. (1992) 36, comments, "On the one hand, rap is the voice of alienated, frustrated, and rebellious black youth who recognise their marginality and vulnerability in post-industrial America. On the other hand, rap is the packaging and marketing of discontent by some of the best ad agencies and largest record producers in the world. It's this duality that . . . made rap and rappers an explosive issue in the 1992 elections."

¹¹⁸ On these points see Fiske, and also Playthell Benjamin, "Seeing is Not Believing," Guardian, 9 May 1992: 34.

¹¹⁹ Reprinted in Haki R. Madhubuti, ed., Why L.A. Happened: Implications of the '92 Los Angeles Rebellion. (Chicago: Third World, 1993). On the role of radio in the revolt, see Ron Sakolsky, "Zoom Black Magic Liberation Radio: The Birth of the Micro-Radio Movement in the USA," A Passion For Radio, ed. Bruce Girard (Montreal: Black Rose, 1993) 106-113

¹²⁰ Wilmette Brown, "No Justice, No Peace: the 1992 Los Angeles Rebellion from a Black/women's Perspective" (London: Wages for Housework Campaign., 1993) 5-8.

¹²¹ Jason Frank, "Television That Works: Labor Video in the 1990s," Socialist Review 93/2 (1993): 37-78.

¹²² Mike Davis, "Armageddon at the Emerald City: Local 226 vs MGM Grand," Nation 11 July 1994: 46-49

¹²³ Steve Zeltzer estimates more than forty labour TV shows on public access cable in the US alone. See his paper, "Labor Media Communication: Voices in the Global Economy," available on the World Wide Web at <http://www.igc.org/lvpsf/lvpsfhtml>.

¹²⁴ Information about the Labor Video project can be found at its World Wide Web site, <http://www.igc.apc.org/lvpsf>

¹²⁵ Information on the campaign to free Mumia Abu Jamal can be found on the World Wide Web page of the Solidarity Group for Political Prisoners, at <http://www.xs4all.nl/~tank/index.html>. Adbusters: Journal of the Mental Environment is published by the Media Foundation, Vancouver, Canada, email adbusters@adbusters.org.

¹²⁶ William H Davidow, The Virtual Corporation: Structuring and Revitalizing the Corporation For the 21st Century (New York: Harper, 1992).

¹²⁷ Marx 1977, 1056. Word order slightly changed.

¹²⁸ Peter Childers and Paul Delany, "Wired World, Virtual Campus: Universities and the Political Economy of Cyberspace," unpublished Paper, Simon Fraser University, 1993. See also Michal Hauben, "The Social Forces Behind the Development of Usenet News," The

Amateur Computerist 5.1/2 (1993) 13-21, and Bruce Sterling, "A Short History of the Internet," Magazine of Fantasy & Science Fiction, Feb. 1993, n.p.

¹²⁹ Andrew Ross, "Hacking Away at the Counterculture," Technoculture, ed. Constance Penley and Andrew Ross (Minneapolis: University of Minnesota, 1991).

¹³⁰ See Katie Hafner and John Markoff, Cyberpunk: Outlaws and Hackers on the Computer Frontier (New York: Simon & Schuster, 1991); Bryan Clough, Approaching Zero: Data Crime and the Computer Underworld (London: Faber & Faber, 1992); Bruce Sterling, The Hacker Crackdown: Law and Disorder on the Electronic Frontier (New York: Bantam, 1992).

¹³¹ Howard Rheingold, The Virtual Community (Reading: Addison-Wesley, 1993).

¹³² For examples of this sort optimistic position see Adam Jones, "Wired World: Communications Technology, Governance and the Democratic Uprising," The Global Political Economy of Communication: Hegemony, Telecommunications, and the Information Economy, ed. Edward Comor (New York: St. Martin's, 1994) 145-164..

¹³³ On this point see Peter Golding, "World Wide Wedge: Division and Contradiction in the Global Information Infrastructure," Monthly Review 48.3 (1996): 78-79.

¹³⁴ See for example Laura Miller, "Women and Children First: Gender and the Settling of the Electronic Frontier," Resisting the Virtual Life, ed. James Brook and Iain A. Boal.(San Francisco: City Lights, 1995) 49-59.

¹³⁵ See for example Ken Hirschop, "Democracy and New Technologies," Monthly Review, 48.3 (1996) 86-98. For a somewhat different line, based largely on Frankfurt School

critique of the reifying powers of technology, see Julian Stallabrass, "Empowering Technology: The Exploration of Cyberspace," New Left Review 211 (1995).

¹³⁶ On the possibilities and problems for women on the Internet, see Ellen Balka, Womantalk Goes On-line: The Use of Computer Networks in the Context of Feminist Social Change, diss., Simon Fraser University, 1991; Leslie Regan Shade, "Gender Issues in Computer Networking," Community Networking: the International Free-Net Conference, Carleton University, Ottawa, Canada, 17-19 Aug. 1993; Hoai-An Truong, with Gail Williams, Judi Clark and Anna Couey and others of Bay Area Women in Telecommunications, "Gender Issues in Online Communications," online, Internet, ACTIVE-L, 13 Jan. 1994; and Dale Spender, Nattering on the Net: Women, Power and Cyberspace (Melbourne: Spinifex, 1995).

¹³⁷ Eric Lee, The Labour Movement and the Internet: The New Internationalism (London: Pluto Press, 1997).

¹³⁸ Lee, 48.

¹³⁹ See Montieth Illingworth, "Workers On The Net, Unite!: Labor Goes Online to Organise, Communicate, and Strike," Information Week, 22 Aug. 1994, online, Internet, ACTIVE-L, 3 Sep. 1994

¹⁴⁰ See Peter Waterman, "International Labour Communication by Computer: The Fifth International?" Working Paper Series 129 (The Hague: Institute of Social Studies, 1992).

¹⁴¹ For example, Solinet exploded with contending views about the appropriate response to a social democratic provincial government in Ontario which launched a major assault on public service workers.

¹⁴² Siegel in "New Chips in Old Skins."

¹⁴³ For further details on the San Francisco Free Press, and a similar use of computer networks by striking newspaper workers in Detroit, see Lee, 79-84.

¹⁴⁴ The Hotel and Restaurant Employees International used the Internet in its campaign to organise a chain of luxury hotels known as the Western Lodging Group. According to Nathan Newman, when mass firings of workers took place at the Lafayette Park Hotel, the publicising of these news on the Internet generated hundreds of letters, calls and emails to management. As the campaign evolved, the union targeted corporate customers of the hotel who regularly use it to house employees or visiting clients. One of these was a software corporation, PeopleSoft. The HREI highlighted negative facts from this company's own financial reports and posted them to a series of computer oriented newsgroups. PeopleSoft claims that within a week the value of their stock dropped by \$63 million dollars because of reactions by investors. Soon after, it announced it was moving customers and other visitors to a different hotel. See Nathan Newman, "'Third Wave Unionism' Takes to the Net," online, Internet, Red Rock Eater News Service, 22 Aug. 1996.

¹⁴⁵ Jim Davis, email to the author, 11 June 1994.

¹⁴⁶ Jim Davis, email to the author, 11 June 1994.

¹⁴⁷ On the 'information highway' see Howard Besser, "From Internet to Information Superhighway," Resisting the Virtual Life, ed. James Brook and Iain A. Boal (San Francisco: City Lights, 1995) 59-71; Andrew Shapiro, "Street Corners in Cyberspace," Nation, 3 July, 1995, 10-13; Herbert Schiller, "The Information Superhighway: Paving Over the Public." Z Magazine, March.(1994) 46-51; Grant Kestner, "Access Denied: Information Policy and the Limits of Liberalism," Afterimage 21.6 (1994): 5-10. For Canadian perspectives, see David McIntosh, "Cyborgs in Denial: Technology & Identity in the Net," Fuse 18.3. 1994, and Heather Menzies, Whose Brave New World?: The Information Highway and the New Economy (Toronto: Between the Lines, 1996). On the repression of hackers, see Sterling, Crackdown, and Jason Wehling, "'Netwars' and Activists Power on the Internet," online, Internet, ACTIV-L, 25 Mar.,1995.

¹⁴⁸ Schiller 46.

¹⁴⁹ See the discussion of these terms in the previous chapter.

¹⁵⁰ For the claim that cyber-struggles displace street-level activism see Mark Poster, The Mode of Information: Poststructuralism and Social Context (Chicago: University of Chicago, 1990), 154.

¹⁵¹ European Counter Network, UK, "INFO: European Counter Network online," online, Internet, ACTIV-L 25 Dec. 1994.

¹⁵² Dorothy Kidd and Nick Witheford, "Counterplanning From Cyberspace and Videoland: or,

Luddites on Monday and Friday, Cyberpunks the Rest of the Week,” paper presented at “Monopolies of Knowledge: A Conference Honoring the Work of Harold Innis,” Vancouver, 12 Nov. 1994: 23.

¹⁵³ See Waterman, and Chapter 6 of this dissertation.

¹⁵⁴ Edward Stewart, The Paris Commune 1871 (London: Eyre and Spottiswoode, 1971).

¹⁵⁵ I owe this phrase to Dorothy Kidd, “Talking the Walk: The Communication Commons Amidst the Media Enclosures,” dissertation, Simon Fraser University, Canada, 1998.