

Chapter 1

Differences

The Difference Engine

In William Gibson and Bruce Sterling's novel The Difference Engine, the year is 1855, the place is England, and the information age has arrived a century-and-a-bit ahead of schedule.¹ Charles Babbage's attempts to develop a mechanical computer, instead of petering out in an expensive failure, have triumphantly succeeded. The Industrial Radical Party, headed by Lord Byron, forges an alliance between bourgeois commerce and scientific "savantry." Ruthlessly repressing Luddite insurgency, it applies the phenomenal powers of steam driven cybernetic Engines to a convulsive transformation of society--automating factories, extending surveillance, and perfecting weapons in a global consolidation of imperial power. Across this digitalised Victorian landscape bizarre intrigues unwind, as nefarious "clackers," the adepts of the new mechanical computing, governmental security forces, and criminal subversives all pursue a secret accidentally discovered by Babbage's co-inventor, Lady Ada Byron, "Queen of Engines," while attempting to meet her gambling debts--the secret of self-conscious artificial intelligence. Meanwhile, societal catastrophes pile up around the conspirators: ecological disasters, Gulf-War style carnage in the Crimea, mass unemployment and dispossession all converge on chaos--yet the alliance of science and capital seems irresistible, even as it drives towards unthinkable transformations in the fate of the human species.

What interests me in this steampunk fantasy--at once historical novel and science fiction, yet so manifestly about neither past nor future, but rather a defamiliarised portrait of our own verge-of-the-21st-century present--is one little detail, tangential to the main

plot, a mere corner of the canvas. For in the world of The Difference Engine, Karl Marx is alive and well. His employment by the New York Daily Tribune (for whom the actual Marx worked during the 1850s as a foreign correspondent in the biggest 'information industry' of his day) has clearly resulted in migration to the United States--a visit yielding momentous consequence. For, in a North America wracked by regional separatism and civil war, revolutionaries have seized the "means of information and production" of the largest city of the New World.² And the Manhattan Communards now provide a nucleus for an international ferment of dissidence which, combining re-emerged Luddites, renegade clackers, anarcho-feminists, Blakean-situationist artists and immiserated proletarians, boils beneath the surface of the bourgeois universe, waiting for the next calamity to burst into revolt.

In what follows, I propose a Marxism for the Marx of The Difference Engine. That is to say, I analyse how the information age, far from transcending the historic conflict between capital and its labouring subjects, constitutes the latest battleground in their encounter; how the new high technologies--computers, telecommunications, and genetic engineering--are shaped and deployed as instruments of an unprecedented, world wide order of general commodification; and how, paradoxically, arising out of this process appear forces which could produce a different future based on the common sharing of wealth--a twenty-first century communism.

Marx and Babbage

To establish some of the issues and conflicts central to this study it may be useful for a moment to look back in the past, to the 'actual' Babbage and Marx. In fact, the

opposition between Babbage--capitalist-computer-savant--and Marx--insurrectionary revolutionary--which Gibson and Sterling propose is well founded in the historical archive. Although Babbage's pioneer attempts to develop machine intelligence collapsed, partly because of the limits of 19th century engineering, partly because of his managerial conflicts with the craft-workers crucial to the production of the "engines," his influence was far in excess of that normally associated with a failed inventor. As Simon Schaffer has recently shown, Babbage was an eminent member of a coterie of radical utilitarian thinkers, including such figures as the political economist Andrew Ure, the philosopher Jeremy Bentham and his brother Samuel, and industrialists such as Marc Brunel and Henry Maudsley, all dedicated to the scientific organisation of a nascent industrial capitalism.³

Indeed, Babbage himself wrote a book in this tradition of Ricardian political economy --- On The Economy of Machinery and Manufactures--which in its argument for the deskilling and fragmentation of labour is now recognised as anticipating Frederick Taylor's system of "scientific management."⁴ Babbage's search for mechanical means to automate labour--both manual and mental--were the logical extension of the desire to reduce and eventually eliminate from production a human factor whose presence could only appear to the new industrialists as a source of constant indiscipline, error and menace. And this in turn was only part of wider project of industrial planning which foresaw the society-wide mobilisation of theoretical knowledge in the service of manufacture, overseen by a "new class of managerial analysts," such as Babbage himself, who would become "the supreme legislators of social welfare" and be rewarded with "newfangled life peerages and political power."⁵ In such schemes, the mechanical maximisation of capitalist profit mercifully coincided with the highest theological aspirations, for Babbage believed

that, "machine intelligence was all that was needed to understand and model the rule of God, whether based on the miraculous works of the Supreme Intelligence or on his promise of an afterlife."⁶

Marx, Babbage's contemporary, read his work. And what he found in its pages was not evidence of the ineluctable march of progress, or an approach to divine wisdom, but a strategy of class war. Writing in London, within living memory of the Luddite revolts that had seen hundreds hanged or transported and vast sections of England subject to martial law, Marx analysed the introduction of machinofacture as a means by which the bourgeoisie strove to subjugate a recalcitrant proletariat. He alludes to Babbage's writings in the great chapter of Capital --"Machinery and Large Scale Industry"--where he describes how the factory owners' relentless transfer of workers' skills into technological systems gives class conflict the form of a "struggle between worker and machine."⁷ He cites, as evidence of the political economist's technological strategy, the work of Babbage's colleague, Ure, who in the conclusion to his 1835 The Philosophy of Manufactures declared "when capital enlists science into her service, the refractory hand of labour will always be taught docility."⁸ "It would be possible" Marx observes, "to write a whole history of the inventions made since 1830 for the sole purpose of providing capital with weapons against working class revolt."⁹

Later, in a section of volume three of Capital entitled "Economy Through Inventions," Marx again footnotes Babbage. Commenting on capital's ever-increasing use of machines, he notes that "mechanical and chemical discoveries" are actually the result of a social co-operative process that he calls "universal labour":

Universal labour is all scientific work, all discovery and invention. It is brought about partly by the co-operation of men now living, but partly also by building on earlier work.¹⁰

The fruits of this collective project are, Marx argues, generally appropriated by the "most worthless and wretched kind of money-capitalists."¹¹ But the ultimate source of their profit is the "new developments of the universal labour of the human spirit and their social applications by combined labour."¹²

Marx had already discussed this tension between the social nature of technoscientific development and its private expropriation by capital--in the final pages of the notebooks for Capital, the Grundrisse. Here, he again makes passing reference to Babbage as, in some of the most volcanically brilliant of all Marx's writing, he foretells the future technological trajectory of capitalism.¹³ At a certain point, Marx predicts, capital's drive to dominate living labour through machinery will mean that "the creation of real wealth comes to depend less on labour time and on the amount of labour employed" than on "the general state of science and on the progress of technology."¹⁴ The key factor in production will become the social knowledge necessary for technoscientific innovation--"general intellect."¹⁵

Marx points in particular to two technological systems whose full development will mark the era of "general intellect"--automatic machinery, which, he predicts, will all but eliminate workers from the factory floor, and the global networks of transport and consolidation binding together the world market. With these innovations, Marx says, capital will appear to attain an unassailable pinnacle of technoscientific power. However--and this is the whole point of Marx's analysis--inside this bourgeois dream lie the seeds of

a bourgeois nightmare. For by setting in motion the powers of scientific knowledge and social co-operation capital undermines the basis of its own rule. Automation, by massively reducing the need for labour, will subvert the wage relations--the basic institution of capitalist society. And the profoundly social qualities of the new technoscientific systems--so dependent for their invention and operation on forms of collective, communicative, co-operation--will overflow the parameters of private property. The more technoscience is applied to production, the less sustainable will become the attachment of income to labour and the containment of creativity within the commodity form. In the era of general intellect "capital thus works towards its own dissolution as the form dominating production."¹⁶

Babbage and Marx were alike prophets of today's information society. But their prophecies are radically opposed--one promising the technoscientific consolidation of market relations, the other the dissolution of that rule. Both spoke, as befits nineteenth century men of science, in tones of confident certainty. After the catastrophes and surprises of the twentieth century, such teleological certainty should no longer be available to any one. Nevertheless, the predictions of both Babbage and Marx are alive and well today, present as vectors of struggle, antagonistic potentialities meeting in a collision that I term 'the contest for general intellect.'

But surely this must be a joke? Are not Marx and Marxism now so thoroughly discredited, so fatally consigned to the dustbin of a history which has itself been dispatched to postmodernist on-screen trash-cans, that any attempt to re-invoke their memory can only be an exercise in speculative dreaming or historical nostalgia? Since Marxism, assailed from all quarters, is generally deemed to have died the death of a thousand cuts it is important, at the very outset, to take difference with this prevailing view.

Deaths of Marxism I: The Neoliberal Critique

In the eyes of many, the fate of Marxism has been sealed by the collapse of state socialism--by the disintegration of the ex-USSR and its East European bloc and the absorption of China into the world market. Unfolding through a progression of scenes--intensifying economic crisis, the people in the streets, confrontation with security forces, bloody repression or flight of demoralised leaders--which seemed in every respect to fulfil the revolutionary anticipations of the left, only with the diabolic twist that it all culminated not in the collapse of capital but in the fall of socialism, these events--have shattered the long-flagging confidence of Marxist militants and intellectuals everywhere.

In the many jubilant post-mortems conducted by neoliberal intellectuals over the corpse of Marxism a wide variety of reasons have been invoked for its demise: the inherent imperfectability of humanity, the innate superiority of markets over state planning, the inevitable transformation of revolutionary aspiration into despotic tyranny, and so on. Not the least important of these is the alleged incapacity of Marxism to comprehend the 'information revolution.' Many analysts suggest that the evident failure of the Soviet regime to deal successfully with new technoscientific conditions of production--computerisation, telecommunication, mass media--is traceable to intrinsic flaws and anachronisms in the legacy of Marxian theory. This argument is, for example, fundamental to that most pompous of neoliberal self-congratulations--the "end of history" announced by Francis Fukuyama, for whom the innate superiority of liberal capitalism in developing the "mechanism" of modern technoscience determines its role as the summum bonum of human development.¹⁷

Fukuyama's work has, however, provoked the emergence of a surprising champion of Marx. In a scathing critique of the "end of history" thesis, Jacques Derrida, has recently questioned the fashionable assumption that the end of state socialism has exorcised the revolutionary "specter" which has haunted capital for so long.¹⁸ Reviving the recognition--long standing in some quarters--that Marxism is not a monolithic body of thought but comprises a multiplicity of intertwined and indeed radically contradictory strands, Derrida challenges any belief that the Bolshevik tradition exhausts this legacy. He further argues that, rather than Marxism being rendered obsolete by the information age, it is only in the light of certain 'informational' developments--globalisation, the pre-eminence of the media, tele-work--that we can see the full importance of certain themes within the texts of Marx--for example, their emphasis on the internationalisation and automation of production. Marxism, Derrida insists, will manifest a continuing "spectrality," an uncanny refusal to stay dead and buried, that is profoundly linked to the increasingly "spectral," immaterial, virtual nature of contemporary techno-capitalism.

Derrida's points are important ones, even if his insights into the multi-stranded nature of Marx's legacy are not original. Marxism is a diversity--so much so that it would be possible to speak, in exemplary postmodern fashion, not so much of Marxism as of 'the Marxisms.' This heterogeneity goes right back to the oeuvre of Marx himself. For Marx said and wrote different things at different times, not all of which are consistent, or--more importantly--all of which can be arranged to form different consistencies. In the historical development of Marxism these statements have been selected, permutated, and refracted into an array of very different, and sometimes fiercely antagonistic forms.

The Leninist strand was only one of these. Its historical pre-eminence over the last century has to be seen as resulting from a mutational process inherent in the relation of communist movements to the capitalism they struggle against. For in the war between capital and anti-capital the combatants are each constantly transforming themselves in order to answer or pre-empt the strategies of their opponent, spiralling in a 'bad infinity' of reciprocal reshaping that can only be broken if one finally extinguishes the other. Inherent in this process is an evident problem, for both sides, of mirroring and introjection--of becoming that which is opposed. Seen in this light, Leninism should be understood as a Marxism highly adapted--indeed, fatally over-adapted--to a particular moment of capitalist development--namely that of Fordist capitalism, with its characteristic Taylorist division of labour, industrial mechanisation and emphasis on 'mass organisation.'

As Karl Heinz Roth has argued, the Leninist party in its division of party managers from proletarian masses uncannily emulated the Taylorist division of labour.¹⁹ The Soviet state carried this mirroring yet further in its concept of socialism as 'soviets plus electrification,' its embrace of scientific management, the adoption of the stopwatch, the assembly line, its gigantism of industrial factories and standardisation of social life.²⁰ Ultimately, this led to a path of modernisation and forced industrialisation which under Stalin constituted nothing so much as a version--hideously enlarged to Russian, rather than English, and 20th, rather than 18th century, scale--of capitalism's era of so-called "primitive accumulation."²¹

As several commentators have pointed out, this process was, by capitalist standards, a great success--producing the fears, so current in the 1950s and now so long forgotten, that Russia and China would overtake the West in economic growth.²² The other

side of the coin, which I would emphasise, is that this introjection of capitalist norms of efficiency, labour discipline, industrialism and accumulation was, in communist terms, a catastrophic defeat--entailing the suppression workers' self-organisation and the bloody annihilation of every different form of Marxism which remembered this aspiration. State socialism thus became a competitor with, but not an alternative to, capitalism.

The eventual collapse of this regime (as opposed to its much earlier abnegation of revolutionary goals) was, as neoliberals claim, intimately related to the new information technologies and post-Fordist production techniques. For these reduced to global irrelevance the industrial, Fordist methods to which Bolshevism had so tightly bound itself. In this respect, the arms race in fact resulted in a victory for the West, not in the anticipated apocalyptic form of a nuclear exchange, but rather because military expenditures provided a super-stimulus to the development of the high technologies that formed the basis for a whole new stage of capitalist restructuring. Blinded by a deeply embedded 'factoryism,' unable to adjust an authoritarian regime of labour discipline suitable for digging canals or running assembly lines to what was needed for making computer software, and vainly trying to impose central state command on ever-proliferating international and domestic media channels, the Soviet state could not adapt to these new conditions, and disintegrated under the pressure of movements which, in their dissident use of samizdat and computer networks, manifested a quintessentially 'informational' subjectivity.

The reader will find no apologies or laments for 'actually existing socialism' here, no debate as to whether Stalin, Trotsky, Lenin, or Engels should be blamed for its failures, nor even any attempt to absolutely exonerate Marx from all the stain of its catastrophe. The question is rather whether there is anything else in the Marxist legacy with which to

confront our own informational commissars. For rather than identifying this disintegration of Bolshevism with the end of Marxism, it can be seen as opening a space within which other, repressed branches of the Marxist genealogy can emerge and blossom.

What makes this probable is that post-Fordist, informational capital exhibits tendencies to catastrophe and conflict perhaps even wider and deeper than those of the Fordist, industrial predecessor which beckoned Bolshevism into being. The unleashing of computerisation, telecommunications, and genetic engineering within a context of general commodification is bringing massive crises of technological unemployment, corporate monopolisation of culture, privatisation of knowledges vital for human well-being and survival, and, ultimately, market driven transformations of humanity's very species-being. In response to these developments are emerging new forms of resistance and counter-initiative. And insofar as the force which these movements find themselves in collision with is capitalism--perhaps a post-Fordist, postmodern, informational capitalism, but capitalism nonetheless, and not some post-industrial society that has transcended commodification--Marx's work can continue to provide participants in these struggles a vital source of insights. As Fredric Jameson has said in a slightly different context, "whatever its other vicissitudes, a postmodern capitalism necessarily calls a postmodern Marxism over against itself."²³

Indeed, in the last twenty-five years, over the very period of the post-Fordist, postmodern restructuring of capitalism, the theoretical elements of such a metamorphosised Marxism have, slowly, painfully, out of the experience of defeat and disintegration, been recomposing themselves. It is a Marxism that, learning from the failure of the Bolshevik experiment, draws from the multiplicity of Marx's writings threads different from those out

of which the Leninist flag was woven, and, moreover, transforms what it takes in the light of the new 'informational' conditions of exploitation and revolt. But this Marxism will mark a reappearance of the very spectre that capital has fled so fast into the future to avoid.

Deaths of Marxism II: The Post-Marxist Critique

Still, any such reconstruction of Marxism has to confront another line of criticism, coming not so much from the free-market neoliberals but from the so-called new social movements--feminism, green movements, anti-racist groups, gay and lesbian rights activists, and others. It is generally claimed that since at least the 1960s, these 'new' movements have displaced the 'old' working class struggles--with which Marxism was so closely identified--as the major source of social dissent in advanced capitalist societies.

This phenomenon, too, is often related to the new informational conditions of automation, computerisation and media-saturation. For many 'social movement theorists,' from Alain Touring through Alberto Melissa to Timothy Luke, the new forms of social upheaval are specifically linked to the advent of a postindustrial order, in which manual labour plays a diminishing role, and the emergence of unprecedented forms of technocratic power elicits novel forms of struggle beyond the ken of conventional class analysis.²⁴ Such 'anti-technocratic' interpretations may not reflect the self-understanding of many feminist, anti-racist, environmental or peace activists. But what is certain is that from these movements, and their academic interpreters, has come a devastating indictment of Marxism's claims to be in forefront of social struggle.

In Marxism, these critics say, people are understood reductively, solely in terms of class-identity--that is, their position within an economic system of production. But this

view strips them of gender, race, culture, or significant relation to nature. This reductionism is reinforced by the totalising nature of Marxist theory--its claim to map and account for the entirety of social relations. Taken together, this totalising, reductive perspective generates a series of disastrous theoretical omissions and repressions: blindness to patriarchy and racism, denial of cultural diversity, scientific triumphalism. From these theoretical flaws flow the often catastrophic record of actual Marxist regimes and parties in terms of sexism, ecological despoliation, and totalitarian repression.

The result of this critique has been the increasing fashionability amongst the left of a "post-Marxist" position of the sort most famously theorised by Ernesto Laclau and Chantal Mouffe.²⁵ This decisively rejects the centrality Marx ascribes to issues of capital and class, now dismissed as the result of a crude, mechanistic economic determinism. In its place is proposed a new lexicon of difference and discourse. Class relations are no longer 'privileged,' but rather seen as only one amongst a diversity of semiotically constructed identities. The extraction of surplus value is simply included within a range of dominations and oppressions (sexism, racism, homophobia, industrialism) none of which can be accorded any priority over the other. Progressive politics has to be rethought on a more plural and populist basis, as a series of variegated struggles against numerous distinct relations of subordination, but all of which may be related in a project not of revolution but of "radical democracy."²⁶

Although my differences with theorists such as Laclau and Mouffe will rapidly become evident, it should be said at once that I find many of the criticisms levelled by social movement activists against Marxism telling. In the pages of Marx himself there are major blindspots to issues of gender, ethnicity and the destruction of nature. That these are

characteristic of his age does not diminish the seriousness of their consequences. Indeed in many respects such problems have been magnified, rather than corrected, in the later development of the Marxist tradition. Why not then just say 'goodbye to all that?' Or, at the very least, adopt the sort of post-Marxist position in which analysis of class and exploitation, rather than occupying a crucial position, is deployed eclectically alongside other approaches?

To this the short answer is: because of capitalism--unfinished business of a serious magnitude. Post-Marxists have seriously mistaken the target of their attack. The major source of practical, brutally-effective reductionism and totalisation at work on the planet today is not Marxism, but the world market, now enabled by computer networks, satellite broadcasts, just-in-time production and high-tech weaponry. This is a system based on the imposition of universal commodification, including, centrally, the buying and selling of human life-time. Its tendency is to subordinate all activity to the law of value--the socially imposed law of exchange. It relates a monological master-narrative in which only money talks. Such a system operates by process of massive reduction--Marx called it "abstraction"--which perceives and processes the world solely as an array of economic factors. Under this classificatory grid--this 'classing' of the world--human subjects figure only as so much labour power and consumption capacity, and their natural surroundings as so much raw material. This reductionism--the reductionism of capital--has today a totalising grip on the planet unlike any other. Other dominations, too, are reductive--sexism reduces women to objects for men, racism negates the humanity of people of colour. But neither patriarchy nor racism has succeeded in knitting the planet together into an integrated, co-ordinated system of interdependencies. This is what capital is doing today,

as, with the aid of new technologies, it globally maps the availability of female labour, ethno-markets, migrancy flows, human gene pools, and entire animal, plant and insect species onto its co-ordinates of value.

In doing so, it is subsuming every other form of oppression to its logic. Contrary to the post-Marxist belief that different kinds of domination politely arrange themselves in a non-hierarchical, pluralistic way the better not to offend anyone's political sensibilities, capitalism is a domination that really dominates. This is not to say--as Marx and many later Marxists sometimes suggest--that the corrosive power of commodification necessarily abolishes patriarchy or sexism (although it can sometimes work in that direction). Indeed, it is possible now to see much better than Marx in his day could how the capitalist international division of labour often incorporates, and largely depends on discrimination by gender or ethnicity to establish its hierarchies of control.

Nevertheless, sexism and racism do not in-and-of themselves act as the main organising principle for the worldwide production and distribution of goods. Patriarchal and racist logics are older than capital, mobilise fears and hatreds beyond its utilitarian economic understanding, and are virulently active today. But they are now compelled to manifest themselves within and mediated through capital's larger, overarching structure of domination: as market-racism, commodity-sexism. Class--capital's classification of its human resources---does tend to assert itself as definitive of social power. It is indeed 'privileged' in all senses of the world--not because of any essential, ontological priority of economics over gender, ethnic, or ecological relations, but because of society's subordination to a system that compels key issues of sexuality, race and nature to revolve around a hub of profit.

Looked at in this way, the conventional division between `old' class politics and `new' social movements seems profoundly mistaken. Capital is a system inimical not only to movements for higher wages, more free time or better working conditions--classic labour objectives--but also to movements for equality-in-difference, peace and the preservation of nature. This is not because it creates racism, sexism, militarism or ecological despoliation, phenomena whose existence handsomely predates its appearance, but rather because it treats them only as opportunities for or impediments to accumulation. Because capital's a priori is profit (its own expanded replication), its logic in regard to the emancipation of women, racial justice or the preservation of the environment is purely instrumental. The prevention of male violence toward women, the saving of rain forests, or the eradication of racism is a matter of bottom line calculus: tolerated or even benignly supported when costless, enthusiastically promoted when profitable, but ruthlessly opposed as soon as they demand any substantial diversion of social surplus. Hence capitalism is antithetical to any movements for whom these goals are affirmed as fundamental, indispensable values.

In this respect, the 1980s and early 1990s have been perversely illuminating. Any belief that the advent of the new social movements marked a transition from the `old' struggle over social surplus must crumble away in the face of neoliberalism's doctrinaire reaffirmation of the market, attack on the welfare state, and unconstrained expansions of commodity exchange. Over this period virtually every objective of social movements--wilderness preservation, equal pay for women, funding for day-care, battered women's shelters, or AIDS education--has had to be fought for, often lost, in the teeth of governmental and corporate insistence on the primacy of austerity, restraint, cutbacks

required by global competition and the reestablishment of wavering profit rates. Insofar as there have been victories, cracks in the reductive logic of capital, it is usually only because movements have been prepared to challenge the overriding priorities of corporate growth in the name of other, differing visions of societal good.

In a bold metaphor, John McMurtry has recently referred to this era as "the cancer stage of capitalism."²⁷ Previously restricted by the 'communist threat' and workers' movements, capital has now, he argues, entered into phase of uncontrolled expansion marked by global mobility and the explosion of financial speculation divorced from any productive function. This process is attacking the social institutions that maintain public health and life in a way analogous to the metastasising encroachments of tumorous cells on a human body. Capital, McMurtry says, is engaged in a systematic subversion of the "social immune system."²⁸ Environmental despoliation, unemployment, the redistribution of income from poor to rich and the dismantling of public forms of life--provision are the symptoms of a malignancy which diverts more and more social resources to fuel its own growth:

Indicative of the classic pattern of cancer mutation and spread are the synergistic effects of money capital's cumulative destruction of the planet's basic conditions of life (air, sunlight, water, soil, and biodiversity), its increasingly aggressive invasions and assaults on social infrastructures and self-protective systems of life sustenance and circulation, its systemic intolerance of bearing the costs of maintaining social and environmental carrying and defence capacities, and its rapidly escalating, autonomous self-multiplication that is no longer subordinated to any requirement of life-organisation.²⁹

McMurtry remarks that the essential problem of such a cancerous form of growth is that "the host body's immune system does not effectively recognise or respond to the cancer's challenge and advance."³⁰ In the case of capitalism, this occurs because the surveillance and communication systems of host-social bodies across the world--i.e. their mass communication and education systems--are themselves subordinate to transnational capital, and largely reject and refuse to disseminate messages that identify the source of the disease.

The academic fashionability of post-Marxism is an aspect of this failure of recognition and response. In its refusal to acknowledge the full depth of capitalism's subsumption of the planet, and in its dismissal of the very political and intellectual tradition that has consistently applied itself to this issue, it is part of a problem of globally life-threatening dimensions. But a reinvented Marxism, one that learns from the new social movements without forgoing its focus on the contradictions specific to capitalism, could be part of the solution.

Back to the Laboratory

This book aims to assist such a reinvention. I imagine it as a laboratory investigation, disinterring seemingly long-dead strands of theoretical DNA coiled within Marx's texts, and exposing them to new mutations. This metaphor of course betrays the influence of biotechnological science-fiction movies such as Jurassic Park or Alien Resurrection. But the story line made familiar by these films has, I think, to be significantly altered. Hollywood's reanimation fantasies tell of inhuman terrors brought back from the past, or from extra-terrestrial origins. To grasp the situation of late capitalism, however,

we must imagine a planet, our planet, on which the dinosaurs (obvious metaphorical figures for the gigantic, alienated powers of global corporations and financial institutions) have lived-on well beyond their appointed time of extinction. The hominid population has by some catastrophic evolutionary detour (in terms of our trope, the failure of early socialisms) been diverted from attaining its full development. It now endures a stunted and terrorised existence, scurrying around the feet of these monsters. The emergence of a truly human form of life, free from chaotic violence and arbitrary predation, becomes conceivable only by genetic experimentation aimed at reviving certain near-extinguished lines of species-being--or, to translate again from the biological to the political, by rediscovering the possibility of a collective, communist transformation of society.

In attempting to recover some of theoretical cell-matter for such a transformation, this book proceeds as follows. The second chapter reviews the work of the heirs of Babbage--today's information revolutionaries. Looking at a line of social theorists that runs from Daniel Bell to Nicholas Negroponte, it shows how these thinkers conceive of informatics as a high-technological 'fix' for the conflicts and crises of capitalism--and how their theories have developed in an antagonistic dialogue with the spectre of Marxism.

The third chapter turns to the Marxist reply to such theories. Starting with an examination of tensions and contradictions around the technology issue in the work of Marx himself, it investigates how these have been developed in very different directions by various Marxian schools and tendencies--'scientific socialists,' 'neo-Luddites,' and 'post-Fordists'--and suggest why none of these represent an adequate answer to the challenge of the information revolutionaries.

Having taken foes and friends alike to task, it is clearly now time for me to show my own hand. Chapter four therefore introduces the perspective which has substantially shaped my thinking on these issues--that of 'autonomist Marxism.' After briefly explaining why I believe this theoretico-political current offers a way beyond the impasse depicted in the previous two chapters, I use the autonomist concept of 'cycles of struggle' to offer an historical analysis that locates the origins of the information society in the conflict between labour and capital, and examines current controversies about class composition in a digitalised era.

Chapter five adopts a more synchronic approach: it proceeds around the 'circuit of capital,' examining the conflicts that attend the informationalisation of production, consumption, social and ecological reproduction, finishing with a look at the cyberspatial realm which increasingly provides a medium both for capitalist control and for the 'circulation of struggles.'

Chapter six expands the territorial scope of the study, so far focussed principally on conflicts within the so-called advanced or developed world and takes up the international dimensions of resistance to high technology capital: it examines 'globalisation' and argues that this process, in which new communication technologies obviously play a central role, can only be understood in terms of two conflicting vectors: the expansion of the world--market and countervailing, oppositional movements increasingly linked in what I term "the other globalisation."

Chapter seven shifts register from the technological to the cultural, and takes up the issue of 'the postmodern.' Building on the analysis of others who suggest that postmodernist thought can be seen as response to world radically restructured by high-technology capital,

I suggest that a new critical analysis of the "postmodern proletariat" opens horizons beyond the traditional theoretical polemics between postmodernists and Marxists.

Chapter eight raises the issue of how computers and other information technologies might play a part in the constitution of a post-capitalist society. Here I consciously break with many other autonomist analysts--who have often, and justly, been reticent about utopian speculations--and make some futuristic proposals of my own about the possible form of an information-age communism.

Finally, chapter nine returns to Marx's category of "general intellect. " It examines more closely his formulation of this concept in the Grundrisse, and then turns to recent reworkings of it by intellectual-activists associated with the French journal Futur Antérieur. Drawing on their work, I review the overall dynamic of conflict in high-technology capitalism. I then turn to look at the situation of universities, which, along all other forms of educational and knowledge-transmitting institutions, are being rapidly transformed by the capital's information revolution, and conclude by assessing the possibilities for academics, such as myself, to intervene in the "contest for general intellect."

Notes

¹ William Gibson and Bruce Sterling, The Difference Engine (New York: Bantam, 1991).

² Gibson and Sterling 293.

³ Simon Schaffer, "Babbage's Intelligence: Calculating Engines and the Factory System," Critical Inquiry. 21 (1994): 203-227.

⁴ "The Babbage principle" asserted that the benefit of the division of labour is not solely increased productivity, but the cheapening of labour that arises from the establishment of a hierarchy of wages. On this topic, see Harry Braverman, Labour and Monopoly Capital: The Degradation of Work in the Twentieth Century (New York: Monthly Review, 1974) 81, 85-88.

⁵ Schaffer 210.

⁶ Schaffer 225.

⁷ Karl Marx, Capital: A Critique of Political Economy vol. 1 (New York: Vintage Books, 1977) 470, 553.

⁸ Andrew Ure, The Philosophy of Manufactures (London, 1835) 367-70. Cited by Marx, Capital, vol. 1, 564.

⁹ Marx, Capital, vol. 1, 563.

¹⁰ Karl Marx, Capital: A Critique of Political Economy, vol. 3 (New York: Vintage Books, 1981) 198-199.

¹¹ Marx, Capital, vol. 3, 199.

¹² Marx, Capital, vol. 3, 199

¹³ Marx, Grundrisse (Harmondsworth: Penguin, 1973) 690.

¹⁴ Marx, Grundrisse 705.

¹⁵ Marx, Grundrisse 706.

¹⁶ Marx, Grundrisse 700.

¹⁷ Francis Fukuyama, The End of History and the Last Man (New York: Macmillan, 1992).

¹⁸ Jacques Derrida, Specters Of Marx: The State of the Debt, the Work of Mourning, and the New International (London: Routledge, 1994).

¹⁹ Karl Heinz Roth, L'Autre Mouvement Ouvrier En Allemagne 1945-1978 (Paris: Christian Bourgeois, 1979).

²⁰ For general critique of the Bolshevik record see Maurice Brinton, The Bolsheviks and Workers' Control 1917 to 1921: The State and Counter Revolution (Montreal: Black Rose, 1975); for a specific discussion of Lenin's attitude to technology see Langdon Winner, Autonomous Technology: Technics-out-of-Control as a Theme in Political Thought (Cambridge: MIT Press, 1977) 268-276, and for broader views of the Soviet state's attitudes to technological development, Steve Smith, "Taylorism Rules OK? Bolshevism, Taylorism and the Technical Intelligentsia in the Soviet Union 1917-41," Radical Science Journal 13 (1983): 3-27, and the essays in Technology and Communist Culture: The Socio-Cultural Impact of Technology Under Socialism, ed. Fredric J. Fleron Jr. (New York: Praeger, 1977). On the U.S.S.R. and Fordism, see Robin Murray, "Fordism and Post-Fordism," New Times, ed. Stuart Hall and Martin Jacques (London: Lawrence & Wishart, 1989). 38-54.

²¹ Marx, Capital, vol. 1, 872-876.

²² This point is made by Fredric Jameson, "Actually Existing Marxism," Marxism Beyond Marxism, ed. Saree Makdisi, Cesare Casarino, & Rebecca E. Karl (London: Routledge, 1996) 14-54, and by Michael Hardt and Antonio Negri, The Labor of Dionysius: A Critique of the State-Form (Minneapolis: University of Minnesota, 1994).

²³ Jameson, 54.

²⁴ Alain Touraine, The Post-Industrial Society: Tomorrow's Social History: Classes, Conflicts and Culture in the Programmed Society (New York: Random House 1971); Alberto Melucci, Nomads of the Present: Social Movements and Individual Needs in Contemporary Society (Philadelphia: Temple University Press, 1989); Tim Luke, Screens of Power: Ideology, Domination and Resistance in an Informational Society (Urbana: University of Illinois, 1989).

²⁵ Ernesto Laclau and Chantall Mouffe, Hegemony and Socialist Strategy: Towards a Radical Democratic Politics (London: Verso, 1985).

²⁶ Laclau and Mouffe, 176.

²⁷ John McMurtry, "The Cancer Stage of Capitalism," Social Justice, n. pag., online, Internet, PEN-L, 24 July, 1996.

²⁸ McMurtry, n. pag.

²⁹ McMurtry, n. pag.

³⁰ McMurtry, n. pag.