CYBORG WORLDS
the military information society

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'... an association in which the free development of each is the condition of the free development of all'

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Towards a Military Information Society?

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All of us are already citizen soldiers, without knowing it.
And some of us know it. The great stroke of luck for the military class's terrorism is that no one recognizes it.
People don't recognize the militarized part of their identity, of their consciousness. (Virilio and Loungier, 1983)

The notion of a 'military information society' may seem a contradiction in terms. After all, the Information Age promises us greater freedom, while things 'military' suggest orders to be obeyed.

As we shall argue, there is inner connection between the two, regarding the kinds of discipline involved. It is not simply a hierarchical command exercised by high-tech managers and military officers alike. It is also an internalized self-discipline, geared to making a system operate more effectively. Through the mediation of computer simulation, such a system seeks total control over a world reduced to calculable, mechanical operations.

As we shall also argue, this involves disavowing human qualities not so easily reducible - or, rather, redefining them according to computer metaphors. Through infotech, military models of reality appeal to widespread illusions of omnipotence, of overcoming human limitations, even as they conceal our relative impotence. Computer-based models of war, work and learning can promote military values, even when they apparently encourage the operator to 'think'. In all those ways, we are presently headed towards a military information society, which encompasses much more of our lives than we would like to acknowledge.

This essay draws connections between military-based discipline and people's experience of infotech. Our argument here proceeds by way of surveying those writers who have most contributed to such a critical
approach or who have expounded the agendas that most warrant criticism. We begin by suggesting how military paradigms have served to shape our society. Then we describe how an emerging military-cybernetic complex influences forms of automation, at the same time as futurologists promise us a cybernetic liberation fulfilling our basic nature, or even improving upon it. In theory and in practice, such schemas reduce the individual to the ‘human component’, the ‘vigilant operator’ of a system – a role for which we are being prepared by recent educational reform and training programmes. Lastly the essay explores the psychic, unconscious dimension of the resulting ‘cyborg self’, and asks how we might find a way out of this possible future.

MILITARY PARADIGMS

Most social-science research ignores the profound effects of war and war preparation upon our culture. Military activities are considered to be exceptions or interruptions. Some commentators, however, have treated the military paradigm as the key to understanding social development.

As Max Weber observed (1948), ‘The discipline of the army gives birth to all discipline.’ The military serves as a model for the organizational imperative ‘that the obedience of a plurality of men is rationally uniform’. From that base, Weber argued, it has developed a pervasive impact upon the broader social order: ‘No special proof is necessary to show that military discipline is the ideal model for the modern capitalist factory, as it was for the ancient plantation.’ The scientific management of both army and industry requires rational calculation and impersonal regulation. In both spheres, ‘the psycho-physical apparatus of man is completely adjusted to the demands of the world, the tools, the machines – in short, to an individual “function”’. Discipline aspires towards the rational conditioning of performance, towards uniform and predictable behaviour.

Lewis Mumford (1964), too, assigned a central role to the military, particularly its development of ‘authoritarian techniques’, which ‘created complex human machines composed of specialized, standardized, replaceable, interdependent parts’. Work armies and military armies ‘raised the ceiling of human achievement: the first in mass construction, the second in mass destruction’. Mumford (1967) argued, moreover, that coercions of a military character permeated and shaped all social activities. The whole social structure was organized as a megamachine, ‘composed of living, but rigid, human parts, each assigned to his special office, role, and task, to make possible the immense work output and grand design of this great collective organization’. And the army was the fundamental model for this generalized megamachine. The system is devoted to control, above all else.

Mumford saw the modern fulfilment of that control mission in the form of cybernetic systems. ‘Through mechanization, automation, cybernetic direction’, he wrote (1964), ‘this authoritarian technics has at last successfully overcome its most serious weakness: its original dependence upon resistant, sometimes actively disobedient servo-mechanisms, still human enough to harbour purposes that do not always coincide with those of the system.’ The centre of authority is shifted from human operators to the system itself. And the objective of this “systems-centred collective, this Pentagon of power... is to displace life, or rather, to transfer the attributes of life to the machine and the mechanical collective, allowing only so much of the organism to remain as may be controlled and manipulated”.

As Anthony Giddens (1985) argues, it is not just that the modern nation-state has depended upon the military for its control over the means of external and internal violence. It is also the case that war and war preparation have been both the stimulus and paradigm for the State’s organization of resources, as well as for industrial organization: ‘The merging of industry, technology and the means of waging war has been one of the most momentous features of processes of industrialization as a whole. More than simply serving military needs, industry tends to model itself after the military.

The technological mediations are explored by Paul Virilio and Sylvère Lotringer (1983), who raise questions about the technics and culture of warfare, about military logistics and control, about the space and speed and time of war. Labelling this process the ‘military/scientific/economic complex’, they argue that we have now arrived at ‘pure war’, the total militarization of society; after all, hasn’t the war machine’s technology invaded the heart of industrial society? Such an inquiry evokes emotional resistance: ‘to be interested in technology through war already makes people suspicious: war is generally considered a negative phenomenon, and technology a positive one’. Yet the war machine is inscribed with a powerful ‘technologic’ of rationality and cold efficiency, of ‘unbridled intelligence which gets its absence from limits from technology, from science’.

War is significant not only in its execution, but also in its constant preparation. As Virilio further argues (1986), it is about ‘setting in place a series of automatisms, reactionary industrial and scientific procedures from which all political choice is absent’. Although he goes too far in attributing total success to the control project, and too far in attributing that success to automated systems replacing humans, he rightly emphasizes the role of military models in narrowing political choices throughout all our institutions.

Indeed, the military has had a totalitarian impact on our society. It has colonized both physical and psychic space. The economy’s orientation to war preparation, its methods of incorporating people into a technological system, and its models of social organization: all these levels embody a
THE MILITARY-CYBERNETIC COMPLEX

As is well known, the new technologies involved in this grand social project have gained impetus from enormous military expenditure. David Noble (1984) has documented how, in the period after World War II, 'the permanent war economy and the military-industrial complex affixed the military imprint on a whole range of heretofore industrial and scientific activities, in the name of national security'. Research and development, science and technology policy, economic and industrial policy: all have been shaped by military imperatives.

Most recently, since the late 1970s, the US Air Force has funded a programme for Integrated Computer-Aided Manufacture (ICAM). Earlier programmes, for numerical control of machine tools, had degraded shopfloor workers' skills by automating machines and transferring judgement to management level, in the name of enhanced efficiency. ICAM extended that logic in order to solve the resulting problems, perceived as managerial inefficiency. ICAM promised 'to free management from executing routine duties to do creative work' - apparently unlike the deskillling of manual workers. By reducing paperwork as well as shop-floor power, ICAM sought to fulfill the dream of 'push-button omnipotence in the factory of the future' (David Noble, 1984). And this programme was intended to serve as a model for all of US industry, to free production from the need for constant human intervention.

Developed into software packages by Honeywell and IBM, ICAM-type systems are designed to translate new information automatically into altered instructions for production, on a 'real-time' basis. In the case of General Electric's plant at Lynn, Massachusetts, dubbed the 'Factory of the Future', management personnel started doing all the computer programming, and all production was to be centralized through a computer positioned on a mezzanine overlooking the shop-floor operations (Centre for Productivity Enhancement, 1987). This type of automation encountered much worker resistance, expressed through the local union. It has been suggested that the Lynn plant's problems arose also from middle management's refusal to cooperate with its own demise, in a new system which assumes that everything works perfectly (Emspak, personal communication, 1989).

Such difficulties in increasing productivity hardly slow the advance of automation, however, as many US firms accept the dictum: 'automate, emigrate or evaporate'. Some attempt to cut costs through military assistance for high-tech investment, rather than risk winning no contracts at all.

From the early 1980s, the US military has won industrial recruits by offering firms direct subsidies to modernize their technology, in return for
providing military supplies at lower costs. Set up by the Air Force's Electronic Systems Division (ESD), the deal has been called 'Productivity Realized through Incentivizing Contractor Efficiency', or GET PRICE for short. It stipulated that either side could propose ways for the other to help unleash productivity. The ESD's ex-Commander, Lt-Gen. James Stansberry, has proclaimed, 'Every time I look at an area, there's something that can be improved. It isn't just a matter of automation or too much material. It is attitudinal more than anything else.' On the other side, a General Electric plant manager noted, 'Rather than just buying a new machine, we developed a holistic management style. We asked if the solution was in equipment, or process, or people, or management, or computers.' (Ball, 1984).

Through a militarized version of holism, GET PRICE leads a relentless drive for management to discipline itself and its work-force to a system's automatic logic. In the USA, at least, military funding pushes firms to pursue the chimera of total control in the 'factory of the future'.

Beyond the USA, the war industry is becoming a multinational military-industrial complex. John Lovering (1987) describes the formation of a new 'Atlantic arms economy', with a whole new global system of military, administrative and industrial institutions: 'On the side of demand this apparatus is an instrument for harmonizing military strategies, thereby creating massive unified arms markets. On the side of supply, it is the framework within which huge international concentrations of capital are being forged out of formerly fragmented national units, to exploit those markets.'

For example, when the British helicopter firm Westland was declared inviable and came up for sale in 1985, government ministers divided over rival bids from US and European firms. The strange public split becomes more intelligible when one critic, Richard Ennals (1986), observed that Westland's sale to the US bidder Sikorsky would make it more attractive for SDI contracts, in a pattern that the government might apply to British Leyland as well. These manoeuvres coincided with a secret 'Memorandum of Understanding', dated December 1985, under which the British government agreed to keep SDI-related research 'secret in perpetuity'. Although the leak of the document resulted in the Memorandum's demise, this episode illustrates the military pressures exerted upon the direction of inoftech research and industrial restructuring.

The great expenditures involved are continually justified by a military logic of total control over uncertainty, indeterminacy and insecurity. Its systemic model is CI - 'command, control, communications and intelligence' - a philosophy of struggle to shape reality through surveillance and information gathering on those labelled the enemy. This authoritarian technics is turned not only against other countries but also against the internal population.

In a context of continuous mobilization lacking popular enthusiasm, the State must fear and discipline its own population in the name of protecting it. Surrendering our freedom appears the unavoidable price we pay for accepting State protection from those who supposedly threaten that freedom. This totalitarian logic of security lies at the heart of political rule; it extends widely across social systems and deeply into human experience.

**CYBERNETIC LIBERATION?**

The security syndrome has been extended to the point of modelling the entire society as a system needing more sophisticated management of its technical parameters. Like the military terrain itself (analysed in this book by Paul N. Edwards), society becomes a closed world in which the enemy is inefficiency, disorder, dysfunction. The projected solution, cybernetics, promises to overcome all such instabilities.

Accordingly, Richard Wolin (1984/5) has described late capitalism as a 'brave new world of systems theory cybernetics', a bureaucratic-technocratic colonization. The scientific turn of Enlightenment rationality has brought us to the point of a cybernetic society, where individual autonomy is seen to threaten chaos, disruption. In search of order and stability, administrative-technical imperatives are handed down to the cybernetic citizen, thus programming the individual's contribution to the society.

Lest this fate be resisted as totalitarian, futurologists have sought to persuade us that systems logic guarantees real freedom and democracy. Rooting his work ultimately in the 'cybernetics laws of nature', cybernetician Stafford Beer developed a massive computer model of the social system - 'the Liberty Machine'. How was it to work?

There ought to be a set of operation rooms, strategically placed in relation to the spread of the system concerned. These rooms would receive real-time data from the systems which they monitor, and they would distil the information content. Using this input to drive models, the people inside the rooms would formulate hypotheses, undertake simulations, and make predictions about world trajectories. The meta-control is of course constituted by the linkage of these rooms across the subsystems - using colour television, and a network of fast-acting real-time computer terminals. (Beer, 1971, p. 347)

His vision draws its inspiration from military systems:

Do we not already have systems looking very much like this - which were built in the cause of defence [sic]? Do we not have 'hot lines' - installed on the premise that the organizational stereotype called diplomacy will not
work in the face of the fast-acting thermonuclear threat, and that knowledge must constitute action? (pp. 347-8)

Is it a coincidence that he takes his model of liberty from the management of superpower nuclear confrontation? As the military system becomes paradigmatic, so do the Enlightenment ideals of freedom and progress become appropriated as technocratic expressions of the new cybernetic vision. For Bier, 'liberty may indeed be usefully redefined for our current technological era. It [liberty] would say that competent information is free to act - and that this is the principle on which the new Liberty Machine should be designed ... [it is] the frustration of competent information, inhibited from action, that forestalls progress.' In this Newspeak, control is freedom.

Here individual freedom is redefined through an information system. People become bearers, transmitters and agents of 'information'. As analysed in Marx's critique of commodity fetishism (1976), the products of human labour become invested with superhuman powers and take on a life of their own: information becomes the subject of history. And the 'hot line' analogy serves as threat and promise, warning us of the terrible consequences if we fail to let information act, in real time.

A more recent schema, James Beniger's The Control Revolution (1986), similarly models society as a system, also rooted in nature. According to him, industrialization precipitated a 'crisis of control, a period in which innovations in information-processing and communication technologies lagged behind those of energy and its application to manufacturing and transportation'. As economic and political control was lost at the local level, this crisis called up new forms of communication to control an economy shifting from local segmented markets to higher levels of organization - what might be seen as the growing 'systemness' of society'.

Here society becomes a cybernetic machine, a programmed and programmable processing system. Control is defined as 'purposive influence towards a predetermined goal', understood in a purely technical sense, acknowledging no possibility of contrary goals, partisan goals. For fulfilling the system's unitary goal, salvation lies in more technology: 'Because both the activities of information processing and communication are inseparable components of the control function, a society's ability to maintain control - at all levels from interpersonal to international relations - will be directly proportional to the development of its information technologies.'

For Beniger, moreover, these particular human activities provide the universal basis of organizational coherence; they are rooted in 'the nature of all living systems ... in individual cells and organisms no less than in national economies or any other purposive system'. After all, he observes, 'All living systems must process matter and energy to maintain themselves counter to entropy, the universal tendency of organization toward breakdown and randomization.' The cybernetic model is naturalized, that is, projected from capitalist society to on nature. Once the model is discovered to be the prerequisite of any society, information-processing devices - be they microchips or bureaucracies - become great leaps forward in evolutionary progress.

The concept of counting entropy was also a reference point for Norbert Wiener when he coined the term 'cybernetics' (from the Greek term for pilot or, latterly, governor). In his book Cybernetics: Or Control and Communication in the Animal and the Machine (1948), he compared animals and machines by their similar methods of controlling the tendency for entropy to increase. 'Feedback loop' could describe the homeostatic processes of warm-blooded animals, as of a thermostat. Later he called these 'locally anti-entropic processes, which perhaps may also be exemplified in many other ways which we should naturally term neither biological nor mechanical' (Wiener, 1954). His scheme allowed a space for ambiguity between nature and artifice, rather than reduce one to the other.

Having refused to continue his war-related research into the Cold War era, Wiener intended cybernetics for human liberation, through such applications as prosthetics to compensate handicapped individuals for a lost sensory mode, and even biochemical prosthetics. Like any science, Wiener's involved anthropomorphic projections, but he did not go as far as to reduce the human mind or social organization to mechanical models. When cyberneticians soon did precisely that, they foreclosed the broad issue of human purposes, in favour of the inhuman use of human beings, against which Wiener warned.

As Steve J. Heims has noted, '... the subjective - an individual's cumulative experience, sensations and feelings, including the subjective experience of being alive - is belittled, seen only within the context of evolutionary theory as providing information useful for survival to the organism... If shorn of Wiener's benign philosophy, what remains of cybernetics can be used within a highly mechanical and dehumanizing, even militaristic, outlook' (in Wiener, 1989). Thus cybernetics can reduce people to an anti-entropic teleology, supposedly embodied in command-and-control systems, as in the human mind and nature itself.

The computer metaphor exerts great power over the late twentiethcentury social imagination. As one enthusiast observed, even before the Information Age was officially declared, 'notions that the brain is like a computer, that man is like a machine, that society is like a feedback system, all reflect the impacts of cybernetics on our idea of human nature' (Neisser, 1966). As new technologies increasingly structure organizational rationalization and impersonal social regulation, the computer metaphor becomes
invested with illusions of omnipotence. Meanwhile people are reduced to a 'human component', as epitomized by the military weapons system.

THE HUMAN COMPONENT

Do not metaphors illuminate in both directions? As nature came to seem more like a machine, did not machines come to seem more natural? (Harding, 1986)

In the military weapons system we find the most extreme expression of a system that reconstitutes human subjectivity as 'human materiel', not entirely distinguished from equipment. As Douglas Noble (1988) has argued, the weapons system has been paradigmatic for a 'new view of man', one in which 'a person is regarded as a 'human component' within the 'personnel subsystem' of complex 'man-machine systems'. Human and machine components, operating in programmed interaction, are seen as interfacing parts of an encompassing psycho-technological network.

Mary Kaldor (1980) suggests that the concept of weapons system may be likened to the replacement of tools by machines: 'Whereas formerly the weapon was the instrument of man, it now appears that man is the instrument of the weapons system: for a weapons system demands a rigid technical division of labour that admits of little variation in the social organization of the men operating it.' Yet there is always a tension between the need for rigid command and flexible response to unpredictable threats.

For that reason, the logic of advanced weapons systems requires that the human component is either upgraded or marginalized. As ordinary soldiers might prove vulnerable and unreliable, a 'super-soldier' is created to satisfy the system's needs. The military now enlists 'techniques that might help troops handle stress, work cohesively, learn skills faster, and fight more effectively', such as biofeedback, split-brain learning, stress management, sleep learning, and even ESP (Miller, 1988). As Chris Gray demonstrates in this book, training programmes attempt to integrate mechanical qualities of endurance with human qualities of intelligent 'quick-response', to shape a new model soldier who behaves as if he were a cybernetic organism.

While one strategy is to overcome human fragility, the other is to eliminate the weak link from the system. As the system's demands are seen to exceed human capability, there has been a drive to introduce automated, 'intelligent' and autonomous weapons systems. Designed to respond to threats in real time, these systems use remote-control cybernetic technologies to transcend human limitations. Yet proponents and even some anti-militarists have overestimated the reliability of these systems (as argued by Tom Athanasiou in this book); the human component can never be fully dispensable.

TOWARDS A MILITARY INFORMATION SOCIETY

The weapons system's dual strategy - alternatively disciplining and withdrawing the human component - is becoming paradigmatic for the entire society, even for our sense of identity. Moreover, the idea of the self as machine has recurred as a pervasive phantasy - realized in harsh reality through the historical development of capitalist technologies. Prime examples have been the Taylorist and Fordist organization of work, in turn derived from military projects (Smith, 1985).

A decisive stage in mechanizing the human was reached in the early twentieth century through the efforts of 'Scientific Management'. Its founder, F. W. Taylor, developed a form of behavioural engineering that treated the body as a machine. To do this, argues Bernard Doray (1988), it was 'necessary to objectify the human subject, to reduce it to complexity and to regard it not as something which speaks to another subjectivity, but as a concrete and desubjectivized manifestation of laws revealed by natural abstractions'. The consequence is an alienating condition, 'Taylorism man', characterized by a 'divorce between that part of his body which has been instrumentalized and calibrated and the remainder of his living personality'. With Fordism, that mind/body split was further structured by the assembly line, a continuous-flow production system.

In the late twentieth century we are seeing control extended to 'the remainder' of the living personality. Behavioural engineering is raised to a new level; mind, along with body, is objectified and instrumentalized. 'In post-industrial capitalism', writes Bill Nichols (1988), 'the human is defined in relation to cybernetic systems - computers, bio-genetically engineered organisms, eco-systems, expert systems, robots, androids, cyborgs'.

Moreover, through the science of cybernetics, the principle of organic life itself is defined on a continuum with that of computational machines. The mechanization of self is intensified through an ontology which assigns a common basis to biology and cybernetics. As the mind is conceived as a computer program, as something estranged, modelled on mechanical virtues, so does 'the remainder' of human subjectivity become further amenable to discipline.

VIGILANT OPERATOR

What kind of discipline? Attempts simply to deskill operators with yet more extreme automation have run up against the limits of supposedly perfect technology, which always turns out to require more human intervention than its designers had anticipated. Moreover 'the remainder' of subjectivity has a tendency to resist the menial or routine role assigned to the body.

An alternative strategy has attempted to plan for 'intelligent' human intervention by 'reskilling' the operator in terms set by the cybernetic system. This reconstitutes the worker's judgement, perhaps even inventive-
ness, as a creative force, now integrated symbiotically with the system's needs. It means reinvigorating the operator's intellect in executing or even designing tasks. Now 'You are paid to think', defined as a suitably flexible, rapid response to the acknowledged unpredictability of the system, for optimal achievement of its goals.

This strategy has been led by the military, as with the 'cyborg soldier', though the model has been extended more widely. The military can be seen as paradigmatic for the 'flexible integration' with which futurologists euphemistically celebrate this 'post-Fordist' advance in capitalist work-organization. If we consider the intensified demands that the system makes upon the intellect and stamina of the worker, now called a technician or 'staffer', we may be justified in calling this a cyborg model of self-discipline. The demeaning effects can be seen in workers' experience of the 'Japanese model' at Nissan-UK (Holloway, 1987) and of the 'team concept' at General Motors, where the work-force accept responsibility for tailoring their own jobs (Parker and Slaughter, 1988).

Military developments in cognitive self-discipline are also embedded in the 'computer literacy' that is being promoted as a means for making the learner more employable, or even an effective citizen. As demonstrated by Douglas Noble (1988), US psychologists-turned-educators have appropriated progressive education within an amalgam of instructional technology and cognitive science, both derived from military psychotechnology. Defining the soldier as the 'human component' of a 'man-machine system', this cybernetic model has become the focus of educational reform emphasizing cognition: problem-solving, thinking skills and the micro-computer.

'Just look at the child sitting in front of his computer at school,' writes Jean Baudrillard (1988), 'Do you think he has been made more interactive, opened up to the world? Child and machine have merely been joined together in an integrated circuit.' Or, rather, the child's play may have become more interactive, but only in relation to a simulated reality. Thus arises the paradox of a regulated play.

The self-discipline mediated by computer microworlds has also served as a model for education and training more generally, or for education as training, and not always by using computers. A newly emerging approach is dedicated to producing an adaptable, flexible, integrated, self-controlling work-force for the embryonic regime of so-called 'post-Fordism'. This aims not simply to subordinate the worker but to integrate a 'responsible' worker into the production system.

Accordingly, note Robins and Webster (1989), elements of progressive education have been transformed into an 'instrumental progressivism'. In particular the concept of 'computer literacy', in the name of empowering the learner, has served to colonize the mind with a narrowly defined cognitive rationality that devolves intuitive, aesthetic and emotional qualities. The profiling of individuals' personal characteristics emphasizes self-disciplined work habits for flexible performance in diverse contexts, irrespective of any real interest in the content. At a conceptual level, at least, these approaches derive from a military-based model of the mind as an efficient machine fulfilling a system's predefined purpose.

Further similarities can be seen in the quasi-military tone used (by the US-based Foxboro Corporation) to market 'intelligent automation systems'. The language of its glossy publicity can be paraphrased as follows: As an industry leader, the firm provides not just hardware, but integrated systems solutions which can measure and control the entire production process. These systems will enhance productivity through 'proactive reorganization', an aggressive attempt to restructure production as a dynamic process. This features paperless order handling, 'just-in-time' methods and the single station controller (operator); thus robotics and vigilant operators form an efficient team. The firm offers gratifying careers to its employees, who form a cadre of specialists representing various disciplines. For its clients the firm provides training in process measurement and control concepts. Here students learn how to install, service, trouble-shoot and repair the system, to minimize down time. They learn to perform routine operations and respond correctly to alarm situations. The trainers share the firm's commitment to total solutions. A distributed global data base provides validated real-time information needed to make better decisions. In this way, each client firm can answer the question, 'Does the end justify the cost?'

Advertised in terms which almost parody crass amorality, the 'intelligent automation system' bears similarities with various training strategies described above. Each, in its own way, seeks to mobilize the operator's full mental involvement, now reconnected with manual tasks and/or physical endurance, together serving the system's programmed purposes and real-time demands. Is this to be the final, total solution to the problem of human unreliability? Judging from actual experience, the declared aim of total control would seem nearly impossible to realize; it warrants analysis as something more complex, even more ominous, than the rationality it claims to impose.

THE CYBORG SELF

At a psychic level, the search for total control enacts a paranoid attack on the self, a war against the self. One pioneer of artificial intelligence research, Marvin Minsky (1979), has even expressed the fear that 'the first self-improving AI machines [will] become “psychotic” in many ways'. This hypothetical mental disorder, attributed to the computer, can be seen partly
as a projection of a human one, as in Minsky's much-quoted distaste for the 'bloody mess of organic matter'. Beyond the pains and pleasures of the flesh, his phrase metaphorically evokes the unpredictability of human desires, against which cybernetics (especially artificial intelligence) helps us construct a psychic defence. Paranoid rationality, expressed in the image of the machine-like self, combines an omniscient phantasy of self-control with fear and aggression directed against emotional and bodily limitations of mere mortals. (Here we use the form of speaking that implies unconscious levels of phantasy, even though the phenomenon often becomes conscious.)

Certainly our culture promotes cybernetic images of progress with phantasies of omnipotence. Futureologists foresee global communications networks giving us unlimited access to 'information'. Such liberatory expectations underpin particularly the whole gamut of technologies referred to as home informatics. Here all human needs can be fulfilled, once they are reduced to things, to consumable goods and services. The projected scenario of the electronic household realizes the phantasy of the technological prosthesis through a man-machine nexus. Indeed, it is envisaged that all life functions - work, consumption, communication, learning, entertainment - can and will be electronically subject to push-button control.

As phantasy, this control can represent a flight from the world. In the seclusion and privacy of the home, the new technologies provide a restrictive, system-dependent form of mastery. A control no longer possible in the outside world finds expression within a private domain, in the protected environment of a microworld.

As a sublimated, compensatory control, it is also illusory. Sherry Turkle (1984) describes how infotech can 'support the desire, the needs and in extreme cases the obsession for "perfect mastery"'; they 'provide a chance to be in complete control, but they can trap people into an infatuation with control, with building one's private world'. While Turkle also describes other modes of relating to infotech, the 'perfect mastery' mode would seem central to the institutional settings analysed in this book. Beyond people's pleasurable experience of such control, we need to understand its role as a regressive compensation for people's everyday impotence and dependence.

The cybernetic state - in either the political or psychological sense - appeals to the subordination of individual reason, desire and emotion, in favour of a rationality dedicated to system maintenance. People experience this regime in complex, contradictory ways. On the one hand, people gain a sense of power and mastery in accommodating its demands. On the other, people disengage from the system with feelings of anxiety, inadequacy or vulnerability. In the context of the wider technological system, push-button omnipotence is always vitiated.

How are contradictory feelings of omnipotence and powerlessness, of mastery and dependence, effectively reconciled? Through a kind of regressive solution, the cyborg self, these conflicted elements are held in tension. By regressing to a phantasy of infantile omnipotence, we deny our dependency upon nature, upon our own nature, upon the bloody mess of organic matter.

In that sense the cyborg self can be seen as a variant of what Christopher Lasch (1985) calls the narcissistic or minimal self. Narcissism is characterized by a refusal of the distinction between the self and the surrounding world, between the self and not-self. According to Lasch, technology 'reactivates infantile appetites and the infantile need for illusions by impressing itself on people's lives as a never-ending series of miracles that obviate the need for human effort'. Infotech can be associated with narcissistic illusions of omnipotence, phantasies of controlling the external world. These evoke a longing either to remake the world in one's own image or to merge into its environment in blissful union.

Cybernetic systems appeal to that phantasy by creating a world of simulacra amenable to total control. As Bill Nichols (1988) suggests, 'cybernetic simulation renders experience, and the real itself, problematic'. It 'draws us into a realm, a design for living, that fosters a fetishized relationship with the simulation as a new reality all its own, based on the capacity to control, within the domain of the simulation, what had once eluded control beyond it'. In short, it entrances us with a 'fetishistic addiction to a process of logical simulation'. Nichols contrasts its meaning in work and leisure: 'Like face-to-face encounter, cybernetic systems offer (and demand) almost immediate response. This is a major part of their hazard in the workplace and their fascination outside it... This is the bane of the "automated work-place" and the joy of the video game.'

Yet management, too, whether military or industrial, can appropriate the thrill of the video game, the omnipotence phantasy of its closed world, to engage the soldier or operator in the required discipline. In the man-machine nexus, the human component interacts with a mechanized reality, a mediated and simulated reality. This indeed facilitates greater control, achieved at the cost of eroding the distinction between phantasy and reality. Through cybernetic mediation, phantasies can flourish uninhibited by a sense of the intractability of the external world.

This kind of mastery involves the technologization of self, the delegation of self to the machine. Integrating human and technological components, the man-machine nexus blurs the self and non-self. This regressive symbiosis is then expressed as a phantasy - extending the self through technological power, as well as incorporating and merging with the technological Other. Whether expressed through Promethean illusions of omnipotence and self-sufficiency, or through phantasies of self-annihilation
and union with the Other, the cyborg self is fundamentally regressive, infantile, defensive. In both cases, it seeks the impossible: to abolish separation from the external world.

Although such phantasies do exist independently of infotech, they are evoked and institutionalized by military-based systems of control. From the SDI strategist to the vigilant operator to the computer-aided learner, illusory control over a 'closed world' makes the systems themselves more credible and reinforces the phantasy. Psychic defence from reality becomes part of the discipline internalized through the man-machine nexus.

OUT OF CONTROL?

In the military information society the war machine is shaping our sense of self, directly and indirectly. While the military project has always subordinated human agency to its imperatives, now infotech is increasingly implicated as mediator, even as model of the human. As social organization and social identity become programmed, processed worlds, we encounter an increasingly blurred distinction between military and civil spheres, between mechanical and human, between inner and outer realms.

Is the military information society out of control? Is there a way out of that control? Finding a way out involves both a psychological and a political challenge. We will need to overcome the duality of real impotence and phantasized omnipotence on which we depend for security. We will also need to challenge the military content borne by supposedly liberatory sciences: information theory, cybernetics, artificial intelligence, systems theory, cognitive psychology. Rather than disavowing their repressive aspects, we will need to acknowledge them - their inner connection to military paradigms, and their permeation throughout our lives.

Is it possible to subvert the dominant cybernetics from within? Some critics suggest the appropriation of elements for liberatory aims, from ecological or feminist standpoints. Extending an argument from Gregory Bateson, Bill Nichols (1985) proposes that cybernetics can offer a method for making ourselves more environmentally responsible: 'The task is to overthrow the prevailing cybernetic model but to transgress its predefined interdictions and limits, using the dynamic of theapperceptive powers it has itself brought into being.' Yes, hypothetically, a cybernetic model of 'the environment' might help us to transgress taboos of a destructive social order. However, it could just as well adapt individuals to that order, in the name of accommodating the needs of an ecosystem, in turn ideologized as a natural order of stability.

Another critic, Donna Haraway, has also suggested a dual potential of cybernetics:

From one perspective, a cyborg world is about the final imposition of a grid of control on the planet, about the final abstraction embodied in a Star War apocrypse waged in the nature of defence, about the final appropriation of women's bodies in a masculinist orgy of war. From another perspective, a cyborg world might be about lived social and bodily realities in which people are not afraid of their joint kinship with animals and machines, not afraid of permanently partial identities and contradictory standpoints. (1985, p. 72)

Here she is playing devil's advocate against a feminism based upon mystical communion with holy Nature. By detaching the cyborg model from its present institutional context, into the realm of phantasy, her discussion can help us to analyse its manifestation in popular culture. Yet that detachment can also lead us away from confronting the social impotence that makes the phantasy appealing.

Any cybernetic model, the cyborg one included, entails the temptation of an omnipotence phantasy about controlling the world, freezing historical forces - if necessary, destroying them in rage, thus containing our anxiety, in the name of maintaining rational control. We will need to acknowledge such irrationality embedded within our rationality. In that sense, the political problem involves far more than how to select cybernetic models and how to use them. It is not a matter of being truly rational, but of struggling to achieve maturity by recognizing all the internal and external forces at work.

Such ambiguities inherent in our technology have been acknowledged, if only implicitly, in popular culture. In the film/book Wargame David Lightman, the boy hero, comes to meet Stephen Falkes, the creator of the US Defence computer that now threatens to unleash a global nuclear war. Explains Falkes,

The computer was not built as a result of an urgent desire of mankind to see a little yellow ball gobbling up dots in a maze. The computer is, in a very real sense, the child of war and as Wordsworth says, the child is the father of the man... Perhaps it is all some magnificent death wish, buried deep in the collective consciousness of us all. (Bischoff, 1983)

Even if there exists no death wish as such, surely there are primitive emotions inseparable from our society's form of reason and technology; the danger lies in pretending that they are neatly separable. Some science-fiction novels and films have explored these connections in more mature ways than do many social critics of technology, in the sense of presenting apparently contradictory aspects as integral to the whole. The RoboCop cyborg, for example, personifies infantile rage expressed through a
cybernetic rationality, even though the story line concludes with a regressive solution, both psychologically and politically (Glass, 1989).

As we have attempted to demonstrate, cybernetics can mediate our most primitive emotions, our sense of the natural, the rational and the real. We will need to work through these feelings and assumptions if we are to make the most of the opportunities for seeking a different path through our cyborg worlds. In diverse realms – the work-place, the school, the training scheme, the home, the video game, as well as the military itself – our resistance to their ‘closed worlds’ will need to be informed by a deep comprehension of their attractions as well as their horrors. In all those realms, moreover, military-derived discipline is internalized in ways that may seem benign, creative, even playful. We will need to challenge those appearances, those definitions, along with the practices themselves.

As in any oppressive regime, discovering alternatives begins with refusal—refusing the pre-programmed purposes of the military information society, in whatever subtle guise they may appear. At the same time, that refusal means struggling with contending definitions of who we are and who we can be – what it means to be human.

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