43. [Introduction] The Work of Culture in the Age of Cybernetic Systems

New media practicioners continually borrow insights and tropes from other forms. Similarly, the study of new media is continually generating itself through borrowings from a wide variety of discourses and examples. Bill Nichols gives a virtuoso demonstration of this approach in his essay below, which draws on feminist film theory, Frankfurt School Marxism, Sherry Turkle (◊34), Norbert Wiener (◊04), Gregory Bateson, intellectual property law, genetics, space weaponry, and *Pac-Man*.

Nichols's project, in brief, is to update Walter Benjamin's famous essay "The Work of Art in the Age of Mechanical Reproduction." Benjamin's text was published in 1936, when film was young. Nichols's was published in 1988, when video games and other simulation media were young (as, indeed, they still are). Nichols discusses this shift in several ways, outlining how it represents a shift from a fetishization of the *object* to fetishization of the *process* of interaction, of simulation. Interaction offers the feeling of greater freedom, but this freedom is always placed within the confines of the larger simulating system. Nichols relates simulation to video games and genetic engineering—a seemingly huge leap, but perhaps not over such a distance after all. Popular interactive experiences such as PF Magic's *Babyz* (a project led by Andrew Stern) and Maxis's *The Sims* (a project led by Will Wright) go beyond *Eliza/Doctor*'s simulation of human conversation to the simulation of human love relations and child rearing. These simulations are much richer than the Tamagotchi from a few years prior, and they tread much more clearly into the territory of ideology. For example, in *The Sims* friendship and happiness exist in a direct relationship to one's house and possessions. *Babyz* doesn't offer any options besides sitting around a stereotyped middle-class home all day, looking after the kids.

Games that enter the territory of *The Sims* may produce a pleasure different from that in other simulations, as ideology becomes more clearly a subject. While *SimCity* encoded certain ideologies of economics and urban planning, these ideologies were more remote, and players may have been more content to play along with what was offered. With *The Sims,* players seem, anecdotally, to more frequently push back against the ideology of the system. Online "family albums" are in many cases focused on the family groupings most difficult to achieve—that is, most discouraged by the underlying system—or on telling stories unrelated to the simulation. Meanwhile, Stern reports that one of the most common questions users ask when first presented with *Babyz* is whether the endearing animated characters can be microwaved, defenestrated, or otherwise treated in a manner that rejects the implicit housewife role of the simulation. Perhaps these reactions are what Wright and Stern intended, and perhaps this is also the reaction for which Nichols hopes in his essay, "not to overthrow the prevailing cybernetic model but to transgress its predefined interdictions and limits."

Nichols's example of war as simulation may lead us to the opposite conclusion, however. Not long after Benjamin wrote, U.S. bombs killed hundreds of thousands of civilians in Dresden, Hiroshima, and Nagasaki. On the U.S. mainland news of the bombing was reproduced mechanically, meeting with little protest. Another war, however, in Vietnam, met with resistance from within the U.S.—after a while—and it is conventional wisdom that this occurred in part because of the immediacy with which it was reported on television. More recently U.S. forces have attacked cities and killed civilians in Iraq and the former Yugoslavia, and media reports (delivered by non-interactive means) have been the product of simulation, on a scale well beyond that of Nichols's examples of Grenada and Libya. The U.S. population has not resisted this, in fact supporting these

04

A discussion of Eliza by that systems creator, Joseph Weizenbaum, is included in this book (◊24).

Of course, both *Babyz* and *The Sims* may be intended as social satire, an option that seems likely given the cultural acumen of designers such as Stern and Wright. In any case, they are open enough simulations to give users the option of working against the system. Games like the high-concept first person shooter *Deus Ex* offer less room to maneuver, since the user must choose between acting out an ideologically-loaded narrative and "losing." Writing in *Suck,* The Internick points out that this is a long tradition in interactive simulations, stretching back to *Adventure* and other early computer games, in which "there are only two ways to exert your influence. Either you follow the obscured path the designers have constructed, or you plunge headlong to your death."

34

attacks. Commentators have characterized "missile cam" images as resembling a videogame, though perhaps they more resemble the special effects of summer blockbusters. In these cases, there seems no call to resist, to transgress the simulation: it's as if it's simply time to sit back and enjoy.
—NWF

The phenomena of game subversion in simulation games such as *The Sims* may actually not be particularly new; players have often chosen to play in ways designers did not intend, just as children subvert other sorts of branded toys and pre-packaged games in ways the creators did not intend.

Starting points for some of Wright's simulations include fascinating and controversial ideas drawn from a number of fields. *SimCity,* for example, was influenced by the "system dynamics" theories of MIT's Jay W. Forrester—which, when applied to urban planning in the late 1960s, produced anger from many quarters. As Forrester reports in "The Beginning of System Dynamics," his conclusions included the idea that "low-cost housing was a double-edged sword for making urban conditions worse. Such housing used up space where jobs could be created, while drawing in people who needed jobs. Constructing low-cost housing was a powerful process for creating poverty, not alleviating it." Forrester's critics were quick to point out that his models were based on assumptions far from verifiable (e.g., that housing is a stronger attraction than jobs) and the workings of his simulated city were not like those of contemporary U.S. urban centers (e.g., Forrester's city was of a fixed size, and commuting into the city was impossible).

Wright's *SimCity* model, of course, is not identical with Forrester's—and it was never claimed to be a means for determining appropriate social and economic policy, though it seems likely to have at least unconsciously shaped the views on urban dynamics of many of its players. Wright's *SimEarth,* on the other hand, was influenced by theorists not generally well-loved by those who subscribe to Dr. Forrester's view of low-income housing: James Lovelock and Lynn Margulis, the proposers of the "Gaia hypothesis." *The Sims,* meanwhile, was influenced by the "pattern theory" work of architect Christopher W. Alexander—which, while not universally popular among architects, has inspired a view of software engineering ("design patterns") so influential that it is being integrated into many undergraduate computer science curricula.

Further Reading

De Landa, Manuel. *War in the Age of Intelligent Machines.* New York: Zone Books, 1991.

Forrester, Jay. "The Beginning of System Dynamics." Banquet Talk at the international meeting of the System Dynamics Society, Stuttgart, Germany, July 13, l989. <http://sysdyn.mit.edu/sdep/papers/D-4165-1.pdf>

Game Studies. Peer-reviewed Web journal. <http:///www.gamestudies.org>

The Internick. "Interactor's Nightmare." *Suck.com,* 27 Jan 1997. <http://www.suck.com/daily/97/01/27/>

Penny, Simon. "Representation, Enaction and the Ethics of Simulation." In *First Person: New Media as Story, Performance, and Game,* edited by Noah Wardrip-Fruin and Pat Harrigan. Cambridge: MIT Press, forthcoming.

Simon Penny argues that it is misleading to consider the impact of simulation using critical tools developed for painting, television, film, or other non-interactive representations:

In interactive media a user is not simply exposed to images which may contain representations of things and actions. The user is trained in the enaction of behaviors in response to images, and images appear in response to behaviors, in the same way that a pilot is trained in a flight simulator. By the same token, passive observation may be shown to have some effect on the beliefs or even the actions of an observer, but an enacted training regime must be a more powerful technique. So critiques of representation derived from painting, photography, film and video are inadequate for discussing the power of interactive experience.

Much debate has occurred on the correlation between pornographic images and sex-crime. Conversations about representations of violence typically conflate movies and computer games, as if they were in the same category. Whatever the power of images, interactive media is more. Not "just a picture," it's an interactive picture which responds to my actions. Our analysis of interactive media must therefore go beyond theories of representation in images. The image is just the target, the surface. The interactive image cannot be spoken of in the terms of traditional passive images because it is procedural. The content of the image is as much in the routine which runs it. Interactive applications are not pictures, they are machines which generate pictures.

Original Publication
Screen 21 (1): 22-46. Winter 1988.

The Work of Culture in the Age of Cybernetic Systems

Bill Nichols

The computer is more than an object: it is also an icon and a metaphor that suggests new ways of thinking about ourselves and our environment, new ways of constructing images of what it means to be human and to live in a humanoid world. Cybernetic systems include an entire array of machines and apparatuses that exhibit computational power. Such systems contain a dynamic, even if limited, quotient of intelligence. Telephone networks, communication satellites, radar systems, programmable laser video disks, robots, biogenetically engineered cells, rocket guidance systems, videotex networks—all exhibit a capacity to process information and execute actions. They are all "cybernetic" in that they are self-regulating mechanisms or systems within predefined limits and in relation to predefined tasks. Just as the camera has come to symbolize the entirety of the photographic and cinematic processes, the computer has come to symbolize the entire spectrum of networks, systems, and devices that exemplify cybernetic or "automated but intelligent" behavior.

This article traverses a field of inquiry that Walter Benjamin has crossed before, most notably in his 1936 essay, "The Work of Art in the Age of Mechanical Reproduction." My intention, in fact, is to carry Benjamin's inquiry forward and to ask how cybernetic systems, symbolized by the computer, represent a set of transformations in our conception of and relation to self and reality of a magnitude commensurate with the transformations in the conception of and relation to self and reality wrought by mechanical reproduction and symbolized by the camera. This intention necessarily encounters the dilemma of a profound ambivalence directed toward that which constitutes our imaginary. Other, in this case not a mothering parent but those systems of artificial intelligence I have set out to examine here. Such ambivalence certainly permeates Benjamin's essay and is at best dialectical, and at worst, simply contradictory. Put more positively, those systems against which we test and measure the boundaries of our own identity require subjection to a double hermeneutic of suspicion and revelation in which we must acknowledge the negative, currently dominant, tendency toward control, and the positive, more latent potential toward collectivity.[1] It will be in terms of law that the dominance of control over collectivity can be most vividly analyzed.

In summary, what I want to do is recall a few of the salient points in Benjamin's original essay, contrast characteristics of cybernetic systems with those of mechanical reproduction, establish a central metaphor with which to understand these cybernetic systems, and then ask how this metaphor acquires the force of the real—how different institutions legitimate their practices, recalibrate their rationale, and modulate their image in light of this metaphor. In particular, I want to ask how the preoccupations of a cybernetic imagination have gained institutional legitimacy in areas such as the law. In this case, like others, a tension can be seen to exist between the liberating potential of the cybernetic imagination and the ideological tendency to preserve the existing form of social relations. I will focus on the *work* of culture—its processes, operations, and procedures—and I will assume that culture is of the essence: I include within it text and practices, art and actions that give concrete embodiment to the relation we have to existing conditions to a dominant mode of production, and the various relations of production it sustains. Language, discourse, and messages are central. Their style and rhetoric are basic. Around each "fact" and every "datum," all realities and evidence, everything "out there," a persuasive, affective tissue of discourse accrues. It is in and through this signifying tissue, arranged in discursive formations and institutional arenas, that struggle takes place and semiosis occurs.

Mechanical Reproduction and Film Culture

Benjamin argues for correspondences among three types of changes: in the economic mode of production, in the nature of art, and in categories of perception. At the base of industrial society lies the assembly line and mass production. Technological innovation allows these processes to extend into the domain of art, separating off from its traditional ritual (or "cult") value a new and distinct market (or "exhibition") value. The transformation also strips art of its

"aura" by which Benjamin means its authenticity, its attachment to the domain of tradition:

> The authenticity of a thing is the essence of all that is transmissible from its beginning, ranging from its substantive duration to its testimony to the history which it has experienced.[2]

The aura of an object compels attention. Whether a work of art or natural landscape, we confront it in one place and only one place. We discover its use value in the exercise of ritual, in that place, with that object, or in the contemplation of the object for its uniqueness. The object in possession of aura, natural or historical, inanimate or human, engages us as if it had "the power to look back in return."[3]

One thing mechanical reproduction cannot, by definition, reproduce is authenticity. This is at the heart of the change it effects in the work of art. "Mechanical reproduction emancipates the work of art from its parasitical dependence on ritual" (p. 224). The former basis in ritual yields to a new basis for art in politics, particularly, for Benjamin, the politics of the masses and mass movements, where fascism represents an ever-present danger. The possibilities for thoroughgoing emancipation are held in check by the economic system surrounding the means of mechanical reproduction, especially in film where "illusion-promoting spectacles and dubious speculations" (p. 232) deflect us from the camera's ability to introduce us to "unconscious optics" that reveal those forms of interaction our eyes neglect:

> The act of reaching for a lighter or a spoon is familiar routine, yet we hardly know what goes on between hand and metal, not to mention how this fluctuates with our moods. Here the camera intervenes with the resources of its lowerings and liftings, its interpretations and isolations, its extensions and accelerations, its enlargements and reductions. (p. 237)

Objects without aura substitute mystique. In a remarkable, prescient passage, relegated to a footnote, Benjamin elaborates how political practice opens the way for a strange transformation of the actor when democracies encounter the crisis of fascism. Mechanical reproduction allows the actor an unlimited public rather than the delimited one of the stage or, for the politician, parliament. "Though their tasks may be different, the change affects equally the actor and the ruler. . . . This results in a new selection, a selection before the equipment (of mechanical reproduction) from which the star and the dictator emerge victoriously" (p. 247).

Alterations like the replacement of aura with mystique coincide with the third major change posited by Benjamin, change in categories of perception. The question of whether film or photography is an art is here secondary to the question of whether art itself has not been radically transformed in form and function. A radical change in the nature of art implies that our very ways of seeing the world have also changed: "During long periods of history, the mode of human sense perception changes with humanity's entire mode of existence" (p. 222).

Mechanical reproduction makes *copies* of visible objects, like paintings, mountain ranges, even human beings, which until then had been thought of as unique and irreplaceable. It brings the upheavals of the industrial revolution to a culmination. The ubiquitous copy also serves as an externalized manifestation of the work of industrial capitalism itself. It paves the way for seeing, and recognizing, the nature and extent of the very changes mechanical reproduction itself produces.

What element of film most strongly testifies to this new form of machine-age perception? For Benjamin it is that element which best achieves what Dadaism has aspired to: "changes of place and focus which periodically assail the spectator." Film achieves these changes through montage, or editing. Montage rips things from their original place in an assigned sequence and reassembles them in everchanging combinations that make the contemplation invited by a painting impossible. Montage multiplies the potential of collage to couple two realities on a single plane that apparently does not suit them into the juxtaposition of an infinite series of realities. As George Bataille proclaimed, "Transgression does not negate an interdiction, it transcends and completes it." In this spirit, montage transcends and completes the project of the Dadaists in their conscious determination to strip aura from the work of art and of the early French ethnographers who delighted in the strange juxtapositions of artifacts from different cultures.

Montage has a liberating potential, prying art away from ritual and toward the arena of political engagement. Montage gives back to the worker a view of the world as malleable. Benjamin writes:

> Man's need to expose himself to shock effects is his adjustment to the changes threatening him. The film corresponds to profound changes in the apperceptive apparatus—changes that are experienced on an

> individual scale by the man in the street in big-city traffic, on a historical scale by every present-day citizen. (p. 250)
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> By close-ups of the things around us, by focusing on hidden details of familiar objects, by exploring commonplace milieus under the ingenious guidance of the camera, the film, on the one hand, extends our comprehension of the necessities which rule our lives; on the other hand, it manages to assure us of an immense and unexpected field of action. Our taverns and our metropolitan streets, our offices and furnished rooms, our railroad stations and our factories appeared to have us locked up hopelessly. Then came the film and burst this prison-world asunder by the dynamite of the tenth of a second, so that now, in the midst of its far-flung ruins and debris, we calmly and adventurously go traveling (p. 236).

Mechanical reproduction involves the appropriation of an original, although with film even the notion of an original fades: that which is filmed has been organized in order to be filmed. This process of appropriation engenders a vocabulary: the "take" or "camera shot" used to "shoot" a scene where both stopping a take and editing are called a "cut." The violent reordering of the physical world and its meanings provides the shock effects Benjamin finds necessary if we are to come to terms with the age of mechanical reproduction. The explosive, violent potential described by Benjamin and celebrated by Brecht is what the dominant cinema must muffle, defuse, and contain. And what explosive potential can be located in the computer and its cybernetic systems for the elimination of drudgery and toil, for the promotion of collectivity and affinity, for interconnectedness, systemic networking and shared decision-making, this, too, must be defused and contained by the industries of information which localize, condense, and consolidate this potential democratization of power into hierarchies of control.

"Montage—the connecting of dissimilars to shock an audience into insight—becomes for Benjamin a major principle to artistic production in a technological age."[4]

Developing new ways of seeing to the point where they become habitual is not ideological for Benjamin but transformative. They are not the habits of old ways but new; they are skills which are difficult to acquire precisely because they are in opposition to ideology. The tasks before us "at the turning points of history" cannot be met by contemplation. "They are mastered gradually by habit, under the guidance of tactile appropriation" (p. 240). The shocks needed in order to adjust to threatening changes may be coopted by the spectacles a culture industry provides. For Benjamin the only recourse is to use those skills he himself adopted: the new habits of a sensibility trained to disassemble and reconstruct reality, of a writing style intended to relieve idlers of their convictions, of a working class trained not only to produce and reproduce the existing relations of production but to reproduce those very relations in a new, liberating form. "To see culture and its norms—beauty, truth, reality—as artificial arrangements, susceptible to detached analysis and comparison with other possible dispositions" becomes the vantage point not only of the surrealist but the revolutionary.[5]

The process of adopting new ways of seeing that consequently propose new forms of social organization becomes a paradoxical, or dialectical, process when the transformations that spawn new habits, new vision, are themselves endangered and substantially recuperated by the existing form of social organization which they contain the potential to overcome. But the process goes forward all the same. It does so less in terms of a culture of mechanical reproduction, which has reached a point similar to that of a tradition rooted in Benjamin's time, than in terms of a culture of electronic dissemination and computation.

We might then ask in what ways is our "sense of reality" being adjusted by new means of electronic computation and digital communication? Do these technological changes introduce new forms of culture into the relations of production at the same time as the "shock of the new" helps emancipate us from the acceptance of social relations and cultural forms as natural, obvious, or timeless? The distinction between an industrial capitalism, even in its "late" phase of monopoly concentration, and an information society that does not "produce" so much as "process" its basic forms of economic resource has become an increasingly familiar distinction for us. Have cybernetic systems brought about changes in our perception of the world that hold liberating potential? Is it conceivable, for example, that contemporary transformations in the economic structure of capitalism, attended by technological change, institute a less individuated, more communal form of perception similar to that which was attendant upon face-to-face ritual and aura but which is now mediated by anonymous circuitry and the simulation of direct encounter? Does montage now have its

Entrepreneurial capitalism	Monopoly capitalism	Multinational capitalism
steam and locomotive power	electricity and petrochemical power	microelectronics and nuclear energy
property rights	corporate rights	copyright and patents
nature as Other/ conquest of nature	aliens as Other/ conquest of Third World	knowledge as Other/ conquest of intelligence
nationalism	imperialism	multinationalism
working-class vanguard	consumer-group vanguard	affinity-group vanguard
Tuberculosis; contamination by nature	Cancer; contamination by an aberrant self	AIDS; deficiency of self (collapse of system that distinguishes self from environment)
isolation of self from threatening environment	isolation of aberrant tissue from self	isolation of self by artificial life support
vulnerability to invasive agents	vulnerability to self-consumption	vulnerability to systemic collapse
heightened individuation	heightened schizophrenia	heightened sense of paranoia
realism	modernism	postmodernism
film	television	computer
mechanical reproduction	instantaneous broadcast	logico-iconic simulations
reproducible instances	ubiquitous occurrences	processes of absorption and feedback
the copy	the event	the chip (and VDT display)
subtext of possession	subtext of mediation	subtext of control
image and representation	collage and juxtaposition	simulacra

equivalent in interactive simulations and simulated interactions experienced according to predefined constraints? Does the work of art in the age of postmodernism lead, at least potentially, to apperceptions of the "deep structure" of postindustrial society comparable to the apperceptive discoveries occasioned by mechanical reproduction in the age of industrial capitalism?

Cybernetic Systems and Electronic Culture

We can put Benjamin's arguments, summarized cursorily here, in another perspective by highlighting some of the characteristics associated with early, entrepreneurial capitalism, monopoly capitalism, and multinational or postindustrial capitalism.

Simulacra introduce the key question of how the control of information moves towards control of sensory experience, interpretation, intelligence, and knowledge. The power of the simulation moves to the heart of the cybernetic matter. It posits the simulation as an imaginary Other which serves as the measure of our own identity and, in doing so, prompts the same form of intense ambivalence that the mothering parent once did: a guarantee of identity based on what can never be made part of oneself. In early capitalism, the human was defined in relation to an animal world that evoked fascination and attraction, repulsion and resentment. The human animal was similar to but different from all other animals. In monopoly capitalism, the human was defined in relation to a machine world that evoked its own distinctive blend of ambivalence. The human machine was similar to but different from all other machines. In postindustrial capitalism, the human is defined in relation to cybernetic systems—computers, biogenetically engineered organisms, ecosystems, expert systems, robots, androids, and cyborgs—all of which evoke those forms of ambivalence reserved for the Other that is the measure of ourselves. The human cyborg is similar but different from all other cyborgs. Through these transformations questions of difference persist. Human identity remains at stake, subject to change, vulnerable to challenge and modification as the very metaphors prompted by the imaginary Others that give it form themselves change. The metaphor that's meant (that's taken as real) becomes the simulation. The simulation displaces any antecedent reality, any aura, any referent to history. Frames collapse. What had been fixed comes unhinged. New identities, ambivalently adopted, prevail.

The very concept of a text, whether unique or one of myriad copies, for example, underpins almost all discussion of cultural forms including film, photography, and their analogue in an age of electronic communication, television (where the idea of "flow" becomes an important

amendment). But in cybernetic systems, the concept of "text" itself undergoes substantial slippage. Although a textual element can still be isolated, computer-based systems are primarily interactive rather than one-way, open-ended rather than fixed. Dialogue, regulated and disseminated by digital computation, de-emphasizes authorship in favor of "messages-in-circuit"[6] that take fixed but effervescent, continually variable form. The link between message and substrate is loosened: words on a printed page are irradicable; text on a video display terminal (VDT) is readily altered. The text conveys the sense of being addressed to us. The message-in-circuit is both addressed to and addressable by us; the mode is fundamentally interactive, or dialogic. That which is most textual in nature—the fixed, read-only-memory (ROM), and software programs—no longer addresses us. Such texts are machine addressable. They direct those operational procedures that ultimately give the impression that the computer responds personally to us, simulating the processes of conversation or of interaction with another intelligence to effect a desired outcome. 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. The temporal flow and once-only quality of face-to-face encounter becomes embedded within a system ready to restore, alter, modify or transform any given moment to us at any time. Cybernetic interactions can become intensely demanding, more so than we might imagine from our experience with texts, even powerfully engaging ones. Reactions must be almost instantaneous, grooved into eye and finger reflexes until they are automatic. This is the bane of the "automated workplace" and the joy of the video game. Experienced video-game players describe their play as an interactive ritual that becomes totally self-absorbing. As David, a lawyer in his mid thirties interviewed by Sherry Turkle, puts it,

> At the risk of sounding, uh, ridiculous, if you will, it's almost a Zen type of thing. . . . When I can direct myself totally but not feel directed at all. You're totally absorbed and it's all happening there. . . . You either get through this little maze so that the creature doesn't swallow you up or you don't. And if you can focus your attention on that, and if you can really learn what you're supposed to do, then you really are in relationship with the game.[7]

The enhanced ability to test the environment, which Benjamin celebrated in film ("The camera director in the studio occupies a place identical with that of the examiner during aptitude tests," p. 246) certainly continues with cybernetic communication.[8] The computer's dialogic mode carries the art of the "what if" even further than the camera eye has done, extending beyond the "what if I could see more than the human eye can see" to "what if I can render palpable those possible transformations of existing states that the individual mind can scarcely contemplate?"

If mechanical reproduction centers on the question of reproducibility and renders authenticity and the original problematic, cybernetic simulation renders experience, and the real itself, problematic. Instead of reproducing, and altering, our relation to an original work, cybernetic communication simulates, and alters, our relation to our environment and mind. As Jean Baudrillard argues, "Instead of facilitating communication, it (information, the message-in-circuit) exhausts itself in the *staging* of communication . . . this is the gigantic simulation process with which we are familiar."[9]

Instead of a representation of social practices recoded into the conventions and signs of another language or sign-system, like the cinema, we encounter simulacra that represent a new form of social practice in their own right and represent nothing. The photographic image, as Roland Barthes proposed, suggests "having been there" of what it represents, of what is present-in-absentia. The computer simulation suggests only a "being here" and "having come from nowhere" of what it presents, drawing on those genetic-like algorithms that allow it to bring its simulation into existence, *sui generis*. Among other things, computer systems simulate the dialogical and other qualities of life itself. The individual becomes nothing but an ahistorical position within a chain of discourse marked exhaustively by those shifters that place him or her within speech acts ("I," "here," "now," "you," "there," "then"). In face-to-face encounter this "I" all speakers share can be inflected to represent some part of the self not caught by words. To respond to the query, "How are you?" by saying "Not *too* bad," rather than "Fine," suggests something about a particular state of mind or style of expression and opens onto the domains of feeling and empathy. What cannot be represented in language directly (the bodily, living "me" that writes or utters words) can

significantly inflect speech, and dialogue, despite its enforced exclusion from any literal representation.

In cybernetic systems, though, "I" and "you" are strictly relational propositions attached to no substantive body, no living individuality. In place of human intersubjectivity we discover a systems interface, a boundary between cyborgs that selectively passes information but without introducing questions of consciousness or the unconscious, desire or will, empathy or conscience, saved in simulated forms.

Even exceptions like ELIZA, a program designed to simulate a therapeutic encounter, prove the rule. "I" and "you" function as partners in therapy only as long as the predefined boundaries are observed. As Sherry Turkle notes, if you introduce the word "mother" into your exchange, and then say, "Let's discuss paths toward nuclear disarmament," ELIZA might well offer the nonsense reply, "Why are you telling me that your mother makes paths toward nuclear disarmament?"[10] Simulations like these may bring with them the shock of recognizing the reification of a fundamental social process, but they also position us squarely within the realm of communication and exchange cleanly evacuated of the intersubjective complexities of direct encounter. Cybernetic systems give form, external expression, to processes of the mind (through messages-in-circuit) such that the very ground of social cohesion and consciousness becomes mediated through a computational apparatus. Cybernetic interaction achieves with an other (an intelligent apparatus) the simulation of social process itself.

Cybernetic dialogue may offer freedom from many of the apparent risks inherent in direct encounter; it offers the illusion of control. This use of intelligence provides a lure that seems to be much more attractive to men than women. At first there may seem to be a gain, particularly regarding the question of the look or gaze. Looking is an intensely charged act, one significantly neglected by Benjamin, but stressed in recent feminist critiques of dominant Hollywood cinema. There looking is posed as a primarily masculine act and "to-be-looked-at-ness" a feminine state, reinforced, in the cinema, by the camera's own voyeuristic gaze, editing patterns that prompt identification with masculine activism and feminine passivity, and a star system that institutionalizes these uses of the look through an iconography of the physical body.[11] This entire issue becomes circumvented in cybernetic systems that simulate dialogic interaction, or face-to-face encounter, but exclude not only the physical self or its visual representation but also the cinematic apparatus that may place the representation of sexual difference within a male-dominant hierarchy.

Correct in so far as it goes, the case for the circumvention of the sexist coding of the gaze overlooks another form of hierarchical sexual coding that revolves around the question of whether a fascination with cybernetic systems is not itself a gender-related (i.e., a primarily masculine) phenomenon (excluding from consideration an even more obvious gender coding that gives almost all video games, for example a strong aura of aggressive militaristic activity). The questions that we pose about the sexist nature of the gaze within the cinematic text and the implications this has for the position we occupy in relation to such texts, may not be wholly excluded so much as displaced. A (predominantly masculine) fascination with the *control* of simulated interactions replaces a (predominantly masculine) fascination with the to-be-looked-at-ness of a projected image. Simulated intersubjectivity as a product of automated but intelligent systems invokes its own peculiar psycho-dynamic. Mechanical reproduction issues an invitation to the fetishist—a special relationship to the images of actors or politicians in place of any more direct association. The fetish *object*—the image of the other that takes the place of the other—becomes the center of attention while fetishistic viewers look on from their anonymous and voyeuristic, seeing-but-unseen sanctuary in the audience. But the output of computational systems stresses simulation, interaction, and process itself. Engagement with this *process* becomes the object of fetishization rather than representations whose own status as produced objects has been masked. Cybernetic interaction emphasizes the fetishist rather than the fetish object: instead of a taxonomy of stars we find a galaxy of computer freaks. The consequence of systems without aura, systems that replace direct encounter and realize otherwise inconceivable projections and possibilities, is a fetishism of such systems and processes of control themselves. Fascination resides in the subordination of human volition to the operating constraints of the larger system. We can talk to a system whose responsiveness grants us an awesome feeling of power. But as Paul Edwards observes, "Though individuals . . . certainly make decisions and set goals, as links in the chain of command they are allowed no choices

regarding the ultimate purposes and values of the system. Their 'choices' are . . . always the permutations and combinations of a predefined set."[12]

The desire to exercise a sense of control over a complex but predefined logical universe replaces the desire to view the image of another over which the viewer can imagine himself to have a measure of control. The explosive power of the dynamite of the tenth of a second extolled by Benjamin is contained within the channels of a psychopathology that leaves exempt from apperception, or control, the mechanisms that place ultimate control on the side of the cinematic apparatus or cybernetic system. These mechanisms—the relay of gazes between the camera, characters and viewer, the absorption into a simulacrum with complex problems and eloquent solutions—are the ground upon which engagement occurs and are not addressable within the constraints of the system itself. It is here, at this point, that dynamite must be applied.

This is even more difficult with computers and cybernetics than with cameras and the cinema. Benjamin himself noted how strenuous a task it is in film to mask the means of production, to keep the camera and its supporting paraphernalia and crew from intruding upon the fiction. Exposure of this other scene, the one behind the camera, is a constant hazard and carries the risk of shattering the suspension of disbelief. Only those alignments between camera and spectator that preserve the illusion of a fictional world without camera, lights, directors, studio sets, and so on are acceptable. Benjamin comments, perhaps with more of a surrealist's delight in strange juxtapositions than a Marxist's, "The equipment-free aspect of reality here (in films) has become the height of artifice; the sight of immediate reality has become an orchid in the land of technology" (p. 233).

With the contemporary prison-house of language, in Frederic Jameson's apt phrase, the orchid of immediate reality, like the mechanical bird seen at the end of *Blue Velvet,* appears to have been placed permanently under glass; but for Benjamin, neither the process by which an illusionistic world is produced nor the narrative strategies associated with it receive extended consideration. For him, the reminders of the productive process were readily apparent, not least through the strenuous efforts needed to mask them. The "other scene" where fantasies and fictions actually become conceptually and mechanically produced may be repressed but is not obliterated. If not immediately visible, it lurks just out of sight in the offscreen space where the extension of a fictional world somewhere collides with the world of the camera apparatus in one dimension and the world of the viewer in another. It retains the potential to intrude at every cut or edit; it threatens to reveal itself in every lurch of implausibility or sleight of hand with which a narrative attempts to achieve the sense of an ending.

With cybernetic systems, this other scene from which complex rule-governed universes actually get produced recedes further from sight. The governing procedures no longer address us in order to elicit a suspension of belief; they address the cybernetic system, the microprocessor of the computer, in order to absorb us into their operation. The other scene has vanished into logic circuits and memory chips, into "machine language" and interface cards. The chip replaces the copy. Just as the mechanical reproduction of copies revealed the power of industrial capitalism to reorganize and reassemble the world around us, rendering it as commodity art, the automated intelligence of chips reveals the power of postindustrial capitalism to simulate and replace the world around us, rendering not only its exterior realm but also its interior ones of consciousness, intelligence, thought and intersubjectivity as commodity experience.

The chip is pure surface, pure simulation of thought. Its material surface is its meaning without history, without depth, without aura, affect, or feeling. The copy reproduces the world, the chip simulates it. It is the difference between being able to remake the world and being able to efface it. The micro-electronic chip 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. The orchids of immediate reality that Benjamin was wont to admire have become the paper flowers of the cybernetic simulation.

Electronic simulation instead of mechanical reproduction. Fetishistic addiction to a process of logical simulation rather than a fascination with a fetishized object of desire. Desire for the dialogic or interactive and the illusion of control versus desire for the fixed but unattainable and the illusion of possession. Narrative and realism draw us into relations of identification with the actions and qualities of characters. Emulation is possible, as well as self-enhancement. Aesthetic pleasure allows for a revision of the world from which a work of art arises. Reinforcing what is or proposing what might be,

the work of art remains susceptible to a double hermeneutic of suspicion and revelation. Mechanical reproduction changes the terms decidedly, but the metonymic or indexical relationship between representational art and the social world to which it refers remains a fundamental consideration.

By contrast, cybernetic simulations offer the possibility of completely replacing any direct connection with the experiential realm beyond their bounds. Like the cinema, this project, too, has its origins in the expansion of nineteenth-century industrialism. The emblematic precursors of the cyborg—the machine as self-regulating system—were those animate, self-regulating systems that offered a source of enchantment even museums could not equal: the zoo and the botanical garden.

At the opening of the first large-scale fair or exhibition, the Great Exhibition of 1851, Queen Victoria spoke of "the greatest day in our history [when] the whole world of nature and art was collected at the call of the queen of cities." Those permanent exhibitions—the zoo and botanical garden—introduced a new form of vicarious experience quite distinct from the aesthetic experience of original art or mechanically reproduced copies. The zoo brings back alive evidence of a world we could not otherwise know, now under apparent control. It offers experience at a remove that is fundamentally different as a result of having been uprooted from its original context. The indifferent, unthreatened, and unthreatening gaze of captive animals provides eloquent testimony to the difference between the zoo and the natural habitat to which it refers. The difference in the significance of what appears to be the same thing, the gaze, indicates that the change in context has introduced a new system of meanings, a new discourse or language.

Instead of the shocks of montage that offer a "true means of exercise" appropriate to the "profound changes in the apperceptive apparatus" under industrial capitalism, the zoo and botanical garden exhibit a predefined, self-regulating world with no reality outside of its own boundaries. These worlds may then become the limit of our understanding of those worlds to which they refer but of which we seldom have direct knowledge. "Wildlife" or "the African savannah" is its simulation inside the zoo or garden or diorama. Absorption with these simulacra and the sense of control they afford may be an alternative means of exercise appropriate to the apperceptive changes required by a service and information economy.

Computer-based systems extend the possibilities inherent in the zoo and garden much further. The ideal simulation would be a perfect replica, now *controlled* by whomever controls the algorithms of simulation—a state imaginatively rendered in films like *The Stepford Wives* or *Blade Runner* and apparently already achieved in relation to certain biogenetically engineered micro-organisms. Who designs and controls these greater systems and for what purpose becomes a question of central importance.

The Cybernetic Metaphor: Transformations of Self and Reality

The problems of tracking antiaircraft weapons against extremely fast targets prompted the research and development of intelligent mechanisms capable of predicting future states or positions far faster than the human brain could do. The main priorities were speed, efficiency and reliability; i.e., fast-acting, error-free systems. ENIAC (Electronic Numerical Integrator and Computer), the first high-powered digital computer, was designed to address precisely this problem by performing ballistic computations at enormous speed and allowing the outcome to be translated into adjustments in the firing trajectory of antiaircraft guns.[13]

"The men [*sic*] who assembled to solve problems of this order and who formalized their approach into the research paradigms of information theory and cognitive psychology through the Macy Foundation Conferences, represent a who's who of cybernetics: John von Neumann, Oswald Weblen, Vannevar Bush, Norbert Wiener, Warren McCulloch, Gregory Bateson and Claude Shannon, among others." Such research ushers in the central metaphors of the cybernetic imagination: not only the human as an automated but intelligent system, but also automated, intelligent systems as human, not only the simulation of reality but the reality of the simulation. These metaphors take form around the question, the still unanswered question, put by John Stroud at the Sixth Macy Conference:

> We know as much as possible about how the associated gear bringing the information to the tracker [of an anti-aircraft gun] operates and how all the gear from the tracker to the gun operates. So we have the human operator surrounded on both sides by very precisely known mechanisms and the

> question comes up, "What kind of machine have we placed in the middle?"[14]

This question of "the machine in the middle" and the simulation as reality dovetails with Jean Baudrillard's recent suggestion that the staging powers of simulation establish a hyperreality we only half accept but seldom refute: "Hyperreality of communication of meaning: by dint of being more real than the real itself, reality is destroyed."[15]

Such metaphors, then, become more than a discovery of similarity, they ultimately propose an identity. Norbert Wiener's term "cyborg" (cybernetic organism) encapsulates the new identity which, instead of seeing humans reduced to automata, sees simulacra which encompass the human elevated to the organic. Consequently, the human cognitive apparatus (itself a hypothetical construct patterned after the cybernetic model of automated intelligence) is expected to negotiate the world by means of simulation.

Our cognitive apparatus treats the real as though it consisted of those properties exhibited by simulacra. The real becomes simulation. Simulacra, in turn, serve as the mythopoeic impetus for that sense of the real we posit beyond the simulation. A sobering example of what is at stake follows from the Reagonomic conceptualization of war. The Strategic Defense Initiative (SDI) represents a vast Battle of the Cyborgs video game where players compete to save the world from nuclear holocaust. Reagan's simulated warfare would turn the electromagnetic force fields of fifties science-fiction films that shielded monsters and creatures from the arsenal of human destructive power into ploughshares beyond the ozone. Star Wars would be the safe-sex version of international conflict: not one drop of our enemy's perilous bodily fluids, none of their nuclear ejaculations, will come into contact with the free world.

Reagan's simulation of war as a replacement for the reality of war does not depend entirely on SDI. We have already seen it at work in the invasion of Grenada and the raid on Libya. Each time, we have had the evocation of the reality of war: the iconography of heroic fighters, embattled leaders, brave decisions, powerful technology, and concerted effort rolled into the image of military victory, an image of quick, decisive action that defines the "American will."

These simulacra of war, though, are fought with an imaginary enemy, in the Lacanian sense, and in the commonsense meaning of an enemy posited within those permutations allowed by a predefined set of assumptions and foreign-policy options: a Grenadian or Libyan "threat" appears on the video screens of America's political leadership. Long experience with the Communist menace leads to prompt and sure recognition. Ronny pulls the trigger. These simulations lack the full-blown, catastrophic consequences of real war, but this does not diminish the reality of this particular simulation nor the force with which it is mapped onto a historical "reality" it simultaneously effaces. Individuals find their lives irreversibly altered, people are wounded, many die. These indelible punctuation marks across the face of the real, however, fall into place according to a discourse empowered to make the metaphoric reality of the simulation a basic fact of existence.

A more complex example of what it means to live not only in the society of the spectacle but also in the society of the simulacrum involves the preservation/simulation of life via artificial life-support systems. In such an environment, the presence of life hinges on the presence of "vital signs." Their manifestation serves as testimony to the otherwise inaccessible presence of life itself, even though life in this state stands in relation to the "immediate reality" of life as the zoo stands in relation to nature. The important issue here is that the power of cybernetic simulations prompts a redefinition of such fundamental terms as life and reality, just as, for Benjamin, mechanical reproduction alters the very conception of art and the standards by which we know it. Casting the issue in terms of whether existence within the limits of an artificial life-support system should be considered "life" obscures the issue in the same way that asking whether film and photography are "art" does. In each case a presumption is made about a fixed, or ontologically given, nature of life or art, rather than recognizing how that very presumption has been radically overturned.

And from preserving life artificially, it is a small step to creating life by the same means. There is, for example, the case of Baby M. Surrogate mothering, as a term, already demonstrates the reality of the simulation: the actual mothering agent—the woman who bears the child—becomes a *surrogate,* thought of, not as a mother, but as an incubator or "rented uterus," as one of the trial's medical "experts" called Mary Beth Whitehead. The *real* surrogate mother, the woman who will assume the role of mother for a child not borne of her own flesh, becomes the real mother, legally and familiarly. The law upholds the priority of the simulation and the power of those who can control this

system of surrogacy—measured by class and gender, for it is clearly upper-class males (Judge Harvey Sorkow and the father, William Stem) who mobilized and sanctioned this particular piece of simulation, largely, it would seem, given the alternative of adoption, to preserve a very real, albeit fantastic preoccupation with a patriarchal blood line.

Here we have the simulation of a nuclear family—a denucleated, artificial simulation made and sanctioned as real, *bona fide*. The trial evoked the reality of the prototypical bourgeois family: well-educated, socially responsible, emotionally stable, and economically solvent, in contrast to the lower middle-class Whitehead household. The trial judgment renders as legal verdict the same moral lesson that Cecil Hepworth's 1905 film, *Rescued by Rover,* presents as artistic theme: the propriety of the dominant class, the menace of an unprincipled, jealous and possessive lower class, the crucial importance of narrative donors like the faithful Rover and of social agents like the patronizing Sorkow, and the central role of the husband as the patriarch able to preside over the constitution and re-constitution of his family. Now replayed as simulation, the morality play takes on a reality of its own. People suffer, wounds are inflicted. Lives are irreversibly altered, or even created. Baby M is a child conceived as a product to be sold to fill a position within the signifying discourse of patriarchy.

The role of the judge in this case was, of course, crucial to its outcome. His centrality signals the importance of the material, discursive struggles being waged within the realm of the law. Nicos Poulantzas argues that the juridical-political is the dominant or articulating region in ideological struggle today. Law establishes and upholds the conceptual frame in which subjects, "free and equal" with "rights" and "duties," engage on a playing field made level by legal recourse and due process. These fundamental concepts of *individuals* with the right to enter into and withdraw from relations and obligations to others underpin, he argues, the work of other ideologically important regions in civil society.[16]

Whether the juridical-political is truly the fulcrum of ideological contestation or not, it is clearly a central area of conflict and one in which some of the basic changes in our conception of the human/computer, reality/simulation metaphors get fought out. Reconceptualizations of copyright and patent law, brought on by computer chip design, computer software, and biogenetic engineering, give evidence of the process by which a dominant ideology seeks to preserve itself in the face of historical change.

Conceptual metaphors take on tangible embodiment through discursive practices and institutional apparatuses. Such practices give a metaphor historical weight and ideological power. Tangible embodiment has always been a conscious goal of the cybernetic imagination where abstract concepts become embedded in the logic and circuitry of a material substrate deployed to achieve specific forms of result such as a computer, an antiaircraft tracking system or an assembly-line robot. These material objects, endowed with automated but intelligent capacities, enter our culture as, among other things, commodities. As a peculiar category of object these cyborgs require clarification of their legal status. What proprietary rights pertain to them? Can they be copyrighted, patented, protected by trade secrets acts; can they themselves as automated but intelligent entities, claim legal rights that had previously been reserved for humans or other living things on a model akin to that which has been applied to animal research?

The answers to such questions do not fall from the sky. They are the result of struggle, of a clash of forces, and of the efforts, faltering or eloquent, of those whose task it is to make and adjudicate the law. New categories of objects do not necessarily gain the protection of patent or copyright law. One reason for this is that federal law in the United States (where most of my research on this question took place) and the Constitution both enshrine the right of individuals to private ownership of the means of production while also enjoining against undue forms of monopoly control. The Constitution states, "The Congress shall have power . . . to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries." Hence the protection of intellectual property (copyright and trademark registration) or industrial and technological property (patents) carves out a proprietary niche within the broader principle of a "free flow" of ideas and open access to "natural" sources of wealth.

The cybernetic organism, of course, confounds the distinction between intellectual and technological property. Both a computer and a biogenetically designed cell "may be temporarily or permanently programmed to perform many different unrelated tasks."[17] The cybernetic metaphor, of course, allows us to treat the cell and the computer as

sources of the same problem. As the author of one legal article observed, "A ribosome, like a computer, can carry out any sequence of assembly instructions and can assemble virtually unlimited numbers of different organic compounds, including those essential to life, as well as materials that have not yet been invented."[18] What legal debates have characterized the struggle for proprietary control of these cyborgs?

Regarding patents, only clearly original, unobvious, practical applications of the "laws of nature" are eligible for protection, a principle firmly established in the Telephone Cases of 1888 where the Supreme Court drew a sharp distinction between electricity itself as nonpatentable since it was a "force of nature" and the telephone where electricity was found, "A new, specific condition not found in nature and suited to the transmission of vocal or other sounds."

Recent cases have carried the issue further, asking whether "intelligent systems" can be protected by patent and, if so, what specific elements of such a system are eligible for protection. Generally, and perhaps ironically, the United States Supreme Court has been more prone to grant protection for the fabrication of new life forms, via recombinant DNA experiments, than for the development of computer software. In *Diamond v. Chakrabatry* (1980), the Supreme Court ruled in favor of patent protection for Chakrabatry who had developed a new bacterial form capable of degrading petroleum compounds for projected use in oil-spill clean-ups. In other, earlier cases, the Supreme Court withheld patent protection for computer software. In *Gottschalk v. Benson* (1972) and in *Parker v. Flook* (1979), the Court held that computer programs were merely algorithms, i.e., simple, step-by-step mathematical procedures, and as such were closer to basic principles or concepts than to original and unobvious applications. These decisions helped prompt recourse to a legislative remedy for an untenable situation (for those with a vested interest in the marketability of computer programs); in 1980 Congress passed the Software Act, granting some of the protection the judicial branch had been reluctant to offer but still leaving many issues unsettled. A Semiconductor Chip Protection Act followed in 1984 with a new *sui generis* form of protection for chip masks (the templates from which chips are made). Neither copyright nor patent, this protection applies for ten years (less than copyright) and demands less originality of design than does patent law. In this case, the law itself replicates the "having come from nowhere" quality of the simulation. The *Minnesota Law Review* 70 (December 1985) is devoted to a symposium on this new form of legal protection for intellectual but also industrial property.

The Software Act began the erosion of a basic distinction between copyright and patent by suggesting that useful objects were eligible for copyright. In judicial cases such as *Diamond v. Diehr* (1981), the court held that "when a claim containing a mathematical formula implements or applies that formula in a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect (for example, transforming or reducing an article to a different state of things), then the claim satisfies the requirements of [the copyright law]."

This finding ran against the grain of the long-standing *White-Smith Music Publishing Co v. Apollo Co* decision of 1908 where the Supreme Court ruled that a player-piano roll was ineligible for the copyright protection accorded to the sheet music it duplicated. The roll was considered part of a machine rather than the expression of an idea. The distinction was formulated according to the code of the visible: a copyrightable text must be visually perceptible to the human eye and must "give to every person *seeing* it the idea created by the original."[19]

Copyright had the purpose of providing economic incentive to bring new ideas to the marketplace. Copyright does not protect ideas, processes, procedures, systems or methods, only a specific embodiment of such things. (A book on embroidery could receive copyright but the process of embroidery itself could not.) Similarly, copyright cannot protect useful objects or inventions. If an object has an intrinsically utilitarian function, it cannot receive copyright. Useful objects can be patented, if they are original enough, or protected by trade secrets acts. For example, a fabric design could receive copyright as a specific, concrete rendition of form. It would be an "original work of authorship" fixed in the tangible medium of cloth and the "author" would have the right to display it as an ornamental or artistic object without fear of imitation. But the same fabric design, once embodied in a dress, can no longer be copyrighted since it is now primarily a utilitarian object. Neither the dress, nor any part of it, can receive copyright. Others would be free to imitate its appearance since the basic goal (according to a somewhat non-fashion-conscious law) is to produce a

utilitarian object meant to provide protection from the elements and a degree of privacy for the body inside it.

What then of a video game? Is this an original work of authorship? Is it utilitarian in essence? And if it is eligible for copyright, what element or aspect of it, exactly, shall receive this copyright? The process of mechanical reproduction had assured that the copyright registration of one particular copy of a work would automatically insure protection for all its duplicates. Even traditional games like *Monopoly*, which might produce different outcomes at each playing, were identical to one another in their physical and visible parts. But the only visible part of a video game is its video display. The display is highly ephemeral and varies in detail with each play of the game. For a game like *Pac-Man*, the notion of pursuit or pursuit through a maze would be too general. Like the notion of the western or the soap opera, it is too broad for copyright eligibility. Instead the key question is whether a general idea, like pursuit, is given concrete, distinctive, *expression*. The working out of this distinction, though, lends insight into the degree of difference between mechanical reproduction and cybernetic systems perceived by the United States judicial system.

For video games like *Pac-Man*, a copyright procedure has developed that gives protection to the outward manifestation of the underlying software programs. Registration of a copyright does not involve depositing the algorithms structuring the software of the ROM (read-only memory) chip in which it is stored. Instead, registration requires the deposit of a videotape of the game in the play mode.[20]

Referring to requirements that copyright is for "original works of authorship fixed in any tangible medium," Federal District Courts have found that creativity directed to the end of presenting a video display constitutes recognizable authorship and "fixation" occurs in the *repetition* of specific aspects of the visual scenes from one playing of a game to the next. But fixing precisely what constitutes repetition when subtle variations are also in play is not a simple matter. For example, in *Atari v. North American Phillips Consumer Electronics Corp* (1981), one District Court denied infringement of Atari's *Pac-Man* by the defendant's *K.C. Munchkin*. The decision rested on a series of particular differences between the games despite overall similarities. In elaboration, the court noted that the Munchkin character, unlike Pac-Man, "initially faces the viewer rather than showing a profile." K.C. Munchkin moves in profile but when he stops, "he turns around to face the viewer with another smile." Thus the central character is made to have a personality which the central character in *Pac-Man* does not have. *K.C. Munchkin* has munchers which are "spookier" than the goblins in *Pac-Man*. Their legs are longer and move more dramatically, their eyes are vacant—all features absent from *Pac-Man*.

This opinion, however, was overturned in *Atari vs North American Phillips* (1982). The Seventh Circuit Court found *Pac-Man*'s expressive distinctiveness to lie in the articulation of a particular kind of pursuit by means of "gobbler" and "ghost-figures," thereby granting broad protection to the game by likening it to a film genre or subgenre. The Circuit Court found the Munchkin's actions of gobbling and disappearing to be "blatantly similar," and went on to cut through to the basic source of the game's appeal and marketability:

> Video-games, unlike an artist's painting or even other audio visual works, appeal to an audience that is fairly undiscriminating insofar as their concern about more subtle differences in artistic expression. The main attraction of a game such as Pac-Man lies in the stimulation provided by the intensity of the competition. A person who is entranced by the play of the game, "would be disposed to overlook" many of the minor differences in detail and "regard their aesthetic appeal as the same."[21]

In this decision, the Court stresses the process of absorption and feedback sustained by an automated but intelligent system that can simulate the reality of pursuit. The decision represents quite a remarkable set of observations. The fetishization of the image as object of desire transforms into a fetishization of a process as object of desire. This throws as much emphasis on the mental state of the participant as on the exact visual qualities of the representation ("A person who is entranced by the play of the game").

In these cases the courts have clearly recognized the need to guarantee the exclusive rights of authors and inventors (and of the corporations that employ them) to the fruits of their discoveries. Simultaneously, this recognition has served to legitimate the cybernetic metaphor and to renormalize the political-legal apparatus in relation to the question: who shall have the right to control the cybernetic system of which we are a part? On the whole, the decisions have funneled

that control back to a discrete proprietor, making what is potentially disruptive once again consonant with the social formation it threatens to disrupt.

Such decisions may require recasting the legal framework itself and its legitimizing discourse. Paula Samuelson identifies the magnitude of the transformation at work quite tellingly: "It [is] necessary to reconceptualize copyright and patent in ways that would free the systems from the historical subjects to which they have been applied. It [is] necessary to rethink the legal forms, pare them down to a more essential base, and adjust their rules accordingly. It [is] necessary to reconceive the social bargain they now reflect."[22]

If efforts to gain proprietary control of computer chip masks, soft-ware and video games have prompted little radical challenge from the left, the same cannot be said for bacteria and babies, for, that is, the issues of proprietorship that are raised by new forms of artificial life and artificial procreation where the "social bargain" woven into our discursive formations undergoes massive transformation.

The hidden agenda of mastery and control, the masculinist bias at work in video games, in Star Wars, in the reality of the simulation (of invasions, raids and wars), in the masculine need for autonomy and control as it corresponds to the logic of a capitalist marketplace becomes dramatically obvious when we look at the artificial reproduction of human life. The human as a metaphorical, automated, but intelligent system becomes quite literal when the human organism is itself a product of planned engineering.

Gametes, embryos, and fetuses become, like other forms of engineered intelligence that have gained legal status, babies-to-be, subject now to the rules and procedures of commodity exchange. Human life, like Baby M herself, becomes in every sense a commodity to be contracted for, subject to the proprietary control of those who rent the uterus, or the test tube, where such entities undergo gestation.

As one expert in the engineering of human prototypes put it, reproduction in the laboratory is willed, chosen, purposed, and controlled, and is, therefore, more human than coitus with all its vagaries and elements of chance.[23] Such engineering affirms the "contractor's" rights to "take positive steps to enhance the possibility that offspring will have desired characteristics, as well as the converse right to abort or terminate offspring with undesired or undesirable characteristics."[24] But what is most fundamentally at stake does not seem to be personal choice, but power and economics. These opportunities shift reproduction from family life, private space, and domestic relations to the realm of production itself by means of the medical expert, clinical space, and commodity relations. The shift allows men who previously enjoyed the privilege of paying for their sexual pleasure without the fear of consequence the added opportunity of paying for their hereditary preferences without the fear of sexual pleasure.

Such "engineered fetuses" and babies become so much like real human beings that their origin as commodities, bought and sold, may be readily obscured. They become the perfect cyborg. As with other instances in which a metaphor becomes operative and extends across the face of a culture, we have to ask who benefits and who suffers? We have to ask what is at stake and how might struggle and contestation occur? What tools are at our disposal and to what conception of the human do we adhere that can call into question the reification, the commodification, the patterns of mastery, and control that the human as cyborg, the cyborg as human, the simulation of reality, and the reality of the simulation make evident?

Like the normalization of the cybernetic metaphor as scientific paradigm or the judicial legitimization of the private ownership of cybernetic systems (even when their substrate happens to be a living organism), the justification for hierarchical control of the cybernetic apparatus takes a rhetorical form because it is, in essence, an ideological argument. Dissent arises largely from those who appear destined to be controlled by the "liberating force" of new cybernetic technologies. But in no arena will the technologies themselves be determining. In each instance of ideological contestation, what we discover is that the ambivalences regarding cybernetic technology require resolution on more fundamental ground: that domain devoted to a social theory of power.

Purpose, System, Power: Transformative Potential versus Conservative Practice

Liberation from any literal referent beyond the simulation, like liberation from a cultural tradition bound to aura and ritual, brings the actual process of constructing meaning, and social reality, into sharper focus. This liberation also undercuts the Renaissance concept of the individual. "Clear and distinct" people may be a prerequisite for an industrial economy based on the sale of labor power, but mutually

dependent cyborgs may be a higher priority for a postindustrial postmodern economy. In an age of cybernetic systems, the very foundation of western culture and the very heart of its metaphysical tradition, the individual, with his or her inherent dilemmas of free will versus determinism, autonomy versus dependence, and so on, may very well be destined to stand as a vestigial trace of concepts and traditions which are no longer pertinent.

The testing Benjamin found possible with mechanical reproduction—the ability to take things apart and reassemble them, using, in film, montage, the "dynamite of the tenth of a second"—extends yet further with cybernetic systems: what had been mere possibilities or probabilities manifest themselves in the simulation. The dynamite of nanoseconds explodes the limits of our own mental landscape. What falls open to apperception is not just the relativism of social order and how, through recombination, liberation from imposed order is possible, but also the set of systemic principles governing order itself, its dependence on messages-in-circuit, regulated at higher levels to conform to predefined constraints. We discover how, by redefining those constraints, liberation from them is possible. Cybernetic systems and the cyborg as human metaphor refute a heritage that celebrates individual free will and subjectivity.

If there is liberating potential in this, it clearly is not in seeing ourselves as cogs in a machine or elements of a vast simulation, but rather in seeing ourselves as part of a larger whole that is self-regulating and capable of long-term survival. At present this larger whole remains dominated by parts that achieve hegemony. But the very apperception of the cybernetic connection, where system governs parts, where the social collectivity of mind governs the autonomous ego of individualism, may also provide the adaptive concepts needed to decenter control and overturn hierarchy.

Conscious purpose guides the invention and legitimization of cybernetic systems. For the most part, this purpose has served the logic of capitalism, commodity exchange, control and hierarchy. Desire for short-term gain or immediate results gives priority to the criteria of predictability, reliability, and quantifiability. Ironically, the survival of the system as a whole (the sum total of system plus environment on a global scale) takes a subordinate position to more immediate concerns. We remain largely unconscious of that total system that conscious purpose obscures. Our consciousness of something indicates the presence of a problem in need of solution, and cybernetic systems theory has mainly solved the problem of capitalist systems that exploit and deplete their human and natural environment, rather than conserving both themselves and their environment.

Anthony Wilden makes a highly germane observation about the zero-sum game, Monopoly. The goal of the game is to win by controlling the relevant environment, the properties, and the capital they generate. But Monopoly and its intensification of rational, conscious purpose masks a logic in the form of being "merely a game" that is deadly when applied to the open ecosystem. Wilden writes, "We usually fail to see that Monopoly supports the ideology of competition by basing itself on a logical and ecological absurdity. It is assumed that the winning player, having consumed all the resources of all the opponents, can actually survive the end of the game. In fact this is impossible. . . . The Monopoly winner [must] die because in the context of the resources provided by the game, the winner has consumed them all, leaving no environment (no other players) to feed on."[25]

"There is the discovery," Gregory Bateson writes in one of his more apocalyptic essays, "that man is only a part of larger systems and that the part can never control the whole."[26] The cybernetic metaphor invites the testing of the purpose and logic of any given system against the goals of the larger ecosystem where the unit of survival is the adaptive organism-in-relation-to-its-environment, not the monadic individual or any other part construing itself as autonomous or "whole."[27] "Transgression does not negate an interdiction; it transcends and completes it." The transgressive and liberating potential which Bataille found in the violation of taboos and prohibitions, and which Benjamin found in the potential of mechanically reproduced works of art, persists in yet another form. The cybernetic metaphor contains the germ of an enhanced future inside a prevailing model that substitutes part for whole, simulation for real, cyborg for human, conscious purpose for the decentered goal-seeking of the totality—system plus environment. The task is not to overthrow the prevailing cybernetic model but to transgress its predefined interdictions and limits, using the dynamite of the apperceptive powers it has itself brought into being.

Notes

1. The concept of the double hermeneutic derives from Fredric Jameson, *The Political Unconscious* (Ithaca: Cornell University Press, 1981), especially the final chapter.

2. Walter Benjamin, "The Work of Art in the Age of Mechanical Reproduction" in *Illuminations,* by Harry Zohn, trans., (New York: Schocken Books, 1969), p. 221. Further page references from this essay are given in the text.

3. Walter Benjamin, *Schriften,* 2 vols. (Frankfurt: Suhrkamp Verlag, 1955), I, p. 461. Translated in Fredric Jameson, *Marxism and Form* (Princeton: Princeton University Press, 1971), p. 77.

4. Terry Eagleton, *Marxism and Literary Criticism* (Berkeley: University of California Press, 1976), p. 63.

5. This quote is from James Clifford, "On Ethnographic Surrealism" *Comparative Studies in Society and History,* vol. 23, 4 (October 1981): 559–564, where he offers an excellent description of the confluences between surrealism and certain tendencies within early ethnography in 1920s France.

6. See, for example, the essays in Part III, "Form and Pathology in Relationship" by Gregory Bateson, *Steps to an Ecology of Mind* (New York: Ballantine Books, 1972), where this phrase is introduced and applied to various situations.

7. Quoted in Sherry Turkle, *The Second Self: Computer and the Human Spirit* (New York: Simon and Schuster, 1984), p. 86.

8. Steven J. Heims, *John von Neumann and Norbert Wiener: From Mathematics to the Technologies of Life and Death* (Cambridge, MA: MIT Press, 1980), describes how research on antiaircraft guidance systems led Julian Bigelow and Norbert Wiener to develop a mathematical theory "for predicting the future as best one can on the basis of incomplete information about the past" (p. 183). For an overview of the history of cybernetic theory and cognitive psychology in the context of its military-industrial origins, see Paul N. Edwards, "Formalized Warfare," unpublished ms. (1984), History of Consciousness Program, University of California, Santa Cruz.

9. Jean Baudrillard, "The Implosion of Meaning in the Media and the Implosion of the Social in the Masses" in Kathleen Woodward, ed., *The Myths of Information,* (Madison, Coda Press, 1980), p. 139.

10. Sherry Turkle, p. 264.

11. See Laura Mulvey, "Visual Pleasure and Narrative Cinema," *Screen,* vol. 16, 3 (Autumn 1975): 6–18.

12. Paul N. Edwards, p. 59.

13. See, for example, Paul N. Edwards, for a more detailed account of this synergism between the development of cybernetics and military needs. For a cybernetic theory of alcoholism and schizophrenia, see Gregory Bateson, and Watzlawick, Beavin and Jackson's study of human interaction in a systems framework in Pragmatics of Human Communication.

14. John Stroud, "Psychological Moments in Perception—Discussions," in H. Van Foersta, et al., eds., *Cybernetics: Circular Causal and Feedback Mechanisms in Biological and Social Systems,* Transactions of the Sixth Macy Conference (New York: Josiah Macy Foundation, 1949), pp. 27–28.

15. Jean Baudrillard, p. 139.

16. See Nicos Poulantzas, *Political Power and Social Class* (London: New Left Books, 1975), pp. 211–214.

17. James J. Myrick and James A. Sprowl, "Patent Law for Programmed Computers and Programmed Life Forms," *American Bar Association Journal,* no. 68 (August 198): 120.

18. Myrick and Sprowl, p. 121. Some other relevant articles include: "Biotechnology: Patent Law Developments in Great Britain and the United States," *Boston College International and Comparative Law Review,* no. 6 (Spring 1983): 563–590; "Can a Computer be an Author? Copyright Aspects of Artificial Intelligence," *Communication Entertainment Law Journal,* 4 (Summer 1982): 707–747; Peter Aufrichtig, "Copyright Protection for Computer Programs in Read-Only Memory Chips," *Hofstra Law Review,* II (February 1982): 329–370; "Patents on Algorithms, Discoveries and Scientific Principles," Idea 24 (1983): 21–39; S. Hewitt, "Protection of Works Created by Use of Computers," *New Law Journal,* 133 (March 11, 1983): 235–237; E.N. Kramsky, "Video Games: Our Legal System Grapples with a Social Phenomenon," *Journal of the Patent Office Society,* 64 (June 1982): 335–351.

19. This case's relevance for computer software litigation is discussed in Peter Aufrichtig's "Copyright Protection for Computer Programs in Read Only Memory Chips,": 329–370.

20. E.N. Kramsky, p. 342.

21. 214 US PQ 33t 7th Cir, 1982, pp. 33, 42, 43.

22. Paula Samuelson, "Creating a New Kind of Intellectual Property: Applying the Lessons of the Chip Law to Computer Programs," *Minnesota Law Review,* 70 (December 1985): 502.

23. Cited in Christine Overall, "Pluck a Fetus from its womb": A Critique of Current Attitudes Toward the Embryo/Fetus," *University of Western Ontario Law Review,* vol. 24, 1 (1986): 6–7.

24. Overall, p. 7.

25. Anthony Wilden, "Changing Frames of Order: Cybernetics and the Machina Mundi" in Kathleen Woodward, ed., *The Myths of Information,* p. 240.

26. Gregory Bateson, "Conscious Purpose and Nature" in *Steps to an Ecology of Mind,* p. 437.

27. Gregory Bateson, "Style, Grace and Information in Primitive Art," *Steps to an Ecology of Mind,* p. 145.