

Technological Futures and Determinisms:

Technoculture and Progressive Embodiment,
Precedent, Causality and Marketplace Choice

They have been with us a long time.

They will outlast the elms. . . .

The Nature of our construction is in every way

A better fit than the Nature it displaces.

– *John Updike, "Telephone Poles" (1963)**

Abstract

This article offers an historical framework for discussing progressive embodiment.¹ The analysis includes a consideration of the incremental pace of technological change and why the term “digital revolution” may be a misnomer. The review of technological determinism and the relationship between society and its tools explores how tools extend consciousness and how technological artifacts, rather than transcending, reflect their times and culture. Use of technology involves choice: to act responsibly given the type of tool in hand; to refuse, as with the Luddite position; to choose selectively and communally as, for instance, the Amish do; and to opt for increasing immersion in the interface, as with the emerging cyborgization. The latter has broad technocultural implications since it exists in tension with the ideology of “progressiveness” and inherently is connected with the global telecommunications and Internet infrastructure as well as with the hybridization process that calls into question assumed human essentialism.

Mapping Technoculture

When we talk about technology, we often are talking about the future – what is next, where we are headed, the as-yet-unrealized. A time untouched by the real-world problems of today, the future evokes pleasant memories of technological promise. This cultural affection can be tapped as nostalgia to merchandise personal electronics accessories, which in turn contribute to a highly commodified, “high tech” lifestyle or fade into obscurity.² Whether a commercial success or failure, consumer communications apparatuses may be resurrected at any point forward as representing an unfulfilled or formerly unappreciated potential: e.g., the mythic vision of the genius entrepreneur ahead of his (rarely is this a woman) time, vintage collectibles with a peer-to-peer swap-meet afterlife, alternative uses and appreciations of devices at odds with their initial consumption, product introductions that recall kitsch Jetsons’s modern style, et al. As the early Jean Baudrillard recognized over 30 years ago, within the consumer technology utopia and cornucopia, the time is always right for yet another item in a series, a relaunch, an upgrade, a reconsideration, the perpetually re/newed and improved.³

The intent of the article is threefold: 1) to review some assumptions about technological revolutions and determinism, as well as our relationship to our mediating tools and their potential, 2) to provide some initial steps toward an historical context for a theoretical understanding of the cyborg and its antecedents, and 3) to borrow from Raymond Williams, to shape a narrative for residual consumer electronics in order to better understand the emergent devices of progressive embodiment and the choices they represent.⁴

Humdrum Technologies

Despite the disruption to the status quo that digitization, the Internet, mobile devices, artificial intelligence, whatever the innovation du jour supposedly will enable – and the general hyperbole of high tech merchandising and our own eagerness to believe that we are part of something new and exciting – thus far the most recent iteration of communication technology has not wholly differed from television and previous forms of electronic and telecommunications media. Mass media and its consumer electronics artifacts continue to be part of the same, ever widening circulation of meaning, manufacture, distribution, retailing, popular consumption or dismissal, subscription and aftermarket support to encourage customer loyalty, institutionalization and administration – whether analog or digital, mechanical or automatic, cable or satellite, online or offline, wired or wireless. If there has been a digital revolution, it has been accommodated by elasticity inherent to the ideological system.

Technology is not supposed to be disruptive. The smooth functioning of the everyday is precisely what we most depend on the technological infrastructure to do, be it steam engine, automobile, refrigerator, television set and programming, wristwatch or pacemaker. The threat of disruption was what the “Year 2000” (Y2K) crisis or noncrisis was about: Nothing happened, which was interpreted as “good,” if somewhat disappointing. No matter how enticing the mechanism and the status it may momentarily impart, within a short while it is *supposed* to be boring, dependable, to recede into the background. As Lewis Mumford noted, mechanisms are supposed to function “like clockwork.”⁵ From most manufacturers’ or inventors’ standpoints, the goal is to make life transparently easier, to encourage us to take the devices for granted. Relax, the odious manual task is being automatically taken care of for you. You need not get your hands dirty.

That there are genuine advances and discoveries is without question. But surely such research-and-development activities must be considered within an interplay of ordinary processes including nonevents, reversals and incremental change that do not make news, but in hindsight perhaps form a pattern of discovery and eventually consumer interest or lack thereof. Even with striking manifestations, such as human-machine fusions and genetic modifications, technologies do not miraculously appear as if from the heavens, *deus ex machina*, or through a brilliant inventor's eureka moment. There are no Ovidian metamorphoses in the modern to postmodern world. Roland Barthes lucidly pointed out nearly a half-century ago that those narratives of promotional origin are mythologies, fictitious as well as culturally, cannily coded stereotypes.⁶ No matter how much money is poured into a product launch or the creation of the Great Man inventor-businessman story, readily seen with Thomas Alva Edison although others would serve nearly as well, and no matter how keen the grasp of the futurist visionary, these matters simply cannot be decided by fiat in the present.⁷

White Noise

Such cultural myths do serve, however, to foreground the gentle hum of plugged-in equipment that we take so much for granted, at least until there is a power outage. Therefore, it is not quite meaningless to announce that a discovery will change the world. James W. Carey and John J. Quirk wrote in their well-known essay, "The History of the Future" (1973), that utopian envisioning has "potent political uses. The ideology of the future can serve as a form of 'false consciousness,' a deflection away from the substantial problems of the present, problems grounded in conflicts over wealth and status and the appropriate uses of technology, toward a future in which these problems, by the very nature of the future, cannot exist" (179-80).⁸ In recent memory, Albert Gore, Jr., in his unsuccessful presidential bids, adopted this deflection strategy to distance himself from notably sticky problems with the family and administrations

with which he was associated. Unfortunately from his standpoint the public took the “information superhighway” for granted remarkably quickly and Gore’s instrumental role in Washington was forgotten or insufficiently appreciated.

This process of acclimation does not preclude the literally earth shattering as history repeatedly has shown through the example of military mechanisms and their effects. A decided shift of an accepted mode for one generation, or only for a few years, may well turn out to be part of everyday life for the next, nothing startling at all, as has been seen to a large extent with the Internet, which emerged in the U.S. from a department within the Pentagon.⁹ Human beings and their technologies are mutually (to assign volition to technology for the moment) responsive and adaptable. Or perhaps technological revolutions ain’t what they used to be. With everything from ballpoint pens with a slightly smoother gliding action to breakthroughs concerning the human genome heralded as “revolutionary,” the term has been downgraded to white-noise status.

The recent shift may turn out to be fungible, interactive, networked, in other words “smart,” media and that may be it. In “Revolutionary Technologies and Technological Revolutions” (1992), Jonathan Gershuny notes that it is entirely possible for a “revolutionary technology [to be] without revolutionary economic consequences” (227).¹⁰ Gershuny discusses the emergence of electricity in turn of the century, steam age London and the difficulty of technocultural forecasting, but the principle applies well to digital technology and whatever we may choose to call the residual paradigm: “atoms to bits,” according to Nicholas Negroponte, cofounder of the Media Laboratory of the Massachusetts Institute of Technology and author of *Being Digital* (1996) (although life as we know it clearly would cease to exist without atoms – nuclear devastation probably not being the vision Negroponte has in mind).¹¹

As of fall 2001, demographic studies show stalemated or declining Net use, which translates into less opportunities for electronic commerce, slowing economic expansion, layoffs and other downgrades that were not forecasted by market researchers willing to go on the record a year ago or less.¹² The “old economy,” which quite never left, is back. If it is not a misnomer altogether, the “digital age” as a term seems past its prime, reminiscent of an atomic age of anxiety from which more than one generation wanted to escape. If a break is to come, it may arise elsewhere, perhaps building momentum right now.¹³ But maybe not. When it comes to divining the future, in our imaginative escapes we tend to stumble over the messy problems of the here and now. As the Magic 8-Ball says, “Future appears cloudy. Try again later.”

Nostalgic Convergence

To further draw on historical precedent, there is little wholly new about personal communications devices that represent converged mechanisms, industrialized processes and distribution channels, and the democratization of formerly specialized media skills and access. Consider Eastman Kodak’s venerable Brownie, the Model T of photographic apparatuses but with far greater longevity as a brand. Launched in 1900, the Brownie combined various simple devices within the box camera, was heavily promoted directly to the general populace in what we might call today a “business to consumer” play as a miracle invention that only cost a dollar each, was brought out in many variations with regular improvements until its final iteration in 1970, and was transported by rail and shipped from strategically located Rochester, New York, around the world, encouraging the creation of a market of amateur photographers where one previously did not exist.¹⁴ Advertised in popular magazines to men and women, young and old, across ethnic groups, the device did not require much literacy, it drew on common human interest in collecting mementoes for as long as the artifact might last and in recording some objective truth that an event had occurred, it minimized the time and skill necessary for

photographic development and was inexpensive as well – truly astonishing and, moreover, the hand-held camera helped bring people together as the telegraph and telephone previously did.

The deceptively modest Brownie contributed to what has become the global “information society,” to use James Beniger’s term.¹⁵ The raw materials could be brought in or were readily available, the chemical processes and plastics had been developed or were in development, the technological infrastructure and mass media dissemination were in place or could be created, Kodak had the capital to invest or could obtain the necessary backing, and a system of manufacture that seeded repetitive retail and institutional sales from the same customer over many years was generated at a time of cultural receptivity to personal communications equipment, including the telephone, phonograph and a bit later the radio.

But this is the recipe for most successful entrepreneurship: to spot the opportunity, to develop the product, to obtain the financing to hire, generate interest and minimize risk, to put together the “business plan,” which must be able to scale effectively, to create distribution and marketing channels, encouraging what Everett Rogers terms the “diffusion of innovation,” and to seize the moment and the profits, perhaps changing the world for the better or worse along the way.¹⁶

The social and environmental effects of production, how the technology will be used or abused, and the surplus left behind, whether the product was used or unused, generally are not prime concerns for management. Business is and must be focused on the next quarter and the next challenge, demonstrating to investors and customers an upward trajectory of goals that have been met, which mean progress for the existing management. Generally speaking, unless it makes “good business sense” or regulatory issues arise, the broader communal impact is not of primary or secondary interest, although not necessarily deemed unimportant altogether.

It is customers, though, who opt in and others who never cast a marketplace vote one way or the other but who are nonetheless affected, who look around at how the world has changed and try to make sense of the product or service and what its breakthrough represents in a larger sense. Commodities become cultural artifacts. The intellectual property is owned by the entrepreneur's company, but the artifact belongs to those who use it:¹⁷ What a culture leaves behind are its devices and implements, glimpses of daily life that can be inferred and judged by archeologists and other social excavators. Many steps removed and with the benefit of hindsight, we make assumptions about cultures based on what tools they used, what they preserved in their repositories, what they exchanged and what resulted. But what we cannot determine from the evidence is what choices were in the offing and why decisions were made.

Technology and Causality

Steam power and electricity, the automobile and the portable camera with disposable roll film that can be replenished are examples of successful and greatly appreciated products and services that have had vast and continuing social and environmental consequences. But it is equally true that technology does not necessarily drive history. Regarding technological determinism, Manuel Castells's thoughts on the relationship between history, society, technology and causality in *The Rise of the Network Society* (1996) are useful:¹⁸

Of course technology does not determine society. Neither does society script the course of technological change, since many factors, including individual inventiveness and entrepreneurialism, intervene in the process of scientific discovery, technological innovation, and social applications, so that the final outcome depends on a complex pattern of interaction. Indeed, the dilemma of technological determinism is probably a false problem, since technology *is* society, and society cannot be understood or represented without its technological tools. (5)

Technology is a contributing part of society, not necessarily separable as cause or effect. To soften Castells a bit, society is becoming a *technoculture* through an ongoing process with tensions and countervailing forces, "a complex pattern of interaction," as he says.¹⁹ His point is well taken, however, that it would be obstinacy not to acknowledge that our tools, whether handmade or manmade, shape us and our potential and are essential for understanding the emerging technologically oriented society. The domestication and personalization of mass produced communication devices has continued at an uneven pace for 150 years or so as a study of the world's fairs shows²⁰ – and often with close ties to the military, law enforcement or emergency services with implications attached, such as protection, surveillance and necessity.

The Tool Made Me Do It

A technological artifact is not neutral, blameless, a blank slate: It is a hackneyed truth that a hammer can be used to build a house or to strike a blow. Technologies are used to do or undo; therefore they are implicitly connected with actions taken or refused. There are choices and there are consequences that the tool represents because of how it was made (including the conditions of its manufacture), how it was used before and how it may be used in the future. With a gun in hand, there are possibilities to consider that are not available with a pen, however similar may be the emotions and urgencies that seem to impel picking up the instrument. Abraham Maslow and Neil Postman have noted that to someone with a hammer, the world looks like a nail; to someone with a camera, the world looks like a photograph; to someone with a computer, the world looks like data.²¹ The specific tool influences how intelligence and emotions find expression and how the world is perceived. In other words, tools affect state of mind, which is to say consciousness. They can encourage a feeling of power, as any driver who has sat in the cockpit of a sports car can attest. In an emergency situation without a telephone in this day and time, we may well feel vulnerable. We filter the world through our

technologies and they are incorporated into our point of view to the extent that it often is difficult to tell where consciousness ends and tool or artifice begins and vice versa, particularly if there is a strong affinity or a skill has been developed for a specific instrument.²²

Rather than viewed as singular, uses of technologies often are tallied and grouped together as empirical data. Thus a recent history of devices and their uses can be established based on verifiable statistical information, surveys and the like. How tools or technologies are used aligns with others who have used them similarly: e.g., the number of people who visit a specific Web site, how many people use cellular telephones when away from the office, how frequently a song is downloaded at what time of day, to what extent teenage violence is increasing or decreasing as related to the frequency of televised exposure to firearms. Statistical analysis of technological usage charts consumption decisions, societal trends and patterns of adoption, differences based on learning styles, demographic and gender preferences, local variances and other ups, downs, ins and outs. In turn, past patterns of use influence future directions, since analysis and predictions extrapolated from gathered data form the foundation on which various rates will be based, and programs and business plans of many kinds rely, among a host of other socioeconomic and regulatory implications and applications.

In what is often hoped to be a self-fulfilling prophecy, verifiable success in the marketplace tends to prompt similar development because its statistical success has been shown, which is taken to mean proven. Thus, as is commonly claimed, a corporate breakthrough is partially a “numbers game” and “spin,” meaning that interpretation of the data was colored by corporate public relations imperatives. Maintaining past success through new iterations in the series and product introductions with marketing campaigns to support the launch and brand is believed to be the best assurance of future dominance in the market or for the corporation, although this

process is far from absolute as has been seen through Microsoft's high-visibility stumbles with MSN, the Bob or Clippie help avatar in Office, WebTV and their instant messaging strategies.

To state the obvious, it is people who interpret statistics for specific reasons. The technology does not "want" anything; technology is inanimate. Computers are fabulous at tabulation and creating graphs. But after it has been purchased, a computer does not care if you use it or what you do with it when you do. The otherness we ascribe to devices, as if they had volition, is useful, though, for self-discovery and it speaks to our investment in the interface. How do you know what you might do with a specific tool in hand until it is there and there are decisions to be made – when there is new potentiality and increased access to chosen media for information and enjoyment at your fingertips? You may do nothing. A large proportion of devices sit around unused, partially because it may seem as though it is too much trouble to figure out how to use them or need for their use arises infrequently. Or the need has passed and the device has become outmoded. But when needed or wanted, such devices may extend the mediated grasp and mastery over temporality as the Brownie did for amateur photographers a century ago and as wristwatches began to do shortly thereafter with their initial popular use following the First World War.²³ The artifice may become part of you in the sense of progressive embodiment, meaning increased immersion in or familiarization with the interface and personal communications gear, which is electronic today but previously was mechanical. Whether left behind by a defunct culture or extant, what any tool will not be is neutral, ahistorical or apolitical. Devices reflect their cultures and the needs for which they were developed.

Technological Indeterminacy

Television and computers clearly have had an effect on society, although many factors have contributed to their influence. No television producer yet has figured out a way to force viewers

to watch what they do not want to watch.²⁴ If advertising truly "worked," then it would be considered more than an inexact science. Perhaps instead of technological determinism, we should think in terms of indeterminacy. There is no Television with a capital "T," but rather many televisions within many contexts, considered for specific populations at specific times, programs, devices, merchandising, New York and Hollywood, popular discourse and so forth. Despite the mass media's proclamations about "The Internet," there is no one, monolithic Internet. The Internet is a vast online Gibsonian sprawl that changes daily and over time as longitudinal studies suggest. Even lumping together the Net as one mass, the Internet of 1999 differs from the Internet of 2001. A statistical snapshot of the Internet of June 2001 will not be the same as December 2001, even within the same demographic group. Your use of the Internet is not the same as your neighbor's. The Internet is slowly developing and taking on different shapes, as it has throughout its 30-plus year history.

Similarly there is no "Cyborg," but rather there are mutating cyborgs, protean forms of artificial and augmented life, various cross-cultural and cross-gender constructions of cyborgness and what they connote. In "The Life Cycle of Cyborgs: Writing the Posthuman" (1993), Katherine Hayles says that cyborgs "actually do exist; about ten percent of the current U.S. population are estimated to be cyborgs in the technical sense."²⁵ Imagined cyborgs date back to earliest human experience and "It's alive!" toolmaking: e.g., Pygmalion's Galatea (pre-Homeric), the golem (sixteenth century), Frankenstein's cobbled-together monster (1818), the "false Maria" in *Metropolis* (1926), progressive embodiment considered from the Other side in "The Bicentennial Man" (1976) and so on through those cinematic forms that recently have caught the public imagination, such as the replicants of *Blade Runner* (1982), *The Terminator* (1984), the bionic *RoboCop* (1987), the *Bildungsroman* of the protagonist in *The Matrix* (1999), and the humanoid hybrids of *A.I.* (2001).

Donna Haraway famously ends her germinal “A Manifesto for Cyborgs: Science, Technology, and Socialist Feminism in the 1980s” (1985) with the bold assertion: “Cyborg imagery can suggest a way out of the maze of dualisms in which we have explained our bodies and our tools to ourselves. . . . It means both building and destroying machines, identities, categories, relationships, spaces, stories. Though both are bound in the spiral dance, I would rather be a cyborg than a goddess” (181).²⁶ Haraway’s attraction to the “cybernetic” speaks to women’s need to break out of Pygmalion-style molding and to actualize an independent, holistic identity.²⁷ Furthermore, the cyborg promises to resolve the perennial Cartesian split and to bridge the boundaries between ourselves and that which we create, the organic and synthetic, our tools and ourselves through a process of bodily incorporation that fuses difference with the interface.

As with other artifacts and tools, cybermachines do not have agency, although they carry accumulated cultural meaning, heritages, histories, ways of looking at the world and of politics – of their eras as well as intrinsic – that grows and changes over time and that affects future interest. This is part of the nostalgic mystique of collectible gizmos, such as funky fifties 3D glasses, which hearken back to what seems, in retrospect, to have been a more innocent time, the atomic age associations emptied out. The kitsch appeal brackets off the object’s temporal politics, the object appealing instead for its transcendent progressiveness. Nevertheless technological objects represent lived experience, shaped by their times. Terms using the “post” prefix tacitly refer to antecedents: e.g., “posthuman” or “postindustrial” and “postmodern.”

Suspended Time

Slightly anticipating Michel Foucault, in “Requiem for the Media” (1972), Baudrillard wrote of George Orwell’s conception of surveillance in *Nineteen Eighty-Four* in 1949: “It is useless to

fantasize about state projection of police control through . . . TV, [which] by virtue of its mere presence, is a social control in itself. There is no need to imagine it as a state periscope spying on everyone's life – the situation as it stands is more efficient than that" (172).²⁸ In this view, omnipresent media acts as police-state control, inseparably aligned with ruling class interests and normalization. Rather than liberation through media, the dystopian sees chains. Carey and Quirk again:

Despite the manifest failure of technology to resolve pressing social issues over the last century, contemporary intellectuals continue to see revolutionary potential in the latest technological gadgets that are pictured as a force *outside* history and politics. The future as it is previsioned is one in which cybernetic machines provide the dynamic of progressive change. (191)

But of course, Baudrillard, Carey and Quirk wrote a decade before Haraway's "Manifesto" and Hayles's thoughts on the posthuman, which she sees as an evolutionary process, "a hybrid species created by crossing biological organism with cybernetic mechanism From the beginning it is constructed, a technobiological object that confounds the dichotomy between natural and unnatural, made and born" (321).²⁹ Such a being, who is re/produced, is a deeply political construct in the feminist and environmental senses. Hayles's cyborg is created from the mediated world that alarmed earlier writers on technoculture and is deeply of it, not split-off, not transcendent, but a tool and functioning member of Carey's and Quirk's "progressive change," living history (or her-story). A superwoman, she nevertheless is an object – there is plenty of food for thought in Hayles formulation, which at first glance seems antithetical to commonsense.

Luddite Negation of Progress

With their dystopic feet on the ground, but not so far removed from the posthuman and its conundrums, environmentalists and Luddites have long argued that technology to a large extent

not only should be a personal choice but does require choices. The culture may seemingly choose to opt in, but why do they necessarily have to be swept along?

In a 1995 BBC Radio Scotland interview, Postman, author of *Technopoly: The Surrender of Culture to Technology* (1993), mentioned shopping for a Honda Accord and being ambushed into paying for an automatic contraption for manipulating the windows.³⁰ He wanted to manually wind the windows up and down as he had always done with gears and a handle. But desired or not, if he wanted this model car he had no choice but to go with the newer push-button mechanism, its limitations and the unnecessary expense, including the projected cost of future repairs. Postman points out that the more advanced technology further nudged him along a path down which he did not wish to venture. Did others making vehicle purchases realize that they too were opting in to an increasingly narrower range of choices by acquiescing to the electric gliding windows gadget? What difference does the color or style make when you are inconvenienced by the device in the first place?

Fond of asking what is the problem to which the proposed technology is a solution, Postman goes on to say that it “frequently limits options. People who are very enthusiastic about technology are always telling us what it will do for us. They almost never address the question of what it will undo” (5).³¹ The knee-jerk reply is that technology will solve the problems wrought by technology, e.g., better chemistry will solve sewage problems, a more efficient carburetor will burn gas more efficiently, a more natural interface will better approximate face-to-face communication. Postman, however, would be likely to accept the “technological fix” as proving his point. Such a reply betrays an inability to think outside technoculture; it is the problem solving of engineers with stopgap measures rather than those of holistically oriented humanists.

But technology can be viewed as a constant process of responsible decision-making. In “Look Who’s Talking” (1999), techno-evangelist Howard Rheingold wrote about the Amish who generally shun modern technology, although they are adept with mechanical devices that employ human and animal labor, pre-industrial revolution.³² To answer Postman’s question, the Amish have mindfully chosen to develop a cellular telephone subculture. They selected this telecommunications technology for communal use for practical purposes, such as to reach the doctor or veterinarian and to place orders for necessary equipment that they cannot provide for themselves. Rheingold ends the article by rhetorically asking, “If we decided that community came first, how would we use our tools differently?” (163). He does not ask if the Amish are a technoculture although it would seem that they are, the term not being restricted to modern electronic conveniences. Rheingold refers to the Amish as “techno-selectives” (131).

Y2K offered the global community a moment to stop and think about technology as we moved into the next millennium. But the challenge was not taken up. New Year’s Eve 2000 was a worldwide party – we saw it on CNN – although it jumped the gun a bit on the true start of the incoming millennium. If Y2K had been as disastrous as was widely predicted, it would have been much more sweeping than anything the Unabomber could have brought about, a wished for reversal of progress that has been simmering since the original band of Luddites rebelled against the machine in early industrialized Great Britain – and in 1812 were quelled by “24,000 troops and local militia . . . more than had gone abroad under Wellington to fight Napoleon.”³³

The Y2K moment passed, however, with barely a techno-selective hiccup and few seem to have taken the time to look back, apparently not even to consider that the perceived necessity to upgrade equipment, provide patches, reverse engineer programming and other special measures was what largely drove the technology boom attributed to dot-com mania.³⁴ Y2K was

used to sell preparedness commodities and services. If it was possible to opt out voluntarily, it was at the threat of grave peril to data and peace of mind. But not only are such measures unnecessary today, they apparently were never needed at all. The Y2K spectacle diverted attention from the marketing and promotional sleight of hand. Nevertheless the calendar moment anticipated a time that only could exist in the future, a culturally wished for moment in which the machine might stop.³⁵ That time must remain suspended indefinitely.

Proto-Cyborgs and the Boogieman Juggernaut

Technology as fashion – gear worn to accessorize, to gain mobility with connectivity, to impart high tech style, to extend the sensory reach and to augment the human or limitations of reality – and the extensive industrial infrastructure and power grid of networks, satellites, poles and towers, transformers, factories and warehouses, transportation systems, regulatory bureaucracies and a plethora of other taken-for-granted, tuned out, seen but unseen until disrupted mechanisms that make the smooth functioning of high tech personalization and embodiment possible – the meta-machine or Deleuzean apparatus of progress – undeniably reflects the dominating choices, which is to say the ideology, of the world in which most of us live – the Unabomber (before his incarceration), the Amish and perhaps a few posthumans aside. The technology of a cellular telephone or a networked personal computer has a vast reach and is anything but natural or neutral, perhaps especially because of its apparent ease. We do not see the system at work and we take it for granted, resting assured, feeling protected.

If we are becoming a society of proto-cyborgs, then this is why: To participate even in the most apparently routine transactions today, such as an automatic teller withdrawal, necessarily requires being at least momentary plugged into the Gibsonian matrix. To revisit the old metaphor used for the telegraph as the nervous system of the world with the locomotive as its

ground-hugging musculature, to connect with the Net means to “jack in” to the neural Net, however unaware of the journeying bits and bytes the participant may be. The invisible transmission extends high up to the heavens, beamed to and from satellites, is carried along cables beneath the seas and crosses expanses that might greatly appeal to Jules Verne.

Technological change, then, is a widespread process of becoming that is less revolutionary than incremental and stealthy, that meanders, that reflects manufacturing processes and corporate dissemination, historical conditions, heritages, politics, personal choice and other factors, as well as statistically verifiable trends and patterns of adoption, cost and availability. A process of sporadic change may well have longevity. But such a process does not necessarily roll on relentlessly as if generated by the inexorable destiny of an armored tank of progress that precludes all other possibilities. There is no boogieman juggernaut. Cultural theory built on Antonio Gramsci's foundation has argued that hegemony involves dialectical tension that accommodates nondominant positions, pushing and pulling and renegotiating that ultimately will be incorporated within the ideological system. The outcome may be predetermined, but the process of resolution is not. Within the struggle lies the possibility of intervention, or at least a creative or ongoing solution, cybernetic progress as a “spiral dance,” as Haraway says.

Nevertheless rigid thinking persists, likely encouraged by an incessant battering of merchandising that seems an unstoppable tidal wave of commodities, each iteration better, more advanced than the last but more of the same, a series of the new and improved, yet comforting and familiar (e.g. the film franchise *Jurassic Park*, theme ride, mementos of the *J.P.* experience, et al.). Whether we buy-in or not, the notion of progress becomes conflated with the next event in chronological order, the worth of which is evaluated in terms of money, which is very much associated with success, meaning progress.³⁶ It is tough to think outside this box.

Moreover, fatalism is an unfortunate legacy of the battlefield of the twentieth century that continues to haunt us today. But if superior, meaning might-makes-right, technology always triumphs, then how to explain Vietnam? Or if that example is still too incendiary, then another that has nearly faded from cultural memory may suffice, the Great War of attrition, 1914-18, through which the industrial revolution and imperialism imploded, the “best” technologies and mechanization of the human resulting in an horrific deadlock.³⁷ Many examples could be provided at the macro-level, such as colonial and postcolonial struggles, and at the micro-level, such as the QWERTY keyboard that is a relic of telegraphy and which should have been replaced long ago or the notably imperfect products produced by Microsoft that seem to get baggier rather than better. But people made these military blunders and continue to support monopolistic practices and eliminate choices that would seem to be in their best interest. While not without blame, the technology was not the originating force.

Selecting Progressive Embodiment

Technological change often catches us by surprise and we reactively overestimate the breadth of influence of a specific outcome that typically is less a cause than a result. There is nothing mystical or predetermined about technological development or what prevails in the marketplace. Socioeconomic circumstances play a large role in determining existence and consciousness. But to this Marxian truism may be added that today these circumstances and the consciousness to which they give rise are mediated by access to technology that bends previous conceptions of existence. Human essentialism no longer can be taken for granted. Society and our bodies are slowly, ambivalently gravitating toward cybernetic fusion, leading to troubled alienation from and equally troubling uncritical acceptance of the nonhuman. But we created the nonhuman; it

reflects us. As cyberspace continues to expand, we face important decisions regarding corporeal assimilation. What kind of techno-selections do we want to make?³⁸

Choosing Immersion

Cyberspace or the online or the virtual is seeping into and absorbing or merging with “real,” unmediated life. Because it apparently crept up on us, not what our cultural egos necessarily wished for, there is confusion. Yet there is joy in the adventure, the freedom of biological hybridization and digital exploration, charting what Mitchell Kapor and John Perry Barlow termed the “electronic frontier” over a decade ago.³⁹ The Web, which no one saw coming, which mushroomed semi-organically, served as an incremental step, following the earlier Net, television and other media, as well as the development of personal computers and computing.

In late 2000, Baudrillard, now an elder statesman of continental postmodernism and Situationist Paris, 1968, who has become, perhaps, the Marshall McLuhan of digital communication but who had written precious little on matters cyber, finally spoke of “The Murder of the Real.”⁴⁰ His current thoughts are close to an Existential appreciation of the absurd: Since “disalienation” is no longer possible, droll celebration of the virtual is the only reasonable response, a symbolic thumbing of the nose, thereby making the world “even more unintelligible, even more enigmatic” (83). Baudrillard seems to have shifted full-scale into an elision of reality that embraces virtuality because a way out can no longer be found, as though cyberspace had become the Conradian Congo where false consciousness is the local dialect. Since we are on a voyage into the darkness of inhumanity, or arguably posthumanity, why restrict ourselves to arranging the deck chairs when we can be part of the performative ensemble?

Baudrillard finds wry humor in what apparently horrifies him. The prospect of progressive embodiment surely can be unsettling – but it is not scripted. The choice largely plays out at the site of determination in a rather prosaic fashion: The customer buys or rejects the goods and services offered for sale. It happens all the time. The marketplace offers choice, but people have the wherewithal to consume or not. A century ago in the U.S., no one held a gun to the heads of would-be amateur photographers, including recent immigrants living on small incomes, and told them that they had to buy Brownie cameras or else. There was no vast conspiracy that dictated through the new cinema and popular magazines that, along with inexpensive cameras and film, the rapidly emerging technoculture must substitute “snapshot” impression for reality and unmediated memory. Similar events were taking place on the auditory side with the telephone, phonograph and radio, substituting and augmenting face-to-face communication and music-making. Apparatuses, media and culture came together and have continued to intersect and metamorphose. The reciprocal process dates back to the beginnings of mediated communication, which is to say Plato and the allegory of the cave and probably earlier. But the natural human interest in extending the sensory reach is met more than halfway today with technologies and potentialities that can give rise to terms like “posthuman.” That *is* different.

Revisiting the “Cyborg’s Dilemma”

Increased familiarization with the cybernetic seems to be chosen, if it can be afforded – including for medical reasons, such as prosthetics, cosmetic surgery and innovations in sports medicine – largely because the enhancements to ourselves and our daily lives are believed to be advantageous. Status plays a role, desire to keep up figures in, as does habitual use of consumer electronics accessories and media. But these explanations only scratch the surface. Most clearly through use of virtual reality systems, reality itself can be augmented and perhaps

sharpened, thereby extending consciousness or presence. Frank Biocca writes in "The Cyborg's Dilemma: Progressive Embodiment in Virtual Environments" (1997):

"[Progressive] embodiment . . . can be characterized as a form of cyborg coupling, the body coupled with its technological extensions. This coupling, I have suggested, is progressive. It is increasing over time and the body is getting tighter and more integrated into every life (e.g., miniaturization, ubiquitous computing, and wearable computing). This soma-technic coupling is beginning to highlight what I call the cyborg's dilemma, a kind of Faustian bargain between us and our technological alter-egos.⁴¹

We are left with the Faustian bargain of technology.⁴² We want new and better devices for what they can do, and the curiosity and wished-for potential they offer is nearly irresistible, but we fear the human cost or what may be lost and what the return voyage might involve, if a return voyage is possible or even of interest. "The more natural the interface, the more we become 'unnatural,'" the more we become more cybernetic, Biocca says.⁴³ There already are multiple alter-egos for ordinary people online: electronic mail handles, usernames, personal identification numbers, avatars in chatrooms, other identities across mobile and telecommunications devices to the extent that a fuller mediated self is not much of a stretch. Biocca goes on to say:

Cyborg theorists point out that "we are already cyborgs." We may have been cyborgs for centuries. The cyborg's dilemma is present in our acceptance of the most primitive technologies: in a piece of clothing, in a wrist watch, in a baseball bat, in short, in all technologies that attach themselves and augment the body. Secondly, it raises questions of what is "natural" about our relationship to our technology. We tend to think of technology as something alien, not a reflection of ourselves. Maybe we have been designed to be cyborgs. It may be our nature, therefore "natural," to embrace our technologies.⁴⁴

With consumer electronics for some time plastic, metal and silicon have been embraced, pressed close to our only too mutable flesh and bone and neural circuitry, inserted into ears, covering eyes and peripheral vision and otherwise extending the human interface, suffusing our minds and senses with more and more media designed for easy personalized consumption on the go in everyday life. William Gibson has often said in interviews that he writes about the present day, not the future.⁴⁵ Through progressive embodiment we casually grant access to that which we consider most inviolably, privately ourselves, to what we think of as who we really are, what we consider the most natural, most un-alien. On one hand we have an opportunity to heal the rift with our cybernetic alter-egos that are still in a formative, pliable stage. On the other hand, “organic mechanism” or “cyborganic” becomes fact.⁴⁶

Again this process cannot be viewed as wholly liberatory – artifacts do not transcend history and politics. If we consider how cultural reliance on technology, particularly media over the last century, has been used, we can interpolate from there. When peering through those 3D glasses, rose-colored or not, there is no telling what, if anything or anyone, will look back or who has been granted direct access to your brain. “Cool” may well be the mental response. Humming quietly in the background, the omnipresent monitor heard and instructs you to relax and enjoy the ride. But of course, you are in control, the pleasant voice inside your ears says, automatically anticipating concern. The sensory experience has been adjusted to how you like it, your preferences safely and confidentially incorporated into the database. Consider the simulations to be a natural extension of you, not unlike listening to a portable disc player or talking on a cellular telephone. You control the amplification of your reality.

Notes

- * John Updike, "Telephone Poles," *Telephone Poles and Other Poems* (New York: Alfred A. Knopf, 1963), p. 43.
- 1 "Progressive embodiment" refers to our increasing immersion and emotional investment in the interface, and is close in meaning to "cyborgization" or the ongoing process of the mechanization of the human taking place today through electronic media, which has been termed the "posthuman" condition. This article traces embodiment and addresses, as well, incorporation of technologies and their socioeconomic infrastructure that extend far beyond the body. See Frank Biocca, "The Cyborg's Dilemma: Progressive Embodiment in Virtual Environments," *The Journal of Computer-Mediated Communication* 3, no. 2 (1997), at <http://www.ascusc.org/jcmc/vol3/issue2/biocca2.html> (June 28, 2001). Biocca's definition is cited in this article on [p. 22](#).
 - 2 R. L. Rutsy, "Introduction: The Questions Concerning High Tech," *High Technç: Art and Technology from the Machine Aesthetic to the Posthuman*, Electronic Mediations 2 (Minneapolis: University of Minnesota Press, 1999), pp. 1-22.
 - 3 Jean Baudrillard, *The System of Objects* (1968), trans. James Benedict (London and New York: Verso, 1996). Baudrillard later discounted this early work in *The Ecstasy of Communication*. See *Ecstasy*, trans. Bernard and Caroline Schutze, ed. Sylvère Lotringer, Semiotext(e) Foreign Agents Series (New York: Columbia University Press, 1987), p. 11.
 - 4 Raymond Williams, *Marxism and Literature* (Oxford: Oxford University Press, 1977), pp. 121-27.
 - 5 See Lewis Mumford, "The Monastery and the Clock," *Technics and Civilization* (San Diego, New York and London: Harcourt Brace, 1934), pp. 12-18.
 - 6 Roland Barthes, *Mythologies*, selected and ed. Annette Lavers (New York: Noonday Press, 1957).
 - 7 See David E. Nye on Thomas Alva Edison, his publicity campaigns and the socioeconomic influence of General Electric: *The Invented Self: An Anti-Biography from Documents of Thomas A. Edison* (Odense: Odense University Press, 1983), *Image Worlds: Corporate Identities at General Electric* (Cambridge, Mass., and London: MIT Press, 1985), *Electrifying America: Social Meanings of New Technology, 1880-1940* (Cambridge, Mass., and London: MIT Press, 1990), *American Technological Sublime* (Cambridge, Mass., and London: MIT Press, 1994) and *Consuming Power: A Social History of American Energies* (Cambridge, Mass., and London: MIT Press, 1997).
 - 8 James W. Carey and John J. Quirk, "The History of the Future" (1973), *Communication as Culture: Essays on Media and Society* (New York and London: Routledge, 1992), pp. 179-80.
 - 9 See Manuel Castells on the U.S. Defense Department Advanced Research Projects Agency (DARPA), *The Rise of the Network Society*, *The Information Age: Economy, Society and Culture* 1 (Cambridge, Mass., and Oxford: Blackwell Publishers, 1996), pp. 6-7, and Constance Penley and Andrew Ross, Introduction, *Technoculture*, *Cultural Politics* 3 (Minneapolis and Oxford: University of Minnesota Press, 1991), xii-xiii.

For the role of the military considered within Internet history, see Janet Abbate, *Inventing the Internet*, Inside Technology (Cambridge, Mass. and London MIT Press, 1999), Katie Hafner, *Where Wizards Stay Up Late: The Origins of the Internet* (New York: Simon and Schuster, 1996), John Naughton, *A Brief History of the Future: From Radio Days to Internet Years in a Lifetime* (Woodstock and New York: Overlook Press, 2000), Howard Rheingold, *The Virtual Community: Homesteading on the*

Electronic Frontier (New York: Harper Collins, 1993), and Stephen Segaller, *Nerds 2.0.1: A Brief History of the Internet* (New York: TV Books, 1999).

- 10 Jonathan Gershuny, "Postscript: Revolutionary Technologies and Technological Revolutions," *Consuming Technologies: Media and Information in Domestic Spaces*, eds. Roger Silverstone and Eric Hirsch (London and New York: Routledge, 1992), p. 227.
- 11 Nicholas Negroponte, "The DNA of Information," *Being Digital* (New York: Vintage Books, 1996), p. 11. The article previously was published in abbreviated form as "Bits and Atoms," *Wired* Jan. 1995: p. 176. "Bits and Atoms" can be found at http://www.wired.com:80/wired/archive/3.01/negroponte_pr.html and <http://www.media.mit.edu/people/nicholas/Wired/WIRED3-01.html> (July 1, 2001).
- 12 See, for example, Pew Internet and American Life, "Who's Not Online: 57% of Those without Internet Access Say They Do Not Plan to Log On," Sept. 21, 2000, at <http://www.pewinternet.org/reports/toc.asp?Report=21> (June 4, 2001); Brian Cruikshank, "Why Aren't More People Online?," Ipsos-Reid, June 13, 2001 (press release), at http://www.ipsos-reid.com/media/content/displaypr.cfm?id_to_view=1244 (June 28, 2001); and Jason Krause, "Has the Net Stopped Growing?," *The Industry Standard Magazine* July 2, 2001: pp. 30-39. The article can be found at http://www.thestandard.com/article/0,1902,27394,00.html?printer_friendly= (July 4, 2001).
- In spring 2001, without specifying the precise shape of things to come or commenting on prior forecasts of Web-based growth that did not pan out, the head of Cambridge, Mass.-based Forrester Research announced the imminent "X-Internet": "'The problem with today's Internet is that it's dumb, boring, and isolated,' said George F. Colony, CEO and chairman of Forrester. . . . 'Now that the novelty has faded, business executives and consumers are going back to reading newspapers and watching TV. Ultimately, the Net hasn't truly become a part of our real worlds.'" See Mariko Zapf, "The Death Of The Web Is Inevitable, According To Forrester Research," May 17, 2001 (press release), at <http://www.forrester.com/ER/Press/Release/0,1769,567,00.html> (June 4, 2001).
- 13 Quite a few MIT professors have written books on the changing paradigm that are not particularly Web-centric. See, for instance: Michael Dertouzos, *The Unfinished Revolution: Human-Centered Computers and What They Can Do for Us* (New York: Harper Collins, 2001) and *What Will Be: How the New World of Information Will Change Our Lives* (San Francisco: Harper Edge Books, 1997); Neil A. Gershenfeld, *When Things Start to Think* (New York: Henry Holt, 1999); William J. Mitchell, *e-topia: "Urban Life, Jim – But Not as We Know It"* (Cambridge, Mass.: MIT Press, 1999) and *City of Bits: Space, Place, and the Infobahn* (Cambridge, Mass.: MIT Press, 1995); and Negroponte (1995).
- 14 Kodak marketed cameras and memories as early as 1888. For Brownie history, see these pages on the Kodak Web site: <http://www.kodak.com/US/en/corp/features/brownieCam/brownieCam.shtml>, <http://www.kodak.com/US/en/corp/aboutKodak/kodakHistory/milestones78to32.shtml> and <http://www.kodak.com/global/en/consumer/products/techInfo/aa13/aa13.shtml> (June 4, 2001). See also Douglas Collins, *The Story of Kodak* (New York: H. N. Abrams, 1990). On Kodak's advertising campaigns and the populist marketing of the Brownie, see Nancy Martha West, *Kodak and the Lens of Nostalgia (Cultural Frames, Framing Culture)* (Charlottesville: University Press of Virginia, 2000).
- Rochester, N.Y., rapidly grew in the mid-nineteenth century after the opening of the Erie Canal in 1825. The canal encouraged a significant increase in trade and transport to and from the American west and greatly expanded New York City's importance as a domestic and international commercial seaport. Kodak's home base in Rochester was fortuitously situated to take advantage of this confluence of technology, transportation, economics and media between New York City and Chicago, later reinforced by construction of railroad and highway systems parallel to the canal. The low-cost Brownie that sold around the world and that can be said to have "revolutionized" photography largely was possible because of this physical infrastructure and the rising industrial and financial importance

of the state of New York. An ongoing history of the Erie Canal and its role in the development of Rochester can be found at <http://www.history.rochester.edu/canal> (July 7, 2001), and the official New York State Canal System Web site can be found at <http://www.canals.state.ny.us> (July 7, 2001).

- 15 James Beniger, *The Control Revolution: Technological and Economic Origins of the Information Society* (Cambridge, Mass., and London: Harvard University Press, 1986).
- 16 Everett M. Rogers, *Diffusion of Innovations*, 4th ed. (New York and London: Free Press, 1995).
- 17 For considerations of intellectual property and online-offline communal property, see James Boyle, *Shamans, Software and Spleens: Law and the Construction of the Information Society* (Cambridge, Mass., and London: Harvard University Press, 1996), and Lawrence Lessig, *Code and Other Laws of Cyberspace* (New York: Basic Books, 1999).
- 18 Castells, p. 5.
- 19 See Baudrillard on “techno-culture,” in “Design and Environment or How Political Economy Escalates into Cyberblitz” (1972), *For a Critique of the Political Economy of the Sign*, trans. Charles Levin (Saint Louis: Telos Press, 1981), p. 185. Baudrillard says that objects, as differentiated from products, are particular to industrial societies. Although he dates this progression from the nineteenth century, it is with “the Bauhaus’ inception that we can logically date the ‘revolution of the object,’” p. 185. For Baudrillard, technoculture arises during the interim between world wars. In a note, Baudrillard says that he based the term on (John Kenneth) Galbraith’s “techno-structure.”
- 20 For social histories of the world’s fairs that discuss escalating mass consumption and national identity, commencing with the legendary Crystal Palace exhibition of 1851 in London, see Jeffrey A. Auerbach, *The Great Exhibition of 1851: A Nation on Display* (New Haven, Conn.: Yale University Press, 1999); Carey and Quirk, “History”; Neil Harris, *Cultural Excursions: Marketing Appetites and Cultural Tastes in Modern America* (Chicago and London: University of Chicago Press, 1990); Michael Leapman, *The World for a Shilling: How the Great Exhibition of 1851 Shaped a Nation* (London: Headline, 2001); Carolyn Marvin, *When Old Technologies Were New: Thinking about Electric Communication in the Late Nineteenth Century* (New York and Oxford, Oxford University Press, 1988); Nye, *American Technological Sublime*; Thomas Richards, *The Commodity Culture of Victorian England: Advertising and Spectacle, 1851-1914* (Stanford, Calif.: Stanford University Press, 1990); and Rosiland Williams, *Dream Worlds: Mass Consumption in Late Nineteenth-Century France* (Berkeley, Los Angeles and Oxford: University of California Press, 1982). See also Walter Benjamin, “Paris, Capital of the Nineteenth Century” (1935), in *Reflections: Essays, Aphorisms, Autobiographical Writings*, trans. Edmund Jephcott, ed. Peter Demetz (New York: Schocken Books, 1969), pp. 146-62, and Umberto Eco, “A Theory of Expositions” (1986), ed. William Weaver, *Travels in Hyperreality* (San Diego, New York and London: Harcourt Brace, 1983), pp. 289-307.
- 21 Abraham H. Maslow, *The Psychology of Science; A Reconnaissance* (New York: Harper & Row (1966), pp. 15-16, and Neil Postman, *Technopoly: The Surrender of Culture to Technology* (New York: Knopf, 1992), p. 14. To which can be added, to someone wearing a watch, the world is experienced in tick-tock allotments of time. Take off the watch, stop looking at clocks, and the experience of the passage of time is remarkably different – variable rather than segmented into mechanical intervals of equal length.
- 22 See Biocca on “The Cyborg’s Dilemma.”
- 23 Cartier generally is credited with designing the first wristwatch that was produced in large enough quantities to become more than a specialist item or a ladies’ accessory. Developed in 1917-18, a clock worn on the wrist was more practical than a pocket watch because in the trenches sudden

movements could be fatal. Still sold today, the model that met with initial success was named the “tank watch” either because the metal wristband resembled treadmarks made by the tanks, which were introduced during the First World War and which left lasting impressions on the countryside, or in recognition of members of the U.S. tank corps for their defense of France toward the closure of the war. Books that discuss the role of Cartier in wristwatch history include Judy Rudoe, *Cartier: 1900-1939* (New York and London: Harry N. Abrams and The Metropolitan Museum of Art, 1997), and Sophie Ann Terrisse, ed., *Prestigious Watches* (New York: BW Publishing and Rizzoli International Publications, 1997). Cartier provides a company chronology on their corporate Web site at http://www.cartier.com/c_cartier/version_us/cartier/1847.shtml (July 1, 2001).

- 24 World War I-era mass communication theory was concerned with the transmission of messages that would (should) be passively received without resistance or feedback, as with propaganda and obedience training, and was visualized as a shooting or “magic” bullet. On early and more sophisticated behaviorist and reception models, see, for example, Denis McQuail and Sven Windahl, *Communication Models for the Study of Mass Communication*, 2nd. ed. (London and New York: Longman, 1993), and Lawrence Grossberg, Ellen Wartella and D. Charles Whitney, *MediaMaking: Mass Media in a Popular Culture* (Thousand Oaks, Calif., London and New Delhi: Sage Publications, 1998), pp. 15-26.
- 25 N. Katherine Hayles, “The Life Cycle of Cyborgs: Writing the Posthuman” (1993), *The Cyborg Handbook*, ed. Chris Hables Gray (New York and London: Routledge, 1995), pp. 321-35. Among the ten percent of the population she considers technically cyborgs, Hayles includes “people with electronic pacemakers, artificial joints, drug implant systems, implanted corneal lenses, and artificial skin. A much higher percentage participates in occupations that make them into metaphoric cyborgs, including the computer keyboarder joined in a cybernetic circuit with the screen, the neurosurgeon guided by fiber optic microscopy during an operation, and the teen gameplayer in the local videogame arcade,” p. 322.
- 26 Donna Haraway, “A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century” (1985), *Simians, Cyborgs, and Women: The Reinvention of Nature* (New York: Routledge, 1991), p. 181.
- 27 For a definition of “cybernetic,” see David Porush, *Soft Machine: Cybernetic Fiction* (New York and London: Methuen, 1985), pp. 2-3. Contemporaneous with Haraway and Gibson, Porush says, “We live not in an information age but a cybernetic one. Our lives are dominated not only by the getting and sending of information but the spin-offs from this technology. . . . In the video arcade, the machines are united by a single principle: ultimately, hardware defeats exhaustible and vulnerable organs and intelligences grown in flesh and housed in bone. Next time you’re there, watch the players hitched to their boxes and ask who controls what. Or what controls whom” (1-2). No fiction discussed in *Soft Machine* was written later than 1980.
- 28 Baudrillard, “Requiem for the Media” (1972), *Critique*, p. 172.
- 29 Hayles, p. 321. See also Hayles’s *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics* (Chicago and London: University of Chicago Press, 1999).
- 30 Postman, interview with Pat Kane, “Kane Over America,” BBC Radio Scotland, 1995. Rpt. In Gordon Graham, *The Internet:// A Philosophical Inquiry* (London and New York: Routledge, 1999), pp. 4-5. Excerpts from the interview can be found at <http://www.abdn.ac.uk/~phl002/a3.htm> (July 4, 2001).
- 31 Ibid. See also Postman, *Technopoly*, p. 61.

- 32 Howard Rheingold, "Look Who's Talking," *Wired* Jan. 1999: pp. 128-31 and 160-63. The article can be found at http://www.wired.com/wired/archive/7.01/amish_pr.html (June 28, 2001).
- 33 Iain A. Boal, "A Flow of Monsters: Luddism and Virtual Technologies," *Resisting the Virtual Life: The Culture and Politics of Information*, eds. James Brook and Boal (San Francisco: City Lights Books, 1995), p. 4.
- 34 See "Similarities Are Uncanny," a chart that accompanies an article on the dot-com demise that draws parallels between the 1929 and post-1999 stock crashes. The article does not bring out the relationship between the fairly obvious rise and fall that neatly maps with the Y2K escalation of intensity and sudden easement. Anya Schiffrin, "The Déjà Vu Downturn," *The Industry Standard Magazine* Apr. 16, 2001: pp 34-35. The chart and article can be found at <http://www.thestandard.com/article/image/popup/0,1942,10511,00.html> and http://www.thestandard.com/article/0,1902,23426,00.html?printer_friendly= (July 4, 2001).
- 35 See Baudrillard, "The Millennium, or the Suspense of the Year 2000," *The Vital Illusion*, ed. Julia Witwer (New York: Columbia University Press, 2000), pp. 31-57, and E. M. Forster, "The Machine Stops" (1909), *The Eternal Moment and Other Stories* (London: Sidgwick & Jackson, 1928), pp. 1-61. The short story can be found at <http://www.plexus.org/forster> (July 1, 2001).
- 36 The association of time with money developed in the late nineteenth, early twentieth century. Emphasis was placed on mass production and mechanized factories running "like clockwork" with employees punching clocks, working shifts (partially enabled by the invention of the electric light bulb in Great Britain and the U.S., circa 1880), being compensated by the hour and earning overtime. Fordism and Taylorism have been important for modern to postmodern conceptions of progress. See, for example, Beniger and David Harvey, *The Condition of Postmodernity: An Enquiry into the Origins of Cultural Change* (Cambridge, Mass., and Oxford: Blackwell Publishers, 1990). For an account of time as money and urgency, but with negligible progress today, see James Gleick, *Faster: The Acceleration of Just about Everything* (New York: Vintage Books, 2000). Gleick argues that contemporary society is on a self-defeating race to beat the clock. Rather than accomplishing more in less time, we are spinning our wheels, stuck at a busy stalemate of meaningless activity, confusing activity with progress, substituting immediacy for importance.
- 37 Hayles locates the origins of "cybernetics" in the post-World War II period and to the coining of the word by Norbert Wiener, *How We Became Posthuman*, p. 50. Wiener's book, *Cybernetics*, was published by MIT Press in 1948. Nevertheless, it is the contention of this author that the process had been building long before World War I (and, in any case, the postwar period reflects the passage of both wars since only 20 years separates them, essentially the same generations were involved, et al.). Indeed, the explosion of invention in the late nineteenth, early twentieth century following the industrial revolution, the fascination with technology and the conflation of people with machinery, the merging of natural rhythms with the mechanistic, is one of the many factors that contributed to the callousness of the war and its legacy. Disconcerting attraction to and revulsion from the "cybernetic," the industrial, perpetual motion and the like found expression in prewar art movements such as art nouveau, cubism and particularly futurism, in the compositions of Ravel, Schoenberg and Stravinsky, and through many other forms of the arts and cultural and business practices too vast to assign to a footnote since human response to the machine contributed to the modern urban world and the arts and sciences that reflect it, which is to say the world as we know it today. With regard to this article, however, cybernetic progressive embodiment is a continuum that reaches back long before modernism but also is characteristic of high modernism through postmodernism, foregrounded today although slowly gaining cultural momentum over the twentieth century in particular.

It is worth mentioning that this interpretive view of the proto-cyborg process, "man as machine," is precisely what Wiener was reacting to and sought to rectify by describing the cybernetic in precise scientific and mathematical language rather than through evocative analogy (see Hayles, *How We*

Became Posthuman, p. 97). Hayles does not discuss Manfred Clynes's coining of the word "cyborg" in 1960 (see "Cyborgs and Space" in *The Cyborg Handbook*, pp. 29-33). Clynes also had a specific definition of the cyborg in mind; the term was intended to describe how astronauts would survive in space. This article has greater interest in the circulation of meaning associated with "cybernetics" and the "cyborg" than necessarily with the men and agendas of those who coined the terms. On Clynes, the military associations of the cybernetic, cyborgs and much more, see *The Cyborg Handbook*. See also Monica Hulsbus, "Virtual Practices, Complex Epistemologies," in *Convergence: The Journal of Research into New Media Technologies* 7, no. 1: pp. 26-27.

- 38 Cofounder of Sun Microsystems, Bill Joy is among those who has seriously contemplated our ultimate fate and whether progressive embodiment (not the term he uses, but more or less the ground he covers) will lead to the decline or terminus of humanity. Joy finds the cyborgization process frightening and surely as worthy of serious consideration as nuclear power was in the mid-century period, partially because both technological processes may lead less to our transcendence or harnessing of nature than to our lemming-like self-destruction. See "Why the Future Doesn't Need Us," cover article of *Wired* Apr. 2000: pp. 238-62. The article can be found at http://www.wired.com/wired/archive/8.04/joy_pr.html (Aug 22, 2001).

Joy's article was written in response to the publication of Ray Kurzweil's *The Age of Spiritual Machines: When Computers Exceed Human Intelligence* (New York: Viking, 1999). For more on cybernetic fusion with excellent illustrations drawn from cinematic fiction and robotic research, see *Artificial Humans: Manic Machines, Controlled Bodies*, edited by Rolf Aurich, Wolfgang Jacobsen and Gabriele Jatho, trans. Stephen Locke, Ishbel Flett and Pauline Cumbers (Berlin: Jovis, 2000) and *Robo Sapiens: Evolution of a New Species*, Peter Menzel and Faith D'Aluisio (Cambridge, Mass.: MIT Press, 2000).

- 39 In "Electronic Frontiers and Online Activists," the ninth chapter of *The Virtual Community*, pp. 241-75, Rheingold traces the founding of the online civil liberties organization, the Electronic Frontier Foundation (EFF), how the term came about and what prompted publication of "Across the Electronic Frontier," by Mitchell Kapor and John Perry Barlow, on July 10, 1990. The book and chapter can be found at <http://www.rheingold.com/vc/book> (June 28, 2001). Kapor's and Barlow's manifesto can be found at http://www.eff.org/pub/Misc/EFF/electronic_frontier.eff (July 2, 2001). See also the EFF's Web site at <http://www.eff.org> (June 28, 2001).

- 40 Baudrillard, "The Murder of the Real," *Vital*, pp. 59-83. A few recent studies of Marshall McLuhan have linked his thought with that of Baudrillard from the latter part of his career, from *Ecstasy* on, which is something the younger Baudrillard of "Requiem" would not seem to have much appreciated. See, for example, Gary Genosko, *McLuhan and Baudrillard: The Masters of Implosion* (London and New York: Routledge, 1999), and Glenn Willmott, *McLuhan, or Modernism in Reverse* (Toronto and Buffalo: University of Toronto Press, 1996). In this light, Tom Wolfe's well-known article, "What If He Is Right?," published in the mid-1960s at the height of McLuhan's fame as the prophet of electronic media, has contemporary relevance if Baudrillard is substituted for McLuhan. See *The Pump House Gang* (New York: Noonday Press, 1968), pp. 133-70.

- 41 Biocca, "Cyborg."

- 42 Postman too speaks of the Faustian bargain of technology. See his BBC radio interview and Graham's chapter on this topic, which draws on Postman, pp. 39-61. In *Technopoly*, Postman alludes to the Faustian bargain on p. 5.

- 43 Biocca, "Cyborg."

- 44 Ibid.

- 45 William Gibson, interview, *Cyberspace: Through the Looking Glass*: "I'm trying to find a way to describe what's happening to us now that won't frighten people. So one of the things I do is I say, 'This is the future. It's not now. It's about the future,' and that sort of lulls the reader. And then I sort of feed them the contemporary reality," Discovery Channel, narr. Jeff Goldblum (episode 2, spring 1997). In *High Technç*, Rutsky cites similar interviews with Gibson, pp. 154-55.

Words and terms coined by Gibson have been used throughout this article, such as "cyberspace," "jack in," "matrix" and "sprawl." Although ubiquitous in the cyberculture lexicon and canon, it bears repeating that they come from his landmark novel *Neuromancer* (New York: Ace Books, 1984), as well as *Count Zero* (1986) and *Mona Lisa Overdrive* (1988), which together form what has become known Gibson's cyberpunk trilogy. Their use here refers to his descriptions and to their freer circulation within cyberculture discourse. The terms therefore are simultaneously fictional and experiential, metaphors for practices taking place today.

- 46 A well-kept Bay Area secret is the WELL (Whole Earth 'Lectronic Link, on which Rheingold's *Virtual Community* is based) spin-off founded by Jonathan Steuer, Cyborganic Gardens. Launched in the mid-1990s, just before the dot-com and commercial virtual real-estate boom, the online-offline community is still somewhat available at <http://www.cyborganic.com> (July 7, 2001). Use of the term "cyborganic" in this article is less a specific reference to the community than to the impulse from which it sprang and what is implied by the clever neologism trademarked by The Cyborganic Corporation.

Keywords

Camera	Determinism	Luddism
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