

Uploading Anticipation, Becoming-Silicon

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. . . more life, fucker!
—*Blade Runner*

Why resound with such an outrageous demand—an expletive that, if Nixon had growled it in his perpetually taped Oval Office, would be deleted from any transcript? Why tempt editorial and scholarly responsibility with this inhuman, posthuman outburst? This outburst sprouts not from silence, but from and through the flickering visual murmur of cinema: *Blade Runner*, director Ridley Scott’s citational transformation (simulation?) of Philip K. Dick’s 1968 novelistic interrogation of the difference between humans and machines, *Do Androids Dream of Electric Sheep?* This novel has itself been repeatedly cited as an exemplary blurring of origins and copies, a shadowed rendering of humans, machines, and their differences. “More life, fucker!” is a demand made of flesh by a hybrid machine, a solicitation not for immortality but for alteration, a becoming that allows for the future, for “more life.”

In *Blade Runner*, this fuzzy citational difference is itself under constant interrogation by the protagonist, who responds to the name Deckard and is simulated by actor Harrison Ford. Deckard, after a thoroughly inadequate attempt to retire from his vocation (like many of us, he seems incapable of living up to the performative “I quit!”), is called on to carry out one more job. He receives a familiar demand from his former boss, one that reverberates through the present as much as this nostalgia for the future: “more work, fucker!” They keep dragging him back.

Responding to this interpellation, Deckard is called on once again to exterminate the android difference. He must locate and then terminate android fugitive slaves who are called “skin jobs” and whose machinic difference in kind can only be determined by an expert. Priests of the human difference such as Deckard must first interpret yet another machine, a physiological testing device deployed by “blade runners” such as

himself. While “more life, fucker!” summons one audience, an audience I will respond to fully below, “more work” provokes another: an audience suspected of a lack that must be obliterated. Deckard must test suspected androids for their missing empathic response, an allegedly testable and thus citational difference between humans and the machines that populate both *Blade Runner* and its qualitatively different textual precursor. Such “tested” audiences are in some literal sense “post-fucking” communities, governed less by reproduction and its taboos than by machinic replication and its machinic prohibitions. Such replications spread not through sex and its companion, death, but through copy and citation, even if that citation is to be in the future. Such communities offer an ethic of machines that seeks less to obliterate than to proliferate, as machines no longer obey the borders of their contexts and spread through human desire.

Even now it is not so clear what a machine *is* exactly. Transformations of the life sciences and their cultural ecologies have turned the organism/machine opposition into a smudge. No longer a sovereign site of interiority, a vital inside that struggles with an inanimate outside, organisms in the contemporary life sciences become moments in an evolutionary syntax, nodes in a network not of “vitality” but of information. Here, living systems become dynamic instantiations of DNA, RNA, protein folds, and their multiplex of evolutionary networks. More than a becoming-machine of the organism, this retooling (or “refiguring”) of life provokes double takes on the becoming-lively of the machine. “Our machines are disturbingly lively,” Donna Haraway observes, “and we ourselves frighteningly inert” (152).

Thus, the demand from the machine—“more life, fucker!”—becomes not simply an index of the desires that machines have today; it offers a map of the odd rhetorical imbroglios of “life” that traverse both contemporary science and science fiction. A demand from a machine—“more life, fucker!”—maps the transversal movement of that old infection of the earth, “life.” It is this ability of the machine to be the double of life that “more life, fucker!” articulates, a capacity to simulate that enables such remarkable production of knowledge about living systems.

This informational nexus between organisms and machines could be described in two registers. On what we might characterize as the rhetorical plane of techno-science, living systems themselves “double” or simulate the flow of information that has enabled the nearly unthinkable expansion of knowledge associated with molecular biology. Thus, the conceptualizations of “life” associated with the metaphors of “code” help craft a set of knowledges to the extent that “organisms” can be

disciplined into and have the capacity for the rhetorical simulation of “machines.” The debt that this crafting of knowledges owes to the rhetorical practices of molecular biology is not simple to evaluate, but suffice it to say that I have attempted to map out the contours of the complicity of such rhetorics in the genealogy of molecular biology (see Doyle). One of the rhetorical effects fostered by the notion of code, for example, is mobility: rather than tied to the interior of a sovereign organism and its life, the essence of an organism is, like any other code, able to be deployed in any context—that is, it is deterritorialized.

It is this mobility—the ability of living characteristics to move from one ecology to another through routes other than organismic ones—that instantiates the other register of relations between organisms and machines. If molecular biology “folded” organisms—that is, rendering them for their codes, moving backward before the “unfolding” of development from flesh to its code—this mobile rendering of the organism launches a redistribution of vitality, a simulation of life by machines. The very rhetoric of code that has transformed the life sciences allows the code of life to find that ecology in silicon, in artificial life.

This deterritorialization of life—its connection to mileus other than carbon—is neither a simple reification nor a reduction. Feminist psychologist Elizabeth Wilson reminds us that a distributed or connectionist notion of cognition—one in which cognition emerges not from a single location but from *between* locations, a network in which “each unit gains its identity not through any essential characteristics . . . but through its placement in the connectionist architecture”—offers enormous promise for understanding ecologies of transformation or learning, informatic economies that are irreducible to a set of rules or compressible algorithms (162). This connectionist map of cognition renders a human subject sculpted not from presence but from difference, an incessant variation whose contingency is directly related to “connectedness”—its exposure and relation to something other than itself. So, too, does a distributed model of life—in which organisms are effects of acentered networks rather than privileged locations of vitality—foster the encounter with life that is something other than an “essence” or a sacred site of interiority.

But why the curse associated with the investment of machines with vitality, “more life, fucker!”? If we remember—or deploy some false memory implants of the sort referenced in this quote’s origin—this demand is directed by an android to its wetware creator, Tyrell, the ambiguous “father” of the machine. Such a memory replays the truth of simulacra: they replicate rather than reproduce, proliferating through an

assemblage of repetition and materiality—an entire ecology mobilized for iteration. Replication is the simulacrum’s habit and habitat. “Fucker!” is therefore not a curse, but an empirical observation about the differing modes of proliferation deployed by simulacra and by sexually reproducing organisms. Simulacra are not simply heterosexual kin; they threaten to float free of their economies or ecologies of “origin.” As replicators and not reproducers, the “skin jobs” of *Blade Runner* threaten not to fuck. Simulacra emerge out of an ecology of neither sex nor death, and the subsequent representations of dangerous desire—a desire not anchored in any reproductive economy—is tellingly indexed by the logic of Rachel Ward’s response to a test to determine if she is that lack called an android: “Mr. Deckard, is this a test to determine if I am an android or a lesbian?”

This threat to reproduction—simulation’s ability to overtake or “forge” the original and become untethered—provokes the demand for “more life.” *Blade Runner* anticipates the contingency of a machine that would float free of the constraints suffered and enjoyed by its creators. As such, *Blade Runner*’s androids have built-in “death effects”—that is, an off switch that automatically engages after four years, tethering simulacra to the same tired trope that incites *Blade Runner*’s fleshier characters: death. *Blade Runner* is thus less a narrative about the latent vitality of machines and their proliferating simulacra and more a testimony to the virulence of that human virus: lack. In its formulation of “more life,” the android also risks replicating a discourse in which life is continually found wanting, one in which the alterity of the future is encountered as a threatened depletion of the present—posthuman, all too human.

This evacuation of the present by the future often figures in tales of exhaustion and forgetting: “We have forgotten the organism. We have forgotten the body.” Perhaps these mantras bear repeating; the contingent emergence of molecular and computational thinking is hardly a simple occasion for celebration. Yet, if the implosion of organisms and molecules, of computers and bodies, dislocates and distributes our corporeal and cognitive effects, it does so through an encounter with the unprecedented, an exteriority whose arrival resounds with more than loss. Through the veritable deconstruction of the concept of “life” by molecular biology, we have swapped an essence for becoming; vitality emerges between the nodes of a network, intermezzos oriented toward the future (“It’s evolving”) but constituted out of contingency (“What is it becoming?”). Less a loss of corporeality than its deterritorialization, the becoming-informatic of life reminds us of the enormous capacities for difference that are living systems. Each new pragmatics mobilized

by a molecular biology founded on the “secret of life” foregrounds the fact that, to paraphrase Spinoza, we don’t know what life can do. In short, new configurations of life are new organizations of contingency, other capacities for becoming.

Such novel morphologies of becoming provoke Gilles Deleuze’s inquiry into the Nietzschean figure of the *Übermensch*. Neither “god” nor “man,” the *Übermensch* emerges out of new relations to finitude. Deleuze maps this composition of human morphology in topological terms, describing the historical emergence of infinity in terms of its capacity to “fold” man, to give humans an “inside,” an infinite soul. Deleuze distinguishes this topological form called “man” from that which emerges from the “superfold”:

It would no longer involve raising to infinity or finitude but an unlimited finity, thereby evoking every situation of force in which a finite number of components yields a practically unlimited diversity of combinations. It would be neither the fold nor the unfold that would constitute the active mechanism, but something like the *Superfold*, as borne out by the foldings proper to the chains of the genetic code, and the potential of silicon in third-generation machines, as well as by the contours of a sentence in modern literature, when literature “merely turns back on itself in an endless reflexivity.” (“Death” 131)

Deleuze describes the emergence of the *Übermensch* not through Michel Foucault’s visual analytics of the “disappearance” of man but through a topological turning or troping of man. Crucial to this “superfold” is its pragmatics—only as a practice does its “unlimited diversity” come into play. Hence, the practices proper to the superfold entail an irreducible contingency, the contingency of enactment. As with Wilson’s analysis of a distributed cognition, the distributed vitality of the superfold—“the potential of silicon”—is irreducible to any set of rules or algorithms as it “resides” only on an itinerary of becoming.

If such contingency organizes the narrative of a potent site of science fiction (in *Blade Runner*, the inability to distinguish human from simulacrum is unprecedented, the future itself), it also inhabits contemporary narratives of techno-science that themselves blur the border between science and fiction. Uploading—the future porting of human identity and corporeality to a non-carbon substrate—is a contemporary utopian narrative of becoming-silicon, a set of rhetorical operations that render the future as “more life.” Copied onto a higher-level instantiation, uploads harken the arrival of a techno-body built with the future, an

exfoliation of the brain onto the universe itself. In *The Physics of Immortality*, Frank Tipler argues that uploads will eventually engulf the universe. Such utopian narratives, announcing a future of plentitude and immortality, figure the implosion of flesh and silicon as an excess, a transformation of the human ecology that promises to materialize infinity—that is, to kill death. What technologies, rhetorical and otherwise, enable these narratives? How does uploading broker the new alignments of information, bodies, and subjectivity and render transformation rather than loss? Aren't these fuckers simply asking for more lack?

Hacking Lack

We might be tempted to locate an amnesia of the body in any conjunction of computers and human subjectivity. We might emphasize the way in which the discovery of DNA as a site of memory has, ironically, fostered a forgetting of corporeality.

In his remarkable book *Terminal Identity*, Scott Bukatman narrates precisely such a loss of corporeality in the discourses of science fiction and cultural theory. As storytellers of the spectacle, Bukatman notes, cyberpunk scribes allegorize the disappearance, dissolution, or implosion of the body in techno-scientific economies of simulation and informatics. In such regimes, Bukatman remarks, the body exists only as “a rhetorical figure” (16). This collapse into rhetoricity—where bodies are rendered as occasions for coding—is marked as a loss, a deficit incurred by becoming postmodern. This lack extends not merely to the increasing devaluation of the experience of the body—as in the notion of genetic “disease” or the allegedly disembodied state of cyberspace—it also troubles the very ontologies networked with the corporeal habit of subjectivity. Describing the unmoored character of both postmodern science fiction and “theory,” Bukatman locates yet another lack: “The narratives of terminal flesh offer a series of provisional conclusions wherein the subject is defined, at different times, as its *body*, its *mind*, or sometimes its *memory*. This proliferation of definitions reveals the absence of definition: our ontology is adrift” (20). While Bukatman’s analysis could be coupled with my own claim that the contemporary life sciences have smeared the operations of organisms and machines, his argument also underscores the sense of loss installed by the mobility of bodies and codes (see Doyle). But such an analysis (with its revelations of “absence”) functions as more than nostalgia for the allegedly stable ontologies of the past; it forestalls the affirmations of multiplicity (the drifts) that are also at play in late, late, late capitalist science fiction and theory. The transformation of a “prolifera-

tion” into an “absence” is more than a theoretical error, an inability to narrate the enormous transformations in subjectivity and corporeality that Bukatman so admirably relates. Such nostalgia also forestalls the effects that inhere in the very transformations wrought by the techno-scientific renderings of the body—that is, contingencies that are not merely represented in science fiction and theory but provoked by them. Clearly, these “narratives of terminal flesh” cannot be simply extracted from the new configurations of bodies and machines that they render. As Allucquère Rosanne Stone has argued, for example, William Gibson’s *Neuromancer*—with its terminal flesh trope of “meat”—became the conceptual currency that supported virtual technology research in the early 1980s. Stone writes: “The critical importance of Gibson’s book was partly due to the way that it triggered a conceptual revolution among the scattered workers who had been doing virtual reality research for years: . . . the technological and social imaginary that it articulated enabled the researchers in virtual reality—or, under the new dispensation, cyberspace—to recognize and organize themselves as a community” (98-99).

Science fiction and theory are thus not merely narrating or “representing” transformations of subjectivity and corporeality; as rhetorical softwares that constitute, discipline, and organize scientific communities, such retoolings of the body and the self can provoke (or “trigger”) conceptual crowds.

Uploading, taken as a practice and not simply as an imaginary ideal (that is, as a symptom of ontological loss), becomes what Foucault has characterized as a “technology of the self,” a comportment or “fashioning” of subjectivity that humans carry out through “a certain number of operations on their own bodies and souls, thoughts, conduct, and way of being, so as to transform themselves in order to attain a certain state of happiness, purity, wisdom, perfection, or immortality” (18). These technologies of the self are primarily discursive—as in the confession, where the obligation to speak the truth about oneself and to exteriorize it in the act of confession paradoxically constituted the interiority of Christian subjectivity. Foucault links this confessional discourse (along with the growing importance of writing) to the emerging bureaucracy of Rome. He writes, “Taking care of oneself became linked to constant writing activity. The self is something to write about, a theme or an object (subject) of writing activity. That is not a modern trait born of the Reformation or of romanticism; it is one of the most ancient Western traditions. It was well established and deeply rooted when Augustine started his *Confessions*” (27). Under this rubric, the secret interior of Christian subjectivity—the

hidden failure that must be exposed—is constituted not out of repression, but through the productive rhetorical circuit of confession. In this economy, the subjectivity of the confessor becomes a mere node in the discourse network of Christianity, his or her flesh the materiality of the writing substrate through which this new soul emerges.

But this economy, as Foucault reminds us, was not just of any character; the discourse network ran on the tropes of finance. While Seneca envisioned self-examination through the lens of an audit—that is, “when a comptroller looks at the books”—Cassian writes through the medium of currency. “Conscience,” the internal simulacrum of the exteriorized confessor, becomes “the money changer of the self.” Ruthless in its discrimination and sense of authenticity, conscience “must examine coins, their effigy, their metal, where they came from. It must weigh them to see if they have been ill used. As there is the image of the emperor on money, so must the image of God be on our thoughts. We must verify the quality of the thought: This effigy of God, is it real?” As Foucault explains, Cassian’s technology of the self is thus haunted by money’s simulacrum, the threat of a copy without origin. Through the continual “verbalizing” of the self, the subject is rendered and purged of scandalous threats to its imprimatur of originality. Master of its own double, the self emerges through the engagement “in the permanent verbalization of all our thoughts. . . . This verbalization is the touchstone or the money of thought” (47). This rhetorical economy—the persuasive character of money, the verbalization of thought—insured the possibility of a noble transaction of selfhood, a transaction with and through the currency of God.

The technology of Christian identity, then, cultivates a transaction space for and of subjectivity, a space exterior to the self that would evaluate and inscribe the self, a subject cultivated through the practices of the market (calculation, evaluation, verification). This “money-changer” self operates in a continual present—“Is it real?”—and encounters the past only through loss (worn coins, notes of dubious origin).

This continual composition of the self, in its constant encounter with the practices of “value,” operates only through an encounter with humans. No alterity—a material, organismic, or technological familiar—enters into the self’s habit or habitat. What Foucault characterizes as a “discriminating power” flows through the face and speech of a “master”: “Even if the master, in his role as a discriminating power, doesn’t say anything, the fact that the thought has been expressed will have an effect of discrimination” (47). Hence, the discourse that articu-

lates this technology of the self operates as an order, a command that installs a difference—“discrimination”—as its primary effect. This difference is a difference of negation. In the cacophony of the confession or in the silence of meditation, discrimination renders a self composed of renunciation. Foucault writes, “You cannot disclose without renouncing” (48). The very matrix of this renunciation is the space of evaluation that, in the first instance, determines the contours of the “human”—the tautological ideal of a master in transaction with a subject.

While the fine grain of Foucault’s arguments concerning technologies of self and their relations to rhetorical practices calls for more inquiry, I want to map out a crucial characteristic that might help to bring uploading’s difference into relief. The technologies of self analyzed by Foucault are essentially human refrains: the confession becomes a discourse franchise on the basis of its regularities; penitence becomes a repeatable, if an asymptotic, “model” of martyrdom. By contrast, *Blade Runner*—itself an “uploaded” version of Dick’s *Do Androids Dream of Electric Sheep?*—features an anticipated, post-apocalyptic world where novel forms of empathy extend primarily to the inhuman. This encounter with the inhuman or “a-human” operates by definition as an “itineration” rather than an iteration, a drifting rather than a marching—what Deleuze and Félix Guattari characterize as a “following.” They locate a respons(e)ability in a milieu, a capacity to be affected by the finitudes and contours of a given ecology. In this sense, practices of itineration—an always mobile metallurgy that follows the flow of metal and ore, an ambulant computer science that must always, finally “run” its code—are constituted out of a continual encounter with something other than human, with an alterity that cannot be mapped or, by definition, “known” in advance. The structural impossibility of knowing such singularities in advance is hardly a lack—relations with the inhuman take place as an encounter rather than as an understanding. It is this possibility of forging technologies of self that are constituted through a regard for an inhuman exteriority that, I will argue, uploading indexes.

More Copies, Fuck: Becoming-Sampled

Unlike the technologies of self described by Foucault, contemporary technologies—rhetorical and otherwise—often provoke something other than an authentic, individuated self constituted through originality. Writing of the possibility of replicating humans through cloning, William S. Burroughs characterizes the technologies of identity as an “illusion” and urges us to consider the possibilities of multiplicity:

The illusion of a separate inviolable identity limits your perceptions and confines you in time. You live in other people and other people live in you; “visiting” we call it and of course it’s ever so much easier with one’s Clonies. . . . I am amazed at the outcry against this good thing not only from Men of the Cloth but from scientists . . . the very scientists whose patient research has brought cloning within our grasp. The very thought of a clone disturbs these learned gentlemen. Like cattle on the verge of stampede they paw the ground mooing apprehensively . . . “Selfness is an essential fact of life. The thought of human non-selfness is terrifying.”

Terrifying to *whom*? Speak for yourself you timorous old beastie cowering in your eternal lavatory. (132)

Burroughs has, of course, been among the most energetic terrorists of multiplicity. But his affirmation of replication in the context of a herd of cattle—more copies, fucker!—marks the possibility that the multiple ontologies of the present yield something more than a lack of “selfhood” or “humanity.” In Burroughs’ view, both the desire for immortality and the terror of replication emerge out of a bad joke: the self. Less a foundation than an allergic reaction, the self is a pathetic “swelling” with “no more continuity than a fever sweat” (131). As in the “clonies” example above, Burroughs gestures towards a distributed identity, one that resides as much in others as in one’s “own” body. Less an extinction of the self than its deterritorialization, Burroughs’ self is a becoming. And, as he asks, it is “terrifying to *whom*?”

No wonder, then, that Burroughs describes conventional visions of immortality as “impossible” (131). As multiplicities, humans garner their identities through transformation and adaptation rather than mastery and autonomy. For Burroughs, the possibilities of cloning are fascinating precisely because they shatter the originality and authenticity of the “ego” and foster new forms of individuation scattered across bodies. The trick in getting out of the hell of time, as Burroughs would have it, is to become a transversal “body” broadcast across space. Thus, organ transplantation and cloning become not “vampire schemes” for the overcoming of entropy; instead, they compose tactics for becoming other, for a distribution into space.

The very operation of Burroughs’ writing attempts to provoke just such multiplicity. The cut up—literally chopping up text and rearranging it—decomposes the consciousness of the “author” Burroughs, even as it distributes “Burroughs-effects” across texts, films, bodies, and music. Burroughs-effects thrive precisely to the extent that they harbor a capacity for difference—the ability to encounter the difference of other contexts,

to be affected and transformed by them. Paradoxically, then, Burroughs’ route to “immortality” is to become other, to be set adrift.

Uploading, as a technology of the self that is also such a technology of replication, operates through the transaction spaces made available by global capital and its emerging writing practices. Deferred to the future, the practice of uploading nonetheless mobilizes its own shattering effects—specifically, dislocation through anticipation. In defense of the plausibility of uploading, a message posted on CryoNet (a discussion group devoted to cryonics and other immortality technologies) highlights the “virtual” character of money and work in the present:

I’ve also never had a *real* job. Work consists of force times distance. I do some work on a keyboard, but it’s a negligible amount. My employer could save money by replacing me with a steam engine which would press all the keys with greater force, through a greater distance, more often, thus doing far more work than I ever did. Actually, this wouldn’t save them any money at all, as they never pay me money. They only give me pieces of paper that have pictures of dead presidents on them. Come to think of it, they don’t even do that. They give me pieces of paper which tell me that numbers in a bank computer somewhere have been incremented. Which is silly, because numbers can’t be in a computer, as numbers are just an abstraction. Actually, they merely change the state of magnetization of various very tiny areas on a disk belonging to a bank. Why should I do real work for that? (Lynch)

In the relentless calculations and anticipations of uploading that take place on Usenet groups such as Sci.nanotech and Sci.cryonics, the evaluation of the uploaded self emerges out of an economy not of individual “money changers” who can determine the veracity of the “money of thought” but out of the fluid crowd phenomena of global markets. Both labor (the hilarious vision of machinic replacement, itself substituting for a thousand monkeys on a thousand typewriters) and value (the shifting and fleeting movements of magnetic media) are figured as elements in an economy of sudden transformation, a regime not of the “real” but of “change.” Indeed, in this milieu the “real” has become kitsch, a ridiculous throwback as primitive and charming as a steam engine. The practices of everyday life—and the technologies of self that emerge through them—are thus composed not so much of evaluation and verification as of anticipation, the sometimes anxiously performative solicitation of futures. This discontinuous ecology of self pulses with the “change of state”—machines transform human labor, numbers are

incremented, disks become reorganized. More than a displacement of the “real” by the “virtual,” this narrative highlights the matrix of constant transformation within which the discourse on uploading is articulated.

Indeed, this association of the alleged “abstraction” of virtuality with the continual variation of global capitalism reminds us that virtuality is anything but “unreal.” Virtualities may “lack” reference, drifting without anchor in the actual. However, it is precisely in the contingent relation of virtuality to actuality—becoming—that new capacities (futures) to be affected emerge. Virtualities are less the ethereal precursors to actuality than the positivity of transformation itself, diagrams of futurity. To encounter the virtual is to enter into an itinerary, an intermezzo that Deleuze characterizes less as an intentional effort and more as a capacity to be affected, an active drifting or surfing: “The basic thing is how to get taken up in the movement of a big wave, a column of rising air, to ‘come between’ rather than to be the origin of an effort” (“Mediators” 281).

The uploaded subject—as the technology of self that effects the writing of subjectivity not to flesh but to silicon—thus marks a relation to market practices emerging not in the present or the past, but soliciting the future, the continually itinerant specter of a “change in state.” No longer referenced by the transcendental guarantee of gold, the “conscience” of global capital emerges not from authenticity or originality, but through the flickering of money’s double: the future. As mathematician and semiotician Brian Rotman argues, the scandal of the post Bretton Woods dollar is that it is backed only by its ability to be traded on a secondary market in the form of futures contracts. This “xenomoney” is “floating and inconvertible to anything outside itself. . . . Its ‘value’ is the relation between what it *was* worth, as an index number in relation to some fixed and arbitrary past state taken as an origin, and what the market judges it *will* be worth at different points in the future” (92). Thus, the value of money is constituted by its capacity for the difference of the future rather than by its authenticity or originality. It is the *anticipated* value—what the market judges it *will* be worth—that drives the operations of futures markets, which are Cassian’s “money changers” of the present. Rotman rightly emphasizes the “loss of anteriority” that inheres in such a shift in the status of monetary signs, but, as with my discussion of cryonics, I seek to map the ways in which such markets operate through the rhetorical production of anticipation, an active drift of anticipation that orients uploading’s technology of self toward the future, a future of itself.

To be sure, uploading exists as an anticipatory technology of the self. Along with Burroughs’ “clonies,” the technologies of silicon brain or

body replication rely on material practices of the future. Robot surgeons, nanotechnological assemblers and extraordinarily high resolution electron microscopes are among the gadgets that can be deployed only contingently in a possible future. But technologies of the self are not, of course, simply technical. As in confession, where the discourse network of Christian subjectivity operated through the disciplinary matrix of the “money changer,” uploading operates in the present through the rhetorical production (or uploading) of anticipation, a summoning of technologies from the future that would constitute a self available for replication and immortality. While some forms of Christian subjectivity, according to Foucault, produced interiority through the masterful exterior relay of the priest, uploading’s technology of self forms a discourse circuit with the future, the arrival of differences that can only be followed or encountered as an itinerary rather than as an iteration. Although the nanotechnology that would enable the uploading of human identity resides in a possible future, the subject formation that would produce and inhabit such technologies sprouts in the itinerant, anticipatory ecology of the present. Indeed, in some sense uploading emerges as the fantasmatic extrusion of a twenty-four-hour global market, a market that demands a subject whose very body is money.

On the Other Thumb

In Gibson’s *Neuromancer*—that apparently obligatory point of passage for any discussion of cyberspace—such an anticipatory immortal replicant is written as Dixie, the “Flatline construct,” a computer replication that renders the skills and effects of a hacker long dead.¹ Case, the appropriately named container for drugs and hacking desire whose very body is leveraged by corporate capital, must complete the job to avoid the dissemination of toxins throughout his body, toxins that will forever render him unfit for the ecology of cyberspace. Dixie’s leverage is different. In exchange for networking with Case and the completion of the job, Dixie demands the right to be erased: “This scam of yours, when it’s over, you erase this goddam thing” (106). Dixie, in the grammatical third person—“this goddam thing”—anticipates a future of absence: no life, fucker!

What’s crucial to note in Gibson’s figuration of an upload—a figuration that helps render uploading thinkable within the community of transhumanists, extropians, and other aficionados of uploading—is the role that Dixie’s “body” plays in the transactions of *Neuromancer*. In this economy, even uploads get paid. In Dixie’s second death, the currency of

the transaction is nothing other than the sudden transformation of his phantom body—its absence is the price that Case and Dixie’s employers pay for work completed. Thus, for Dixie, it is possible not only to examine himself *as if* he were currency; he *is* currency, the currency of a transaction that would allow his catastrophic, apocalyptic exit from the money economy—that is, out of any economy whatsoever, this “scam.”

Dixie’s currency, though, suffers the uncanny fate of the simulacrum. Like Cassian’s technologist of self (that money changer called conscience), Dixie ceaselessly evaluates the authenticity or “reality” of his own thought:

“How you doing, Dixie?”
 “I’m dead, Case. Got enough time in on this Hosaka to figure that one.”
 “How’s it feel?”
 “It doesn’t.”
 “Bother you?”
 “What bothers me is, nothin’ does.” (105)

But rather merely experiencing this “nothin’” as a lack, Dixie notes the uncanny, itchy presence of the simulacrum, comparing his fate to a phantom limb: “Had me this buddy in the Russian camp, Siberia, his thumb was frostbit. Medics came by and they cut it off. Month later he’s tossin’ all night. Elroy, I said, what’s eatin’ you? Goddam thumb’s itchin’, he says. So I told him, scratch it. McCoy, he says, it’s the *other* goddam thumb” (105-06).

An itch that can’t be scratched, the uploaded subject can only anticipate. Rather than an incessant “verbalization of thought,” though, Dixie’s technology of self operates through the anticipation of something other than the simulacrum, the positive production of erasure, a qualitative fracture in the endless iterations of selfhood. In his desire to erase his presence, Dixie seeks to comport a subject in the future that would escape the nonstop operations of a market, an economy in which even one’s own death must be purchased. In the present, Dixie regards his own “body” as an abjected double—“this goddam thing”—a regard that, in its very articulation, renders Dixie as a multiplicity, a being that is more than one.

This literary rendition of anticipation may seem to merely “represent” the desires of the computer-loving subjects of Silicon Valley for a tape backup of identity, much as *SimLife* author Ken Karakotsios describes his “hope” in the comic “About the Author” notes that come bundled with each game: “Ken Karakotsios lives in Northern California with his wife

Lucia and their three computers. He designed software in a previous life and hopes to someday return to hardware, as a program.”

But such a reading of Karakotsios’ “hope”—a symptom, no doubt, of the much discussed loathing that cyberpunks have for “the body”—overlooks the productive work of such anticipation in the ecology of self bundled with contemporary techno-science. “Uploading”—the desire to be wetware—makes possible a new technology of the self, one solicitous of the qualitative difference of the future. For Dixie, of course, this change in kind is an erasure; however, what’s crucial to uploaded subjectivity is this cultivation of qualitative difference—a frenzied purgatory between the present and the future—rather than any specific destination. And while anticipation is, of course, an affect that has been available to hominids for some time, uploading seems to install discursive, material, and social mechanisms for the anticipation of an externalized self, a techno-social difference in kind that is perhaps best characterized as a new capacity to be affected by, and addicted to, the future.

In *Origins of the Modern Mind*, cognitive scientist Merlin Donald traces out the relations between “external symbolic storage” and the cognitive evolution of humans. With the emergence of writing, Donald argues, human cognition becomes “permanently wedded” to external sources of memory in a “cognitive symbiosis unique in nature” (356). Donald argues persuasively that the evolutionary emergence of capacities for prediction and explanation—what he too simply characterizes as “theoretic thought”—were bundled with a dislocation of human memory. No longer localized “in” the human brain or body, memory becomes, with the emergence of writing, an external symbolic affair.

Without granting some of Donald’s premises—the opposition between oral and written culture, the precedence of theoretical thought, the binary of a brain that resides “in here” versus a memory that resides “out there”—I would nonetheless suggest that his arguments concerning human cognition are highly suggestive for uploading. If external symbolic storage and theoretic culture rendered a subject with the capacities to be affected by the past (a complex of memory), then uploading technologies render a “subject” capable of being similarly affected by the difference of futures (a complex of anticipation). As a rhetorical practice and a technology of the self, uploading composes what Deleuze and Guattari have characterized as “collective assemblages of enunciation,” a set of speech acts whose articulation only emerges out of a multiplicity—in this case, the future(s) (7). In contrast to the futural constitution of a Christian subjectivity—in which confession and other disciplines suture

the interiority of a subject that encounters the contingent future (“Will I go to Heaven?”)—uploading renders a subject entirely complicit with a contingency that is yet to come. As a kind of externalized brain or “exobrain,” the uploaded subject launches synapses that remained fissured in the present and, perhaps, emerge as a thought of the future. The selves that emerge out of such a set of practices are defined by a relation not to a priest, nation, class, gender, race, or ethnicity, but to an enormous set of contingencies.² Unlike the discourse circuit described by Foucault, such a technology of self is constitutively itinerant; it is precisely the singularity of futures that is being cultivated or encountered. As Burroughs asks, “Terrifying to *whom?*”

While this may seem to be a literary affect provoked by an overdose of science fiction, new markets and forms of finance capital suggest that the frenzied encounter with a contingent future is constitutive of more than Gibson’s characters or of Usenet discourse. If the literary technology of the uploaded self still relies on a self as a “money changer” that examines itself through the lens of an economic transaction, then the market that would render any such transaction intelligible has itself been uploaded sometimes into the computer softwares and financial instruments known as exotic derivatives.

Exotic derivatives are extraordinarily complex financial instruments whose value can only be evaluated by computer softwares. A contract with the future, the exotic differs from the usual run of futures contracts in that it cannot be resold on a secondary market. Unlike, say, a contract on orange juice futures for 1998, an exotic derivative cannot be sold to another investor over the course of the contract. Instead, an exotic derivative is an algorithm whose execution is deferred to the future.

Many exotics are deployed as hedges—that is, as instruments that smooth out the difference between the present and the future. So, for example, if AT&T is planning to expand in the Chinese market in 2002, it might purchase a contract that will lock in the cost of borrowing money at that time, freeze the price of fiber-optic cable, and hedge the cost of computer chips. As such, the exotic forestalls the difference of the future—it is insurance against the contingency of markets yet to come.

However, the value of such a contract cannot, by definition, be determined until the contract is executed. In terms of the value of such a financial instrument, then, one can only anticipate based on the evaluation of the present or the simulation practices of a computer. Unlike a conventional futures contract, whose value can be determined by being

sold, the value of a derivative resides in a strange intermezzo space of anticipation, a virtual haunting by the future.

Engines of Anticipation

This rhetorical production of anticipation—the smearing of the future into the very operations of the present—percolates through the quasi-popular, quasi-scientific discourses that uploading draws on and lives in. Indeed, in “If Uploads Come First”—an essay by researcher Robin Hanson whose title telegraphs the anticipated *jouissance* of uploaded replication—the anticipation of uploading is itself networked with the market:

What does this all mean for you now? If you expect that you or people you care about might live to see an upload transition, you might want to start to teach yourself and your children some new habits. Learn to diversify your assets, so they are less at risk from a large drop in wages; invest in mutual funds, real estate, etc., and consider ways in which you might sell fractions of your future wages for other forms of wealth. If you can’t so diversify, consider saving more.

So, too, does the appropriately named Foresight Institute—one of the foremost resources for uploading discourse that was founded by nanotechnological personality Eric Drexler—operate in such an anticipatory economy. Not merely a site for research into nanotechnology and uploading, Foresight’s policy, according to its Web site, is “to prepare for nanotechnology” by:

- promoting understanding of nanotechnology and its effects;
- informing the public and decision makers;
- developing an organizational base for addressing nanotechnology-related issues and communicating openly about them; and,
- actively pursuing beneficial outcomes of nanotechnology, including improved economic, social and environmental conditions.

That is, the Foresight Institute is an institute of anticipation, a site of research into the effects of a technology that will, perhaps, emerge in the future. This program of anticipation emerges out of the writings of Drexler. In *Engines of Creation*, Drexler describes the powerful effects wrought by a shift in anticipation or expectation:

Expectations always shape actions. Our institutions and personal plans both reflect our expectation that all adults now living will die in mere decades. Consider how this belief inflames the urge to acquire, to ignore the future in pursuit of a fleeting pleasure. Consider how it blinds us to the future, and obscures the long-term benefits of cooperation. Erich Fromm writes: “If the individual lived five hundred or one thousand years, this clash (between his interests and those of society) might not exist or at least might be considerably reduced. He then might live and harvest with joy what he sowed in sorrow; the suffering of one historical period which will bear fruit in the next one could bear fruit for him too.” (125-26)

Thus, research into nanotechnology—and, by extension, uploading—becomes a remedy for a blindness. This remedy opens a gaze to the future, a future whose technology of self will not “ignore” but will be constituted by events to come. Indeed, it is almost as if the first technology of nanotechnology is anticipation itself, a technology mobilized by Foresight. So, too, are the effects of nanotechnology cast as anticipation—the expectation of human subjects for extraordinarily long lives.³

An emphasis on the (often invisible) material economy of this anticipatory program highlights the contingency at play in the symbiotic encounter with silicon rather than highlighting a meatless, transcendental realm where the body is “only” a rhetorical figure. Susan Oyama, writing of the metaphor of “program” within developmental biology, notes that while a program may be quite predictable (and hence not contingent) epistemologically, such algorithms retain an ontological contingency insofar as they are dependent on a Rube Goldberg economy of temporal and material factors for their instantiation: “reliably repeated assemblies can be noncontingent in the sense of being highly predictable, while being thoroughly contingent in their dependence on complex, elaborately extended systems of interacting factors whose dynamic organization cannot be explained in terms of a single component or central agency” (“Accident” 511; see also Oyama, *Ontogeny*). While Oyama writes of the operation of such contingency within distributed biological systems, her principle applies equally to other instantiations of the program metaphor. In a discussion of uploading, Keith Lynch puts it this way: “If we knew what the result of a computer program would be, there would be little point in writing or running it. In fact, it’s a fundamental theorem of computer theory that in the general case, there’s no way to tell what a program will do, other than to run it and see what happens.” Crucial to this formulation is the constitutive role that contingency plays in “repeated assembly” of computer programs. The very point or purpose of the program involves,

paradoxically enough, contingency. Becoming-silicon, uploaders *are* precisely such programs. Not tied to any single central agency (such as an autonomous self), programs find themselves contingent on the exterior assemblages with which they are implicated. Thus, as a technology of self, uploading must be seen not simply as the erasure of contingency and the inscription of repetition. Instead, the dice throw of uploading highlights the necessity of contingency, an ontological and epistemological contingency called “the future” that emerges out of the rhetorical and material assemblage of uploading.

Within uploading discourse, this anticipation of the materiality of simulation—not what software is, but what it is contingently capable of becoming—shatters the present and disorients identity. In “If Uploads Come First,” Hanson notes that different moments of replication would yield different versions of identity in any given “present”: “Uploads who copy themselves at many different times would produce a zoo of entities of varying degrees of similarity to each other. Richer concepts of identity would be needed to deal with this zoo, and social custom and law would face many new questions, ranging from ‘Which copies do I send Christmas cards to?’ to ‘Which copies should be punished for the crimes of any one of them?’” Indeed, these “richer” concepts of identity provoked by the discourse on uploading include encounters with the effects that different material instantiations would have on each upload. Hans Moravec, one of the canonical authors of uploading discourse, notes the various dislocations of “identity” and “body” that would be fostered by different uploading platforms: “If you found life on a neutron star and wished to make a field trip, you might devise a way to build a robot there of neutron stuff, then transmit your mind to it. Since nuclear reactions are about a million times quicker than chemical ones, the neutron-you might be able to think a million times faster” (114). Of course, such a formulation preserves the category of a “you,” an identity that is fundamentally the same, only faster. However, the *mobility* anticipated by this argument is not simply a mobility away from “the” body; it characterizes a space where bodies are nodes in new becomings proper to humans. Hanson explains,

Fast uploads who want physical bodies that can keep up with their faster brains might use proportionally smaller bodies. . . . an approx. 7 mm. tall human-shaped body could have a brain that that [sic] fits in its brain cavity, keeps up with its approx. 260 times faster body motions, and consumes approx. 16 W of power. Such uploads would glow like

Tinkerbell in air, or might live underwater to keep cool. Bigger slower bodies could run much cooler by using reversible computers. . . . Other uploads may reject the familiar and aggressively explore the new possibilities. For such tiny uploads, gravity would seem much weaker, higher sound pitches would be needed, and visual resolution of ordinary light might decline (in both angular and intensity terms).

Thus, the anticipated body of the upload is not simply an occlusion or amputation of the body and its contingencies. It is a promised body, one summoned but not completed by the simulacrum. Peter Merel outlines the debt that both such technologies of the self have to the contingency of the future:

For me, the only thing I need to know is that there's a chance, there's hope that they might revive me—that's enough. As to whether I revive uploaded or meat, or even in Tipler's omega point, I don't care. My reason for considering cryonics is not to establish some kind of continuity of identity with the future; in fact I don't think that identity means anything useful. I think we're waves on the ocean. I think that "I" and "you" are just roles, like "left" and "right", and I don't invest those roles with any metaphysics beyond those of the context of consideration. Is "I yesterday" the same as "I tomorrow"? To me that's just tommyrot.

While this may seem to be a late twentieth-century retooling of Pascal's wager—what have we got to lose?—I would argue that a more profound affirmation of contingency is at play here. Less enthralled to the immortality of the self than to the future itself, uploading becomes a technology of self that renders the univocal self "tommyrot." Indeed, as Merel suggests, the desire to be uploaded resides not so much in the self as in the other of the future:

No, my reason for wanting to be suspended, or indeed for wanting to wake up tomorrow, is purely irrational. It's a creative urge. I like to build things, to write things, to nurture things and impart things to others. I don't care so much who receives those things, so long as they find them useful. . . . If my recipients are alive now, or if they're in the crew of misfits and lollygaggers that thaw me out in a few decades, or in a few thousand years, or at the end of the universe, I don't care—I find it equally satisfying to hope that one of these ways I might create more things.

Less an ontology of loss than of anticipation, uploading sloughs off the body of the present and puts on the future, a future composed of

contingency rather than eternity. In some sense, then, uploaders are dependent on, even addicted to, contingency. The possibilities of uploading are—through a feedback loop that remains to be mapped—entangled with the networks of techno-science and desire that would actualize its concepts. In addition, the futural practice of uploading is thoroughly networked with other uploads, even if those other uploads are replicants of oneself. That is, replication entails an iterability that would make the claim for the "authenticity" of any upload meaningless. For to be replicable—that is, uploaded—is precisely to be iterable, and when it comes to iteration (as with some salty snacks), you can't have just one. As Deleuze and Guattari suggest it in *A Thousand Plateaus*, it is precisely this ability to be copied that is bundled with deterritorialization: "only something deterritorialized is capable of reproducing itself" (59-60).

Thus, the unlimited character of the upload—its immortality dose—depends not on its ability to render the "original," but on its ability to render connectivity, the capacity to be networked and even sampled by other uploads, a capacity available only in the future. Anticipation persists even through the actualization of the upload, as the structural possibility of an upload becomes the capacity for futures—that is, futures composed not of persistence but of sampling that will become articulable in another moment or context, the context of silicon. As in Burroughs' method of the cut up, to become immortal is continually to become other, a continual variation—to be set adrift.

This becoming-sampled marks a new ecology of subjectivity, one in which the sheer exteriority and risk of the future—rather than the certainty of death—sculpts the subject of the present. The diagram of human cognition drawn by Donald and executed by multiple disciplines—an interiority constituted through an external matrix of memory folded into a pocket of regret, death, and secrecy—becomes folded, twisted into a mobius body that is neither past nor future but is an intermezzo of anticipation.⁴

It will be objected that this new topology of subjectivity is not "real," that in its dependence on technologies that are yet to come it is at best a messianic ethos. This is correct, if one persists in understanding uploading as an entirely "technical" project whose success can be determined in terms of actual uploads. But as a virtual entity (a concept), uploading is hardly immaterial as it mobilizes resources—for research on nanotechnology, for example—and constitutes subjects in the present. Indeed, fusion with the computer could be seen to be the contemporary vanishing point of the human, an optical orientation that, like other

vanishing points, organizes human life even as it is thoroughly fictive. I will close with an account not of a vanishing point, whose optics seem to have vanished, but with a regard for an encounter with the fracture, a fissure of consciousness that perhaps best maps becoming-silicon.

The Outcome, or, What You've Been Waiting For

Jean Baudrillard ends his now canonical text *Simulacra and Simulation* with a remarkable example of life in the field of simulacra, an example that perhaps encapsulates the all too speedy and greedy nature of Baudrillard's formulation of simulacra as the "desert of the real" (1). Speaking of the conflation of the real and its models, a moment in which the real becomes nothing other than the ability to be reproduced, Baudrillard meditates on a moment when "each is already technically in possession of the instantaneous reproduction of his own life, where the pilots of Tupolev that crashed at Bourget could see themselves die on their own camera" (149). Whereas Baudrillard, in a kind of instant metaphysics (a metaphysics of the instant) collapses the execution of a death with its simulation, this very example articulates the way in which uploads enthrall through anticipation. The witnessing of one's own death as a virtual event can only be rhetorically (and not corporeally) rendered. Rather than enforcing Baudrillard's declaration that the real has disappeared in favor of the implosions of the hyperreal, the gaze of the pilot allegorizes the futural character of uploads, the way in which such replicants enthrall with the impossible, next image, a becoming-visible, an agonizingly gorgeous or fascinating unfolding.

In his work on cinema, Deleuze offers a compelling diagram of such an image. He argues that while the classical cinematic image operated through the visualization of movement, the mutant sign of the post-war cinema is the time image. Whereas the movement image, Deleuze claims, animates movement through an absence—a hole or gap between cinematic frames "where" movement occurs—and focuses on the apparently self-moving entities within frames, the time image renders the gap or cut itself, the "intermezzo" or the discontinuous "interstice." If the classical cinematic image operates with a movement "buried" in the interior of the cinematic assemblage—a visible invisibility of the present—then simulation (particularly uploading) seems to work through a becoming-visible of the future, a becoming whose rhetorical effect is "anticipation." Rather than composing its image through gaps in the present, the simulation is constituted out of a fracture or a fractal, the unlimited finitude of the future, virtuality crashing into actualization.

What You Were Waiting For, Part Two: Long Live the New Flesh

In *Videodrome*, David Cronenberg meditates on a kind of uploading onto video. At the end of the film, the main character, played by James Woods, puts a gun to his head as a sacrifice of his old body in favor of the "new flesh" of video. We are again, like the pilots at Orly, anticipating the virtual witnessing of one's own death—Woods is, of course, *on* video as he makes the transition to the new flesh *of* video. But the anticipatory gaze leads to a blank screen, an interstice that paradoxically comes at the end.

Rather than a simple refusal to display the "world" of the new flesh, Cronenberg's production of a blank yields the mechanism of the "new flesh," an invisible mechanism whose visibility is continually anticipated but which is imaged only through a fracture or a break. Hanson's "If Upload's Come First" similarly renders this image of the future in his subtitle: "The Crack of a Future Dawn." Uploading is thus an anticipation of precisely "more life": life not free of the body but distributed into spaces not yet visible, our best name left for the remains of life in the age of the simulacrum, the unprecedented.

Clearly, uploading is a technology of self that thus far replicates little. It intrigues not so much because this technology of self is common, or even likely to be so. Rather, uploading discourse offers a map of contemporary technologies of self, technologies that are contingently sculpted. Addicted to contingency, or prowling for mastery, uploaded subjects mark out the materiality and possibility of the new flesh, the anticipated flesh that is something other than either transcendental or meatless. As for my own anticipations, I'll adopt an affect not of anxious waiting but of cheerful and prankish hailings of the future: "more contingency, fucker!" or, to sample Alluquère Rosanne Stone in a rather anticipatory mood, "I hope to observe the outcome" (113).

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Notes

1. The literary history of uploading, of course, extends well beyond Gibson. Pynchon wrote of "electro freaks" in *Gravity's Rainbow*. Here Pop gives Slothrop a lecture on the danger of the electronic soul:

—Listen Tyrone, you don't know how dangerous that stuff is. Suppose someday you just plug in and go away and never come back? Eh?

—Ho, ho! . . . You're such an old fuddyduddy! . . . Maybe there *is* a

Machine to take us away, take us completely, suck us out through the electrodes out of the skull 'n' into the Machine and live there forever with all the other souls it's got stored there. . . . Dope never gave you immortality. (699)

Also see Dick, who wrote of a slightly more eroticized uploading, an amplified precursor to Internet sex in *Flow My Tears, the Policeman Said*.

2. Of course, the demographic profile of uploading enthusiasts does bear the stamp of such constitutive categories as race. My point here is that in the operation of the discourse circuit by which self "fashioning" occurs within uploading, race and gender are not simply unmarked categories; they are usurped categories, subsumed by the very encounter with the future.

3. Drexler seeks to increase the quality of this anticipation in the present through new models of hypertext publishing, through rhetorical tools that will help us to avoid the mistakes that would haunt or foil any nanotechnological future. Drexler writes, "We face many other big, messy problems where discussion is up against one or more of the above limits. Examples include acid rain, ozone depletion, nuclear winter, genetic engineering, nanotechnology, economic policy, and military strategy. Many of these issues are cross-disciplinary, involving chemistry, physics, biology, ecology, economics, political science, and so forth. All are complex, involving economic systems, ecosystems, multiple technologies, international politics, and so forth. All are subjects of contention. In all of them, an improved chance of avoiding major mistakes could be of enormous value" ("Hypertext").

4. Take a strip of paper. Fold it in half. Leave it undisturbed for a few days. Notice the dust, dust mites, and dandruff that make up the ecology of the fold. Now take the strip and twist it. What ecologies are enabled by this new surface?

Works Cited

- Baudrillard, Jean. *Simulacra and Simulation*. Trans. Sheila Faria Glaser. Ann Arbor: U of Michigan P, 1994.
- Blade Runner*. Dir. Ridley Scott. Perf. Harrison Ford, Rutger Hauer, and Sean Young. Videocassette. Warner Bros., 1982.
- Bukatman, Scott. *Terminal Identity: The Virtual Subject in Postmodern Science Fiction*. Durham: Duke UP, 1993.
- Burroughs, William S. *The Adding Machine: Selected Essays*. New York: Seaver, 1986.
- CryoNet. <http://www.cryonet.org> (23 Aug. 2000).

- Deleuze, Gilles. *Cinema*. Trans. Hugh Tomlinson and Barbara Habberjam. Minneapolis: U of Minnesota P, 1989.
- . "On the Death of Man and Superman." *Foucault*. Trans. and Ed. Sean Hand. Minneapolis: U of Minnesota P, 1988. 124-32.
- . "Mediators." Trans. Martin Joughin. *Incorporations*. Ed. Jonathan Crary and Sanford Kwinter. New York: Zone, 1992. 281-94.
- . *Nietzsche and Philosophy*. Trans. Hugh Tomlinson. New York: Columbia UP, 1983.
- Deleuze, Gilles, and Félix Guattari. *A Thousand Plateaus: Capitalism and Schizophrenia*. Trans. Brian Massumi. Minneapolis: U of Minnesota P, 1987.
- Dick, Philip K. *Do Androids Dream of Electric Sheep?* 1968. New York: Ballantine, 1996.
- . *Flow My Tears, the Policeman Said*. 1974. New York: Vintage, 1993.
- Donald, Merlin. *Origins of the Modern Mind: Three Stages in the Evolution of Culture and Cognition*. Cambridge, MA: Harvard UP, 1991.
- Doyle, Richard. *On Beyond Living: Rhetorical Transformations of the Life Sciences*. Stanford: Stanford UP, 1997.
- Drexler, K. Eric. *Engines of Creation*. Garden City, NY: Doubleday, 1986.
- . "Hypertext Publishing and the Evolution of Knowledge." *Foresight Institute*. 1998. <http://www.foresight.org/WebEnhance/HPEK4.html> (13 Sept. 2000).
- "Foresight Institute Purposes and Policy." *Foresight Institute*. 1997. <http://www.foresight.org/Updates/Policy.html> (13 Sept. 2000).
- Foucault, Michel. "Technologies of the Self." *Technologies of the Self: A Seminar with Michel Foucault*. Ed. Luther H. Martin, Huck Gutman, and Patrick H. Hutton. Amherst: U of Massachusetts P, 1988. 16-49.
- Gibson, William. *Neuromancer*. New York: Ace, 1984.
- Hanson, Robin. "If Uploads Come First: The Crack of a Future Dawn." 8 Mar. 1994. <http://hanson.gmu.edu/uploads.html> (23 Aug. 2000).

- Haraway, Donna J. *Simians, Cyborgs, and Women: The Reinvention of Nature*. New York: Routledge, 1991.
- Karakotsios, Ken, and Justin V. McCormick. *SimLife: The Genetic Playground*. Maxis, 1992.
- Lynch, Keith F. "Virtual Reality." 30 Nov. 1995. *Cryonet*. <http://www.cryonet.org> (15 Dec. 2000).
- Merel, Peter. "SCI.CRYONICS Virtual Reality and Reasons to Live." *Cryonet*. <http://www.cryonet.org> (15 Dec. 2000).
- Moravec, Hans. *Mind Children: The Future of Robot and Human Intelligence*. Cambridge, MA: Harvard UP, 1988.
- Oyama, Susan. "The Accidental Chordate: Contingency in Developmental Systems." *South Atlantic Quarterly* 94 (1995): 509-26.
- . *The Ontogeny of Information: Developmental Systems and Evolution*. Cambridge, Eng.: Cambridge UP, 1985.
- Pynchon, Thomas. *Gravity's Rainbow*. New York: Viking, 1973.
- Rotman, Brian. *Signifying Nothing: The Semiotics of Zero*. New York: St. Martin's, 1987.
- Stone, Allucquère Rosanne. "Will the Real Body Please Stand Up? Boundary Stories about Virtual Cultures." *Cyberspace: First Steps*. Ed. Michael Benedikt. Cambridge, MA: MIT P, 1991. 81-118.
- Tipler, Frank J. *The Physics of Immortality: Modern Cosmology, God and the Resurrection of the Dead*. New York: Anchor, 1994.
- Videodrome*. Dir. David Cronenberg. Perf. James Woods, Sonja Smits, and Deborah Harry. Videocassette. Universal, 1982.
- Wilson, Elizabeth A. *Neural Geographies: Feminism and the Microstructure of Cognition*. New York: Routledge, 1998.