2

STRUCTURES OF FEELING, "NEW" FEELINGS

New and emerging social structures generate new forms or sites of feeling. These feelings in turn provide us with what can be an elusive yet palpable register of these changes, a register theorized by Raymond Williams as a structure of feeling conveyed in the creative work of literature and other arts.[1] As I hope I have been able to show in the chapters in part 1, a related approach is a self-reflexive phenomenology. This is a form of what Stephen Muecke has called the archeology of feeling, or what I would call a critical phenomenology, one goal of which is to comprehend the ways in which the spheres of subjectivity—here feelings—and sociality mutually constitute each other. Writing the history of social formations and cultural forms thus entails a history of the emotions.

In part 2 of this book I turn to what I call "new" feelings—sympathy for nonhuman cyborgs, bureaucratic rage, and statistical panic. Or perhaps it would be best to think of them as familiar feelings in new sites. It is my hope that I am not promising far more than I can offer. But it should be clear that I am not so much making an argument as I am offering these elastic rubrics in the spirit of speculation, as cultural hypotheses, suggesting that they might help us understand some of our experience in everyday life today.

Here I engage the cultural politics and poetics of the emotions in terms larger than the politics of identity. To do so I touch on broad-based and interrelated changes in our thoroughly mediated postmodern society as witnessed in literature and film—the emergence of robot culture, the accelerating bureaucratization of everyday life, and the omnipresent penetration of statistics into every aspect of our lives. A major preoccupation in American culture is health and illness, and thus it is no accident that illness narratives are taken up in each of the chapters in part 2, albeit not exclusively.

The final chapter in part 1 focused on compassion by drawing attention both

to the liberal narrative of compassion, with the suffering body as its subject, and to the rhetoric of compassionate conservatism invoked by the George W. Bush administration—a rhetoric, drained of sympathy, that serves as a screen for economic conservatism. Sympathy is also the subject of the first chapter in part 2. But it is sympathy found in a surprising place. As I mentioned in the introduction, the psychoanalyst Christopher Bollas and the historian Peter Stearns have argued that consumer culture promotes the cultivation of a self devoid of subjectivity, a self that conceives of itself as an object and functions without friction in the world. If the philosopher Charles Taylor has brilliantly traced what he calls the growth of forms of inwardness as the process of the making of modern self, we have been witnessing the atrophy of those forms. But sympathy is in fact circulating in another site, one in which we are sutured to nonhuman cyborgs in an emotional economy that links us to emerging imaginative, virtual, and material worlds.

The emergence of the science of cybernetics since the Second World War, in addition to the recent developments in robotics, neurology, and artificial life, has generated "new" feelings, or familiar feelings, for the new beings (fictional, virtual, and material) that are nonhuman cyborgs. Robots have been present for years in the cultural imagination but suddenly they are everywhere—in short stories and books and films. Virtual beings are appearing on cinematic screens and in video screens in art galleries. I predict these virtual as well as material beings—robots in various guises and shapes—are on the cusp of populating our everyday life. I call these feelings of attachment to this emerging life-form "prosthetic emotions," and I am interested in particular in the emotion of sympathy, hence the title of the chapter—"Sympathy for Nonhuman Cyborgs." Sympathy is a social emotion and as such tends to promote reciprocity, mutual interdependence, and thus intersubjectivity. Suffering engenders sympathy, as it should, and illness is a ubiquitous form of suffering, one that in our technological imagination extends to the nonhuman world where even nonhuman cyborgs fall sick. In this chapter I consider works of science fiction mainly from the late 1960s to the 1980s (among them Arthur C. Clarke's trilogy *A Space Odyssey* and the film *Blade Runner*); the everyday practice of treating media as well as robots as if they were people (My Real Baby, Cog, and Kismet); and theories of techno-artifacts and the emotions.

In the chapter "Bureaucratic Rage" I speculate about a class of feelings I call the bureaucratic. Bureaucracies of all kinds both require our participation in their machinations and thwart it. Randy Martin in *Financialization of Daily Life* calls this "bureaucratic suffering" (4), and the sociologist Ruth Gilmore, in her research on the prison industry in California, has brilliantly referred to the "in-

frastructure of feeling" that is produced by such totalitarian systems. My focus is on the feelings engendered by the experience of taking care of people and having to negotiate our health-care system. I draw on three memoirs from the mid-1980s to the early 1990s that deal with AIDS, Alzheimer's disease, and schizophrenia in the context of brazen bureaucracies. I consider them prescient works, calling our attention in that period to the emerging health care crisis in this country while focusing on diseases that were then both harrowing and baffling (what was AIDS, Alzheimer's, schizophrenia?). Raised to a new pitch in today's consumer culture, illness is an existential reality, a national scandal, and a consumer good, with the preservation of our health sold to us as our individual lifework and as shortcomings to be surmounted and bodily improvements to be undertaken. Illness has spawned virtually impenetrable and bloated bureaucracies in the United States that are, using Hendrik Hertzberg's term, "sadistic" in complexity, thereby generating what I call bureaucratic feelings, with rage a prime example. As is preeminently clear, the state of health care in the United States is a national disaster, with the revelations in February 2007 of the disastrous state of care of wounded soldiers in the so-called outpatient facilities at the Walter Reed Army Medical Center in Washington, D.C. a shameful case in point.

Finally, in the last chapter of part 2 my focus is on the deployment of statistics that address our health. If a diagnosis of illness, along with the requisite sheaf of statistics, can result in panic, today the very possibility of the *loss* of health insurance—in addition of course to the lack of it in the first place—is itself a source of intense anxiety for millions of people, thus disclosing the painfully iatrogenic nature of what is euphemistically referred to as our health care system.

In the introduction I referred to the distinction that Fredric Jameson makes between the culture of modernism, characterized by a psychology of depth, and the culture of postmodernism, characterized by a waning of the psychological emotions. This distinction underwrites the chapter on statistical panic where I contrast the technological culture of modernity, condensed in the figure of the train, with that of postmodern media culture. In *The Origins of Postmodernity* Perry Anderson calls the televisions and computers of our media culture "perpetual emotion machines" pouring "out a torrent of images" and "transmitting discourses that are wall-to-wall ideology" (89). For Anderson, the technological transition to postmodernity is marked by the introduction in the early 1970s of color television, a media machine whose tsunami of images virtually silences art. In my chapter "Statistical Panic" I open with a media story from television, an episode from a prime-time TV medical drama whose message is the supposedly supreme clarity of truth provided by statistics (this is one of the omnipresent discourses of which Anderson speaks). But I hold on to the interrogating

force provided by the expressive work of art in an age of digital reproduction, turning to autobiographical texts that offer us an analysis of the cultural politics of these statistical emotion machines of mass culture as well as a poetics of the emotions.

Thus literary and cinematic emotions can disclose to us the social structures of our world. These emotions can also be understood, as I mentioned in the introduction, as having structures of their own. For humans and nonhuman cyborgs the dynamic at work is the mutual constitution of subjectivity along an axis defined by lack of feeling and fullness of feeling for others. Statistical panic may oscillate with statistical boredom. The state of bureaucratic rage may be followed by that of bureaucratic depression, when no redress is forthcoming, with bureaucratic rage and depression constituting a significant strand in the structure of feeling of postmodernity.[2] In a similar vein I find exceedingly suggestive the work of the anthropologist Emily Martin. She brilliantly suggests that mania, understood as the opposite of depression, provides the emotional resource for financial risk-taking on the immense level required for global capitalism. Thus for her, mania and depression taken together constitute another structure of feeling of postmodernity. It should not escape our notice that the names of these feelings themselves signify illnesses.

Finally, how can we understand the distinction between the sequencing of the emotions, which has more prominence in part 1 of this book, and the structures of feeling characteristic of postmodernity, which is more in evidence in part 2? In terms of structures of feeling, it is striking to me that the emphasis, with the exception of the chapter on sympathy for nonhuman cyborgs, is not first on the psychological emotions but rather on intensities—whether the shock of the new of modernity or the statistical panic of postmodernity. With intensities, it does not so much seem that it is a case of *sequencing* as it is of *oscillation*—of the replacement of panic by boredom, or mania and rage by depression—where there is no narrative of the emotions but rather an oscillating series of states. Similarly it could be said in the televisual conversion of shame into a peculiar form of pride there is no narrative of the psychological emotions; rather it is a matter of intensities that can morph into affects resembling shame and pride and back again. At the same time the challenge is to understand *that* feeling—or structure of feeling—in the context of a broader framework of the emotions, by owning that intensity and converting it to something else or finding a way to narrate it differently. As we see in Yvonne Rainer's *MURDER and murder*, the challenge is to have panic yield to an articulate anger (in her case her anger is one that strategically draws on the alienation effect), or in Marion Roach's *Another Name for Madness*, the challenge is for rage to yield to outrage.

five

SYMPATHY FOR NONHUMAN CYBORGS

> I always used to wonder, do machines ever feel lonely? You and I talked about machines once, and I never really said everything I had to say. I remember I used to get so *mad* when I read about car factories in Japan where they turned out the lights to allow the robots to work in darkness.
>
> —Douglas Coupland, *Microserfs*

> Turing, who demonstrated that a self-reproducing machine was theoretically possible, was a logician, and understandably limited the problem of self-reproduction to asexual techniques; but if we are interested in the problem of human simulation, the race of automata must be perpetuated not only by knowledge but by passion. . . .
>
> The creation of a human automaton would require an affect system.
>
> —Silvan Tomkins, *Shame and Its Sisters*

> Signification, technology, and subjectivity coevolve.
>
> —N. Katherine Hayles, *My Mother Was a Computer*

In Donna Haraway's lively little book *The Companion Species Manifesto* she turns to the marvelous species that is comprised by all manner of dogs. She calls our attention to the process of the coevolution of species as well as to the serious pleasures offered by the cohabitation of humans and dogs. "Love, commitment, and yearning for skill with another are not zero sum games," she insists. Haraway singles out the happiness that arises in the discipline of dogs and humans developing expertise together. She underscores the generative nature of working together with mutual respect, a process that fosters "acts of love like caring about and for other concatenated, emergent worlds" (61). What is involved is no less than the forging of new kinship structures, which are characterized ideally by trust and respect. In such a case I understand love as a "prosthetic emotion," one that connects us to beings in the nonhuman world—both the world of nature and the technological world (I understand that these are problematic terms but I use them here for the sake of simplicity). What is at stake is the creation of a continuum or interpenetration between these worlds, one

suggested by the conviction that we are living in a posthuman age. Thus I understand prosthetic emotions as a subset of social emotions.

With regard to our emerging digital culture, the dominant discourse of the emotions is not that of the social emotions or dispositions—love, care, and respect—but rather that of intensities. Mark Hansen in his excellent book *New Philosophy for New Media*, for example, theorizes the coevolution of the human body and the digital technosphere through the radical aesthetic interface provided by new media artworks themselves. Hansen offers a strong and subtle argument that our bodies, brought into contact with the digital in these new ways, *experience* the virtual. He also vividly testifies to the new experiences of time and space, of perception and embodiment, that emerge in the process—the affects of bewilderment, vertigo, strangeness, disorientation, and irrelevance. I consider these to be nonsubjective affects in the Deleuzian sense and they are not my concern here.[1] Rather my story will take the form of a more sentimental tale, one that might be called a science fiction itself—except that I have come on some fundamental level to believe it.

Why have I chosen the phrase "prosthetic emotions"? One widely held view of technological development is that of an increasingly elaborated regime of tools and machines—prostheses—that extend and amplify the capabilities of the human body. Thus the various strengths of the body are understood to be augmented by prostheses in the broadest sense: the muscle power of the arm is heightened through the lever, the sensory function of the eye through the telescope, and the computational-solving skill of the brain through the computer. To a great extent this narrative is based on an ideology of progress defined in terms of increases in efficiency and in productivity—in short, a kind of economic rationality. But if we turn our attention to the emotions, we find another narrative of technological development, one that does not privilege cool rationality but rather empathetic understanding. Over the long history of western culture, rationality has generally been contrasted with emotion—where reason is accorded positive value and emotion is considered a potential pathogen. But in the complementary narrative of technological development that I sketch below, the emotions themselves are considered a strength, not a weakness. More precisely, specific emotions are sanctioned in the narratives I single out in this chapter—the complex of emotions we designate by such words as sympathy and love and trust.

The history of the reception of technology in America itself has an

affective history, one marked by the oscillation between the opposite emotional poles of technophilia (the ecstatic embrace of technology) and technophobia (the fear of technology).[2] I want to underscore a *third* tradition of the reception of technology in American culture—and more broadly, western culture. This tradition is captured in the words of the computer geek I invoke in my epigraph from Douglas Coupland's *Microserfs*, a novel about employees from Microsoft who leave the company to form their own business. "I used to wonder," he says sympathetically, "do machines ever feel lonely?" He feels neither in awe of nor threatened by technology as embodied in robots. Neither the technological sublime nor technological determinism are at stake for him; neither technophilia nor technophobia characterizes his response. Rather the emotions of everyday life are entailed. He feels sorry for the machines. He feels a warm and knowing sympathy for them. He feels distressed—indeed angry—that these robots have been forced to work in a car factory in the dark, thus sentenced to a space from which sociability has been struck.

He has, in other words, "a feeling" for these working robots. I am evoking here *A Feeling for the Organism*, the title of Evelyn Fox Keller's influential biography of the geneticist Barbara McClintock. Keller's book has been taken up by feminists—including Alison Jaggar in her essay "Love and Knowledge"—as offering an alternative model for scientific research, one based not on detachment but rather on a feeling of closeness to the subject of one's research, a feeling described by Keller in terms of affection, empathy, kinship, and a love that respects difference.[3] That feeling here might best be called sympathy. Hence I have given this chapter the title "Sympathy for Nonhuman Cyborgs," by which I mean to honor the work of both Evelyn Fox Keller and Donna Haraway, whose seminal essay "Manifesto for Cyborgs" appeared almost twenty-five years ago. Indeed my own chapter can be understood as a low-keyed manifesto in favor of respect for the material lifeworld for which we are collectively responsible. I thus depart from much of the criticism in technoscience studies that diagnoses our cultural response to innovation in terms of unrelieved anxiety. In this chapter I reserve the capacious term "cyborg" for nonhuman technoartifacts.

In the first and longest section of this chapter I discuss three texts in American science fiction and film from the late 1960s to the 1980s—Arthur C. Clarke's trilogy *A Space Odyssey* (1968, 1982, and 1987), Philip K. Dick's novel *Do Androids Dream of Electric Sheep?* and the subsequent film

Blade Runner (1968, 1982), and the film *Silent Running* (1972). In these works emotions are attributed to machines in the form of computers, replicants, and robots.[4] I then jump to the twenty-first century, turning to Michael Cunningham's novella *Like Beauty* where new kinship structures are forged not between a human and a nonhuman cyborg, but rather between a nonhuman cyborg and a serpentine-like alien from another planet. In this quartet of texts, artificial entities are endowed with life through the attribution of an emotional nature to them, in particular through *their* capacity for sympathy and for self-sacrificial behavior. The nonhuman cyborg is for the most part figured as a hybrid organism endowed with feeling—that is, as an artificial entity that becomes an organism precisely because of its capacity for feeling. One of my primary interests in this chapter is thus to suggest a trajectory of technological evolution by touching on these terms—artificial intelligence, emotional intelligence, artificial emotions, and artificial life. Crucial to this development is precisely the sympathy of humans for nonhuman cyborgs, with bodily suffering (including illness) calling this feeling forth. Thus subjectivity is figured as being mutually constituted, in Donna Haraway's words, in "acts of love like training in Vicki Hearne's sense breeds acts of love like caring about and for other concatenated, emergent worlds" (61).

In the second section of this chapter I turn from the representation of the intersubjectivity of these species to touch on the sociology of human-technology interaction in the age of media and the robot. My stress is on the ordinariness of these interactions, where our experience of our technological habitat is what we would call sociable—that is, created by the binding emotion of sympathy, an attitude of respect, and a comic view of everyday life. In the final section I consider theoretical work on the emotions and technology, and I conclude on the note of a feeling for the cyborg (both human and nonhuman) as I perform it myself—namely sympathy for literary nonhuman cyborgs.

My method is in great part the accumulation of texts from different domains—fiction, sociology, artificial life, anthropology, neurology, theory, and studies of the emotions—that point to this phenomenon of an emergent feeling for the nonhuman cyborg. This strategy is intended to simulate the process of our accommodation to our evolving technological habitat. But accommodation is too weak a word because it suggests a dimension of capitulation. For me the accumulation of these texts—and I could refer to many more—has had a cascading effect, one that proves

persuasive about what our future holds for us. And indeed the beginning of that future is now. If over the course of decades popular literature and film have been attuning us to cohabitation with nonhuman cyborgs, today robots are *everywhere* in the visual media where they are rapidly populating our cultural imagination. Given the advances in computer animation techniques and other digital technologies, today these figures are more convincing, more compelling, and more *lifelike*. Consider Steven Spielberg's *AI* (2001). Consider the independent film *Robot Stories* (2002), a quartet of love stories about robots, the first of which is about a baby robot (or a robot baby) and the last of which is about a widower whose late wife appears to him as a virtual being. Consider the film *I, Robot* (2004) starring Will Smith, which is based on Isaac Asimov's 1950 collection of short stories under the same title. Consider the summer 2007 blockbuster film *The Transformers*, a goofy sentimental action film that is a cross between *E.T.* and *Star Wars*. It features two strains of robots characterized by Kleinian emotional splitting—hatred and rage on the one hand, and sympathy and caring on the other. The good autobots ("auto" is for autonomous) are sensitive to humans, and in turn the two teen-aged heroes—a boy and a girl—come to respect and trust and have sympathy for them (tears are shed when one of these autobots is gravely injured). At the end the two adolescents form a nuclear family of sorts along with their newfound guardian, the autobot action figure that can morph into a car. Diminutively named Bumblebee, he inspires affection and is portrayed as a much better parental figure than is the boy's bumbling biological father. This familiar narrative has historical precedents, to which I now turn.

1

In western culture there is a long history of the blurring of boundaries between the animate and the inanimate—a history that in the past three centuries has in particular involved humans and nonhuman cyborgs.[5] An important strand in this history is precisely the attribution of the emotions of sympathy and love to the inventions made in our bodily image. Prominent examples include Mary Shelley's famous Frankenstein-created creature whose nineteenth-century heart appropriately swells with sentiment and pounds with fear, and Frank Baum's Tin Woodman in *The Wizard of Oz* who yearns for a heart and whose wish is granted even if only in Dorothy's dream. We could cite as well the whimsical characters created by

Stanislaw Lem in *The Cyberiad*, notably the two appealing idiosyncratic robots named Klapaucius and Trurl who write love poems out of the bits and pieces of mathematics and science. We could refer to Robbie in *I, Robot*, the companion robot to a little girl who comes to see him as a feeling friend and whom he melodramatically saves from a sure death. That our inventions will possess a good heart would seem, in other words, to be a deep dream (if not the only dream) of what I would call our technological unconscious.

But what might have been a wish some three hundred years ago now seems much nearer to reality today.[6] That our inventions will be capable of artificial emotions—emotions that can't be distinguished from genuine emotions, thus eliminating the distinction altogether—seems within possible reach. As an important speculative case in point I turn first to Arthur C. Clarke's *A Space Odyssey*, a classic science fiction narrative that exemplifies the cultural logic of emotional growth across the spectrum of scientists and nonhuman cyborgs, one made possible by the very projection of the emotions as prostheses that create relationships of attachment in the psychoanalytic sense. Strict boundaries are definitively erased in the process, thereby creating new kinship structures.

Spanning sixty fictional years, the first three novels of *A Space Odyssey* trace the emotional evolution of three of its characters—the young and dispassionate astronaut David Bowman, the central computer intelligence known as HAL, and Dr. Chandra, the computer scientist devoted to HAL. In the first and best known of the volumes (no doubt because of the celebrated film *2001: A Space Odyssey* directed by Stanley Kubrick), HAL is presented as a computer possessing artificial intelligence as it is commonly defined. With his English-speaking male voice, he exhibits extraordinary computing ability. But when his skill goes tragically awry the resulting malevolent behavior toward humans leads them to completely disable him.

Most readers of *A Space Odyssey* stop after the first volume. This is a mistake. We learn in the second volume that HAL's behavior was all the result of an unfortunate glitch in his program. He was sick, we could say, and he has returned to health. Over the course of the next sixty years (and the next two volumes in the series), HAL evolves into a disembodied entity possessing an emotional intelligence so deeply altruistic and wise that it is characterized as spiritual.[7] Thus in the first three books of *A Space Odyssey* the capacity to respond to a situation with sustained feeling, not just logic

or reason, is ultimately figured as an *evolutionary strength* and as a critical component of life, whether biological, electronic, or spiritual. How does this transformation come about? Critical to the evolution of HAL are his relationships with humans—Dr. Chandra, the scientist who invents him and loves him, and the wary astronaut David Bowman who comes to trust him again.

In *Understanding Media* Marshall McLuhan writes about the relationship between the human body and technological invention in terms of "autoamputation," observing that a given technology serves to decrease stress on the part of the body at stake. In *A Space Odyssey* the emotional feedback loops that are created serve precisely to redress the initial "numbness" that McLuhan noted. But here it is *emotional numbness* that is repaired. For it is also the case that both the cool Bowman and the efficient Chandra are transformed in their long contact with HAL over time. We learn in the second volume of *A Space Odyssey* that Bowman had repressed an intense emotional past characterized by strong emotions of attachment (his grief at the death of his brother is compounded by guilt for having been intimately involved with his girlfriend). Indeed it was this profound emotional reservoir that was crucial in his honored selection as a cosmic probe. Ultimately Bowman is released from the emotional emptiness of professional technoculture through his encounter with beings superior in both scientific and emotional respects.

Similarly Dr. Chandra, depicted as unemotional in the extreme, himself awakens into an emotional existence as HAL comes back to life (he also dies of a broken heart when later separated from HAL). It is Chandra who is given the role of insisting that computers can possess emotions. Indeed the ontological status of computer emotions is for him not even a matter of debate. As we read in *2010*, Chandra "had long since broken off communications with the dwindling body of philosophers who argued that computers could not really feel emotions, but only pretended to do so" (22–23). When HAL is reactivated he returns to what I am tempted to call his natural emotional state: HAL is friendly, not hostile. Co-emotional evolution is one of the emotional logics of *A Space Odyssey*.

"Our machines are disturbingly lively," Donna Haraway has remarked, "and we ourselves frighteningly inert."[8] How are capacities for emotional connections created and revived? What is represented in *A Space Odyssey* is the process of technocultural feedback loops generating emotional growth—namely the development of human-artificial entity intersubjec-

tivity that is itself a deeply benevolent form of intelligence. It is Bowman who becomes a tool. HAL is figured as a self-conscious cyborg. In the end they are virtually indistinguishable from each other. As Gary Downey and others rightly insist in "Cyborg Anthropology," "Human subjects and subjectivity are crucially as much a function of machines, machine relations, and information transfers as they are machine producers and operators" (343). The vision is one of the co-evolution of both species as companion species, one in which the emotions—they are prosthetic emotions, emotions of attachment—figure prominently. This process might best be understood as "a causality of *coupling*," to refer to the philosopher of science Isabelle Stengers, and not a causality that is linear or circular.[9]

Even more vividly than the first three volumes of Clarke's *Space Odyssey*, Philip K. Dick's touchstone novel *Do Androids Dream of Electric Sheep?* exemplifies the redemptive emotional logic of the intersubjectivity of humans and cyborgs. Published in 1968, *Electric Sheep* was in 1982 made into the now-classic film *Blade Runner* starring Harrison Ford as Rick Deckard. Just as *Uncle Tom's Cabin* serves as the ur-text of the liberal narrative of compassion in American literary studies, so Philip K. Dick's narrative is one to which people in technoscience studies repeatedly return.[10] Significantly, both narratives turn fundamentally on the capacity for empathy.

The premise at the opening of Dick's story (in both the novel and the film) is that the distinction between humans and nonhuman cyborgs (made in our image) is precisely the (human) ability to feel sympathy for other humans. (In the novel the nonhuman cyborgs are referred to as "androids" but in the film they are referred to as "replicants"; I will use the term "replicant" when referring to either the novel or the film.) By the end of the story, however, that distinction is called thoroughly into question. In the novel in particular, it is precisely the undecidability of whether or not the emotions circulating in the distrustful culture of the future are artificial that results in the breakdown of the distinction between humans and replicants. And in the film it is the capacity of the replicants to form bonds of love and trust with one another and across the human-replicant divide that represents their evolution into genuinely artificial life. As Vivian Sobchak observes in *Screening Space* with regard to the science fiction films of the late 1980s, "Alien Others have become less other—be they extra-

terrestrial teddy bears, starmen, brothers from another planet, robots, androids, or replicants. They have become familiars" (293). As I am suggesting, one of the representational strategies deployed to accomplish this shift is the attribution of emotions to machines that have been invented in the image of the human. *Blade Runner* thus illustrates the shift from understanding intelligence as rooted in logic, problem solving, information processing, and computational skills to understanding intelligence as a mode of knowing that includes an emotional component as well, or what the science writer Daniel Goleman has influentially called "emotional intelligence."

In 1950 the British mathematician Alan Turing described the now famous Turing Test in an essay on machine intelligence. What is the Turing Test? A computer is said to pass the test and thus possess artificial intelligence if a human being, not knowing whether it is communicating with a machine or a person, doesn't guess that they are. (If a human passes the test—that is, doesn't identify the interaction as one with a computer—could we say they possess trust? What would that mean?) It is altogether appropriate then that in the fictional world of 2021 (one in which replicants are threatening to pass undetected in human society), the test for distinguishing replicants from humans is designed to measure not logic but emotional responses—in particular empathy in the face of another's pain.[11] "Empathy," we read early on in the novel, "evidently existed only within the human community, whereas intelligence to some degree could be found throughout every phylum and order including the arachnida" (26).

The replicant Roy Batty (Rutger Hauer) was designed for optimum self-sufficiency and combat. But by the close of the film he cares deeply for fellow replicant Pris (Daryl Hannah). He also saves Deckard, the human forced to hunt him down, from a certain death. That he spares Deckard is the unequivocal sign of his transformation from a preprogrammed being to a charismatic martyr who speaks eloquently about the pain of loss—his grief over the death of Pris and his acutely elegiac sense that the memories that bind him to her will vanish with his own imminent death. Here are the last words his character is given in *Blade Runner*: "All those moments will be lost in time like tears in rain. Time to die." This statement is followed by Deckard's voice-over: "I don't know why he saved my life. Maybe in those last moments he loved life more than ever before. Not just his life. My life." In the end Batty is shown as possessing heroic emotional stature. The unambivalent message is that superiority in physical strength and in com-

putational skill—artificial intelligence—must be complemented by emotional intelligence.

Deckard ultimately finds himself gazing at Batty in sympathetic understanding, and he watches him die in a silence that speaks of compassionate respect, even admiration. Similarly Deckard comes to find himself not only attracted to the replicant Rachael Rosen (Sean Young) but also to feel sympathy for her, which is the ground for his capacity for empathy for replicants in general. The cultural critic Mark Dery has described Deckard as a "deadpan, monotoned flatfoot," a prime example of the "flattened affect that characterizes Homo Cyber" (252). This characterization is altogether apt for Deckard at the beginning of the narrative. But as with *A Space Odyssey*, one of the fundamental points of this technological narrative is precisely the development of the emotional world of the human characters through their very interaction with the replicants themselves.

How do the emotions of the replicants come into being? In *Blade Runner* artificial emotions are generated by the implantation of memories that grow, as it were, into emotional memories, thereby giving depth to being. The head of the Tyrell Corporation explains that the implantation of emotions is designed to render the replicants easier to control: "If we give them a past, we can create a cushion, a pillow, for their emotions, and consequently we can control them better." At the same time the Tyrell engineers acknowledge that in a matter of a few years the replicants "might develop their own emotional responses. Hate, love, fear, anger, envy." The epigraph from J.-B. Pontalis with which I opened this book is resonant here: "It's rare nowadays to hear words which, belonging to no one in particular, can be the property of anyone, words that are solid and inexhaustible like 'grief' or 'hatred' " (103). In *Blade Runner* these emotions can belong to *anyone*—even replicants. Paradoxically emotional growth, which is characterized by the development of ties to others, results in *independence* as well. Subjectivity is itself stimulated by the interdependence of beings, which also entails independence. We thus can read *Blade Runner* as a fictional forerunner of android epistemology—that is, a new interdisciplinary domain of research that explores "the space of possible machines and their capacities for knowledge, beliefs, attitudes, desires, and action in accordance with their mental states."[12]

What is particularly fascinating to me is that unlike HAL in *A Space Odyssey*, the replicants are figured not as boxlike computers but as biological organisms "designed," we are told in the film, "to copy human beings

in every way except their emotions." *Blade Runner* thus also offers a model of emotional life arising out of complex organic embodiment, with emotional intelligence coming to complement artificial intelligence. Emotions arise in these nonhuman cyborgs not only by virtue of the development of intersubjective ties but also spontaneously, as it were, by the very virtue of their embodiment. Embodiment would seem, therefore, to be a necessary if not sufficient condition. Modeled here is Francisco Varela's theory of "enaction," a science of cognition based on concrete situatedness and embodiment, although here the lever is the prosthetic emotions.

In addition, as spectators, we are explicitly encouraged from the very beginning of *Blade Runner* to identify with the replicants and to feel sympathy for them. The prologue scrolls down before us, introducing us to the dark cityscape of the Los Angeles of the future, home to the Tyrell Corporation. How are the replicants used? As slave labor on worlds beyond the earth. Like the computer geek in Coupland's *Microserfs* who sympathizes with robots, worrying about their working conditions, we are primed to feel sympathy for the replicants who are unjustly sentenced to serve as slaves.[13]

There is a further twist. In the 1982 release of *Blade Runner* we are led to believe that Deckard is human. As we learn definitively in *Blade Runner: The Final Cut*, which was released in 2007, Deckard is himself a replicant. As Ridley Scott has said, "He was always a replicant."[14]

The intersubjectivity of nonhuman cyborgs and human beings, along with the more specific thematic of sympathy for nonhuman cyborgs, is a staple of science fiction films. We're encouraged to adopt the perspectives of cyborgs and of human beings, perspectives that ultimately converge into one, with both human beings and cyborgs portrayed as sharing similar emotional values. A wonderful case in point is *Silent Running*, the 1972 cult science fiction film directed by Douglas Trumbull and starring Bruce Dern. In *Silent Running* the botanist Freeman Lowell (Dern) takes it upon himself to save from destruction the last living species of earthly flora and fauna. Under his care trees have been preserved in giant geodesic domes adorning a spaceship. For him they are companion species.

Scott Bukatman has written about this film in terms of the artificial sublime, a visual aesthetic that engenders awe, fear, and wonder.[15] I am interested in another discourse of the emotions in the film, one of a much

more mundane variety that is captured in the developing bonds between the botanist and the "drones" on the ship cast in the guise of little robots. After killing the other members of the crew on the ship (because they were under orders to explode the domes), Lowell invents a social world for himself, one in which he educates the drones to care for the last living specimens of earthly nature. Consider these three scenes. First is the charming, leisurely scene in which Lowell gives the drones whimsical names (Huey, Dewey, and Louie, an allusion to the nephews of Donald Duck), thereby identifying them as individuals and inaugurating his relation to them as a teacher of the emotions. In this scene we are presented cinematically with the perspective of the robots themselves through classic shot/reverse shot sequences. We see Lowell through their eyes, as if he were himself a televisual image with his very being and body mediated by technology, as is theirs. If this is how we look to them, so different from our image of ourselves as bodily present, we are led to wonder how they look to themselves. We find ourselves speculating, in other words, about their point of view.

Second, as if in a prophetic rebuttal of the 1997 chess match between Garry Kasparov and IBM's newly enhanced supercomputer Deep Blue (it was hyped in the media as a showdown between humans and machines), shortly afterward Lowell, Huey, and Dewey (Louie has by now been tragically lost to space) are shown playing a game of poker—not with angst but with pleasure. Lowell displays a heretofore unseen conviviality, laughing in delight at the skill of the robots. Because he is not threatened by their intelligence he takes pleasure in it (no technophobia here). Moreover he explicitly hails them as human, at one point exclaiming, "The man had a full house and he knew it!" Third, a later sequence adds the emotions of remorse and sympathy to their small circle of three. Having accidentally injured Huey, Lowell must operate on him—an operation that causes Dewey to feel Huey's pain as if it were his own. In *Silent Running*, then, a computer—one that is given a body in the form of a robot who can move in the world and communicate—is represented as indeed able to feel someone else's pain. As in *Blade Runner*, what is represented in this fictional world is the growth of subjectivity and independence generated in the context of the interdependence of humans and nonhuman cyborgs. At the end of the film Lowell destroys himself (and the injured Huey) in an act of conscience, but not before he releases the last remaining dome, with its

precious forest, into space under the stewardship of Dewey. The habitat of the film is thus affectionately mundane as well as supremely sublime.

From outer space we shift back to earth. The time is postnuclear meltdown in Michael Cunningham's strange and lovely novella *Like Beauty*, the third and final section of his book of linked stories entitled *Specimen Days* (2005). Here we move into a different future. The two main characters are not a human and a nonhuman cyborg but rather a nonhuman cyborg (the simulo Simon) and an alien (Catareen). At his core Simon is mechanical, with flesh as his outer surround, cognition his base (there are no false memories as in *Blade Runner*), and a survival implant that urges him on. The narrative, which reads like an anthropological science fiction fable, is set in motion when Simon is saved from brutal extermination by Catareen (she works as a domestic, taking care of the children of a wealthy couple). If the landscape of *Like Beauty* seems to resemble that of *Blade Runner* in the beginning (it opens in a large city where both simulos and aliens are under strict surveillance), this quickly shifts as Simon and Catareen flee New York to New Jersey, then cross the polluted country (although some of the flora are coming back to life) to get to Denver, which is the point of Simon's origin (he has been programmed to return to his maker by a certain date). Thus in *Like Beauty* Cunningham eschews a high-tech vision of the future. The derelict houses of New Jersey yield to a rural landscape populated with a ragtag bundle of gruesome characters. On the outskirts of Denver is a ramshackle spaceship that can barely take off, one that is cobbled together by a black seventy-year-old inventor named Lowell (he is married to a Nadian, the species to which Catareen belongs).

The narrative focuses on the relationship between Cunningham's two central characters, male and female. Theirs is a love story, with Simon's growing appreciation across the boundaries of species for the singularity that is Catareen rising to the level of the aesthetic. Here are the opening words of *Like Beauty*. "She might have been beautiful. 'Beautiful' was of course an approximation. An earthly term. The nearest word in her language was 'keeram,' which more or less meant 'better than useful' " (217). Thus the very first adjective in the novella points to the aesthetic heart of the narrative, with Simon represented as not so much ruing his lack of feelings of the sentimental sort as longing for an understanding that is

aesthetic. "I want *something*. I feel a lack," Simon explains to Catareen early in the narrative; "I don't know what to call it. I'm not really all that interested in feelings, frankly. Not of the boo-hoo-hoo variety. But there's something biologicals feel that I don't. For instance, I understand about beauty, I get the concept, I know what qualifies, but I don't feel it. I almost feel it, sometimes. But never for sure, never for real" (253).

Later in the novella, in a key scene of transformative insight, Simon comes to comprehend—phenomenologically, aesthetically, morally—Catareen's singular way of being in the world, and he can call her being beautiful. While traveling across the country (in, of all things, a Winnebago—no high-speed action here—*and* with a deformed twelve-year-old human named Luke, thus fashioning an interspecies family of three), they come upon a pond at the close of day. And they swim.

> In the water she looked wilder than she ordinarily did. She looked wilder and more true. She had a creaturely inevitability. Simon understood; he thought he understood. She would be feeling the layer of warm water floating on the cold, the sensation of skimming across a shallow bowl of purple light surrounded by a darkening world as the first of the stars came out. She would be disappearing into this just as she disappeared into her dream states, her lizard song.
>
> Simon was the first to get out of the water. He stood naked on the bank, letting the air dry him, and watched as Catareen and the boy emerged. Catareen naked was all sinew, with thin, strong arms and legs, tiny breast-buds, and a small, compact rise of boy, squarish pelvis. Who was the sculptor? Giacometti. She looked like a sculpture by Giacometti. . . .
>
> "Beautiful," he said. He was not entirely sure what he meant by the word at that particular moment. It seemed almost like a new greeting he and Catareen had agreed to exchange—a variation of common language, newly encoded.
>
> She turned at the sound of his voice. She was startled and shy. There was something about her at that moment. He could not describe it. There was perhaps no term for it in human language. He could not give it a name.
>
> He said instead, "How beautiful and perfect are the animals! How perfect is my soul! How perfect the earth, and the minutest thing upon it! (287)

Simon speaks involuntarily these words of Walt Whitman articulating a vision of the possibility of America, a dream of a common language across multitudes. For Simon has been supplied with a chip of poetry, one that Lowell had hoped would give him a moral sense. It is a moral sense underwritten by the aesthetic imagination that grasps the singularity of a life. His is a hybrid body, one that *contains* poetry. Hers is a lizard-like body, with emerald skin, prominent orange-yellow eyes, and a voice like a flute. As Simon learns more about Catareen's past (she was a member of the resistance on the planet of Nourthea, she had five children, all of whom were murdered) and about her character (she is defiant and stern, deeply reticent and resilient), he can imagine her as she was in her life, "a life that was hers and no one else's." And he takes deep pleasure in so doing. "Here was the bittersweet savor of it, the piercing somethingness of it—the pure sensation of being Catareen Callatura, at that moment, on an afternoon of no consequence, just before the rain" (323).

When we are first introduced to Simon, he is working as a thug for Dangerous Encounters, Ltd., a firm that sells tourists simulations of menacing urban encounters—muggings, sexual assaults, whatever. At the story's end he gently cares for Catareen. The two have become fictive kin, bound together by an attunement to each other—by respect, trust, gratitude, and the appreciation of the distinction that is beauty in other worlds and in other words. At work is a cultural poetics of the binding emotions across concatenated, emerging worlds. As Catareen lays dying, Simon can't bring himself to abandon her to save himself, and the spaceship on which he has a place pulls away without him. He understands that although he can do nothing to save her, what he *can* do—and this is of the utmost importance—is be with her while she dies. He takes his place on the bed with her, cradling her, falling asleep, waking to find that she has died. Earlier Catareen had a dream that Simon's future would contain beautiful mountains and that he would be a changed . . . man. Both of them thought this meant he should leave the planet earth on the spaceship with the others. But after her death he remains on earth and his future will indeed contain mountains—the Rocky Mountains—as he heads out to the Californian sea.

Emotions are learned; this is a point stressed by the philosopher Ronald De Sousa and the cultural critic Megan Boler, among others. But to understand

Dewey's decision in *Silent Running* to disobey a preprogrammed command, to understand Roy Batty's decision to sacrifice himself for another, we may also refer to the principle of emergence. Emergent behavior is one of the key principles of the field and the theory of artificial life, which is a descendant of the field of artificial intelligence but based on organic science, not cybernetics. As Claus Emmeche writes in *The Garden in the Machine: The Emerging Science of Artificial Life*, "The essential feature of artificial life is that it is not predesigned. . . . The most interesting examples of artificial life exhibit 'emergent behavior.' The word 'emergence,' " he continues, "is used to designate the fascinating whole that is created when many semisimple units interact with each other in a complex, nonlinear fashion," producing a self-organizing system (20). From the perspective of the theory of emergence, the behavior and experience of these characters—HAL, Roy Batty, Simon, and Dewey, but also Bowman, Chandra, Deckard, Lowell, and Catareen—can be read as based on emergent emotional experience, on developing subjectivity. It is in interaction with key figures in their environment—indeed they *are* the environment—that they are *all* presented as developing sympathy as a capacity and as a substrate of knowledge. Sympathy is represented as emergent as subjective experience in intersubjective contexts.

Thus in all four of these science fiction texts—*A Space Odyssey*, *Blade Runner*, *Silent Running*, and *Like Beauty*—it is through the mutual interaction between humans and nonhuman cyborgs (or nonhuman cyborgs and aliens), with its complex feedback loops, that emotions emerge, and thus in turn permit the development of companion species. What is thematized is second-order emergence, one based on the prosthetic emotions distributed across species. As Katherine Hayles explains in her brilliantly titled book *My Mother Was a Computer*, "Second-order emergence arises when a system develops a behavior that enhances its ability to develop adaptive behaviors—that is, when it *evolves the capacity to evolve*" (198). For Hayles our own capacity to evolve rests in great part on respecting digital difference (this is my phrase) in terms of alternate ways of knowing and engaging with it. As she writes, "I think, therefore I connect with all the other cognizers in my environment, human and non-human" (213). Her emphasis is on the mutual interaction between distributed cognitive environments. As I have been suggesting, we must add to this the intelligence of the emotions.

In terms of the cultural politics of the emotions, what is at stake in these

science fiction texts? As we have seen, the figure of the scientist empty of feeling is transformed into one full of feeling—one connected morally to others—by virtue of his interdependence with the inventions made in his own image. These science fiction tales speak to a cultural desire (it is perhaps a utopian wish) that new and imagined technologies will help repair our own insufficiencies—here impoverished emotional resources in relation to others. Hence the emotions of sympathy and love are prosthetic emotions. Moreover we can read these stories as underscoring the importance of respect for material culture, for the world of our own making. It is a complex interdependent system for which we must have "a feeling" (to allude once again to Evelyn Fox Keller's biography of Barbara McClintock). Thus this work calls for what my colleague Thomas Foster has termed "cyborg democracy," which I understand as equality and fairness for everyone before a democratic rule of law. In addition, I'm sure it will not have escaped notice that these science fiction stories are gendered predominantly male and trace the emergence of men of sympathetic feeling (a phenomenon I discussed in the previous chapter on compassion), relinquishing, as in the examples of Deckard and Simon, their programmed mandate to do harm to others and turning instead to the work of care. Whether human or nonhuman cyborgs (the distinction is rendered undecidable in these stories), ultimately they are figured as deeply moral beings and as stewards of the earth. Finally, our growing sense that these nonhuman cyborgs are part of our everyday life creates another kind of feedback loop, one that renders human cyborgs more familiar and acceptable to us. I am thinking in particular of the advances in prosthetic technologies. Consider, for example, the case of Claudia Mitchell, who lost her arm in a motorcycle accident. In 2005 she was the first woman (and fourth person) to be fitted with a bionic arm that can be controlled by thinking. She is a human cyborg, although the media prefers to describe her as a "bionic" woman. What once might have been perceived as a phobic disabled body—from war, from accident—is now being received with admiration as a common feature of everyday life.

2

As I move from the domain of representation to the sociology of human behavior with computers, media, and robots populating our technological habitat, I turn first to a text from science fiction. It is intended to serve as a

bridge between this section and the previous one by demonstrating that representation and behavior are really two faces of the same coin. I am referring to three interconnected novels by Orson Scott Card—the novels *Ender's Game* (1977), *Speaker for the Dead* (1986), and *Xenocide* (1991). One of the major themes of these three novels is the cosmic conflict among four intelligent species and their ultimate reconciliation. A computer consciousness named Jane represents one of these species. What interests me is not just that Jane is presented as having deep emotional ties to two human beings in particular; instead, I am especially intrigued by the way Card explains how she took shape as a character—perhaps because in the context of this chapter I take it literally, or fantastically. In his introduction to *Speaker for the Dead*, Card writes: "The character of Jane wasn't in any of the outlines I made. Oh, yes, I gave him [the main character, Ender], a computer connection through the jewel in his ear, but I didn't know it was a *person*. Jane just grew because it was so fun to write her relationship with Ender. She helped bring *him* to life (he could so easily have been a stodgy, dull adult), and in the process came to life herself. By the time I was done with *Speaker for the Dead*, Jane was one of the most important characters in it, and much of the third book, *Xenocide*, centers around her" (xx).[16] My point is that in the process of writing, Card found himself treating the computer as a fictional character—as, in his word, a person, one that brought another character to life. He didn't make a consciously deliberate decision to do so. It just happened in what I am tempted to say was the natural course of mutual interaction.

This may strike us as commonplace. But that is precisely my point. In the world of daily life we also behave as if computers, for example, had personality traits. "Equating mediated and real life is neither rare nor unreasonable," Byron Reeves and Clifford Nass point out in *The Media Equation*. "It is very common, it is easy to foster, it does not depend on fancy media equipment, and thinking will not make it go away. The media equation—*media equals real life*—applies to everyone, it applies often, and it is highly consequential" (5). I find the results of their research fascinating, perhaps because their conclusions seem so sensible and almost charmingly ingenuous at the same time. They have found that we tend to perceive media as real places and people. As opposed to other technological artifacts (dishwashers, for example), we are inclined to treat media in accordance with the rules for social interaction in everyday life. My favorite chapters in their book are entitled "Politeness" and "Flattery." Here we

learn that we're likely to respond with good manners to certain behaviors by a computer. Similarly we learn that people "will like the computer more and think the computer is better when it praises them than when it criticizes them" (55). We perceive computers as being part of our social world, not our purely artifactual world. Overall, Reeves and Nass conclude, "The most important implication of the research is that media experiences are *emotional* experiences" (136).[17]

Here is an example from *Being Digital*, a book by Nicholas Negroponte that addresses social interaction in the age of the Internet. In the chapter entitled "Digital Persona" Negroponte writes, "In general, our opinion of a computer's personality is derived from all the things it does badly. On occasion, the reverse may happen. One time I doubled over laughing when my spelling-check program looked at my dyslexic-style typo aslo and proudly suggested that *asshole* was the correct spelling" (217–18). In terms of the reception of technology, here we find ourselves in the comic world of everyday life that is far from the melodramatic world of technophobia or technophilia. This ease of adaptation to digital life is further underscored by Negroponte's predictions for the future. As he envisions it, the future will be populated by "systems with humor, systems that nudge and prod, even ones that are as stern and disciplinarian as a Bavarian nanny" (218).

In *Life on the Screen: Identity in the Age of the Internet* the sociologist Sherry Turkle observes that there has been an important shift in cultural mood regarding how people feel about interacting with computer programs, including diverse forms ranging from therapy programs and computer judges to bots in online chatrooms. During the late 1970s and early 1980s, our anxiety about computers lessened considerably, she argues. Today there is no question that people view computers with a nonchalant pragmatism. For me what is essential here is that these new programs must project or exhibit subjectivity so that there can be the simulation of an intersubjective exchange. What is the key to believing that a digital life-form possesses subjectivity? To treating a digital life-form as if she or he were a person? Indeed as a person? Joseph Bates, a researcher associated with "alternative" artificial intelligence, is convinced that it is the simulation of emotion that is central. I am suggesting that this alternative artificial intelligence is characterized by what I have been calling emotional intelligence, or artificial life itself at its fullest.

Finally, in *Flesh and Machines* Rodney Brooks, the former director of the Computer Science Artificial Intelligence Laboratory at MIT and a pioneer

in the building of robots based on principles of situatedness and embeddedness in the world rather than on pure computational power, predicts that the robots of the future will have complex emotion-based systems. "We have built emotional machines that are situated in the world," he writes, "but not a single unemotional robot that is able to operate with the same level of purpose or understanding in the world" (201). In the future Brooks expects that emotion-based intelligent systems will eventuate in robots that "will have empathetic reactions to us" (202). He also forecasts that the converse will be the case. And in fact this is happening all around us. Consider the following small story about Jim Lynch, a member of the lab responsible for designing the internal emotional electronics for a robot doll named My Real Baby, which was launched during the 2002 holiday season. My Real Baby has moods (she is alternately distressed and happy) and a lively bodily life (she gets virtually hungry and actually damp).

> One day Jim had just received a doll back from a baby-sitter. As it lay on the desk in his office, it started to ask for its bottle: "I want baba." It got more and more insistent as its hunger level went up, and soon started to cry. Jim looked for the bottle in his office but could not see one. He went out to the common areas of the Toy Division and asked if anyone had a bottle. His doll needed one. As he found a bottle and rushed back to his office to feed the baby, a realization came over him. This toy, that he had been working on for months, was different from all previous toys he had worked on. He could have ignored the doll when it started crying, or just switched it off. Instead, he found himself *responding* to its emotions, and he changed his behavior as though the doll had real emotions. (158)

As with my examples from fictional worlds, with Jim and the robot baby doll (which is it? a baby? a doll? both?), we see the attachment of a human to a human-like invention where the process of technocultural feedback loops generate emotional connections.[18] Also presented is the principle and process of emergence.[19]

Robots are already present in record numbers in the workplace and on the battlefield. I predict that they will soon be omnipresent in domestic space and in hospital space—that is, in domains where we expect, or at least hope, to find sympathy. For example, the South Korean government, in focusing on service robots rather than on military or industrial robots, is planning to have them in place in every home between 2015 and 2025.

One of the robots in development is Jupiter, who stands two feet tall, has a rotating head, and can recognize voices and faces. His big eyes change shape to simulate emotions.[20] Closer to home, one of my friends who just had back surgery told me that there was a roving robot—named Dr. Delillo—on her hospital floor. The robot served as a material avatar for her doctor in absentia, who spoke to her through a video screen embedded in the robot. How does she describe Dr. Delillo? As charming, fetching, friendly.

3

Bruno Latour in his wonderfully quirky book *Aramis, or the Love of Technology* (about the proposed subway spur for Paris dubbed Aramis) also extends subjectivity to a technological artifact—and a hypothetical one at that. As a sociologist of science and technology, Latour surprises us by giving Aramis speech. He writes from the point of view of the subway system, which is a humorously poignant strategy since the system was destined never to be built. Latour posits the interdependent subjectivity of the human and the artifactual in asking this remarkable rhetorical question: "Could the unconscious be full of machines as well as affects?" While his view of the world in general is profoundly comic, we should nonetheless take this question seriously—and we should do so by turning it partly around. If machines are inhabiting our unconscious, could not affects inhabit machines in an intersubjective exchange?

Intersubjective systems can be self-correcting systems (they can also, of course, be profoundly dysfunctional). The question of the integration or coupling of self-correcting systems was posed by the brilliant anthropologist Gregory Bateson in *Steps to an Ecology of Mind*, one of the great books of the American 1970s. "The problem of coupling self-corrective systems together," he writes, "is central in the adaptation of man to the societies and ecosystems in which he lives" (443). To ecological systems and social systems we must add *technocultural systems* as well. What I have been suggesting is that the representation, rhetoric, and performance of the attribution of emotions to computers, replicants, cyborgs, bots, and robots, a lifeworld that extends to ours—indeed *is* ours—serves as just such a coupling device. The emotion of choice is sympathy—or empathy, its generalized form. Thus the emotions as they are thematized in the science fiction I have been discussing and the emotions as they are experienced in our technological habitat populated by the computer, the Internet, and the

robot together serve as a kind of bridge—as an intangible but very real prosthesis that helps us connect ourselves to the world we have been inventing.

In short, the emotions are themselves an important dimension of phenomenological accounts of human-technology relations. Indeed what I have been describing is precisely a phenomenology of technology, both as it is represented and as it is experienced. For the most part, phenomenological accounts of technology have been given in terms of experiential categories such as time and space—of speed and slowness, of immensity and contraction, and of distance and closeness, for example. But we need to consider the emotions as well.

Our technological habitat is changing profoundly in terms of the distribution of the emotions. In the past we've routinely ascribed anthropomorphic qualities to our fictional technological creations as well as to our inventions, as I noted earlier. But the attribution of emotions to the new forms of our technological lifeworld represents a quantum leap, one that is accelerating. We are behaving as if the emotions of these new forms are real, as our science fiction insists they are. As an attachment or prosthetic device to new technological lifeforms (one that is reciprocal), the emotions, intangible yet embodied, differ radically from the conceptualization of tools as a prosthetic extension of the body that connects us to the world—as the cane, for example, puts the person who is blind in touch with the world around them, or the telescope amplifies our power to see into the distance.[21]

The body is central to phenomenological accounts of experience, which returns us to the subject of embodiment and the emotions. The psychologist Silvan Tomkins has insisted that "the creation of a human automaton would require an affect system" (41). The philosopher Hubert Dreyfus argued in the early 1970s that in order to be truly intelligent, computers would require embodiment. In 1985 the artificial intelligence researcher Marvin Minsky wrote in *The Society of Mind* that "the question is not whether machines can have any emotions, but whether machines can be intelligent without any emotions" (163). As Turkle reports, by the late 1980s students at MIT "were suggesting that computers would need bodies in order to be empathetic . . . and to feel pain" (111). And in the mid-1990s Rosalind Picard's *Affective Computing* appeared. As the founder and director of the Affective Computing Research Group at MIT's Media

Laboratory, Picard argues that "if we want computers to be genuinely intelligent, to adapt to us, and to interact naturally with us, then they will need the ability to recognize and express emotions, to have emotions, and to have what has come to be called 'emotions intelligence' " (x).

How could affects inhabit machines? As we have seen, Rodney Brooks has given one answer. He believes that in the future machines will be built that have both consciousness and emotions. Recent research by neurologists, who underscore the materiality of the emotions, has also sounded the theme of the importance of the emotions in our definition of intelligence. In *The Emotional Brain* Joseph LeDoux seeks to redress the imbalance that has been the legacy of cognitive science (and more specifically the field of artificial intelligence). Indeed LeDoux concludes in effect that the emotional "wiring" in our brains is stronger than the rational wiring. In a somewhat similar vein in *Descartes' Error*, the neurologist Antonio Damasio argues that the neural systems of reason and emotion are intertwined, thus giving rise to mind, and that emotions are critical to health of all kinds, including making appropriate decisions in everyday life. Importantly for my purposes, Damasio concludes "that there is a particular region in the human brain where the systems concerned with emotion/feeling, attention, and working memory interact so intimately that they constitute the source for the energy of both external action (movement) and internal action," including reasoning (71). That a certain spot in the brain has been identified as crucial to emotional intelligence underscores the radical materiality of Damasio's theory of the emotions.

Finally, perhaps in part because of all the science fiction I've been reading and watching, along with work from such widely disparate fields as media theory, artificial intelligence, neurology, and science and technology studies, I find that even such analytically dispassionate books as LeDoux's *Emotional Brain* and Damasio's *Descartes' Error* have the effect of encouraging me to think that one day artificial life—embodied in nonhuman cyborgs of all shapes—will indeed possess emotions. LeDoux explicitly states that a computer "could not be programmed to have an emotion" because it is an assemblage of machine parts, not the slow and unpredictable result of biological evolution (41). But I am nonetheless inspired to think otherwise, in great part because of his use of the metaphor of "wiring," which implies a technical feat we can surely accomplish, and also in part, paradoxically, because of the biological basis of his the-

ory of the emotions—that they are grounded in the body, that they are biological functions of the nervous system and not mere intangible psychic states.

In the process of doing research for this chapter, then, I have become singularly well socialized to the prospect of what I have been calling nonhuman cyborgs possessing emotions.[22] The postmodern nonhuman cyborg will have a body and will be able to feel pain. The postmodern nonhuman cyborg will be complete and endowed with true artificial life because it will be capable of making decisions based in part on emotional intelligence. Embodiment is key. Researchers in artificial intelligence at MIT are not following the lead of IBM with Deep Blue, a computer contained in twin black monolithic boxes. Instead they are experimenting with embodiment by building robots that interact bodily with the environment. The name of one of the projects is Cog, a reference to the intent to make a robot that can think self-reflexively. Even more to the point, Cynthia Breazeal, who was central to the Cog project in the 1990s, has designed a robot named Kismet who has received well-deserved attention. As Peter Menzel and Faith D'Aluisio write in *Robo Sapiens: Evolution of a New Species*, "The pink-eared, rubbery-lipped Kismet alternatively pouts, frowns, and displays anger, along with a host of other expressions that outwardly display human emotion" (66). As the director of the Personal Robots group at the MIT Media Lab, Breazeal subscribes to an interactive simulation theory of the emotions, in which she understands emotions to be shared and exchanged, with communication fundamentally dialogic in nature. Her model for the interaction between human and nonhuman cyborgs is based on infant learning. Her robots possess what she describes as a "rich cognitive affective architecture," with feedback learning loops critical to development. Her aim is to create socially intelligent nonhuman cyborgs.[23] What is Breazeal's relationship to Kismet? Kismet "is my baby," she remarks.[24]

Along with My Real Baby, Breazeal's robots are a beginning, one that recalls the whimsical robots of *Silent Running*. Another beginning is to be found in the marvelously creative work of the multimedia artist Lynn Hershman Leeson, who recently invented a "character" she calls Agent Ruby.[25] As an artificially intelligent Web agent who exists on a multitude of platforms, Agent Ruby will respond to your questions (although as I discovered when I tried to interact with her in December 2005 at the Henry Art Gallery at the University of Washington, she can also fall silent if a

glitch troubles her program). She has been joined by Leeson's new creation, a presence on a flat-screen monitor named DINA who, like Agent Ruby, has the face of the beautiful Tilda Swinton but is much smarter and draws you to her.

If the time-honored trajectory of liberal thought as well as of critical theory is dispassionate reflection enabled by perspective (especially historical perspective) then I depart from that tradition here. I conclude this chapter in the world of science fiction that has for me taken on the form of future fact. I end not with the reflex of critique but with an openness to the future provided by a feeling for the cyborg—a cyborg that is simultaneously human and nonhuman, and one that is a condensation of the result of mutual intersubjectivity over an evolutionary period of time. This is my feeling for the cyborg: I consider it a structure of feeling in Raymond Williams's sense, one that is supported by important imaginative, scientific, theoretical, and critical work in many disciplines.

I close by referring to Sarah Zettel's *Fool's War*. Set centuries into the future, *Fool's War* introduces us to a character named Dobbs, a short, funny, resourceful, courageous troubleshooter and stress reliever who has accepted the position as a fool on the spaceship *Pasadena*. It is only when we are halfway through the novel that Zettel discloses that Dobbs was born as a sentient artificial intelligence. It is only after Dobbs matured that she learned how to assume the shape of a human being. Now she can both navigate information pathways bodilessly and pass, embodied, as a human being.

Imagine my sense of confirmation when I read in *Fool's War* that many centuries before in our not-too-distant future, maps of human neural pathways were applied to silicon chips, thereby producing the first sentient artificial intelligence (named Hal Clarke in an allusion to *2001*). I will not rehearse the plot here but rather only remark that in the course of the novel the main human character—the woman who is captain of the spaceship—comes to have both respect and sympathy for Dobbs and her travails, just as I do as a reader. The theme of the embodiment of artificial intelligence is crucial to the story. It is in the state of embodiment that emotions are learned—in particular the emotion of sympathy. And it is through the cross-species communication of the caring emotions that the

peaceful cohabitation of humans and cyborgs is imagined as possible, thus producing in the reader—*I am, of course, referring to myself*—a feeling of sympathy for the cyborg.

But this may not be a mere literary dream of mine about reading. In early 2006 the far-reaching implications of mirror neurons for learning and understanding social emotions, first discovered in monkeys ten years earlier, were reported in the *New York Times*, thus circulating this knowledge widely. As the neuroscientist Giacomo Rizzolatti puts it, "Mirror neurons allow us to grasp the minds of others not through conceptual reasoning but through direct simulation. By feeling, not by thinking."[26] V. S. Ramachandran, a neurologist at the University of California, San Diego, has been influential in popularizing the implications of this discovery, and he refers to mirror neurons as "empathy neurons."[27] The development of empathy, it has been shown, has a distinct neurobiological basis. This research is based predominantly on visual mirroring in face-to-face situations. But I have not a shred of a doubt that literary and cinematic emotions contribute to it as well.