

Introduction: Identity in the age of the internet

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There was a child went forth every day,
And the first object he look'd upon, that object he became.

—Walt Whitman

We come to see ourselves differently as we catch sight of our images in the mirror of the machine. A decade ago, when I first called the computer a second self, these identity-transforming relationships were almost always one-on-one, a person alone with a machine. This is no longer the case. A rapidly expanding system of networks, collectively known as the Internet, links millions of people in new spaces that are changing the way we think, the nature of our sexuality, the form of our communities, our very identities.

At one level, the computer is a tool. It helps us write, keep track of our accounts, and communicate with others. Beyond this, the computer offers us both new models of mind and a new medium on which to project our ideas and fantasies. Most recently, the computer has become even more than tool and mirror: We are able to step through the looking glass. We are learning to live in virtual worlds. We may find ourselves alone as we navigate virtual oceans, unravel virtual mysteries, and engineer virtual skyscrapers. But increasingly, when we step through the looking glass, other people are there as well.

The use of the term “cyberspace” to describe virtual worlds grew out of science fiction,¹ but for many of us, cyberspace is now part of the routines of everyday life. When we read our electronic mail or send postings to an electronic bulletin board or make an airline reservation over a computer network, we are in cyberspace. In cyberspace, we can talk, exchange ideas, and assume personae of our own creation. We have the opportunity to build new kinds of communities, virtual communities, in which we participate with people from all over the world, people with whom we converse daily, people with whom we may have fairly intimate relationships but whom we may never physically meet.

¹William Gibson, *Neuromancer* (New York: Ace, 1984)

This book describes how a nascent culture of simulation is affecting our ideas about mind, body, self, and machine. We shall encounter virtual sex. and cyberspace marriage, computer psychotherapists, robot insects, and researchers who are trying to build artificial two-year-olds. Biological children, too, are in the story as their play with computer toys leads them to speculate about whether computers are smart and what it is to be alive. Indeed, in much of this, it is our children who are leading the way, and adults who are anxiously trailing behind.

In the story of constructing identity in the culture of simulation, experiences on the Internet figure prominently, but these experiences can only be understood as part of a larger cultural context. That context is the story of the eroding boundaries between the real and the virtual, the animate and the inanimate, the unitary and the multiple self, which is occurring both in advanced scientific fields of research and in the patterns of everyday life. From scientists trying to create artificial life to children "morphing" through a series of virtual personae, we shall see evidence of fundamental shifts in the way we create and experience human identity. But it is on the Internet that our confrontations with technology as it collides with our sense of human identity are fresh, even raw. In the real-time communities of cyberspace, we are dwellers on the threshold between the real and virtual, unsure of our footing, inventing ourselves as we go along.

In an interactive, text-based computer game designed to represent a world inspired by the television series *Star Trek: The Next Generation*, thousands of players spend up to eighty hours a week participating in intergalactic exploration and wars. Through typed descriptions and typed commands, they create characters who have casual and romantic sexual encounters, hold jobs and collect paychecks, attend rituals and celebrations, fall in love and get married. To the participants, such goings-on can be gripping; "This is more real than my real life," says a character who turns out to be a man playing a woman who is pretending to be a man. In this game the self is constructed and the rules of social interaction are built, not received.²

In another text-based game, each of nearly ten thousand players creates a character or several characters, specifying their genders and other physical

²For a general introduction to LambdaMOO and MUDding, see Pavel Curtis, "Mudding: Social Phenomena in Text-Based Virtual Realities," available via anonymous ftp://patcftp.xerox.com/pub/MOO/papers/DIAC92.*; Amy Bruckman, "Identity Workshop: Emergent Social and Psychological Phenomena in Text-Based Virtual Reality," unpub. ms., March 1992, available via <http://www.cc.gatech.edu/asb/papers/>; and the chapter on MUDs in Howard Rheingold's *Virtual Community: Homesteading on the Electronic Frontier* (New York: Addison-Wesley, 1993). On virtual community in general, see Allucquere Rosanne Stone, "Will the Real Body Please Stand Up?: Boundary Stories about Virtual Cultures," in *Cyberspace: First Steps*, ed. Micheal Benedikt (Cambridge, Mass.: MIT Press, 1992), pp. 81-118. The asterisk in a net address indicates that the document is available in several formats.

and psychological attributes. The characters need not be human and there are more than two genders. Players are invited to help build the computer world itself. Using a relatively simple programming language, they can create a room in the game space where they are able to set the stage and define the rules. They can fill the room with objects and specify how they work; they can, for instance, create a virtual dog that barks if one types the command "bark Rover." An eleven-year-old player built a room she calls the condo. It is beautifully furnished. She has created magical jewelry and makeup for her dressing table, When she visits the condo, she invites her cyberfriends to join her there, she chats, orders a virtual pizza, and flirts.

Living in the MUD

The *Star Trek* game, TrekmUSE, and the other, LambdaMOO, are both computer programs that can be accessed through the Internet. The Internet was once available only to military personnel and technical re-searchers. It is now available to anyone who can buy or borrow an account on a commercial online service. TrekmUSE and LambdaMOO are known as MUDs, Multi-User Domains or, with greater historical accuracy, Multi-User Dungeons, because of their genealogy from Dungeons and Dragons, the fantasy role-playing game that swept high schools and colleges in the late 1970s and early 1980s.

The multiuser computer games are based on different kinds of software (this is what the MUSE or MOO or MUSH part of their names stands for). For simplicity, here I use the term MUD to refer to all of them.

MUDs put you in virtual spaces in which you are able to navigate, converse, and build. You join a MUD through a command that links your computer to the computer on which the MUD program resides. Making the connection is not difficult; it requires no particular technical sophistication. The basic commands may seem awkward at first but soon become familiar. For example, if I am playing a character named ST on LambdaMOO, any words I type after the command "say" will appear on all players' screens as "ST says." Any actions I type after the command "emote will appear after my name just as I type them, as in "ST waves hi" or "ST laughs uncontrollably." I can "whisper" to a designated character and only that character will be able to see my words. As of this writing there are over five hundred MUDs in which hundreds of thousands of people participate.³

³The number of MUDs is changing rapidly. Most estimates place it at over five hundred, but an increasing number are private and so without any official "listing." The software on which they are based (and which gives them their names as MOOs, MUSHes, MUSEs, etc.) determines several things about the game; among these is the general layout of the game space. For example, in the class of MUDs known as AberMUDs, the center of town is similar from one game to another, but the mountains, castles, and forests that surround the town are different in different games, because these have been built specifically for that

In some MUDs, players are represented by graphical icons; most MUDs are purely text-based. Most players are middle class. A large majority are male. Some players are over thirty, but most are in their early twenties and late teens. However, it is no longer unusual to find MUDs where eight- and nine-year-olds “play” such grade-school icons as Barbie or the Mighty Morphin Power Rangers.

MUDs are a new kind of virtual parlor game and a new form of community. In addition, text-based MUDs are a new form of collaboratively written literature. MUD players are MUD authors, the creators as well as consumers of media content. In this, participating in a MUD has much in common with script writing, performance art, street theater, improvisational theater—or even *commedia dell’arte*. But MUDs are something else as well.

As players participate, they become authors not only of text but of themselves, constructing new selves through social interaction. One player says, “You are the character and you are not the character, both at the same time.” Another says, “You are who you pretend to be.” MUDs provide worlds for anonymous social interaction in which one can play a role as close to or as far away from one’s “real self” as one chooses. Since one participates in MUDs by sending text to a computer that houses the MUD’s program and database, MUD selves are constituted in interaction with the machine. Take it away and the MUD selves cease to exist: “Part of me, a very important part of me, only exists inside PernMUD,” says one player. Several players joke that they are like “the electrodes in the computer,” trying to express the degree to which they feel part of its space.

On MUDs, one’s body is represented by one’s own textual description, so the obese can be slender, the beautiful plain, the “nerdy” sophisticated. A *New Yorker* cartoon captures the potential for MUDs as laboratories for experimenting with one’s identity. In it, one dog, paw on a computer keyboard, explains to another, “On the Internet, nobody knows you’re a dog.” The anonymity of MUDs—one is known on the MUD only by the name of one’s character or characters—gives people the chance to express multiple and often unexplored aspects of the self, to play with their identity and to try out new ones. MUDs make possible the creation of an identity so fluid and multiple that it strains the limits of the notion. Identity, after all,

game by its resident “wizards.” MUDs also differ in their governance. In MUD parlance, wizards are administrators; they usually achieve this status through virtuosity in the game. In AberMUDs only wizards have the right to build onto the game. In other kinds of MUDs, all players are invited to build. Who has the right to build and how building is monitored (for example, whether the MUD government should allow a player to build a machine that would destroy other players’ property or characters) is an important feature that distinguishes types of MUDs. Although it may be technically correct to refer to begin in a MUD (as in a dungeon), it is also common to speak of being on a MUD (as in logging on to a program). To me, the dual usage reflects the ambiguity of cyberspace as both space and program. I (and my informants) use both in this book.

refers to the sameness between two qualities, in this case between a person and his or her persona. But in MUDs, one can be many.

Dedicated MUD players are often people who work all day with computers at their regular jobs—as architects, programmers, secretaries, students, and stockbrokers. From time to time when playing on MUDs, they can put their characters “to sleep” and pursue “real life” (MUD players call this RL) activities on the computer—all the while remaining connected, logged on to the game’s virtual world. Some leave special programs running that send them signals when a particular character logs on or when they are “paged” by a MUD acquaintance. Some leave behind small artificial intelligence programs called bots (derived from the word “robot”) running in the MUD that may serve as their alter egos, able to make small talk or answer simple questions. In the course of a day, players move in and out of the active game space. As they do so, some experience their lives as a “cycling through” between the real world, RL, and a series of virtual worlds. I say a series because people are frequently connected to several MUDs at a time. In an MIT computer cluster at 2 A.M., an eighteen-year-old freshman sits at a networked machine and points to the four boxed-off areas on his vibrantly colored computer screen. “On this MUD I’m relaxing, shooting the breeze. On this other MUD I’m in a flame war.⁴ On this last one I’m into heavy sexual things. I’m travelling between the MUDs and a physics homework assignment due at 10 tomorrow morning”.

This kind of cycling through MUDs and RL is made possible by the existence of those boxed-off areas on the screen, commonly called windows. Windows provide a way for a computer to place you in several contexts at the same time. As a user, you are attentive to only one of the windows on your screen at any given moment, but in a sense you are a presence in all of them at all times. For example, you might be using your computer to help you write a paper about bacteriology. In that case, you would be present to a word-processing program you are using to take notes, to communications software with which you are collecting reference materials from a distant computer, and to a simulation program, which is charting the growth of virtual bacterial colonies. Each of these activities takes place in a window; your identity on the computer is the sum of your distributed presence.

Doug is a midwestern college junior. He plays four characters distributed across three different MUDs. One is a seductive woman. One is a macho, cowboy type whose self-description stresses that he is a “Marlboros rolled in the T-shirt sleeve kind of guy.” The third is a rabbit of unspecified gender who wanders its MUD introducing people to each other, a character he calls Carrot. Doug says, “Carrot is so low key that people let it be

⁴A flame war is a computer culture jargon for an incendiary expression of differences of opinion. In flame wars, participants give themselves permission to state their positions in strong, even outrageous terms with little room for compromise.

around while they are having private conversations. So I think of Carrot as my passive, voyeuristic character.” Doug’s fourth character is one that he plays only on a MUD in which all the characters are furry animals. “I’d rather not even talk about that character because my anonymity there is very important to me,” Doug says. “Let’s just say that on FurryMUDs I feel like a sexual tourist.”⁵ Doug talks about playing his characters in windows and says that using windows has made it possible for him to “turn pieces of my mind on and off.”

I split my mind. I’m getting better at it. I can see myself as being two or three or more. And I just turn on one part of my mind and then another when I go from window to window. I’m in some kind of argument in one window and trying to come on to a girl in a MUD in another, and another window might be running a spreadsheet program or some other technical thing for school.... And then I’ll get a real-time message (that flashes on the screen as soon as it is sent from another system user), and I guess that’s RL It’s just one more window.

“RL is just one more window,” he repeats, “and its not usually my best one.”

The development of windows for computer interfaces was a technical innovation motivated by the desire to get people working more efficiently by cycling through different applications. But in the daily practice of many computer users, windows have become a powerful metaphor for thinking about the self as a multiple, distributed system. The self is no longer simply playing different roles in different settings at different times, some-thing that a person experiences when, for example, she wakes up as a lover, makes breakfast as a mother, and drives to work as a lawyer. The life practice of windows is that of a decentered self that exists in many worlds and plays many roles at the same time. In traditional theater and in role-playing games that take place in physical space, one steps in and out of character; MUDs, in contrast, offer parallel identities, parallel lives. The experience of this parallelism encourages treating on-screen and off screen lives with a surprising degree of equality. Experiences on the Internet extend the metaphor of windows—now RI. itself, as Doug said, can be “just one more window.”

MUDs are dramatic examples of how computer-mediated communication can serve as a place for the construction and reconstruction of identity.

⁵I promised Doug anonymity, a promise I made to all the people I interviewed in researching this book. Doug has been told that his name will be changed, his identity disguised, and the names and distinguishing features of his MUD characters altered. It is striking that even given these reassurances, which enable him to have an open conversation with me about his social and sexual activities on MUDs, he want to protect his FurryMUD character.

There are many others. On the Internet, Internet Relay Chat (commonly known as IRC) is another widely used conversational forum in which any user can open a channel and attract guests to it, all of whom speak to each other as if in the same room. Commercial services such as America Online and CompuServe provide online chat rooms that have much of the appeal of MUDs—a combination of real time interaction with other people, anonymity (or, in some cases, the illusion of anonymity), and the ability to assume a role as close to or as far from one's "real self" as one chooses.

As more people spend more time in these virtual spaces, some go so far as to challenge the idea of giving any priority to RL at all. "After all," says one dedicated MUD player and IRC user, "why grant such superior status to the self that has the body when the selves that don't have bodies are able to have different kinds of experiences?" When people can play at having different genders and different lives, it isn't surprising that for some this play has become as real as what we conventionally think of as their lives, although for them this is no longer a valid distinction.

French lessons

In late 1960s and early 1970s, I lived in a culture that taught that the self is constituted by and through language, that sexual congress is the exchange of signifiers, and that each of us is a multiplicity of parts, fragments, and desiring connections. This was the hothouse of Paris intellectual culture whose gurus included Jacques Lacan, Michel Foucault, Gilles Deleuze, and Felix Guattari.⁶ But despite such ideal conditions for learning, my "French lessons" remained merely abstract exercises. These theorists of poststructuralism and what would come to be called postmodernism spoke words that addressed the relationship between mind and body but, from my point of view, had little or nothing to do with my own.

In my lack of connection with these ideas, I was not alone. To take one example, for many people it is hard to accept any challenge to the idea of an autonomous ego. While in recent years, many psychologists, social theorists, psychoanalysts, and philosophers have argued that the self should be thought of as essentially decentered, the normal requirements of everyday life exert strong pressure on people to take responsibility for their actions

⁶I immersed myself in these "French Lessons," first in the aftermath of the May 1968 student revolt, a revolt in which Lacan and Foucault became intellectual heroes. Later, in 1973-74, the immersion continued while I studied the intellectual fallout of that failed revolution. That fallout included a love affair with things Freudian and an attack on unitary models of self. While followers of Lacan relied on reinterpretations of Freud that challenged models of a centralized ego, Deleuze and Guattari proposed more radical views that described the self as a multiplicity of desiring machines. See Gilles Deleuze and Félix Guattari, *Anti-Oedipus: Capitalism and Schizophrenia*, trans. Robert Hurley, Mark Seem, and Helen R. Lane (Minneapolis: University of Minnesota Press, 1983).

and to see themselves as intentional and unitary actors. This disjuncture between theory (the unitary self is an illusion) and lived experience (the unitary self is the most basic reality) is one of the main reasons why multiple and decentered theories have been slow to catch on—or when they do, why we tend to settle back quickly into older, centralized ways of looking at things.

Today I use the personal computer and modem on my desk to access MUDs. Anonymously, I travel their rooms and public spaces (a bar, a lounge, a hot tub). I create several characters, some not of my biological gender, who are able to have social and sexual encounters with other characters. On different MUDs, I have different routines, different friends, different names. One day I learned of a virtual rape. One MUD player had used his skill with the system to seize control of another player's character. In this way the aggressor was able to direct the seized character to submit to a violent sexual encounter. He did all this against the will and over the distraught objections of the player usually "behind" this character, the player to whom this character "belonged." Although some made light of the offender's actions by saying that the episode was just words, in text-based virtual realities such as MUDs, words are deeds.

Thus, more than twenty years after meeting the ideas of Lacan, Foucault, Deleuze, and Guattari, I am meeting them again in my new life on the screen. But this time, the Gallic abstractions are more concrete. In my computer-mediated worlds, the self is multiple, fluid, and constituted in interaction with machine connections; it is made and transformed by language; sexual congress is an exchange of signifiers; and understanding follows from navigation and tinkering rather than analysis. And in the machine-generated world of MUDS, I meet characters who put me in a new relationship with my own identity.

One day on a MUD, I came across a reference to a character named Dr. Sherry, a cyberpsychologist with an office in the rambling house that constituted this MUD's virtual geography. There, I was informed, Dr. Sherry was administering questionnaires and conducting interviews about the psychology of MUDs. I suspected that the name Dr. Sherry referred to my long career as a student of the psychological impact of technology. But I didn't create this character. I was not playing her on the MUD. Dr. Sherry was (she is no longer on the MUD) a derivative of me, but she was not mine. The character I played on this MUD had another name—and did not give out questionnaires or conduct interviews. My formal studies were conducted offline in a traditional clinical setting where I spoke face-to-face with people who participate in virtual communities. Dr. Sherry may have been a character someone else created as an efficient way of communicating an interest in questions about technology and the self, but I was experiencing her as a little piece of my history spinning out of control. I tried to quiet my mind. I told myself that surely one's books, one's intellectual identity,

one's public persona, are pieces of oneself that others may use as they please. I tried to convince myself that this virtual appropriation was a form of flattery. But my disquiet continued. Dr. Sherry, after all, was not an inanimate book but a person, or at least a person behind a character who was meeting with others in the MUD world.

I talked my disquiet over with a friend who posed the conversation-stopping question, "Well, would you prefer it if Dr. Sherry were a bot trained to interview people about life on the MUD?" (Recall that bots are computer programs that are able to roam cyberspace and interact with characters there.) The idea that Dr. Sherry might be a bot had not occurred to me, but in a flash I realized that this too was possible, even likely. Many bots roam MUDs. They log onto the games as though they were characters. Players create these programs for many reasons: bots help with navigation, pass messages, and create a background atmosphere of animation in the MUD. When you enter a virtual café, you are usually not alone. A waiter bot approaches who asks if you want a drink and delivers it with a smile.

Characters played by people are sometimes mistaken for these little artificial intelligences. This was the case for Doug's character Carrot, because its passive, facilitating persona struck many as one a robot could play. I myself have made this kind of mistake several times, assuming that a person was a program when a character's responses seemed too automatic, too machine-like. And sometimes bots are mistaken for people. I have made this mistake too, fooled by a bot that flattered me by remembering my name or our last interaction. Dr. Sherry could indeed have been one of these. I found myself confronted with a double that could be a person or a program. As things turned out, Dr. Sherry was neither; it was a composite character created by two college students who wished to write a paper on the psychology of MUDs and who were using

my name as a kind of trademark or generic descriptor for the idea of a cybershrink.⁷ On MUDs, the one can be many and the many can be one.

So not only are MUDs places where the self is multiple and constructed by language, they are places where people and machines are in a new relation to each other, indeed can be mistaken for each other. In such ways, MUDs are evocative objects for thinking about human identity and, more generally, about a set of ideas that have come to be known as "postmodernism."

These ideas are difficult to define simply, but they are characterized by such terms as "decentered," "fluid," "nonlinear," and "opaque." They contrast with modernism, the classical world-view that has dominated Western thinking since the Enlightenment. The modernist view of reality is characterized by such terms as "linear," "logical," "hierarchical," and by having

⁷Jill Serpentelli, "Conversational Structure and Personality Correlates of Electronic Communication," unpub. ms., 1992.

“depths” that can be plumbed and understood. MUDs offer an experience of the abstract postmodern ideas that had intrigued yet confused me during my intellectual coming of age. In this, MUDs exemplify a phenomenon we shall meet often in these pages, that of computer-mediated experiences bringing philosophy down to earth.

In a surprising and counter-intuitive twist, in the past decade, the mechanical engines of computers have been grounding the radically nonmechanical philosophy of postmodernism. The online world of the Internet is not the only instance of evocative computer objects and experiences bringing postmodernism down to earth. One of my students at MIT dropped out of a course I teach on social theory, complaining that the writings of the literary theorist Jacques Derrida were simply beyond him. He found that Derrida’s dense prose and far-flung philosophical allusions were incomprehensible. The following semester I ran into the student in an MIT cafeteria. “Maybe I wouldn’t have to drop out now,” he told me. In the past month, with his roommate’s acquisition of new software for his Macintosh computer, my student had found his own key to Derrida. That software was a type of hypertext, which allows a computer user to create links between related texts, songs, photographs, and video, as well as to travel along the links made by others. Derrida emphasized that writing is constructed by the audience as well as by the author and that what is absent from the text is as significant as what is present. The student made the following connection:

Derrida was saying that the messages of the great books are no more written in stone than are the links of a hypertext. I look at my roommate’s hypertext stacks and I am able to trace the connections he made and the peculiarities of how he links things together. . . . And the things he might have linked but didn’t. The traditional texts are like [elements in] the stack. Meanings are arbitrary, as arbitrary as the links in a stack.

“The cards in a hypertext stack,” he concluded, “get their meaning in relation to each other. It’s like Derrida. The links have a reason but there is no final truth behind them.”⁸

Like experiences on MUDs, the student’s story shows how technology is bringing a set of ideas associated with postmodernism—in this case, ideas about the instability of meanings and the lack of universal and knowable truths—into everyday life. In recent years, it has become fashionable to

⁸The student’s association of Derrida and hypertext may be unsophisticated, but it is far from outlandish. See, for example, George P. Landow, *Hypertext: The Convergence of Critical Theory and Technology* (Baltimore: Johns Hopkins, 1992), pp 1–34; and in George P. Landow and Paul Delany, eds., *Hypermedia and Literary Studies* (Cambridge, Mass.: MIT Press, 1991).

poke fun at postmodern philosophy and lampoon its allusiveness and density. Indeed, I have done some of this myself. But in this book we shall see that through experiences with computers, people come to a certain understanding of postmodernism and to recognize its ability to usefully capture certain aspects of their own experience, both online and off.

In *The Electronic Word*, the classicist Richard A. Lanham argues that open-ended screen text subverts traditional fantasies of a master narrative, or definitive reading, by presenting the reader with possibilities for changing fonts, zooming in and out, and rearranging and replacing text. The result is “a body of work active not passive, a canon not frozen in perfection but volatile with contending human motive.”⁹ Lanham puts technology and postmodernism together and concludes that the computer is a “fulfillment of social thought.” But I believe the relationship is better thought of as a two-way process. Computer technology not only “fulfills the postmodern aesthetic” as Lanham would have it, heightening and concretizing the postmodern experience, but helps that aesthetic hit the street as well as the seminar room. Computers embody postmodern theory and bring it down to earth.

As recently as ten to fifteen years ago, it was almost unthinkable to speak of the computer’s involvement with ideas about unstable meanings and unknowable truths.¹⁰ The computer had a clear intellectual identity as a calculating machine. Indeed, when I took an introductory programming course at Harvard in 1978, the professor introduced the computer to the class by calling it a giant calculator. Programming, he reassured us, was a cut and dried technical activity whose rules were crystal clear.

These reassurances captured the essence of what I shall be calling the modernist computational aesthetic. The image of the computer as calculator suggested that no matter how complicated a computer might seem, what happened inside it could be mechanically unpacked. Programming was a technical skill that could be done a right way or a wrong way. The right way was dictated by the computer’s calculator essence. The right way was linear and logical. My professor made it clear that this linear, logical calculating machine combined with a structured, rule-based method of writing software offered guidance for thinking not only about technology and programming, but about economics, psychology, and social life. In other words, computational ideas were presented as one of the great modern metanarratives, stories of how the world worked that provided unifying

⁹Richard A. Lanham, *The Electronic Word: Democracy, Technology, and the Arts* (Chicago: The University of Chicago Press, 1993), p. 51. George Landow sees critical theory and technology in the midst of “convergence.” See Landow, *Hypertext*.

¹⁰I say almost unthinkable because a small number of postmodern writers had begun to associate their work with the possibilities of computer technology. See, in particular, Jean-François Lyotard, *The Postmodern Condition: A Report on Knowledge*, trans. Geoff Bennington and Brian Massumi (Minneapolis: University of Minnesota Press, 1984).

pictures and analyzed complicated things by breaking them down into simpler parts. The modernist computational aesthetic promised to explain and unpack, to reduce and clarify. Although the computer culture was never monolithic, always including dissenters and deviant subcultures, for many years its professional mainstream (including computer scientists, engineers, economists, and cognitive scientists) shared this clear intellectual direction. Computers, it was assumed, would become more powerful, both as tools and as metaphors, by becoming better and faster calculating machines, better and faster analytical engines.

From a culture of calculation toward a culture of simulation

Most people over thirty years old (and even many younger ones) have had an introduction to computers similar to the one I received in that programming course. But from today's perspective, the fundamental lessons of computing that I was taught are wrong. First of all, programming is no longer cut and dried. Indeed, even its dimensions have become elusive. Are you programming when you customize your wordprocessing software? When you design "organisms" to populate a simulation of Darwinian evolution in a computer game called SimLife? Or when you build a room in a MUD so that opening a door to it will cause "Happy Un-Birthday" to ring out on all but one day of the year? In a sense, these activities are forms of programming, but that sense is radically different from the one presented in my 1978 computer course.

The lessons of computing today have little to do with calculation and rules; instead they concern simulation, navigation, and interaction. The very image of the computer as a giant calculator has become quaint and dated. Of course, there is still "calculation" going on within the computer, but it is no longer the important or interesting level to think about or interact with. Fifteen years ago, most computer users were limited to typing commands. Today they use off-the-shelf products to manipulate simulated desktops, draw with simulated paints and brushes, and fly in simulated airplane cockpits. The computer culture's center of gravity has shifted decisively to people who do not think of themselves as programmers. The computer science research community as well as industry pundits maintain that in the near future we can expect to interact with computers by communicating with simulated people on our screens, agents who will help organize our personal and professional lives.

On my daughter's third birthday she received a computer game called The Playroom, among the most popular pieces of software for the preschool set. If you ask for help, The Playroom offers an instruction that is one sentence long: "Just move the cursor to any object, click on it, explore

and have fun.” During the same week that my daughter learned to click in The Playroom, a colleague gave me my first lesson on how to use the World Wide Web, a cyberconstruct that links text, graphics, video, and audio on computers all over the world. Her instructions were almost identical to those I had just read to my daughter: “Just move the cursor to any underlined word or phrase, click on it, explore, and have fun.” When I wrote this text in January 1995, the Microsoft corporation had just introduced Bob, a “social” interface for its Windows operating system, the most widely used operating system for personal computers in the world.¹¹ Bob, a computer agent with a human face and “personality,” operates within a screen environment designed to look like a living room that is in almost every sense a playroom for adults. In my daughter’s screen playroom, she is presented with such objects as alphabet blocks and a dock for learning to tell time. Bob offers adults a wordprocessor, a fax machine, a telephone. Children and adults are united in the actions they take in virtual worlds. Both move the cursor and click.

The meaning of the computer presence in people’s lives is very different from what most expected in the late 1970s. One way to describe what has happened is to say that we are moving from a modernist culture of calculation toward a postmodernist culture of simulation.

The culture of simulation is emerging in many domains. It is affecting our understanding of our minds and our bodies. For example, fifteen years ago, the computational models of mind that dominated academic psychology were modernist in spirit: Nearly all tried to describe the mind in terms of centralized structures and programmed rules. In contrast, today’s models often embrace a postmodern aesthetic of complexity and decentering. Mainstream computer researchers no longer aspire to program intelligence into computers but expect intelligence to emerge from the interactions of small subprograms. If these emergent simulations are “opaque,” that is, too complex to be completely analyzed, this is not necessarily a problem. After all, these theorists say, our brains are opaque to us, but this has never prevented them from functioning perfectly well as minds.

Fifteen years ago in popular culture, people were just getting used to the idea that computers could project and extend a person’s intellect. Today people are embracing the notion that computers may extend an individual’s physical presence. Some people use computers to extend their physical presence via real-time video links and shared virtual conference rooms. Some use computer-mediated screen communication for sexual encounters. An Internet list of “Frequently Asked Questions” describes the latter activity—known as netsex, cybersex, and (in MUDs) TinySex—as people typing messages with erotic content to each other, “sometimes with

¹¹ *The Wall Street Journal*, 3 January 1995: A3, A4, and *The Wall Street Journal*, 10 January 1995: B1, B3.

one hand on the keyset, sometimes with two.”

Many people who engage in netsex say that they are constantly surprised by how emotionally and physically powerful it can be. They insist that it demonstrates the truth of the adage that ninety percent of sex takes place in the mind. This is certainly not a new idea, but netsex has made it commonplace among teenage boys, a social group not usually known for its sophistication about such matters. A seventeen-year-old high school student tells me that he tries to make his erotic communications on the net “exciting and thrilling and sort of imaginative.” In contrast, he admits that before he used computer communication for erotic purposes he thought about his sexual life in terms of “trying [almost always unsuccessfully] to get laid.” A sixteen-year-old has a similar report on his cyberpassage to greater sensitivity: “Before I was on the net, I used to masturbate with Playboy; now I do netsex on DinoMUD¹² with a woman in another state.” When I ask how the two experiences differ, he replies:

With netsex, it is fantasies. My MUD lover doesn’t want to meet me in RL. With Playboy, it was fantasies too, but in the MUD there is also the other person. So I don’t think of what I do on the MUD as masturbation. Although, you might say that I’m the only one who’s touching me. But in netsex, I have to think of fantasies she will like too. So now, I see fantasies as some-thing that’s part of sex with two people, not just me in my room.

Sexual encounters in cyberspace are only one (albeit well-publicized) element of our new lives on the screen. Virtual communities ranging from MUDs to computer bulletin boards allow people to generate experiences, relationships, identities, and living spaces that arise only through interaction with technology. In the many thousands of hours that Mike, a college freshman in Kansas, has been logged on to his favorite MUD, he has created an apartment with rooms, furniture, books, desk, and even a small computer. Its interior is exquisitely detailed, even though it exists only in textual description. A hearth, an easy chair, and a mahogany desk warm his cyberspace. “It’s where I live,” Mike says. “More than I do in my dingy dorm room. There’s no place like home.”

As human beings become increasingly intertwined with the technology and with each other via the technology, old distinctions between what is specifically human and specifically technological become more complex. Are we living life on the screen or life in the screen? Our new technologically enmeshed relationships oblige us to ask to what extent we ourselves have

¹²Here I have changed the name of the MUD (there is to my knowledge no DinoMUD) to protect the confidentiality I promise all informants. I use the real name of a MUD when it is important to my account and will not compromise confidentiality. See “A Note on Method.”

become cyborgs, transgressive mixtures of biology, technology, and code.¹³ The traditional distance between people and machines has become harder to maintain.

Writing in his diary in 1832, Ralph Waldo Emerson reflected that “Dreams and beasts are two keys by which we are to find out the secrets of our nature. . . they are our test objects.”¹⁴ Emerson was prescient. Freud and his heirs would measure human rationality against the dream. Darwin and his heirs would insist that we measure human nature against nature itself—the world of the beasts seen as our forbears and kin. If Emerson had lived at the end of the twentieth century, he would surely have seen the computer as a new test object. Like dreams and beasts, the computer stands on the margins. It is a mind that is not yet a mind. It is inanimate yet interactive. It does not think, yet neither is it external to thought. It is an object, ultimately a mechanism, but it behaves, interacts, and seems in a certain sense to know. It confronts us with an uneasy sense of kinship. After all, we too behave, interact, and seem to know, and yet are ultimately made of matter and programmed DNA. We think we can think. But can *it* think? Could it have the capacity to feel? Could it ever be said to be alive?

Dreams and beasts were the test objects for Freud and Darwin, the test objects for modernism. In the past decade, the computer has become the test object for postmodernism. The computer takes us beyond a world of dreams and beasts because it enables us to contemplate mental life that exists apart from bodies. It enables us to contemplate dreams that do not need beasts. The computer is an evocative object that causes old boundaries to be renegotiated.

This book traces a set of such boundary negotiations. It is a reflection on the role that technology is playing in the creation of a new social and cultural sensibility. I have observed and participated in settings, physical and virtual, where people and computers come together.¹⁵ Over the past decade, I have talked to more than a thousand people, nearly three hundred of them children, about their experience of using computers or computational objects to program, to navigate, to write, to build, to experiment, or to communicate. In a sense, I have interrogated the computers as well. What messages, both explicit and implicit, have they carried for their human users about what is possible and what is impossible, about what is valuable and what is unimportant?

In the spirit of Whitman’s reflections on the child, I want to know what

¹³See, for example, Donna Haraway, “A Manifesto for Cyborgs: Science, Technology, and Socialist Feminism in the 1980s,” *Socialist Review* 80 (March–April 1985): 65–107.

¹⁴The quotation is from a journal entry by Emerson in January 1832. The passage reads in full, “Dreams and beasts are two keys by which we are to find out the secrets of our nature. All mystics use them. They are like comparative anatomy. They are our test objects.” See Joel Porte, ed., *Emerson in His Journals* (Cambridge, Mass.: Belknap Press, 1982), p. 81.

¹⁵See “A Note on Method.”

we are becoming if the first objects we look upon each day are simulations into which we deploy our virtual selves. In other words, this is not a book about computers. Rather, it is a book about the intense relationships people have with computers and how these relationships are changing the way we think and feel. Along with the movement from a culture of calculation toward a culture of simulation have come changes in what computers do *for* us and in what they do *to* us—to our relationships and our ways of thinking about ourselves.

We have become accustomed to opaque technology. As the processing power of computers increased exponentially, it became possible to use that power to build graphical user interfaces, commonly known by the acronym GUI, that hid the bare machine from its user. The new opaque interfaces—most specifically, the Macintosh iconic style of interface, which simulates the space of a desktop as well as communication through dialogue—represented more than a technical change. These new interfaces modeled a way of understanding that depended on getting to know a computer through interacting with it, as one might get to know a person or explore a town.

The early personal computers of the 1970s and the IBM PC of the early 1980s presented themselves as open, “transparent,” potentially reducible to their underlying mechanisms. These were systems that invited users to imagine that they could understand its “gears” as they turned, even if very few people ever tried to reach that level of understanding. When people say that they used to be able to “see” what was “inside” their first personal computers, it is important to keep in mind that for most of them there still remained many intermediate levels of software between them and the bare machine. But their computer systems encouraged them to represent their understanding of the technology as knowledge of what lay beneath the screen surface. They were encouraged to think of understanding as looking beyond the magic to the mechanism.

In contrast, the 1984 introduction of the Macintosh’s iconic style presented the public with simulations (the icons of file folders, a trash can, a desktop) that did nothing to suggest how their underlying structure could be known. It seemed unavailable, visible only through its effects. As one user said, “The Mac looked perfect, finished. To install a program on my DOS machine, I had to fiddle with things. It clearly wasn’t perfect. With the Mac, the system told me to stay on the surface.” This is the kind of involvement with computers that has come to dominate the field; no longer associated only with the Macintosh, it is nearly universal in personal computing. *We have learned to take things at interface value.* We are moving toward a culture of simulation in which people are increasingly comfortable with substituting representations of reality for the real. We use a Macintosh-style “desktop” as well as one on four legs. We join virtual communities that exist only among people communicating on computer networks as well

as communities in which we are physically present. We come to question simple distinctions between real and artificial. In what sense should one consider a screen desktop less real than any other? The screen desktop I am currently using has a folder on it labeled "Professional Life." It contains my business correspondence, date book, and telephone directory. Another folder, labeled "Courses," contains syllabuses, reading assignments, class lists, and lecture notes. A third, "Current Work," contains my research notes and this book's drafts. I feel no sense of unreality in my relationship to any of these objects. The culture of simulation encourages me to take what I see on the screen "at (inter)face value." In the culture of simulation, if it works for you, it has all the reality it needs.

The habit of taking things at interface value is new, but it has gone quite far. For example, a decade ago, the idea of a conversation with a computer about emotional matters, the image of a computer psychotherapist, struck most people as inappropriate or even obscene. Today, several such programs are on the market, and they tend to provoke a very different and quite pragmatic response. People are most likely to say, "Might as well try it. It might help. What's the harm?"

We have used our relationships with technology to reflect on the human. A decade ago, people were often made nervous by the idea of thinking about computers in human terms. Behind their anxiety was distress at the idea that their own minds might be similar to a computer's "mind." This reaction against the formalism and rationality of the machine was romantic.

I use this term to analogize our cultural response to computing to nineteenth century Romanticism. I do not mean to suggest that it was merely an emotional response. We shall see that it expressed serious philosophical resistance to any view of people that denied their complexity and continuing mystery. This response emphasized not only the richness of human emotion but the flexibility of human thought and the degree to which knowledge arises in subtle interaction with the environment. Humans, it insists, have to be something very different from mere calculating machines.

In the mid-1980s, this romantic reaction was met by a movement in computer science toward the research and design of increasingly "romantic machines." These machines were touted not as logical but as biological, not as programmed but as able to learn from experience. The researchers who worked on them said they sought a species of machine that would prove as unpredictable and undetermined as the human mind itself. The cultural presence of these romantic machines encouraged a new discourse; both persons and objects were reconfigured, machines as psychological objects, people as living machines.

But even as people have come to greater acceptance of a kinship between computers and human minds, they have also begun to pursue a new set of boundary questions about things and people. After several decades of asking, "What does it mean to think?" the question at the end of the

twentieth century is, "What does it mean to be alive?" We are positioned for yet another romantic reaction, this time emphasizing biology, physical embodiment, the question of whether an artifact can be a life.¹⁶

These psychological and philosophical effects of the computer presence are by no means confined to adults. Like their parents, and often before their parents, the children of the early 1980s began to think of computers and computer toys as psychological objects because these machines combined mind activities (talking, singing, spelling, game playing, and doing math), an interactive style, and an opaque surface. But the children, too, had a romantic reaction, and came to define people as those emotional and unprogrammable things that computers were not. Nevertheless, from the moment children gave up on mechanistic under-standings and saw the computer as a psychological entity, they began to draw computers closer to themselves. Today children may refer to the computers in their homes and classrooms as "just machines," but qualities that used to be ascribed only to people are now ascribed to computers as well. Among children, the past decade has seen a movement from defining people as what machines are not to believing that the computational objects of everyday life think and know while remaining "just machines."

In the past decade, the changes in the intellectual identity and cultural impact of the computer have taken place in a culture still deeply attached to the quest for a modernist understanding of the mechanisms of life. Larger scientific and cultural trends, among them advances in psychopharmacology and the development of genetics as a computational biology, reflect the extent to which we assume ourselves to be like machines whose inner workings we can understand. "Do we have our emotions," asks a college sophomore whose mother has been transformed by taking antidepressant medication, "or do our emotions have us?" To whom is one listening when one is "listening to Prozac"?¹⁷ The aim of the Human Genome Project is to specify the location and role of all the genes in human DNA. The Project is often justified on the grounds that it promises to find the pieces of our genetic code responsible for many human diseases so that these may be better treated, perhaps by genetic reengineering. But talk about the Project also addresses the possibility of finding the genetic markers that determine human personality, temperament, and sexual orientation. As we contemplate reengineering the genome, we are also reengineering our view of ourselves as programmed beings.¹⁸ Any romantic reaction that relies on biology as

¹⁶In a recent review of the place of genetics in contemporary popular culture, Dorothy Nelkin and Susan Lindee have said: "DNA has taken on the social and cultural functions of the soul." See their *The DNA Mystique: The Gene as a Cultural Icon* (San Francisco and New York: W. H. Freeman, 1995), p. 42.

¹⁷Peter Kramer, *Listening to Prozac: A Psychiatrist Explores Mood-Altering Drugs and the New Meaning of the Self* (New York: Viking, 1993).

¹⁸Nelkin and Lindee's *The DNA Mystique* documents the degree to which genetic essen-

the bottom line is fragile, because it is building on shifting ground. Biology is appropriating computer technology's older, modernist models of computation while at the same time computer scientists are aspiring to develop a new opaque, emergent biology that is closer to the postmodern culture of simulation.¹⁹

Today, more lifelike machines sit on our desktops, computer science uses biological concepts, and human biology is recast in terms of deciphering a code. With descriptions of the brain that explicitly invoke computers and images of computers that explicitly invoke the brain, we have reached a cultural watershed. The rethinking of human and machine identity is not taking place just among philosophers but "on the ground," through a philosophy in everyday life that is in some measure both provoked and carried by the computer presence.

We have sought out the subjective computer. Computers don't just do things for us, they do things to us, including to our ways of thinking about ourselves and other people. A decade ago, such subjective effects of the computer presence were secondary in the sense that they were not the ones being sought.²⁰ Today, things are often the other way around. People explicitly turn to computers for experiences that they hope will change their ways of thinking or will affect their social and emotional lives. When people explore simulation games and fantasy worlds or log on to a community where they have virtual friends and lovers, they are not thinking of the computer as what Charles Babbage, the nineteenth-century mathematician who invented the first programmable machine, called an analytical engine. They are seeking out the computer as an intimate machine.

You might think from its title that this was a book about filmgoers and the ways that a fan—the heroine of Woody Allen's *The Purple Rose of Cairo*, for example—might project himself or herself into favorite movies. But here I argue that it is computer screens where we project our-selves into our own dramas, dramas in which we are producer, director, and star. Some of these dramas are private, but increasingly we are able to draw in other people. Computer screens are the new location for our fantasies, both erotic and intellectual. We are using life on computer screens to become comfortable with new ways of thinking about evolution, relationships, sexuality, politics, and identity. How all of this is unfolding is the subject of this book.

tialism dominates American popular culture today.

¹⁹Evelyn Fox Keller, "The Body of a New Machine: Situating the Organism Between Telegraphs and Computers," *Perspectives on Science* 2, no. 3 (1994): 302–32.

²⁰For a view on this matter from the perspective of the 1980s, see Sherry Turkle, *The Second Self: Computers and the Human Spirit* (New York: Simon & Schuster, 1984).