SHERRY TURKLE

WHAT IS LIFE? What does it really mean for something to "be alive"? Questions like these were not on Sherry Turkle's mind when she took her daughter Rebecca to see a special exhibition on the life and work of Charles Darwin, the naturalist who first described the processes behind natural evolution. One of the first dioramas in the show included two live tortoises like the ones Darwin encountered on his expedition to the Galapagos Islands:

> One tortoise was hidden from view; the other rested in its cage, utterly still. Rebecca inspected the visible tortoise thoughtfully for a while and then said matter-of-factly, "They could have used a robot." I was taken aback and asked what she meant. She said she thought it was a shame to bring the turtle all this way from its island home in the Pacific, when it was just going to sit there in the museum, motionless, doing nothing.... [Later] a ten-year-old girl told me that she would prefer a robot turtle because aliveness comes with aesthetic inconvenience: "Its water looks dirty. Gross."

This reaction pushed Turkle to rethink much of her enthusiasm for technology. What kind of future might await humankind when children grow up preferring machines to biological life? What will happen to us psychologically if we envy our robots' skill, intelligence, and immortality?

Sherry Turkle's subject is the technology we tend to look at with uncritical awe—as she herself did for many years. Only gradually did Turkle come to understand that unless we stop to reflect, we might wind up as the tools of our tools: if our androids and PCs are meant to serve as extensions of ourselves, we could become their extensions instead. A further irony is that no one can foresee how our inventions will change us because no one can predict where technology is headed. Without a framework for assessing change, we might someday bitterly regret our naivety. Technology could prove to be unstoppable, but Turkle believes that we still have the power to control its pace and direction.

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Quotation comes from Sherry Turkle, *Alone Together: Why We Expect More from Technology and Less from Each Other* (New York: Basic Books, 2011), 3.

"subjective side" of technology. Her books include *The Second Self: Computers and the Human Spirit* (1984), *Life on the Screen: Identity in the Age of the Internet* (1995), *Simulation and Its Discontents* (2009), *Reclaiming Conversation: The Power of Talk in a Digital Age* (2015). The selection that follows comes from her book, *Alone Together: Why We Expect More from Technology and Less from Each Other* (2011).

Selections from Alone Together: Why We Expect More from Technology and Less from Each Other

My first brush with a computer program that offered companionship was in the mid-1970s. I was among MIT students using Joseph Weizenbaum's ELIZA, a program that engaged in dialogue in the style of a psychotherapist. So, a user typed in a thought, and ELIZA reflected it back in language that offered support or asked for clarification.[1] To "My mother is making me angry," the program might respond, "Tell me more about your mother," or perhaps, "Why do you feel so negatively about your mother?" ELIZA had no model of what a mother might be or any way to represent the feeling of anger. What it could do was take strings of words and turn them into questions or restate them as interpretations.

Weizenbaum's students knew that the program did not know or understand; nevertheless they wanted to chat with it. More than this, they wanted to be alone with it. They wanted to tell it their secrets.[2] Faced with a program that makes the smallest gesture suggesting it can empathize, people want to say something true. I have watched hundreds of people type a first sentence into the primitive ELIZA program. Most commonly they begin with "How are you today?" or "Hello." But four or five interchanges later, many are on to "My girlfriend left me," "I am worried that I might fail organic chemistry," or "My sister died."

Soon after, Weizenbaum and I were coteaching a course on computers and society at MIT. Our class sessions were lively. During class meetings he would rail against his program's capacity to deceive; I did not share his concern. I saw ELIZA as a kind of Rorschach, the psychologist's inkblot test. People used the program as a projective screen on which to express themselves. Yes, I thought, they engaged in personal conversations with ELIZA, but in a spirit of "as if." They spoke as if someone were listening but knew they were their own audience. They became caught up in the exercise. They thought, I will talk to this program as if it were a person. I will vent; I will rage; I will get things off my chest. More than this, while some learned enough about the program to trip it up, many more used this same inside knowledge to feed ELIZA responses that would make it seem more lifelike. They were active in keeping the program in play.

Weizenbaum was disturbed that his students were in some way duped by the program into believing—against everything they knew to be true—that they were dealing with an intelligent machine. He felt almost guilty about the deception machine he had created. But his worldly students were not deceived. They knew all about ELIZA's limitations, but they were eager to "fill in the blanks." I came to think of this human complicity in a digital fantasy as the "ELIZA effect." Through the 1970s, I saw this complicity with the machine as no more threatening than wanting to improve the working of an interactive diary. As it turned out, I underestimated what these connections augured. At the robotic moment, more than ever, our willingness to engage with the inanimate does not depend on being deceived but on wanting to fill in the blanks.

Now, over four decades after Weizenbaum wrote the first version of ELIZA, artificial intelligences known as "bots" present themselves as companions to the millions who play computer games on the Internet. Within these game worlds, it has come to seem natural to "converse" with bots about a variety of matters, from routine to romantic. And, as it turns out, it's a small step from having your "life" saved by a bot you meet in a virtual world to feeling a certain affection to ward it—and not the kind of affection you might feel toward a stereo or car, no matter how beloved. Meantime, in the physical real, things proceed apace. The popular Zhu Zhu robot pet hamsters come out of the box in "nurturing mode." The official biography of the Zhu Zhu named Chuck says, "He lives to feel the love." For the elderly, the huggable baby seal robot Paro is now on sale. A hit in Japan, it now targets the American nursing home market. Roboticists make the case that the elderly need a companion robot because of a lack of human resources. Almost by definition, they say, robots will make things better.

While some roboticists dream of reverse engineering love, others are content to reverse engineer sex.[3] In February 2010, I googled the exact phrase "sex robots" and came up with 313,000 hits, the first of which was linked to an article titled "Inventor Unveils $7,000 Talking Sex Robot." Roxxxy, I learned, "may be the world's most sophisticated, talking sex robot."[4] The shock troops of the robotic moment, dressed in lingerie, may be closer than most of us have ever imagined. And true to the ELIZA effect, this is not so much because the robots are ready but because we are.

In a television news story about a Japanese robot designed in the form of a sexy woman, a reporter explains that although this robot currently performs only as a receptionist, its designers hope it will someday serve as a teacher and companion. Far from skeptical, the reporter bridges the gap between the awkward robot before him and the idea of something akin to a robot wife by referring to the "singularity." He asks the robot's inventor, "When the singularity comes, no one can imagine where she [the robot] could go. Isn't that right? … What about these robots after the singularity? Isn't it the singularity that will bring us the robots that will surpass us?"

The singularity? This notion has migrated from science fiction to engineering. The singularity is the moment—it is mythic; you have to believe in

it—when machine intelligence crosses a tipping point.[5] Past this point, say those who believe, artificial intelligence will go beyond anything we can currently conceive. No matter if today's robots are not ready for prime time as receptionists. At the singularity, everything will become technically possible, including robots that love. Indeed, at the singularity, we may merge with the robotic and achieve immortality. The singularity is technological rapture.

As for Weizenbaum's concerns that people were open to computer psychotherapy, he correctly sensed that something was going on. In the late 1970s, there was considerable reticence about computer psychotherapy, but soon after, opinions shifted.[6] The arc of this story does not reflect new abilities of machines to understand people, but people's changing ideas about psychotherapy and the workings of their own minds, both seen in more mechanistic terms.[7] Thirty years ago, with psychoanalysis more central to the cultural conversation, most people saw the experience of therapy as a context for coming to see the story of your life in new terms. This happened through gaining insight and developing a relationship with a therapist who provided a safe place to address knotty problems. Today, many see psychotherapy less as an investigation of the meaning of our lives and more as an exercise to achieve behavioral change or work on brain chemistry. In this model, the computer becomes relevant in several ways. Computers can help with diagnosis, be set up with programs for cognitive behavioral therapy, and provide information on alternative medications.

Previous hostility to the idea of the computer as psychotherapist was part of a "romantic reaction" to the computer presence, a sense that there were some places a computer could not and should not go. In shorthand, the romantic reaction said, "Simulated thinking might be thinking, but simulated feeling is not feeling; simulated love is never love." Today, that romantic reaction has largely given way to a new pragmatism. Computers "understand" as little as ever about human experience—for example, what it means to envy a sibling or miss a deceased parent. They do, however, perform understanding better than ever, and we are content to play our part. After all, our online lives are all about performance. We perform on social networks and direct the performances of our avatars in virtual worlds. A premium on performance is the cornerstone of the robotic moment. We live the robotic moment not because we have companionate robots in our lives but because the way we contemplate them on the horizon says much about who we are and who we are willing to become.

How did we get to this place? The answer to that question is hidden in plain sight, in the rough-and-tumble of the playroom, in children's reactions to robot toys. As adults, we can develop and change our opinions. In childhood, we establish the truth of our hearts.

I have watched three decades of children with increasingly sophisticated computer toys. I have seen these toys move from being described as "sort of alive" to "alive enough," the language of the generation whose childhood play was with sociable robots (in the form of digital pets and dolls). Getting to "alive enough" marks a watershed. In the late 1970s and early 1980s, children tried to make philosophical distinctions about aliveness in order to categorize computers. These days, when children talk about robots as alive enough for *specific purposes*, they are not trying to settle abstract questions. They are being pragmatic: different robots can be considered on a case-by-case and context-by-context basis. (Is it alive enough to be a friend, a babysitter, or a companion for your grandparents?) Sometimes the question becomes more delicate: If a robot makes you love it, is it alive?

Life Reconsidered

In the late 1970s and early 1980s, children met their first computational objects: games like Merlin, Simon, and Speak & Spell. This first generation of computers in the playroom challenged children in memory and spelling games, routinely beating them at tic-tac-toe and hangman.[8] The toys, reactive and interactive, turned children into philosophers. Above all else, children asked themselves whether something programmed could be alive.

Children's starting point here is their animation of the world. Children begin by understanding the world in terms of what they know best: themselves. Why does the stone roll down the slope? "To get to the bottom," says the young child, as though the ball had its own desires. But in time, animism gives way to physics. The child learns that a stone falls because of gravity; intentions have nothing to do with it. And so a dichotomy is constructed: physical and psychological properties stand opposed to one another in two great systems. But the computer is a new kind of object: it is psychological and yet a thing. Marginal objects such as the computer, on the lines between categories, draw attention to how we have drawn the lines.[9]

Swiss psychologist Jean Piaget, interviewing children in the 1920s, found that they took up the question of an object's life status by considering its physical movement.[10] For the youngest children, everything that could move was alive, then only things that could move without an outside push or pull. People and animals were easily classified. But clouds that seemed to move on their own accord were classified as alive until children realized that wind, an external but invisible force, was pushing them along. Cars were reclassified as not alive when children understood that motors counted as an "outside" push. Finally, the idea of autonomous movement became focused on breathing and metabolism, the motions most particular to life.

In the 1980s, faced with computational objects, children began to think through the question of aliveness in a new way, shifting from physics to psychology.[11] When they considered a toy that could beat them at spelling games, they were interested not in whether such an object could move on its own but in whether it could think on its own. Children asked if this game could "know." Did it cheat? Was knowing part of cheating? They were fascinated by how electronic games and toys showed a certain autonomy. When an early version of Speak & Spell—a toy that played language and spelling games—had a programming bug and could not be turned off during its "say it" routine, children shrieked with excitement, finally taking out the game's batteries to "kill it" and then (with the reinsertion of the batteries) bring it back to life.

In their animated conversations about computer life and death, children of the 1980s imposed a new conceptual order on a new world of objects.[12] In the

1990s, that order was strained to the breaking point. Simulation worlds—for example the Sim games—pulsed with evolving life forms. And child culture was awash in images of computational objects (from Terminators to digital viruses) all shape-shifting and morphing in films, cartoons, and action figures. Children were encouraged to see the stuff of computers as the same stuff of which life is made. One eight-year-old girl referred to mechanical life and human life as "all the same stuff, just yucky computer 'cy-dough-plasm.'" All of this led to a new kind of conversation about aliveness. Now, when considering computation, children talked about evolution as well as cognition. And they talked about a special kind of mobility. In 1993, a ten-year-old considered whether the creatures on the game SimLife were alive. She decided they were "if they could get out of your computer and go to America Online."[13]

Here, Piaget's narrative about motion resurfaced in a new guise. Children often imbued the creatures in simulation games with a desire to escape their confines and enter a wider digital world. And then, starting in the late 1990s, digital "creatures" came along that tried to dazzle children not with their smarts but with their sociability. I began a long study of children's interactions with these new machines. Of course, children said that a sociable robot's movement and intelligence were signs of its life. But even in conversations specifically about aliveness, children were more concerned about what these new robots might feel. As criteria for life, everything pales in comparison to a robot's capacity to care.

Consider how often thoughts turn to feelings as three elementary school children discuss the aliveness of a Furby, an owl-like creature that plays games and seems to learn English under a child's tutelage. [The] first, a five-year-old girl, can only compare it to a Tamagotchi, a tiny digital creature on an LED screen that also asks to be loved, cared for, and amused. She asks herself, "Is it [the Furby] alive?" and answers, "Well, I love it. It's more alive than a Tamagotchi because it sleeps with me. It likes to sleep with me." A six-year-old boy believes that something "as alive as a Furby" needs arms: "It might want to pick up something or to hug me." A nine-year-old girl thinks through the question of a Furby's aliveness by commenting, "I really like to take care of it.... It's as alive as you can be if you don't eat.... It's not like an animal kind of alive."

From the beginning of my studies of children and computers in the late 1970s, children spoke about an "animal kind of alive" and a "computer kind of alive." Now I hear them talk about a "people kind of love" and a "robot kind of love." Sociable robots bring children to the locution that the machines are alive enough to care and be cared for. In speaking about sociable robots, children use the phrase "alive enough" as a measure not of biological readiness but of relational readiness. Children describe robots as alive enough to love and mourn. And robots, as we saw at the American Museum of Natural History, may be alive enough to substitute for the biological, depending on the context. One reason the children at the museum were so relaxed about a robot substituting for a living tortoise is that children were comfortable with the idea of a robot as both machine and creature. I see this flexibility in seven-year-old Wilson, a bright, engaged student at a Boston public elementary school where I bring robot toys for

after-school play. Wilson reflects on a Furby I gave him to take home for several weeks: "The Furby can talk, and it looks like an owl," yet "I always hear the machine in it." He knows, too, that the Furby, "alive enough to be a friend," would be rejected in the company of animals: "A real owl would snap its head off." Wilson does not have to deny the Furby's machine nature to feel it would be a good friend or to look to it for advice. His Furby has become his confidant. Wilson's way of keeping in mind the dual aspects of the Furby's nature seems to me a philosophical version of multitasking, so central to our twentieth-century attentional ecology. His attitude is pragmatic. If something that seems to have a self is before him, he deals with the aspect of self he finds most relevant to the context.

This kind of pragmatism has become a hallmark of our psychological culture. In the mid-1990s, I described how it was commonplace for people to "cycle through" different ideas of the human mind as (to name only a few images) mechanism, spirit, chemistry, and vessel for the soul.[14] These days, the cycling through intensifies. We are in much more direct contact with the machine side of mind. People are fitted with a computer chip to help with Parkinson's. They learn to see their minds as program and hardware. They take antidepressants prescribed by their psychotherapists, confident that the biochemical and oedipal self can be treated in one room. They look for signs of emotion in a brain scan. Old jokes about couples needing "chemistry" turn out not to be jokes at all. The compounds that trigger romantic love are forthcoming from the laboratory. And yet, even with biochemical explanations for attraction, nothing seems different about the thrill of falling in love. And seeing that an abused child has a normal brain scan does not mean one feels any less rage about the abuse. Pluralistic in our attitudes toward the self, we turn this pragmatic sensibility toward other things in our path—for example, sociable robots. We approach them like Wilson: they can be machines, and they can be more.

Writing in his diary in 1832, Ralph Waldo Emerson described "dreams and beasts" as "two keys by which we are to find out the secrets of our nature.... They are our test objects."[15] If Emerson had lived today, he would have seen the sociable robot as our new test object. Poised in our perception between inanimate program and living creature, this new breed of robot provokes us to reflect on the difference between connection and relationship, involvement with an object and engagement with a subject. These robots are evocative: understanding how people think about them provides a view onto how we think about ourselves. When children talk about these robots, they move away from an earlier cohort's perception of computers as provocative curiosities to the idea that robots might be something to grow old with. It all began when children met the seductive Tamagotchis and Furbies, the first computers that asked for love.[16]

The Tamagotchi Primer

When active and interactive computer toys were first introduced in the late 1970s, children recognized that they were neither dolls nor people nor animals. Nor did they seem like machines. Computers, first in the guise of electronic toys and games, turned children into philosophers, caught up in spontaneous debates

about what these objects might be. In some cases, their discussions brought them to the idea that the talking, clever computational objects were close to kin. Children consider the question of what is special about being a person by contrasting themselves with their "nearest neighbors." Traditionally, children took their nearest neighbors to be their dogs, cats, and horses. Animals had feelings; people were special because of their ability to think. So, the Aristotelian definition of man as a rational animal had meaning for even the youngest children. But by the mid-1980s, as thinking computers became nearest neighbors, children considered people special because only they could "feel." Computers were intelligent machines; in contrast, people were emotional machines.[17]

But in the late 1990s, as if on cue, children met objects that presented themselves as having feelings and needs. As emotional machines, people were no longer alone. Tamagotchis and Furbies (both of which sold in the tens of millions) did not want to play tic-tac-toe, but they would tell you if they were hungry or unhappy. A Furby held upside down says, "Me scared," and whimpers as though it means it. And these new objects found ways to express their love.

Furbies, put on the market in 1998, had proper robotic "bodies"; they were small, fur-covered "creatures" with big eyes and ears. Yet, the Tamagotchi, released in 1997, a virtual creature housed in a plastic egg, serves as a reliable primer in the psychology of sociable robotics—and a useful one because crucial elements are simplified, thus stark. The child imagines Tamagotchis as embodied because, like living creatures and unlike machines, they need constant care and are always on. A Tamagotchi has "body enough" for a child to imagine its death.[18] To live, a Tamagotchi must be fed, amused, and cleaned up after. If cared for, it will grow from baby to healthy adult. Tamagotchis, in their limited ways, develop different personalities depending on how they are treated. As Tamagotchis turn children into caretakers, they teach that digital life can be emotionally roiling, a place of obligations and regrets.[19] The earliest electronic toys and games of thirty years ago—such as Merlin, Simon, and Speak & Spell—encouraged children to consider the proposition that something smart might be "sort of alive." With Tamagotchis, needy objects asked for care, and children took further steps.

As they did with earlier generations of hard-to-classify computational objects, curious children go through a period of trying to sort out the new sociable objects. But soon children take them at interface value, not as puzzles but as playmates. The philosophical churning associated with early computer toys (are they alive? do they know?) quickly gives way to new practices. Children don't want to comprehend these objects as much as take care of them. Their basic stance: "I'm living with this new creature. It and many more like it are here to stay." When a virtual "creature" or robot asks for help, children provide it. When its behavior dazzles, children are pleased just to hang out with it.

In the classic children's story *The Velveteen Rabbit*, a stuffed animal becomes "real" because of a child's love. Tamagotchis do not wait passively but demand attention and claim that without it they will not survive. With this aggressive demand for care, the question of biological aliveness almost falls away. We love what we nurture; if a Tamagotchi makes you love it, and you feel it loves you in return, it is alive enough to be a creature. It is alive enough to share a bit of your life. Children approach sociable machines in a spirit similar to the way they approach sociable pets or people—with the hope of befriending them. Meeting a person (or a pet) is not about meeting his or her biochemistry; becoming acquainted with a sociable machine is not about deciphering its programming. While in an earlier day, children might have asked, "What is a Tamagotchi?" they now ask, "What does a Tamagotchi want?"

When a digital "creature" asks children for nurturing or teaching, it seems alive enough to care for, just as caring for it makes it seem more alive. Neil, seven, says that his Tamagotchi is "like a baby. You can't just change the baby's diaper. You have to, like, rub cream on the baby. That is how the baby knows you love it." His eight-year-old sister adds, "I hate it when my Tamagotchi has the poop all around. I am like its mother. That is my job. I don't like it really, but it gets sick if you just leave it messy." Three nine-year-olds consider their Tamagotchis. One is excited that his pet requires him to build a castle as its home. "I can do it. I don't want him to get cold and sick and to die." Another looks forward to her digital pet's demands: "I like it when it says, 'I'm hungry' or 'Play with me.'" The third boils down her relationship to a "deceased" Tamagotchi to its most essential elements: "She was loved; she loved back."[20]

Where is digital fancy bred? Most of all, in the demand for care. Nurturance is the "killer app." In the presence of a needy Tamagotchi, children become responsible parents: demands translate into care and care into the feeling of caring. Parents are enlisted to watch over Tamagotchis during school hours. In the late 1990s, an army of compliant mothers cleaned, fed, and amused their children's Tamagotchis; the beeping of digital pets became a familiar background noise during business meetings.

This parental involvement is imperative because a Tamagotchi is always on. Mechanical objects are supposed to turn off. Children understand that bodies need to be always on, that they become "off" when people or animals die. So, the inability to turn off a Tamagotchi becomes evidence of its life. Seven-year-old Catherine explains, "When a body is 'off,' it is dead." Some Tamagotchis can be asked to "sleep," but nine-year-old Parvati makes it clear that asking her Tamagotchi to sleep is not the same as hitting the pause button in a game. Life goes on: "When they sleep, it is not that they are turned off. They can still get sick and unhappy, even while they are sleeping. They could have a nightmare."

In the late 1970s, computers, objects on the boundary between animate and inanimate, began to lead children to gleeful experiments in which they crashed machines as they talked about "killing" them. And then, there would be elaborate rituals of resuscitation as children talked about bringing machines back to life. After these dramatic rebirths, the machines were, in the eyes of children, what they had been before. Twenty years later, when Tamagotchis die and are reset for a new life, children do not feel that they come back as they were before. Children looked forward to the rebirth of the computers they had crashed, but they dread the demise and rebirth of Tamagotchis. These provoke genuine remorse because, as one nine-year-old puts it, "It didn't have to happen. I could have taken better care."[21]

Unforgettable

I took care of my first Tamagotchi at the same time that my seven-year-old daughter was nurturing her own. Since I sometimes took a shift attending to her Tamagotchi, I could compare their respective behaviors, and I convinced myself that mine had idiosyncrasies that made it different from hers. My Tamagotchi liked to eat at particular intervals. I thought it prospered best with only small doses of amusement. I worked hard at keeping it happy. I did not anticipate how bad I would feel when it died. I immediately hit the reset button. Somewhat to my surprise, I had no desire to take care of the new infant Tamagotchi that appeared on my screen.

Many children are not so eager to hit reset. They don't like having a new creature in the same egg where their virtual pet has died. For them, the death of a virtual pet is not so unlike the death of what they call a "regular pet." Eight-year-olds talk about what happens when you hit a Tamagotchi's reset button. For one, "It comes back, but it doesn't come back as exactly your same Tamagotchi.... You haven't had the same experiences with it. It has a different personality." For another, "It's cheating. Your Tamagotchi is really dead. Your one is really dead. They say you get it back, but it's not the same one. It hasn't had the same things happen to it. It's like they give you a new one. It doesn't remember the life it had." For another, "When my Tamagotchi dies, I don't want to play with the new one who can pop up. It makes me remember the real one [the first one]. I like to get another [a new egg].... If you made it die, you should start fresh." Parents try to convince their children to hit reset. Their arguments are logical: the Tamagotchi is not "used up"; a reset Tamagotchi means one less visit to the toy store. Children are unmoved.

Sally, eight, has had three Tamagotchis. Each died and was "buried" with ceremony in her top dresser drawer. Three times Sally has refused to hit the reset button and convinced her mother to buy replacements. Sally sets the scene: "My mom says mine still works, but I tell her that a Tamagotchi is cheap, and she won't have to buy me anything else, so she gets one for me. I am not going to start up my old one. It died. It needs its rest."

In Sally's "It died. It needs its rest," we see the expansiveness of the robotic moment. Things that never could go together—a program and pity for a weary body—now do go together. The reset button produces objects that are between categories: a creature that seems new but is not really new, a stand-in for something now gone. The new creature, a kind of imposter, is a classic case of Sigmund Freud's uncanny—it's familiar, yet somehow not.[22] The uncanny is always compelling. Children ask, "What does it mean for a virtual creature to die?" Yet, while earlier generations debated questions about a computer's life in philosophical terms, when faced with Tamagotchis, children quickly move on to day-to-day practicalities. They temper philosophy with tearful experience. They know that Tamagotchis are alive enough to mourn.

Freud teaches us that the experience of loss is part of how we build a self.[23] Metaphorically, at least, mourning keeps a lost person present. Child culture is rich in narratives that take young people through the steps of this fitful process. So, in *Peter Pan*, Wendy loses Peter in order to move past adolescence and become a grown woman, able to love and parent. But Peter remains present in her playful and tolerant way of mothering. Louisa May Alcott's Jo loses her gentle sister Beth. In mourning Beth, Jo develops as a serious writer and finds a new capacity to love. More recently, the young wizard Harry Potter loses his mentor Dumbledore, whose continuing presence within Harry enables him to find his identity and achieve his life's purpose. With the Tamagotchi, we see the beginning of mourning for artificial life. It is not mourned as one would mourn a doll. The Tamagotchi has crossed a threshold. Children breathe life into their dolls. With the Tamagotchi, we are in a realm of objects that children see as having their own agendas, needs, and desires. Children mourn the life the Tamagotchi has led.

A child's mourning for a Tamagotchi is not always a solitary matter. When a Tamagotchi dies, it can be buried in an online Tamagotchi graveyard. The tombstones are intricate. On them, children try to capture what made each Tamagotchi special.[24] A Tamagotchi named Saturn lived to twelve "Tamagotchi years." Its owner writes a poem in its memory: "My baby died in his sleep. I will forever weep. Then his batteries went dead. Now he lives in my head." Another child mourns Pumpkin, dead at sixteen: "Pumpkin, Everyone said you were fat, so I made you lose weight. From losing weight you died. Sorry." Children take responsibility for virtual deaths.[25] These online places of mourning do more than give children a way to express their feelings. They sanction the idea that it is appropriate to mourn the digital—indeed, that there is something "there" to mourn.

Alive Enough

In the 1990s, children spoke about making their virtual creatures more alive by having them escape the computer. Furbies, the sensation of the 1998 holiday season, embody this documented dream. If a child wished a Tamagotchi to leap off its screen, it might look a lot like the furry and owl-like Furby. The two digital pets have other things in common. As with a Tamagotchi, how a Furby is treated shapes its personality. And both present themselves as visitors from other worlds. But Furbies are more explicit about their purpose in coming to Earth. They are here to learn about humans. So, each Furby is an anthropologist of sorts and wants to relate to people. They ask children to take care of them and to teach them English. Furbies are not ungrateful: they make demands, but they say, "I love you."

Furbies, like Tamagotchis, are "always on," but unlike Tamagotchis, Furbies manifest this with an often annoying, constant chatter.[26] To reliably quiet a Furby, you need a Phillips screwdriver to remove its batteries, an operation that causes it to lose all memory of its life and experiences—what it has learned and how it has been treated. For children who have spent many hours "bringing up" their Furbies, this is not a viable option. On a sunny spring afternoon in 1999, I bring eight Furbies to an afternoon playgroup at an elementary school in western Massachusetts. There are fifteen children in the room, from five to eight years old, from the kindergarten through the third grade. I turn on a tape recorder as

I hand the Furbies around. The children start to talk excitedly, greeting the Furbies by imitating their voices. In the cacophony of the classroom, this is what the robotic moment sounds like:

> He's a baby! He said, "Yum." Mine's a baby? Is this a baby? Is he sleeping now? He burped! What is "be-pah?" He said, "Be-pah." Let them play together. What does "a lee koo wah" mean? Furby, you're talking to me. Talk! C'mon boy. Good boy! Furby, talk! Be quiet everybody! Oh, look it, he's in love with another one! Let them play together! It's tired. It's asleep. I'm going to try to feed him. How come they don't have arms? Look, he's in love! He called you "Mama." He said, "Me love you." I have to feed him. I have to feed mine too. We love you, Furby. How do you make him fall asleep? His eyes are closed. He's talking with his eyes closed. He's sleeptalking. He's dreaming. He's snoring. I'm giving him shade.
>
> C'mon, Furby, c'mon—let's go to sleep, Furby. Furby, shh, shh. Don't touch him. I can make him be quiet. This is a robot. Is this a robot? What has this kind of fur? He's allergic to me. It's kind of like it's alive. And it has a body. It has a motor. It's a monster. And it's kind of like it's real because it has a body. It was alive. It is alive. It's not alive. It's a robot.

From the very first, the children make it clear that the Furby is a machine but alive enough to need care. They try to connect with it using everything they have: the bad dreams and scary movies that make one child see the Furby "as a monster" and their understanding of loneliness, which encourages another to exhort, "Let them play together!" They use logic and skepticism: Do biological animals have "this kind of fur?" Do real animals have motors? Perhaps, although this requires a new and more expansive notion of what a motor can be. They use the ambiguity of this new object to challenge their understanding of what they think they already know. They become more open to the idea of the biological as mechanical and the mechanical as biological. Eight-year-old Pearl thinks that removing the batteries from a Furby causes it to die and that people's death is akin to "taking the batteries out of a Furby."

Furbies reinforce the idea that they have a biology: each is physically distinct, with particular markings on its fur, and each has some of the needs of living things. For example, a Furby requires regular feeding, accomplished by depressing its tongue with one's finger. If a Furby is not fed, it becomes ill. Nursing a Furby back to health always requires more food. Children give disease names to Furby malfunctions. So, there is Furby cancer, Furby flu, and Furby headache.

Jessica, eight, plays with the idea that she and her Furby have "body things" in common, for example, that headache. She has a Furby at home; when her sisters pull its hair, Jessica worries about its pain: "When I pull my hair it really hurts, like when my mother brushes the tangles. So, I think [the Furby's hair pulls] hurt too." Then, she ponders her stomach. "There's a screw in my belly button," she says. "[The screw] comes out, and then blood comes out." Jessica thinks that people, like Furbies, have batteries. "There are hearts, lungs, and a big battery inside." People differ from robots in that our batteries "work forever like the sun." When children talk about the Furby as kin, they experiment with the idea that they themselves might be almost machine. Ideas about the human as machine or as joined to a machine are played out in classroom games.[27] In their own way, toy robots prepare a bionic sensibility. There are people who do, after all, have screws and pins and chips and plates in their flesh. A recent recipient of a cochlear implant describes his experience of his body as "rebuilt."[28]

We have met Wilson, seven, comfortable with his Furby as both machine and creature. Just as he always "hears the machine" in the Furby, he finds the machine in himself. As the boy sings improvised love songs about the robot as a best friend, he pretends to use a screwdriver on his own body, saying, "I'm a Furby." Involved in a second-grade class project of repairing a broken Furby by dismantling it, screw by screw, Wilson plays with the idea of the Furby's biological nature: "I'm going to get [its] baby out." And then he plays with the idea of his own machine nature: he applies the screwdriver to his own ankle, saying, "I'm unscrewing my ankle."

Wilson enjoys cataloguing what he and the Furby have in common. Most important for Wilson is that they "both like to burp." In this, he says, the Furby "is just like me—I love burping." Wilson holds his Furby out in front of him, his hands lightly touching the Furby's stomach, staring intently into its eyes. He burps just after or just before his Furby burps, much as in the classic bonding scene in *E.T.: The Extraterrestrial* between the boy Elliott and the visitor from afar. When Wilson describes his burping game, he begins by saying that he makes his Furby burp, but he ends up saying that his Furby makes him burp. Wilson likes the sense that he and his Furby are in sync, that he can happily lose track of where he leaves off and the Furby begins.[29]

What Does a Furby Want?

When Wilson catalogues what he shares with his Furby, there are things of the body (the burping) and there are things of the mind. Like many children, he thinks that because Furbies have language, they are more "peoplelike" than a "regular" pet. They arrive speaking Furbish, a language with its own dictionary, which many children try to commit to memory because they would like to meet their Furbies more than half way. The Furby manual instructs children, "I can learn to speak English by listening to you talk. The more you play with me, the more I will use your language." Actually, Furby English emerges over time, whether or not a child talks to the robot. (Furbies have no hearing or language- learning ability.[30]) But until age eight, children are convinced by the illusion and believe they are teaching their Furbies to speak. The Furbies are alive enough to need them.

Children enjoy the teaching task. From the first encounter, it gives them something in common with their Furbies and it implies that the Furbies can grow to better understand them. "I once didn't know English," says one six-year-old. "And now I do. So I know what my Furby is going through." In the classroom with Furbies, children shout to each other in competitive delight: "My Furby speaks more English than yours! My Furby speaks English."

I have done several studies in which I send Furbies home with schoolchildren, often with the request that they (and their parents) keep a "Furby diary." In my first study of kindergarten to third graders, I loan the Furbies out for two weeks at a time. It is not a good decision. I do not count on how great will be children's sense of loss when I ask them to return the Furbies. I extend the length of the loans, often encouraged by parental requests. Their children have grown too attached to give up the robots. Nor are they mollified by parents' offers to buy them new Furbies. Even more so than with Tamagotchis, children attach to a particular Furby, the one they have taught English, the one they have raised.

For three decades, in describing people's relationships with computers, I have often used the metaphor of the Rorschach, the inkblot test that psychologists use as a screen onto which people can project their feelings and styles of thought. But as children interact with sociable robots like Furbies, they move beyond a psychology of projection to a new psychology of engagement. They try to deal with the robot as they would deal with a pet or a person. Nine-year-old Leah, in an after-school playgroup, admits, "It's hard to turn it [the Furby] off when it is talking to me." Children quickly understand that to get the most out of your Furby, you have to pay attention to what it is telling you. When you are with a Furby, you can't play a simple game of projective make-believe. You have to continually assess your Furby's "emotional" and "physical" state. And children fervently believe that the child who loves his or her Furby best will be most loved in return.

This mutuality is at the heart of what makes the Furby, a primitive exemplar of sociable robotics, different from traditional dolls. As we've seen, such relational artifacts do not wait for children to "animate" them in the spirit of a Raggedy Ann doll or a teddy bear. They present themselves as already animated and ready for relationship. They promise reciprocity because, unlike traditional dolls, they are not passive. They make demands. They present as having their own needs and inner lives. They teach us the rituals of love that will make them thrive. For decades computers have asked us to *think* with them; these days, computers and robots, deemed sociable, affective, and relational, ask us to *feel* for and with them.

Children see traditional dolls as they want them or need them to be. For example, an eight-year-old girl who feels guilty about breaking her mother's best crystal pitcher might punish a row of Barbie dolls. She might take them away from their tea party and put them in detention, doing unto the dolls what she imagines should be done unto her. In contrast, since relational artifacts present themselves as having minds and intentions of their own, they cannot be so easily punished for one's own misdeeds. Two eight-year-old girls comment on how their "regular dolls" differ from the robotic Furbies. The first says, "A regular doll, like my Madeleine doll ... you can make it go to sleep, but its eyes are painted open, so, um, you cannot get them to close their eyes.... Like a Madeleine doll cannot go, 'Hello, good morning.'" But this is precisely the sort of thing a Furby can do. The second offers, "The Furby tells you what it wants."

Indeed, Furbies come with manuals that provide detailed marching orders. They want language practice, food, rest, and protestations of love. So, for example, the manual instructs, "Make sure you say 'HEY FURBY! I love you!' frequently so that I feel happy and know I'm loved." There is general agreement among children that a penchant for giving instructions distinguishes Furbies from traditional dolls. A seven-year-old girl puts it this way: "Dolls let you tell them what they want. The Furbies have their own ideas." A nine-year-old boy sums up the difference between Furbies and his action figures: "You don't play with the Furby, you sort of hang out with it. You do try to get power over it, but it has power over you too."

Children say that traditional dolls can be "hard work" because you have to do all the work of giving them ideas; Furbies are hard work for the opposite reason. They have plenty of ideas, but you have to give them what they want and when they want it. When children attach to a doll through the psychology of projection, they attribute to the doll what is most on their mind. But they need to accommodate a Furby. This give-and-take prepares children for the expectation of relationship with machines that is at the heart of the robotic moment.

Daisy, six, with a Furby at home, believes that each Furby's owner must help his or her Furby fulfill its mission to learn about people. "You have to teach it; when you buy it, that is your job." Daisy tells me that she taught her Furby about Brownie Girl Scouts, kindergarten, and whales. "It's alive; I teach it about whales; it loves me." Padma, eight, says that she likes meeting what she calls "Furby requests" and thinks that her Furby is "kind of like a person" because "it talks." She goes on: "It's kind of like me because I'm a chatterbox." After two weeks, it is time for Padma to return her Furby, and afterward she feels regret: "I miss how it talked, and now it's so quiet at my house.... I didn't get a chance to make him a bed."

After a month with her Furby, Bianca, seven, speaks with growing confidence about their mutual affection: "I love my Furby because it loves me.... It was like he really knew me."[31] She knows her Furby well enough to believe that "it doesn't want to miss fun ... at a party." In order to make sure that her social butterfly Furby gets some rest when her parents entertain late into the evening, Bianca clips its ears back with clothespins to fool the robot into thinking that "nothing is going on ... so he can fall asleep." This move is ineffective, and all of this activity is exhausting, but Bianca calmly sums up her commitment: "It takes lots of work to take care of these."

When Wilson, who so enjoys burping in synchrony with his Furby, faces up to the hard work of getting his Furby to sleep, he knows that if he forces sleep by removing his Furby's batteries, the robot will "forget" whatever has passed between them—this is unacceptable. So Furby sleep has to come naturally. Wilson tries to exhaust his Furby by keeping it up late at night watching television. He experiments with Furby "sleep houses" made of blankets piled high over towers of blocks. When Wilson considers Furby sleep, his thoughts turn to Furby dreams. He is sure his Furby dreams "when his eyes are closed." What do Furbies dream of? Second and third graders think they dream "of life on their flying saucers."[32] And they dream about learning languages and playing with the children they love.

David and Zach, both eight, are studying Hebrew. "My Furby dreams about Hebrew," says David. "It knows how to say *Eloheinu*.... I didn't even try to teach it; it was just from listening to me doing Hebrew homework." Zach agrees: "Mine said *Dayeinu* in its sleep." Zach, like Wilson, is proud of how well he can make his Furby sleep by creating silence and covering it with blankets. He is devoted to teaching his Furby English and has been studying Furbish as well; he has mastered the English/Furbish dictionary that comes with the robot. A week after Zach receives his Furby, however, his mother calls my office in agitation. Zach's Furby is broken. It has been making a "terrible" noise. It sounds as though it might be suffering, and Zach is distraught. Things reached their worst during a car trip from Philadelphia to Boston, with the broken Furby wailing as though in pain. On the long trip home, there was no Phillips screwdriver for the ultimate silencing, so Zach and his parents tried to put the Furby to sleep by nestling it under a blanket. But every time the car hit a bump, the Furby woke up and made the "terrible" noise. I take away the broken Furby, and give Zach a new one, but he wants little to do with it. He doesn't talk to it or try to teach it. His interest is in "his" Furby, the Furby he nurtured, the Furby he taught. He says, "The Furby that I had before could say 'again'; it could say 'hungry.'" Zach believes he was making progress teaching the first Furby a bit of Spanish and French. The first Furby was never "annoying," but the second Furby is. *His* Furby is irreplaceable.

After a few weeks, Zach's mother calls to ask if their family has my permission to give the replacement Furby to one of Zach's friends. When I say yes, Zach calmly contemplates the loss of Furby #2. He has loved; he has lost; he is not willing to reinvest. Neither is eight-year-old Holly, who becomes upset and withdrawn when her mother takes the batteries out of her Furby. The family was about to leave on an extended vacation, and the Furby manual suggests taking out a Furby's batteries if it will go unused for a long time. Holly's mother did not understand the implications of what she saw as commonsense advice from the manual. She insists, with increasing defensiveness, that she was only "following the instructions." Wide-eyed, Holly tries to make her mother understand what she has done: when the batteries are removed, Holly says, "the Furby forgets its life."

Designed to give users a sense of progress in teaching it, when the Furby evolves over time, it becomes the irreplaceable repository and proof of its owner's care. The robot and child have traveled a bit of road together. When a Furby forgets, it is as if a friend has become amnesic. A new Furby is a stranger. Zach and Holly cannot bear beginning again with a new Furby that could never be the Furby into which each has poured time and attention.

Operating Procedures

In the 1980s, the computer toy Merlin made happy and sad noises depending on whether it was winning or losing the sound-and-light game it played with children. Children saw Merlin as "sort of alive" because of how well it played memory games, but they did not fully believe in Merlin's shows of emotion. When a Merlin broke down, children were sorry to lose a playmate. When a Furby doesn't work, however, children see a creature that might be in pain.

Lily, ten, worries that her broken Furby is hurting. But she doesn't want to turn it off, because "that means you aren't taking care of it." She fears that if she shuts off a Furby in pain, she might make things worse. Two eight-year-olds fret about how much their Furbies sneeze. The first worries that his sneezing Furby is allergic to him. The other fears his Furby got its cold because "I didn't do a good enough job taking care of him." Several children become tense when Furbies make unfamiliar sounds that might be signals of distress. I observe children with their other toys: dolls, toy soldiers, action figures. If these toys make strange sounds, they are usually put aside; broken toys lead easily to boredom. But when a Furby is in trouble, children ask, "Is it tired?" "Is it sad?" "Have I hurt it?" "Is it sick?" "What shall I do?"

Taking care of a robot is a high-stakes game. Things can—and do—go wrong. In one kindergarten, when a Furby breaks down, the children decide they want to heal it. Ten children volunteer, seeing themselves as doctors in an emergency room. They decide they'll begin by taking it apart.

The proceedings begin in a state of relative calm. When talking about their sick Furby, the children insist that this breakdown does not mean the end: people get sick and get better. But as soon as scissors and pliers appear, they become anxious. At this point, Alicia screams, "The Furby is going to die!" Sven, to his classmates' horror, pinpoints the moment when Furbies die: it happens when a Furby's skin is ripped off. Sven considers the Furby as an animal. You can shave an animal's fur, and it will live. But you cannot take its skin off. As the operation continues, Sven reconsiders. Perhaps the Furby can live without its skin, "but it will be cold." He doesn't back completely away from the biological (the Furby is sensitive to the cold) but reconstructs it. For Sven, the biological now includes creatures such as Furbies, whose "insides" stay "all in the same place" when their skin is removed. This accommodation calms him down. If a Furby is simultaneously biological and mechanical, the operation in process, which is certainly removing the Furby's skin, is not necessarily destructive. Children make theories when they are confused or anxious. A good theory can reduce anxiety.

But some children become more anxious as the operation continues. One suggests that if the Furby dies, it might haunt them. It is alive enough to turn into a ghost. Indeed, a group of children start to call the empty Furby skin "the ghost of Furby" and the Furby's naked body "the goblin." They are not happy that this operation might leave a Furby goblin and ghost at large. One girl comes up with the idea that the ghost of the Furby will be less fearful if distributed. She asks if it would be okay "if every child took home a piece of Furby skin." She is told this would be fine, but, unappeased, she asks the same question two more times. In the end, most children leave with a bit of Furby fur.[33] Some talk about burying it when they get home. They leave room for a private ritual to placate the goblin and say good-bye.

Inside the classroom, most of the children feel they are doing the best they can with a sick pet. But from outside the classroom, the Furby surgery looks alarming. Children passing by call out, "You killed him." "How dare you kill

Furby?" "You'll go to Furby jail." Denise, eight, watches some of the goings-on from the safety of the hall. She has a Furby at home and says that she does not like to talk about its problems as diseases because "Furbies are not animals." She uses the word "fake" to mean nonbiological and says, "Furbies are fake, and they don't get diseases." But later, she reconsiders her position when her own Furby's batteries run out and the robot, so chatty only moments before, becomes inert. Denise panics: "It's dead. It's dead right now.... Its eyes are closed." She then declares her Furby "both fake and dead." Denise concludes that worn-out batteries and water can kill a Furby. It is a mechanism, but alive enough to die.

Linda, six, is one of the children whose family has volunteered to keep a Furby for a two-week home study. She looked forward to speaking to her Furby, sure that unlike her other dolls, this robot would be worth talking to. But on its very first night at her home, her Furby stops working: "Yeah, I got used to it, and then it broke that night—the night that I got it. I felt like I was broken or something.... I cried a lot.... I was really sad that it broke, 'cause Furbies talk, they're like real, they're like real people." Linda is so upset about not protecting her Furby that when it breaks she feels herself broken.

Things get more complicated when I give Linda a new Furby. Unlike children like Zach who have invested time and love in a "first Furby" and want no replacements, Linda had her original Furby in working condition for only a few hours. She likes having Furby #2: "It plays hide-and-seek with me. I play red light, green light, just like in the manual." Linda feeds it and makes sure it gets enough rest, and she reports that her new Furby is grateful and affectionate. She makes this compatible with her assessment of a Furby as "just a toy" because she has come to see gratitude, conversation, and affection as something that toys can manage. But now she will not name her Furby or say it is alive. There would be risk in that: Linda might feel guilty if the new Furby were alive enough to die and she had a replay of her painful first experience.

Like the child surgeons, Linda ends up making a compromise: the Furby is both biological and mechanical. She tells her friends, "The Furby is kind of real but just a toy." She elaborates that "[the Furby] is real because it is talking and moving and going to sleep. It's kind of like a human and a pet." It is a toy because "you had to put in batteries and stuff, and it could stop talking."

So hybridity can offer comfort. If you focus on the Furby's mechanical side, you can enjoy some of the pleasures of companionship without the risks of attachment to a pet or a person. With practice, says nine-year-old Lara, reflecting on her Furby, "you can get it to like you. But it won't die or run away. That is good." But hybridity also brings new anxieties. If you grant the Furby a bit of life, how do you treat it so that it doesn't get hurt or killed? An object on the boundaries of life, as we've seen, suggests the possibility of real pain.

An Ethical Landscape

When a mechanism breaks, we may feel regretful, inconvenienced, or angry. We debate whether it is worth getting it fixed. When a doll cries, children know that they are themselves creating the tears. But a robot with a body can get "hurt," as

we saw in the improvised Furby surgical theater. Sociable robotics exploits the idea of a robotic body to move people to relate to machines as subjects, as creatures in pain rather than broken objects. That even the most primitive Tamagotchi can inspire these feelings demonstrates that objects cross that line not because of their sophistication but because of the feelings of attachment they evoke. The Furby, even more than the Tamagotchi, is alive enough to suggest a body in pain as well as a troubled mind. Furbies whine and moan, leaving it to their users to discover what might help. And what to make of the moment when an upside down Furby says, "Me scared!"?

Freedom Baird takes this question very seriously.[34] A recent graduate of the MIT Media Lab, she finds herself engaged with her Furby as a creature and a machine. But how seriously does she take the idea of the Furby as a creature? To determine this, she proposes an exercise in the spirit of the Turing test.

In the original Turing test, published in 1950, mathematician Alan Turing, inventor of the first general-purpose computer, asked under what conditions people would consider a computer intelligent. In the end, he settled on a test in which the computer would be declared intelligent if it could convince people it was not a machine. Turing was working with computers made up of vacuum tubes and Teletype terminals. He suggested that if participants couldn't tell, as they worked at their Teletypes, if they were talking to a person or a computer, that computer would be deemed "intelligent."[35]

A half century later, Baird asks under what conditions a creature is deemed alive enough for people to experience an ethical dilemma if it is distressed. She designs a Turing test not for the head but for the heart and calls it the "upside-down test." A person is asked to invert three creatures: a Barbie doll, a Furby, and a biological gerbil. Baird's question is simple: "How long can you hold the object upside down before your emotions make you turn it back?" Baird's experiment assumes that a sociable robot makes new ethical demands. Why? The robot performs a psychology; many experience this as evidence of an inner life, no matter how primitive. Even those who do not think a Furby has a mind—and this, on a conscious level, includes most people—find themselves in a new place with an upside-down Furby that is whining and telling them it is scared. They feel themselves, often despite themselves, in a situation that calls for an ethical response. This usually happens at the moment when they identify with the "creature" before them, all the while knowing that it is "only a machine."

This simultaneity of vision gives Baird the predictable results of the upside-down test. As Baird puts it, "People are willing to be carrying the Barbie around by the feet, slinging it by the hair ... no problem.... People are not going to mess around with their gerbil." But in the case of the Furby, people will "hold the Furby upside down for thirty seconds or so, but when it starts crying and saying it's scared, most people feel guilty and turn it over."

The work of neuroscientist Antonio Damasio offers insight into the origins of this guilt. Damasio describes two levels of experiencing pain. The first is a physical response to a painful stimulus. The second, a far more complex reaction, is an emotion associated with pain. This is an internal representation of the physical.[36] When the Furby says, "Me scared," it signals that it has crossed the

line between a physical response and an emotion, the internal representation. When people hold a Furby upside down, they do something that would be painful if done to an animal. The Furby cries out—as if it were an animal. But then it says, "Me scared"—as if it were a person.

People are surprised by how upset they get in this theater of distress. And then they get upset that they are upset. They often try to reassure themselves, saying things like, "Chill, chill, it's only a toy!" They are experiencing something new: you can feel bad about yourself for how you behave with a computer program. Adults come to the upside-down test knowing two things: the Furby is a machine and they are not torturers. By the end, with a whimpering Furby in tow, they are on new ethical terrain.[37]

We are at the point of seeing digital objects as both creatures and machines. A series of fractured surfaces—pet, voice, machine, friend—come together to create an experience in which knowing that a Furby is a machine does not alter the feeling that you can cause it pain. Kara, a woman in her fifties, reflects on holding a moaning Furby that says it is scared. She finds it distasteful, "not because I believe that the Furby is really scared, but because I'm not willing to hear anything talk like that and respond by continuing my behavior. It feels to me that I could be hurt if I keep doing this." For Kara, "That is not what I do.... In that moment, the Furby comes to represent how I treat creatures."

When the toy manufacturer Hasbro introduced its My Real Baby robot doll in 2000, it tried to step away from these complex matters. My Real Baby shut down in situations where a real baby might feel pain. This was in contrast to its prototype, a robot called "IT," developed by a team led by MIT roboticist Rodney Brooks. "IT," evolved into "BIT" (for Baby IT), a doll with "states of mind" and facial musculature under its synthetic skin to give it expression.[38] When touched in a way that would induce pain in a child, BIT cried out. Brooks describes BIT in terms of its inner states:

> If the baby were upset, it would stay upset until someone soothed it or it finally fell asleep after minutes of heartrending crying and fussing. If BIT ... was abused in any way—for instance, by being swung upside down—it got very upset. If it was upset and someone bounced it on their knee, it got more upset, but if the same thing happened when it was happy, it got more and more excited, giggling and laughing, until eventually it got overtired and started to get upset. If it were hungry, it would stay hungry until it was fed. It acted a lot like a real baby.[39]

BIT, with its reactions to abuse, became the center of an ethical world that people constructed around its responses to pleasure and pain. But when Hasbro put BIT into mass production as My Real Baby, the company decided not to present children with a toy that responded to pain. The theory was that a robot's response to pain could "enable" sadistic behavior. If My Real Baby were touched, held, or bounced in a way that would hurt a real baby, the robot shut down.

In its promotional literature, Hasbro marketed My Real Baby as "the most real, dynamic baby doll available for young girls to take care of and nurture."

They presented it as a companion that would teach and encourage reciprocal social behavior as children were trained to respond to its needs for amusement as well as bottles, sleep, and diaper changes. Indeed, it was marketed as realistic in all things—except that if you "hurt" it, it shut down. When children play with My Real Baby, they do explore aggressive possibilities. They spank it. It shuts down. They shake it, turn it upside down, and box its ears. It shuts down.

Hasbro's choice—maximum realism, but with no feedback for abuse—inspires strong feelings, especially among parents. For one group of parents, what is most important is to avoid a child's aggressive response. Some believe that if you market realism but show no response to "pain," children are encouraged to inflict it because doing so seems to have no cost. Others think that if a robot simulates pain, it enables mistreatment.

Another group of parents wish that My Real Baby would respond to pain for the same reason that they justify letting their children play violent video games: they see such experiences as "cathartic." They say that children (and adults too) should express aggression (or sadism or curiosity) in situations that seem "realistic" but where nothing "alive" is being hurt. But even these parents are sometimes grateful for My Real Baby's unrealistic show of "denial." They do not want to see their children tormenting a screaming baby.

No matter what position one takes, sociable robots have taught us that we do not shirk from harming realistic simulations of life. This is, of course, how we now train people for war. First, we learn to kill the virtual. Then, desensitized, we are sent to kill the real. The prospect of studying these matters raises awful questions. Freedom Baird had people hold a whining, complaining Furby upside down, much to their discomfort. Do we want to encourage the abuse of increasingly realistic robot dolls?

When I observe children with My Real Baby in an after-school playgroup for eight-year-olds, I see a range of responses. Alana, to the delight of a small band of her friends, flings My Real Baby into the air and then shakes it violently while holding it by one leg. Alana says the robot has "no feelings." Watching her, one wonders why it is necessary then to "torment" something without feelings. She does not behave this way with the many other dolls in the playroom. Scott, upset, steals the robot and brings it to a private space. He says, "My Real Baby is like a baby and like a doll.... I don't think she wants to get hurt."

As Scott tries to put the robot's diaper back on, some of the other children stand beside him and put their fingers in its eyes and mouth. One asks, "Do you think that hurts?" Scott warns, "The baby's going to cry!" At this point, one girl tries to pull My Real Baby away from Scott because she sees him as an inadequate protector: "Let go of her!" Scott resists. "I was in the middle of changing her!" It seems a good time to end the play session. As the research team, exhausted, packs up to go, Scott sneaks behind a table with the robot, gives it a kiss, and says good-bye, out of the sight of the other children.

In the pandemonium of Scott and Alana's playgroup, My Real Baby is alive enough to torment and alive enough to protect. The adults watching this—a group of teachers and my research team—feel themselves in an unaccustomed

quandary. If the children had been tossing around a rag doll, neither we, nor presumably Scott, would have been as upset. But it is hard to see My Real Baby treated this way. All of this—the Furbies that complain of pain, the My Real Babies that do not—creates a new ethical landscape. The computer toys of the 1980s only suggested ethical issues, as when children played with the idea of life and death when they "killed" their Speak & Spells by taking out the toys' batteries. Now, relational artifacts pose these questions directly.

One can see the new ethics at work in my students' reactions to Nexi, a humanoid robot at MIT. Nexi has a female torso, an emotionally expressive face, and the ability to speak. In 2009, one of my students, researching a paper, made an appointment to talk with the robot's development team. Due to a misunderstanding about scheduling, my student waited alone, near the robot. She was upset by her time there: when not interacting with people, Nexi was put behind a curtain and blindfolded.

At the next meeting of my graduate seminar, my student shared her experience of sitting alongside the robot. "It was very upsetting," she said. "The curtain—and why was she blindfolded? I was upset because she was blindfolded." The story of the shrouded and blindfolded Nexi ignited the seminar. In the conversation, all the students talked about the robot as a "she." The designers had done everything they could to give the robot gender. And now, the act of blindfolding signaled sight and consciousness. In class, questions tumbled forth: Was the blindfold there because it would be too upsetting to see Nexi's eyes? Perhaps when Nexi was turned off, "her" eyes remained open, like the eyes of a dead person? Perhaps the robot makers didn't want Nexi to see "out"? Perhaps they didn't want Nexi to know that when not in use, "she" is left in a corner behind a curtain? This line of reasoning led the seminar to an even more unsettling question: If Nexi is smart enough to need a blindfold to protect "her" from fully grasping "her" situation, does that mean that "she" is enough of a subject to make "her" situation abusive? The students agreed on one thing; blindfolding the robot sends a signal that "this robot can see." And seeing implies understanding and an inner life, enough of one to make abuse possible.

I have said that Sigmund Freud saw the uncanny as something long familiar that feels strangely unfamiliar. The uncanny stands between standard categories and challenges the categories themselves. It is familiar to see a doll at rest. But we don't need to cover its eyes, for it is we who animate it. It is familiar to have a person's expressive face beckon to us, but if we blindfold that person and put them behind a curtain, we are inflicting punishment. The Furby with its expressions of fear and the gendered Nexi with her blindfold are the new uncanny in the culture of computing.

I feel even more uncomfortable when I learn about a beautiful "female" robot, Aiko, now on sale, that says, "Please let go ... you are hurting me," when its artificial skin is pressed too hard. The robot also protests when its breast is touched: "I do not like it when you touch my breasts." I find these programmed assertions of boundaries and modesty disturbing because it is almost impossible to hear them without imagining an erotic body braced for assault....

NOTES

1. Weizenbaum had written the program a decade earlier. See Joseph Weizenbaum, "ELIZA—a Computer Program for the Study of Natural Language Communication Between Man and Machine," *Communications of the ACM*, vol. 9, no. 1 (January 1966): 36–45.
2. See Joseph Weizenbaum, *Computer Power and Human Reason: From Judgment to Calculation* (San Francisco: W. H. Freeman, 1976).
3. For whatever kind of companionship, a classical first step is to make robots that are physically identical to people. In America, David Hanson has an Albert Einstein robot that chats about relativity. At the TED conference in February 2009, Hansen discussed his project to create robots with empathy as the "seeds of hope for our future." See http://www.ted.com/talks/david_hanson_robots_that_relate_to_you.html (accessed August 11, 2010) On Hanson, also see Jerome Groopman, "Robots That Care: Advances in Technological Therapy," *The New Yorker*, November 2, 2009, www.newyorker.com/reporting/2009/11/02/091102fa_fact_groopman (accessed November 11, 2009).

   These days, you can order a robot clone in your own image (or that of anyone else) from a Japanese department store. The robot clone costs $225,000 and became available in January 2010. See "Dear Santa: I Want a Robot That Looks Just Like Me," Ethics Soup, December 17, 2009, www.ethicsoup.com/2009/12/dear-santa-i-want-a-robot-that-looks-like-me.html (accessed January 12, 2010).
4. Bryan Griggs, "Inventor Unveils $7,000 Talking Sex Robot," CNN, February 1, 2010, www.cnn.com/2010/TECH/02/01/sex.robot/index.html (accessed June 9, 2010).
5. Raymond Kurzweil, *The Singularity Is Near: When Humans Transcend Biology* (New York: Viking, 2005). On radical images of our future, see Joel Garreau, *Radical Evolution: The Promise and Peril of Enhancing Our Minds, Our Bodies—and What It Means to Be Human* (New York: Doubleday, 2005).
6. For my further reflections on computer psychotherapy, see "Taking Things at Interface Value," in Sherry Turkle, *Life on the Screen: Identity in the Age of the Internet* (New York: Simon and Schuster, 1995), 102–124.
7. There is, too, a greater willingness to enter into a relationship with a machine if people think it will make them feel better. On how easy it is to anthropomorphize a computer, see Byron Reeves and Clifford Nass, *The Media Equation: How People Treat Computers, Television and New Media Like Real People and Places* (New York: Cambridge University Press, 1996). See also, on computer psychotherapy, Harold P. Erdman, Marjorie H. Klein, and John H. Greist, "Direct Patient Computer Interviewing," *Journal of Consulting and Clinical Psychology* 53 (1985): 760–773; Kenneth Mark Colby, James B. Watt, and John P. Gilbert, "A Computer Method for Psychotherapy: Preliminary Communication," *Journal of Nervous and Mental Diseases* 142, no. 2 (1966): 148–152; Moshe H. Spero, "Thoughts on Computerized Psychotherapy," *Psychiatry* 41 (1978): 281–282.
8. For my work on early computational objects and the question of aliveness, see Sherry Turkle, *The Second Self: Computers and the Human Spirit* (1984; Cambridge, MA: MIT Press, 2005). That work on aliveness continued with a second generation of computational objects in Turkle, *Life on the Screen*. My inquiry, with an emphasis on children's reasoning rather than their answers, is inspired by Jean Piaget, *The*

Child's Conception of the World, trans. Joan Tomlinson and Andrew Tomlinson (Totowa, NJ: Littlefield, Adams, 1960).

9. On the power of the liminal, see, for example, Victor Turner, *The Ritual Process: Structure and Anti-Structure* (Chicago: Aldine, 1969), and *The Forest of Symbols: Aspects of Ndembu Ritual* (1967; Ithaca, NY: Cornell University Press, 1970). See also Mary Douglas, *Purity and Danger: An Analysis of Concepts of Pollution and Taboo* (London: Routledge and Kegan Paul, 1966).
10. Piaget, *The Child's Conception*.
11. Turkle, *The Second Self*, 33–64.
12. Children, in fact, settled on three new formulations. First, when it came to thinking through the aliveness of computational objects, autonomous motion was no longer at the heart of the matter. The question was whether computers had autonomous cognition. Second, they acknowledged that computer toys might have some kind of awareness (particularly of them) without being alive. Consciousness and life were split. Third, computers seemed alive because they could think on their own, but were only "sort of alive" because even though they could think on their own, their histories undermined their autonomy. So an eight-year-old said that Speak & Spell was "sort of alive" but not "really alive" because it had a programmer. "The programmer," he said, "gives it its ideas. So the ideas don't come from the game." These days, sociable robots, with their autonomous behavior, moods, and faces, seem to take the programmer increasingly out of the picture. And with the formulation "alive enough," children put the robots on a new terrain. As for cognition, it has given way in children's minds to the capacity to show attention, to be part of a relationship of mutual affection.
13. Turkle, *Life on the Screen*, 169.
14. Turkle, *Life on the Screen*, 173–174.
15. The 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, MA: Belknap Press, 1982), 81.
16. According to psychoanalyst D. W. Winnicott, objects such as teddy bears, baby blankets, or a bit of silk from a first pillow mediate between the infant's earliest bonds with the mother, who is experienced as inseparable from the self, and other people, who will come to be experienced as separate beings. These objects are known as "transitional," and the infant comes to know them both as almost inseparable parts of the self and as the first "not me" possessions. As the child grows, these transitional objects are left behind, but the effects of early encounters with them remain. We see them in the highly charged relationships that people have with later objects and experiences that call forth the feeling of being "at one" with things outside the self. The power of the transitional object is associated with religion, spirituality, the perception of beauty, sexual intimacy, and the sense of connection with nature. And now, the power of the transitional object is associated with computers and, even more dramatically, with sociable robots. On transitional objects, see D. W. Winnicott, *Playing and Reality* (New York: Basic Books, 1971).
17. In the early 1980s, children's notion of people as "emotional machines" seemed to me an unstable category. I anticipated that later generations of children would find other formulations as they learned more about computers. They might, for example, see through the apparent "intelligence" of the machines by developing a greater understanding of how they were created and operated. As a result, children might be less inclined to see computers as kin. However, in only a few years, things moved in a very different direction. Children did not endeavor to make computation more transparent. Like the rest of the culture, they accepted it as opaque, a behaving system. Children taking sociable robots "at interface value" are part of a larger trend. The 1984 introduction of the Macintosh encouraged its users to stay on the surface of things. The Macintosh version of "transparency" stood the traditional meaning of that word on its head. Transparency used to refer to the ability to "open up the hood" and look inside. On a Macintosh it meant double-clicking an icon. In other words, transparency had come to mean being able to make a simulation work without knowing how it worked. The new transparency is what used to be called opacity. For more on this question, see Turkle, *Life on the Screen*, especially 29–43, and Sherry Turkle, *Simulation and Its Discontents* (Cambridge, MA: MIT Press, 2009).

18. Our connections with the virtual intensifies when avatars look, gesture, and move like us; these connections become stronger when we move from the virtual to the embodied robotic. Computer scientist Cory Kidd studied attachment to a computer program. In one condition the program issued written commands that told study participants what to do. In a second condition, an on-screen avatar issued the same instructions. In a third condition an on-screen robot was used to give the same instructions. The robot engendered the greatest attachment. Cory Kidd, "Human-Robot Interaction" (master's thesis, Massachusetts Institute of Technology, 2003).
19. The Tamagotchi website cautions about unfavorable outcomes: "If you neglect your little cyber creature, your Tamagotchi may grow up to be mean or ugly. How old will your Tamagotchi be when it returns to its home planet? What kind of virtual caretaker will you be?" The packaging on a Tamagotchi makes the agenda clear: "There are a total of 4 hearts on the 'Happy' and 'Hunger' screens and they start out empty. The more hearts that are filled, the better satisfied Tamagotchi is. You must feed or play with Tamagotchi in order to fill the empty hearts. If you keep Tamagotchi full and happy, it will grow into a cute, happy cyberpet. If you neglect Tamagotchi, it will grow into an unattractive alien." The manufacturer of the first Tamagotchi is Bandai. Its website provides clear moral instruction that links nurturance and responsibility. See the Bandai website at www.bandai.com (accessed October 5, 2009).
20. See "Tamagotchi Graveyard," Tamagotchi Dreamworld, http://shesdevilish.tripod.com/grave.html (accessed June 15, 2009).
21. In Japan, a neglected Tamagotchi dies but can be uploaded to a virtual graveyard. In the United States, manufacturers propose gentler resolutions. Some neglected Tamagotchis might become "angels" and return to their home planet. On the Tamagotchis I played with, it was possible to hit a reset button and be presented with another creature.
22. Sigmund Freud, "The Uncanny," in The Standard Edition of Sigmund Freud, ed. and trans. James Strachey et al. (London: Hogarth Press, 1953–1974), 17:219–256.
23. Sigmund Freud, "Mourning and Melancholia," in *The Standard Edition*, 14: 237–258.
24. See "Tamagotchi Graveyard."
25. Other writings on the Tamagotchi gravesite include the epitaph for a Tamagotchi named Lacey who lived for ninety-nine years. We know how hard it was for her

owner to achieve this result, but he is modest about his efforts: "She wasn't much trouble at all." But even with his considerable accomplishment, he feels her death was due to his neglect: "I slept late on a Sunday and she died." But in the simple expressions of guilt (or perhaps a playing at guilt) are frank admissions of how hard it is to lose someone you love. Mourners say, "I was his mama and he will always love me as I loved him"; "He went everywhere with me. He was a loving and faithful pet"; "I'm sorry and I real[l]y miss you!"; and "God gave him life. I gave him death." Some mourners express their belief in redemption through the generativity of generations. Thus is "Little Guy" memorialized, dead at forty-eight: "I hope you are very happy, Little Guy. I'm currently taking care of your son. I know he's yours because he looks and acts just like you. I'm really sorry I couldn't save you and had you on pause a lot when you were older." See "Tamagotchi Graveyard."

26. The fact that the Furby was so hard to quiet down was evidence of its aliveness. Even adults who knew it was not alive saw it as playing on the boundaries of life. The response of many was to see the Furby as out of control, intolerable, or, as one put it, insane. A online video of an "insane Furby" shows the Furby chatting away, to the increasing consternation of its adult owner. To stop it, he slaps its face, sticks his fingers in its mouth, holds down its ears and eyes, smashes it against a wall, and throws it down a flight of stairs. None of these shuts it down. If anything, its language becomes more manic, more "desperate." Finally comes the solution of taking out the Furby's batteries with a Phillips screwdriver. Now, the quiet Furby is petted. Its owner comments, "That's better." See "Insane Furby," YouTube, March 15, 2007, www.youtube.com/watch?v=g4Dfg4xJ6Ko (accessed November 11, 2009).
27. These enactments bring theory to ground level. See Donna Haraway, "A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century," in *Simians, Cyborgs and Women: The Reinvention of Nature* (New York: Routledge, 1991), 149–181, and N. Katherine Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics* (Chicago: University of Chicago Press, 1999).
28. Michael Chorost, *Rebuilt: How Becoming Part Computer Made Me More Human* (Boston: Houghton Mifflin, 2005).
29. Here, the Furby acts as what psychoanalyst D. W. Winnicott termed a "transitional object," one where the boundaries between self and object are not clear. See D. W. Winnicott, *Playing and Reality* (New York: Basic Books, 1971).
30. The idea that the Furby had the capacity to learn new words by "listening" to the language around it was persistent. The belief most likely stemmed from the fact that it was possible to have the Furby say certain preprogrammed words or phrases more often by petting it whenever it said them. As a result of this myth, several intelligence agencies banned Furbies from their offices, believing that they were recording devices camouflaged as toys.
31. Children move back and forth between he, she, and it in talking about relational artifacts. Once they make a choice, they do not always stick with it. I report on what children say and, thus, their sentences are sometimes inconsistent.
32. Peter H. Kahn and his colleagues studied online discussion groups that centered on Furbies. For their account, see Batya Friedman, Peter H. Kahn Jr., and Jennifer Hagman, "Hardware Companions? What Online AIBO Discussion Forums Reveal About the Human-Robotic Relationship," in *Proceedings of the Conference on Human Factors in Computing Systems* (New York: ACM Press, 2003), 273–280.

33. The artist Kelly Heaton played on the biological/mechanical tension in the Furby's body by creating a fur coat made entirely from the fur of four hundred "skinned" Furbies, reengineered into a coat for Mrs. Santa Claus. The artwork, titled Dead Pelt, was deeply disturbing. It also included a wall of reactive eyes and mouths, taken from Furbies, and a formal anatomical drawing of a Furby. See the Feldman Gallery's Kelly Heaton page at www.feldmangallery.com/pages/artistsrffa/arthea01.html (accessed August 18, 2009).
34. Baird developed her thought experiment comparing how people would treat a gerbil, a Barbie, and a Furby for a presentation at the Victoria Institute, Gothenburg, Sweden, in 1999.
35. In Turning's paper that argued the existence of intelligence if a machine could not be distinguished from a person, one scenario involved gender. In "Computing Machinery and Intelligence," he suggested an "imitation game": a man and then a computer pose as female, and the interrogator tries to distinguish them from a real woman. See Alan Turing, "Computing Machinery and Intelligence," *Mind* 59, no. 236 (October 1950): 433–460.
36. Antonio Damasio, *The Feeling of What Happens: Body and Emotion in the Making of Consciousness* (New York: Harcourt, 1999). Since emotions are cognitive representations of body states, the body cannot be separated from emotional life, just as emotion cannot be separated from cognition.
37. There are online worlds and communities where people feel comfortable expressing love for Furbies and seriously mourning Tamagotchis. These are places where a deep sense of connection to the robotic are shared. These "sanctioned spaces" play an important part in the development of the robotic moment. When you have company and a community, a sense of intimacy with sociable machines comes to feel natural. Over time, these online places begin to influence the larger community. At the very least, a cohort has grown up thinking that their attitudes toward the inanimate are widely shared.
38. BIT was developed by Brooks and his colleagues at the IS Robotics Corporation. IS Robotics was the precursor to iRobot, which first became well known as the makers of the Roomba robotic vacuum cleaner.
39. Rodney A. Brooks, *Flesh and Machines: How Robots Will Change Us* (New York: Pantheon, 2002), 202.

QUESTIONS FOR MAKING CONNECTIONS WITHIN THE READING

1. How have our relations to simulated life changed in the period from Joseph Weizenbaum's ELIZA to My Real Baby and Nexi? How has the technology evolved? In what ways have our culture and psychology changed in response to the technology's evolution? Who controls the process, judging from the evidence Turkle provides? Are scientists the ones really in charge, and, if so, what are their motives? If the scientists are not in charge, how about the manufacturers, like the Hasbro Company? How about consumers—the parents who buy the Furbies and Tamagotchis?

2. Turkle refers to what she calls our "human complicity in a digital fantasy." In what sense does our involvement with simulations qualify as "fantasy"? Doesn't everyone—even children—understand that Furbies are pretend creatures, not real living beings? If everyone understands, can we still be deceived in some way? What does Turkle have in mind when she distinguishes between a "psychology of projection" and a "psychology of engagement"? *Projection* refers to qualities we impose on things. Does *engagement* mean that our creations are in some way changing us in turn?
3. How have the new technologies changed the ways we think about life and being alive? If you read Turkle carefully, you can see that no single definition of *life* has become the dominant one, but in her account you can identify a range of responses. Among these responses what seem to be the most important differences and similarities? Have words like *alive* and *living* become meaningless? When we treat a Tamagotchi as alive—and when we mourn its "death"—are we giving life a new meaning or have we lost sight of reality?

QUESTIONS FOR WRITING

1. What does it say about the life of our times that people, even children, look to machines in order to meet their basic emotional needs? Does this development provide evidence of a poverty in our social and cultural lives? Are we starved for affection, closeness, family, and friendship? If we are, does our turn to technological solutions remedy the problem or only make it worse? Will the technologies of simulation ultimately make us more machine-like? Are we trying to humanize our machines, or have machines become the form of life we aspire to?
2. When we invest computers with human characteristics are we actually enlarging the world of human value and feeling, in much the same way as we give meaning to paintings, sculptures, and buildings? When people praise Michelangelo's *Pietà* for its emotional depth, or Van Gogh's *Sunflowers* for its vitality, they are ascribing to stone and pigments on canvas qualities these objects actually lack. Holden Caulfield from *The Catcher in the Rye* and Pip from *Great Expectations* have no real thoughts and feelings although we sometimes act as though they do. How does our response to Furbies and Tamagotchis differ from our response to works of art or fictional characters? When we humanize them, are we diminishing ourselves?

QUESTIONS FOR MAKING CONNECTIONS BETWEEN READINGS

1. Are Tamagotchis bad or are they good for our mental health? Considering the evidence that Turkle provides, would you say that devices like Furbies encourage dissociation of the kind described by Martha Stout in "When I Woke Up Tuesday Morning, It Was Friday"? A person like Julia seems fully functional in most contexts, and yet she absents herself from reality in ways that others never notice and that she herself never recognizes. Are devices like Tamagotchis actually machines for "spacing out," or do they instead prepare us to live more engaged and aware lives?
2. Ethan Watters's "The Mega-Marketing of Depression in Japan" makes the case that pharmaceutical companies have changed the psychology of the Japanese people in ways that will allow the companies to sell drugs designed to treat depression, an illness unknown in that country before the advent of Western psychiatry. Drug manufacturers see themselves as responding to a crucial human need—which, according to Watters, they actually create and profit from. Have the makers of Furbies and Tamagotchis done much the same thing? Are they creating needs in order to meet them? In what ways do the new technologies of simulated life force us to rethink the rationale behind technological development? Have we become the servants of our technology?