Johnson, Steven. Everything Bad is Good for You: How Today's Popular Culture is Actually Making Us Smarter. New York: Riverhead, 2006. Print.

SCIENTIST A: Has he asked for anything special?

SCIENTIST B: Yes, why, for breakfast . . . he requested something called "wheat germ, organic honey, and tiger's milk."

SCIENTIST A: Oh, yes. Those were the charmed substances that some years ago were felt to contain life-preserving properties.

SCIENTIST B: You mean there was no deep fat? No steak or cream pies or . . . hot fudge?

SCIENTIST A: Those were thought to be unhealthy. . . .

—from Woody Allen's *Sleeper*

Ours is an age besotted with graphic entertainments. And in an increasingly infantilized society, whose moral philosophy is reducible to a celebration of "choice," adults are decreasingly distinguishable from children in their absorption in entertainments and the kinds of entertainments they are absorbed in—video games, computer games, hand-held games, movies on their computers and so on. This is progress: more sophisticated delivery of stupidity.

—George Will

This book is an old-fashioned work of persuasion that ultimately aims to convince you of one thing: that popular culture has, on average, grown more complex and intellectually challenging over the past thirty years. Where most commentators assume a race to the bottom and a dumbing down—"an increasingly infantilized society," in George Will's words—I see a progressive story: mass culture growing more sophisticated, demanding more cognitive engagement with each passing year. Think of it as a kind of positive brainwashing: the popular media steadily, but almost imperceptibly, making our minds sharper, as we soak in entertainment usually dismissed as so much lowbrow fluff. I call this upward trend the Sleeper

Curve, after the classic sequence from Woody Allen's mock sci-fi film, where a team of scientists from 2173 are astounded that twentieth-century society failed to grasp the nutritional merits of cream pies and hot fudge.

I hope for many of you the argument here will resonate with a feeling you've had in the past, even if you may have suppressed it at the time—a feeling that the popular culture isn't locked in a spiral dive of deteriorating standards. Next time you hear someone complaining about violent TV mobsters, or accidental onscreen nudity, or the inanity of reality programming, or the dull stares of the Nintendo addicts, you should think of the Sleeper Curve rising steadily beneath all that superficial chaos. The sky is not falling. In many ways, the weather has never been better. It just takes a new kind of barometer to tell the difference.

Introduction

THE SLEEPER CURVE

EVERY CHILDHOOD HAS its talismans, the sacred objects that look innocuous enough to the outside world, but that trigger an onslaught of vivid memories when the grown child confronts them. For me, it's a sheaf of xeroxed numbers that my father brought home from his law firm when I was nine. These pages didn't seem, at first glance, like the sort of thing that would send a grade-schooler into rapture. From a distance you might have guessed that they were payroll reports, until you got close enough to notice that the names were familiar ones, even famous: Catfish Hunter, Pete Rose, Vida Blue. Baseball names, stranded in a sea of random numbers.

Those pages my dad brought home were part of a game,

though it was a game unlike any I had ever played. It was a baseball simulation called APBA, short for American Professional Baseball Association. APBA was a game of dice and data. A company in Lancaster, Pennsylvania, had analyzed the preceding season's statistics and created a collection of cards, one for each player who had played more than a dozen games that year. The cards contained a cryptic grid of digits that captured numerically each player's aptitudes on the baseball diamond: the sluggers and the strikeout prone, the control artists and the speed demons. In the simplest sense, APBA was a way of playing baseball with cards, or at least pretending to be a baseball *manager*: you'd pick out a lineup, decide on your starting pitchers, choose when to bunt and when to steal.

APBA sounds entertaining enough at that level of generality—what kid wouldn't want to manage a sports team?—but actually playing the game was a more complicated affair. On the simplest level, the game followed this basic sequence: you picked your players, decided on a strategy, rolled a few dice, and then consulted a "lookup chart" to figure out what happened—a strikeout, or a home run, a grounder to third.

But it was never quite that simple with APBA. You could play against a human opponent, or manage both teams yourself, and the decisions made for the opposing team transformed the variables in subtle but crucial ways. At the beginning of each game—and anytime you made a

substitution—you had to add up all the fielding ratings for each player in your lineup. Certain performance results would change if your team was unusually adept with the glove, while teams that were less talented defensively would generate more errors. There were completely different charts depending on the number of runners on base: if you had a man on third, you consulted the "Runner on Third" chart. Certain performance numbers came with different results, depending on the quality of the pitcher: if you were facing a "grade A" pitcher, according to the data on his card, you'd get a strikeout, while a "grade C" pitcher would generate a single to right field. And that was just scratching the surface of the game's complexity. Here's the full entry for "Pitching" on the main "Bases Empty" chart:

> The hitting numbers under which lines appear may be altered according to the grade of the pitcher against whom the team is batting. Always observe the grade of the pitcher and look for possible changes of those numbers which are underlined. "No Change" always refers back to the D, or left, column and always means a base hit. Against Grade D pitchers there is never any change—the left hand column only is used. When a pitcher is withdrawn from the game make a note of the grade of the pitcher who relieves him. If his grade is different, a different column must be referred to when the underlined numbers come up. Certain players may have the numbers

> 7, 8, and/or 11 in the second columns of their cards. When any of these numbers is found in the second column of a player card, it is not subject to normal grade changes. Always use the left (Grade D) column in these cases, no matter what the pitcher's grade is. Occasionally, pitchers may have A & C or A & B ratings. Always consider these pitchers as Grade A pitchers unless the A column happens to be a base hit. Then use the C or B column, as the case may be, for the final play result.

Got that? They might as well be the tax form instructions you'd happily pay an accountant to decipher. Reading these words now, I have to slow myself down just to follow the syntax, but my ten-year-old self had so thoroughly internalized this arcana that I played hundreds of APBA games without having to consult the fine print. *An 11 in the second column on the batter's card? Obviously,* obviously *that means ignore the normal grade changes for the pitcher. It'd be crazy not to!*

The creators of APBA devised such an elaborate system for understandable reasons: they were pushing the limits of the dice-and-cards genre to accommodate the statistical complexity of baseball. This mathematical intricacy was not limited to baseball simulations, of course. Comparable games existed for most popular sports: basketball sims that let you call a zone defense or toss a last-minute three-point Hail Mary before the clock ran out; boxing games that let

you replay Ali/Foreman without the rope-a-dope strategy. British football fans played games like Soccerboss and Wembley that let you manage entire franchises, trading players and maintaining the financial health of the virtual organization. A host of dice-based military simulations re-created historical battles or entire world wars with painstaking fidelity.

Perhaps most famously, players of Dungeons & Dragons and its many imitators built elaborate fantasy narratives—all by rolling twenty-sided dice and consulting bewildering charts that accounted for a staggering number of variables. The three primary manuals for playing the game were more than five hundred pages long, with hundreds of lookup charts that players consulted as though they were reading from scripture. (By comparison, consulting the APBA charts was like reading the back of a cereal box.) Here's the *Player's Handbook* describing the process by which a sample character is created:

> Monte wants to create a new character. He rolls four six-sided dice (4d6) and gets 5, 4, 4, and 1. Ignoring the lowest die, he records the result on scratch paper, 13. He does this five more times and gets these six scores: 13, 10, 15, 12, 8, and 14. Monte decides to play a strong, tough Dwarven fighter. Now he assigns his rolls to abilities. Strength gets the highest score, 15. His character has a +2 Strength bonus that will serve him well in combat. Con-

> stitution gets the next highest score, 14. The Dwarf's +2 Constitution racial ability adjustment [see Table 2-1: Racial Ability Adjustments, pg. 12] improves his Constitution score to 16, for a +3 bonus. . . . Monte has two bonus-range scores left (13 and 12) plus an average score (10). Dexterity gets the 13 (+1 bonus).

And that's merely defining the basic faculties for a character. Once you released your Dwarven fighter into the world, the calculations involved in determining the effects of his actions—attacking a specific creature with a specific weapon under specific circumstances with a specific squad of comrades fighting alongside you—would leave most kids weeping if you put the same charts on a math quiz.

Which gets to the ultimate question of why a ten-year-old found any of this *fun*. For me, the embarrassing truth of the matter is that I did ultimately grow frustrated with my baseball simulation, but not for the reasons you might expect. It wasn't that arcane language wore me down, or that I grew tired of switching columns on the Bases Empty chart, or that I decided that six hours was too long to spend alone in my room on a Saturday afternoon in July.

No, I moved on from APBA because it wasn't realistic enough.

My list of complaints grew as my experience with APBA deepened. Playing hundreds of simulated games revealed the blind spots and strange skews of the simulation. APBA

neglected the importance of whether your players were left-handed or right-handed, crucial to the strategy of baseball. The fielding talents of individual players were largely ignored. The vital decision to throw different kinds of pitches—sliders and curveballs and sinkers—was entirely absent. The game took no notice of *where* the games were being played: you couldn't simulate the vulnerable left-field fence in Fenway Park, so tempting to right-handed hitters, or the swirling winds of San Francisco's old Candlestick Park. And while APBA included historic teams, there was no way to factor in historical changes in the game when playing teams from different eras against each other.

And so over the next three years, I embarked on a long journey through the surprisingly populated world of dice-baseball simulations, ordering them from ads printed in the back of the *Sporting News* and Street and Smith's annual baseball guide. I dabbled with Strat-o-Matic, the most popular of the baseball sims; I sampled Statis Pro Baseball from Avalon Hill, maker of the then-popular Diplomacy board game; I toyed with one title called Time Travel baseball that specialized in drafting fantasy teams from a pool of historic players. I lost several months to a game called Extra Innings that bypassed cards and boards altogether; it didn't even come packaged in a box—just an oversized envelope stuffed with pages and pages of data. You rolled six separate dice to complete a play, sometimes consulting five or six separate pages to determine what had happened.

Eventually, like some kind of crazed addict searching for an ever-purer high, I found myself designing my own simulations, building entire games from scratch. I borrowed a twenty-sided die from my Dungeons & Dragons set—the math was far easier to do with twenty sides than it was with six. I scrawled out my play charts on yellow legal pads, and translated the last season's statistics into my own home-brewed player cards. For some people, I suppose, thinking of youthful baseball games conjures up the smell of leather gloves and fresh-cut grass. For me, what comes to mind is the statistical purity of the twenty-sided die.

This story, I freely admit, used to have a self-congratulatory moral to it. As a grownup, I would tell new friends about my fifth-grade days building elaborate simulations in my room, and on the surface I'd make a joke about how uncool I was back then, huddled alone with my twenty-sided dice while the other kids roamed outside playing capture the flag or, God forbid, *real* baseball. But the latent message of my story was clear: I was some kind of statistical prodigy, building simulated worlds out of legal pads and probability charts.

But I no longer think that my experience was all that unusual. I suspect millions of people from my generation probably have comparable stories to tell: if not of sports simulations then of Dungeons & Dragons, or the geopolitical strategy of games like Diplomacy, a kind of chess superimposed onto actual history. More important, in the quarter

century that has passed since I first began exploring those xeroxed APBA pages, what once felt like a maverick obsession has become a thoroughly mainstream pursuit.

This book is, ultimately, the story of how the kind of thinking that I was doing on my bedroom floor became an everyday component of mass entertainment. It's the story of how systems analysis, probability theory, pattern recognition, and—amazingly enough—old-fashioned *patience* became indispensable tools for anyone trying to make sense of modern pop culture. Because the truth is my solitary obsession with modeling complex simulations is now ordinary behavior for most consumers of digital age entertainment. This kind of education is not happening in classrooms or museums; it's happening in living rooms and basements, on PCs and television screens. This is the Sleeper Curve: The most debased forms of mass diversion—video games and violent television dramas and juvenile sitcoms—turn out to be nutritional after all. For decades, we've worked under the assumption that mass culture follows a steadily declining path toward lowest-common-denominator standards, presumably because the "masses" want dumb, simple pleasures and big media companies want to give the masses what they want. But in fact, the exact opposite is happening: the culture is getting more intellectually demanding, not less.

Most of the time, criticism that takes pop culture seriously involves performing some kind of symbolic analysis, decoding the work to demonstrate the way it represents

some other aspect of society. You can see this symbolic approach at work in academic cultural studies programs analyzing the ways in which pop forms expressed the struggle of various disenfranchised groups: gays and lesbians, people of color, women, the third world. You can see it at work in the "zeitgeist" criticism featured in media sections of newspapers and newsweeklies, where the critic establishes a symbolic relationship between the work and some spirit of the age: yuppie self-indulgence, say, or post-9/11 anxiety.

The approach followed in this book is more systemic than symbolic, more about causal relationships than metaphors. It is closer, in a sense, to physics than to poetry. My argument for the existence of the Sleeper Curve comes out of an assumption that the landscape of popular culture involves the clash of competing forces: the neurological appetites of the brain, the economics of the culture industry, changing technological platforms. The specific ways in which those forces collide play a determining role in the type of popular culture we ultimately consume. The work of the critic, in this instance, is to diagram those forces, not decode them.

Sometimes, for the sake of argument, I find it helpful to imagine culture as a kind of man-made weather system. Float a mass of warm, humid air over cold ocean water, and you'll create an environment in which fog will thrive. The fog doesn't appear because it somehow symbolically reenacts the clash of warm air and cool water. Fog arrives instead as an emergent effect of that particular system and its internal dynamics. The same goes with popular culture: certain kinds of environments encourage cognitive complexity; others discourage complexity. The cultural object—the film or the video game—is not a metaphor for that system; it's more like an output or a result.

The forces at work in these systems operate on multiple levels: underlying changes in technology that enable new kinds of entertainment; new forms of online communications that cultivate audience commentary about works of pop culture; changes in the economics of the culture industry that encourage repeat viewing; and deep-seated appetites in the human brain that seek out reward and intellectual challenge. To understand those forces we'll need to draw upon disciplines that don't usually interact with one another: economics, narrative theory, social network analysis, neuroscience.

This is a story of trends, not absolutes. I do not believe that most of today's pop culture is made up of masterpieces that will someday be taught alongside Joyce and Chaucer in college survey courses. The television shows and video games and movies that we'll look at in the coming pages are not, for the most part, Great Works of Art. But they are more complex and nuanced than the shows and games that preceded them. While the Sleeper Curve maps *average* changes across the pop cultural landscape—and not just the

complexity of single works—I have focused on a handful of representative examples in the interest of clarity. (The endnotes offer a broader survey.)

I believe that the Sleeper Curve is the single most important new force altering the mental development of young people today, and I believe it is largely a force for good: enhancing our cognitive faculties, not dumbing them down. And yet you almost never hear this story in popular accounts of today's media. Instead, you hear dire stories of addiction, violence, mindless escapism. "All across the political spectrum," television legend Steve Allen writes in a *Wall Street Journal* op-ed, "thoughtful observers are appalled by what passes for TV entertainment these days. No one can claim that the warning cries are simply the exaggerations of conservative spoil-sports or fundamentalist preachers. . . . The sleaze and classless garbage on TV in recent years exceeds the boundaries of what has traditionally been referred to as Going Too Far." The influential Parents Television Council argues: "The entertainment industry has pushed the content envelope too far; television and films filled with sex, violence, and profanity send strong negative messages to the youth of America—messages that will desensitize them and make for a far more disenfranchised society as these youths grow into adults." And then there's syndicated columnist Suzanne Fields: "The television sitcom is emblematic of our culture; parents, no matter what their degree of education, have abandoned the simplest standard of

shame. Their children literally 'do not know better.' The drip, drip, drip of the popular culture dulls our senses. An open society with high technology exposes increasing numbers of adults and children to the lowest common denomination of sex and violence." You could fill an encyclopedia volume with all the kindred essays published in the past decade.

Exceptions to this dire assessment exist, but they are of the rule-proving variety. You'll see the occasional grudging acknowledgments of minor silver linings: an article will suggest that video games enhance visual memory skills, or a critic will hail *The West Wing* as the rare flowering of thoughtful programming in the junkyard of prime-time television. But the dominant motif is one of decline and atrophy: we're a nation of reality program addicts and Nintendo freaks. Lost in that account is the most interesting trend of all: that the popular culture has been growing increasingly complex over the past few decades, exercising our minds in powerful new ways.

But to see the virtue in this form of positive brainwashing, we need to begin by doing away with the tyranny of the morality play. When most op-ed writers and talk show hosts discuss the social value of media, when they address the question of whether today's media is or isn't good for us, the underlying assumption is that entertainment improves us when it carries a healthy message. Shows that promote smoking or gratuitous violence are bad for us, while those

that thunder against teen pregnancy or intolerance have a positive role in society. Judged by that morality play standard, the story of popular culture over the past fifty years—if not five hundred—is a story of steady decline: the morals of the stories have grown darker and more ambiguous, and the anti-heroes have multiplied.

The usual counterargument here is that what media has lost in moral clarity it has gained in realism. The real world doesn't come in nicely packaged public service announcements, and we're better off with entertainment that reflects that fallen state with all its ethical ambiguity. I happen to be sympathetic to that argument, but it's not the one I want to make here. I think there is another way to assess the social virtue of pop culture, one that looks at media as a kind of cognitive workout, not as a series of life lessons. Those dice baseball games I immersed myself in didn't contain anything resembling moral instruction, but they nonetheless gave me a set of cognitive tools that I continue to rely on, nearly thirty years later. There may indeed be more "negative messages" in the mediasphere today, as the Parents Television Council believes. But that's not the only way to evaluate whether our television shows or video games are having a positive impact. Just as important—if not *more* important—is the kind of thinking you have to do to make sense of a cultural experience. That is where the Sleeper Curve becomes visible. Today's popular culture may not be showing us the righteous path. But it is making us smarter.

PART ONE

* * *

The student of media soon comes to expect the new media of any period whatever to be classed as pseudo by those who acquired the patterns of earlier media, whatever they may happen to be.

—MARSHALL MCLUHAN

Games

You can't get much more conventional than the conventional wisdom that kids today would be better off spending more time reading books, and less time zoning out in front of their video games. The latest edition of *Dr. Spock*—"revised and fully expanded for a new century" as the cover reports—has this to say of video games: "The best that can be said of them is that they may help promote eye-hand coordination in children. The worst that can be said is that they sanction, and even promote aggression and violent responses to conflict. But what can be said with much greater certainty is this: most computer games are a colossal waste of time." But where reading is concerned, the advice is quite

different: "I suggest you begin to foster in your children a love of reading and the printed word from the start. . . . What is important is that your child be an avid reader."

In the middle of 2004, the National Endowment for the Arts released a study that showed that reading for pleasure had declined steadily among all major American demographic groups. The writer Andrew Solomon analyzed the consequences of this shift: "People who read for pleasure are many times more likely than those who don't to visit museums and attend musical performances, almost three times as likely to perform volunteer and charity work, and almost twice as likely to attend sporting events. Readers, in other words, are active, while nonreaders—more than half the population—have settled into apathy. There is a basic social divide between those for whom life is an accrual of fresh experience and knowledge, and those for whom maturity is a process of mental atrophy. The shift toward the latter category is frightening."

The intellectual nourishment of reading books is so deeply ingrained in our assumptions that it's hard to contemplate a different viewpoint. But as McLuhan famously observed, the problem with judging new cultural systems on their own terms is that the presence of the recent past inevitably colors your vision of the emerging form, highlighting the flaws and imperfections. Games have historically suffered from this syndrome, largely because they have been contrasted with the older conventions of reading. To

get around these prejudices, try this thought experiment. Imagine an alternate world identical to ours save one techno-historical change: video games were invented and popularized *before* books. In this parallel universe, kids have been playing games for centuries—and then these page-bound texts come along and suddenly they're all the rage. What would the teachers, and the parents, and the cultural authorities have to say about this frenzy of reading? I suspect it would sound something like this:

> Reading books chronically understimulates the senses. Unlike the longstanding tradition of gameplaying—which engages the child in a vivid, three-dimensional world filled with moving images and musical soundscapes, navigated and controlled with complex muscular movements—books are simply a barren string of words on the page. Only a small portion of the brain devoted to processing written language is activated during reading, while games engage the full range of the sensory and motor cortices.
>
> Books are also tragically isolating. While games have for many years engaged the young in complex social relationships with their peers, building and exploring worlds together, books force the child to sequester him or herself in a quiet space, shut off from interaction with other children. These new "libraries" that have arisen in recent years to facilitate reading activities are a frightening sight: dozens of young children, normally so vivacious

and socially interactive, sitting alone in cubicles, reading silently, oblivious to their peers.

Many children enjoy reading books, of course, and no doubt some of the flights of fancy conveyed by reading have their escapist merits. But for a sizable percentage of the population, books are downright discriminatory. The reading craze of recent years cruelly taunts the 10 million Americans who suffer from dyslexia—a condition that didn't even exist as a condition until printed text came along to stigmatize its sufferers.

But perhaps the most dangerous property of these books is the fact that they follow a fixed linear path. You can't control their narratives in any fashion—you simply sit back and have the story dictated to you. For those of us raised on interactive narratives, this property may seem astonishing. Why would anyone want to embark on an adventure utterly choreographed by another person? But today's generation embarks on such adventures millions of times a day. This risks instilling a general passivity in our children, making them feel as though they're powerless to change their circumstances. Reading is not an active, participatory process; it's a submissive one. The book readers of the younger generation are learning to "follow the plot" instead of learning to lead.

It should probably go without saying, but it probably goes better with saying, that I don't agree with this argument. But neither is it exactly right to say that its contentions are untrue. The argument relies on a kind of amplified selectivity: it foregrounds certain isolated properties of books, and then projects worst-case scenarios based on these properties and their potential effects on the "younger generation." But it doesn't bring up any of the clear benefits of reading: the complexity of argument and storytelling offered by the book form; the stretching of the imagination triggered by reading words on a page; the shared experience you get when everyone is reading the same story.

A comparable sleight of hand is at work anytime you hear someone bemoaning today's video game obsessions, and their stupefying effects on tomorrow's generations. Games are not novels, and the ways in which they harbor novelistic aspirations are invariably the least interesting thing about them. You can judge games by the criteria designed to evaluate novels: Are the characters believable? Is the dialogue complex? But inevitably, the games will come up wanting. Games are good at novelistic storytelling the way Michael Jordan was good at playing baseball. Both could probably make a living at it, but their world-class talents lie elsewhere.

Before we get to those talents, let me say a few words about the virtues of reading books. For the record, I think those virtues are immense ones—and not just because I make a living writing books. We should all encourage our kids to read more, to develop a comfort with and an appetite

for reading. But even the most avid reader in this culture is invariably going to spend his or her time with other media—with games, television, movies, or the Internet. And these other forms of culture have intellectual or cognitive virtues in their own right—different from, but comparable to, the rewards of reading.

What are the rewards of reading, exactly? Broadly speaking, they fall into two categories: the information conveyed by the book, and the mental work you have to do to process and store that information. Think of this as the difference between acquiring information and exercising the mind. When we encourage kids to read for pleasure, we're generally doing so because of the mental exercise involved. In Andrew Solomon's words: "[Reading] requires effort, concentration, attention. In exchange, it offers the stimulus to and the fruit of thought and feeling." Spock says: "Unlike most amusements, reading is an activity requiring active participation. We must do the reading ourselves—actively scan the letters, make sense of the words, and follow the thread of the story." Most tributes to the mental benefits of reading also invoke the power of imagination; reading books forces you to concoct entire worlds in your head, rather than simply ingest a series of prepackaged images. And then there is the slightly circular—though undoubtedly true—argument for the long-term career benefits: being an avid reader is good for you because the educational

system and the job market put a high premium on reading skills.

To summarize, the cognitive benefits of reading involve these faculties: effort, concentration, attention, the ability to make sense of words, to follow narrative threads, to sculpt imagined worlds out of mere sentences on the page. Those benefits are themselves amplified by the fact that society places a substantial emphasis on precisely this set of skills.

The very fact that I am presenting this argument to you in the form of a book and not a television drama or a video game should make it clear that I believe the printed word remains the most powerful vehicle for conveying complicated information—though the *electronic* word is starting to give printed books a run for their money. The argument that follows is centered squarely on the side of mental exercise—and not content. I aim to persuade you of two things:

1. By almost all the standards we use to measure reading's cognitive benefits—attention, memory, following threads, and so on—the nonliterary popular culture has been steadily growing more challenging over the past thirty years.
2. Increasingly, the nonliterary popular culture is honing *different* mental skills that are just as important as the ones exercised by reading books.

Despite the warnings of Dr. Spock, the most powerful examples of both these trends are found in the world of video games. Over the past few years, you may have noticed the appearance of a certain type of story about gaming culture in mainstream newspapers and periodicals. The message of that story ultimately reduces down to: Playing video games may not actually be a *complete* waste of time. Invariably these stories point to some new study focused on a minor side effect of gameplaying—often manual dexterity or visual memory—and explain that heavy gamers show improved skills compared to non-gamers. (The other common let's-take-games-seriously story is financial, usually pointing to the fact that the gaming industry now pulls in more money than Hollywood.)

Now, I have no doubt that playing today's games does in fact improve your visual intelligence and your manual dexterity, but the virtues of gaming run far deeper than hand-eye coordination. When I read these ostensibly positive accounts of video games, they strike me as the equivalent of writing a story about the merits of the great novels and focusing on how reading them can improve your spelling. It's true enough, I suppose, but it doesn't do justice to the rich, textured experience of novel reading. There's a comparable blindness at work in the way games have been covered to date. For all the discussion of gaming culture that you see, the actual experience of playing games has been strangely misrepresented. We hear a lot about the content of games:

the carnage and drive-by killings and adolescent fantasies. But we rarely hear accurate descriptions about what it actually *feels like* to spend time in these virtual worlds. I worry about the experiential gap between people who have immersed themselves in games, and people who have only heard secondhand reports, because the gap makes it difficult to discuss the meaning of games in a coherent way. It reminds me of the way the social critic Jane Jacobs felt about the thriving urban neighborhoods she documented in the sixties: "People who know well such animated city streets will know how it is. People who do not will always have it a little wrong in their heads—like the old prints of rhinoceroses made from travelers' descriptions of the rhinoceroses."

So what does the rhinoceros actually look like? The first and last thing that should be said about the experience of playing today's video games, the thing you almost never hear in the mainstream coverage, is that games are fiendishly, sometimes maddeningly, *hard*.

* * *

THE DIRTY little secret of gaming is how much time you spend not having fun. You may be frustrated; you may be confused or disoriented; you may be stuck. When you put the game down and move back into the real world, you may find yourself mentally working through the problem you've

been wrestling with, as though you were worrying a loose tooth. If this is mindless escapism, it's a strangely masochistic version. Who wants to escape to a world that irritates you 90 percent of the time?

Consider the story of Troy Stolle, a construction site worker from Indianapolis profiled by the technology critic Julian Dibbell. When he's not performing his day job as a carpenter building wooden molds, Stolle lives in the virtual world of *Ultima Online,* the fantasy-themed game that allows you to create a character—sometimes called an avatar—and interact with thousands of other avatars controlled by other humans, connected to the game over the Net. (Imagine a version of Dungeons & Dragons where you're playing with thousands of strangers from all over the world, and you'll get the idea.) *Ultima* and related games like *EverQuest* have famously developed vibrant simulated economies that have begun to leak out into the real world. You can buy a magic sword or a plot of land—entirely made of digital code, mind you—for hundreds of dollars on eBay. But earning these goods the old-fashioned within-the-gameworld way takes time—a lot of time. Dibbell describes the ordeal Stolle had to go through to have his avatar, named Nils Hansen, purchase a new house in the *Ultima* world:

> Stolle had had to come up with the money for the deed. To get the money, he had to sell his old house. To get that house in the first place, he had to spend hours crafting virtual swords and plate mail to sell to a steady clientele of about three dozen fellow players. To attract and keep that clientele, he had to bring Nils Hansen's blacksmithing skills up to Grandmaster. To reach that level, Stolle spent six months doing nothing but smithing: He clicked on hillsides to mine ore, headed to a forge to click the ore into ingots, clicked again to turn the ingots into weapons and armor, and then headed back to the hills to start all over again, each time raising Nils' skill level some tiny fraction of a percentage point, inching him closer to the distant goal of 100 points and the illustrious title of Grandmaster Blacksmith.
>
> Take a moment now to pause, step back, and consider just what was going on here: Every day, month after month, a man was coming home from a full day of bone-jarringly repetitive work with hammer and nails to put in a full night of finger-numbingly repetitive work with "hammer" and "anvil"—and paying $9.95 per month for the privilege. Ask Stolle to make sense of this, and he has a ready answer: "Well, it's not work if you enjoy it." Which, of course, begs the question: Why would anyone enjoy it?

Why? Anyone who has spent more than a few hours trying to complete a game knows the feeling: you get to a point where there's a sequence of tasks you know you have to complete to proceed further into the world, but the tasks

themselves are more like chores than entertainment, something you *have* to do, not something you want to do: building roads and laying power lines, retreating through a tunnel sequence to find an object you've left behind, conversing with characters when you've already memorized their lines. And yet a large part of the population performing these tasks every day is composed of precisely the demographic group most averse to doing chores. If you practically have to lock kids in their room to get them to do their math homework, and threaten to ground them to get them to take out the trash, then why are they willing to spend six months smithing in *Ultima*? You'll often hear video games included on the list of the debased instant gratifications that abound in our culture, right up there with raunchy music videos and fast food. But compared to most forms of popular entertainment, games turn out to be all about *delayed* gratification—sometimes so long delayed that you wonder if the gratification is ever going to show.

The clearest measure of the cognitive challenges posed by modern games is the sheer size of the cottage industry devoted to publishing game guides, sometimes called walkthroughs, that give you detailed, step-by-step explanations of how to complete the game that is currently torturing you. During my twenties, I'd wager that I spent somewhere shockingly close to a thousand dollars buying assorted cheat sheets, maps, help books, and phone support to assist my usually futile attempt to complete a video game. My relationship to these reference texts is intimately bound up with my memory of each game, so that the *Myst* sequel *Riven* brings to mind those hours on the automated phone support line, listening to a recorded voice explain that the lever has to be rotated 270 degrees before the blue pipe will connect with the transom, while the playful *Banjo-Kazooie* conjures up a cheery atlas of vibrant level maps, like a child's book where the story has been replaced with linear instruction sets: jump twice on the mushroom, then grab the gold medallion in the moat. Admitting just how much money I spent on these guides sounds like a cry for help, I know, but the great, looming racks of these game guides at most software stores are clear evidence that I am not alone in this habit. The guidebook for the controversial hit game *Grand Theft Auto* alone has sold more than 1.6 million copies.

Think about the existence of these guides in the context of other forms of popular entertainment. There are plenty of supplementary texts that accompany Hollywood movies or Billboard chart-toppers: celebrity profiles, lyrics sheets, reviews, fan sites, commentary tracks on DVDs. These texts can widen your understanding of a film or an album, but you'll almost never find yourself *needing* one. People don't walk into theaters with guidebooks that they consult via flashlight during the film. But they regularly rely on these guides when playing a game. The closest cultural form to the game guide is the august tradition of CliffsNotes marketed as readers' supplements to the Great Books. There's noth-

ing puzzling about the existence of CliffsNotes: we accept both the fact that the Great Books are complicated, and the fact that millions of young people are forced more or less against their will to at least pretend to read them. Ergo: a thriving market for CliffsNotes. Game guides, however, confound our expectations: because we're not used to accepting the complexity of gaming culture, and because nobody's forcing the kids to master these games.

The need for such guides is a relatively new development: you didn't need ten pages to explain the *PacMan* system, but two hundred pages barely does justice to an expanding universe like *EverQuest* or *Ultima*. You need them because the complexity of these worlds can be overwhelming: you're stuck in the middle of a level, with all the various exits locked and no sign of a key. Or the password for the control room you thought you found two hours ago turns out not to work. Or the worst case: you're wandering aimlessly through hallways, like those famous tracking shots from *The Shining*, and you've got no real idea what you're supposed to be doing next.

This aimlessness, of course, is the price of interactivity. You're more in control of the narrative now, but your supply of information about the narrative—whom you should talk to next, where that mysterious package has been hidden—is only partial, and so playing one of these games is ultimately all about filling in that information gap. When it works, it can be exhilarating, but when it doesn't—well,

that's when you start shelling out the fifteen bucks for the cheat sheet. And then you find yourself hunched over the computer screen, help guide splayed open on the desk, flipping back and forth between the virtual world and the level maps, trying to find your way. After a certain point—perhaps when the level maps don't turn out to be all that helpful, or perhaps when you find yourself reading the help guides over dinner—you start saying to yourself: Remind me why this is fun?

* * *

SO WHY does anyone bother playing these things? Why do we use the word "play" to describe this torture? I'm always amazed to see what our brains are willing to tolerate to reach the next level in these games. Several years ago I found myself on a family vacation with my seven-year-old nephew, and on one rainy day I decided to introduce him to the wonders of *SimCity 2000*, the legendary city simulator that allows you to play Robert Moses to a growing virtual metropolis. For most of our session, I was controlling the game, pointing out landmarks as I scrolled around my little town. I suspect I was a somewhat condescending guide—treating the virtual world as more of a model train layout than a complex system. But he was picking up the game's inner logic nonetheless. After about an hour of tinkering, I was concentrating on trying to revive one particularly run-

down manufacturing district. As I contemplated my options, my nephew piped up: "I think we need to lower our industrial tax rates." He said it as naturally, and as confidently, as he might have said, "I think we need to shoot the bad guy."

The interesting question here for me is not whether games are, on the whole, more complex than most other cultural experiences targeted at kids today—I think the answer to that is an emphatic yes. The question is why kids are so eager to soak up that much information when it is delivered to them in game form. My nephew would be asleep in five seconds if you popped him down in an urban studies classroom, but somehow an hour of playing *SimCity* taught him that high tax rates in industrial areas can stifle development. That's a powerful learning experience, for reasons we'll explore in the coming pages. But let's start with the more elemental question of desire. Why does a seven-year-old soak up the intricacies of industrial economics in game form, when the same subject would send him screaming for the exits in a classroom?

The quick explanations of this mystery are not helpful. Some might say it's the flashy graphics, but games have been ensnaring our attention since the days of *Pong*, which was—graphically speaking—a huge step backward compared with television or movies, not to mention reality. Others would say it's the violence and sex, and yet games like *SimCity*—and indeed most of the best-selling games of all time—have

almost no violence and sex in them. Some might argue that it's the interactivity that hooks, the engagement of building your own narrative. But if active participation alone functions as a drug that entices the mind, then why isn't the supremely *passive* medium of television repellant to kids?

Why do games captivate? I believe the answer involves a deeper property that most games share—a property that will be instantly familiar to anyone who has spent time in this world, but one that is also strangely absent from most outside descriptions. To appreciate this property you need to look at game culture through the lens of neuroscience. There's a logical reason to use that lens, of course: If you're trying to figure out why cocaine is addictive, you need a working model of what cocaine is, and you need a working model of how the brain functions. The same goes for the question of why games are such powerful attractors. Explaining that phenomenon without a working model of the mind tells only half the story.

This emphasis on the inner life of the brain will be a recurring theme in the coming pages. Cultural critics like to speculate on the cognitive changes induced by new forms of media, but they rarely invoke the insights of brain science and other empirical research in backing up those claims. All too often, this has the effect of reducing their arguments to mere superstition. If you're trying to make sense of a new cultural form's effect on the way we view the world, you need to be able to describe the cultural object in some de-

tail, and also demonstrate how that object transforms the mind that is apprehending it. In some instances, you can measure that transformation through traditional modes of intelligence testing; in some cases, you can measure changes by looking at brain activity directly, thanks to modern scanning technology; and in cases where the empirical research hasn't yet been done, you can make informed speculation based on our understanding of how the brain works.

To date, there has been very little direct research into the question of how games manage to get kids to learn without realizing that they're learning. But a strong case can be made that the power of games to captivate involves their ability to tap into the brain's natural reward circuitry. Because of its central role in drug addiction, the reward circuits of the brain have been extensively studied and mapped in recent years. Two insights that have emerged from this study are pertinent to the understanding of games. First, neuroscientists have drawn a crucial distinction between the way the brain seeks out reward and the way it delivers pleasure. The body's natural painkillers, the opioids, are the brain's pure pleasure drugs, while the reward system revolves around the neurotransmitter dopamine interacting with specific receptors in a part of the brain called the nucleus accumbens.

The dopamine system is a kind of accountant: keeping track of expected rewards, and sending out an alert—in the form of lowered dopamine levels—when those rewards don't arrive as promised. When the pack-a-day smoker de-

prives himself of his morning cigarette; when the hotshot Wall Street trader doesn't get the bonus he was planning on; when the late-night snacker opens the freezer to find someone's pilfered all the Ben & Jerry's—the disappointment and craving these people experience is triggered by lowered dopamine levels.

The neuroscientist Jaak Panksepp calls the dopamine system the brain's "seeking" circuitry, propelling us to seek out new avenues for reward in our environment. Where our brain wiring is concerned, the craving instinct triggers a desire to explore. The system says, in effect: "Can't find the reward you were promised? Perhaps if you just look a little harder you'll be in luck—it's got to be around here somewhere."

How do these findings connect to games? Researchers have long suspected that geometric games like *Tetris* have such a hypnotic hold over us (longtime *Tetris* players have vivid dreams about the game) because the game's elemental shapes activate modules in our visual system that execute low-level forms of pattern recognition—sensing parallel and perpendicular lines, for instance. These modules are churning away in the background all the time, but the simplified graphics of *Tetris* bring them front and center in our consciousness. I believe that what *Tetris* does to our visual circuitry, most video games do to the reward circuitry of the brain.

Real life is full of rewards, which is one reason why there

are now so many forms of addiction. You can be rewarded by love and social connection, financial success, drug abuse, shopping, chocolate, and watching your favorite team win the Super Bowl. But supermarkets and shopping malls aside, most of life goes by without the potential rewards available to you being clearly defined. You know you'd like that promotion, but it's a long way off, and right now you've got to deal with getting this memo out the door. Real-life reward usually hovers at the margins of day-to-day existence—except for the more primal rewards of eating and making love, both of which exceed video games in their addictiveness.

In the gameworld, reward is everywhere. The universe is literally teeming with objects that deliver very clearly articulated rewards: more life, access to new levels, new equipment, new spells. Game rewards are fractal; each scale contains its own reward network, whether you're just learning to use the controller, or simply trying to solve a puzzle to raise some extra cash, or attempting to complete the game's ultimate mission. Most of the crucial work in game interface design revolves around keeping players notified of potential rewards available to them, and how much those rewards are currently needed. Just as *Tetris* streamlines the fuzzy world of visual reality to a core set of interacting shapes, most games offer a fictional world where rewards are larger, and more vivid, more clearly defined, than life.

This is true even of games that have been rightly celebrated for their open-endedness. *SimCity* is famous for not forcing the player along a preordained narrative line; you can build any kind of community you want: small farming villages, vast industrial Coketowns, high-centric edge cities or pedestrian-friendly neighborhoods. But the game has a subtle reward architecture that plays a major role in the game's addictiveness: the software withholds a trove of objects and activities until you've reached certain predefined levels, either of population, money, or popularity. You can build pretty much any kind of environment you want playing *SimCity*, but you can't build a baseball stadium until you have fifty thousand residents. Similarly, *Grand Theft Auto* allows players to drive aimlessly through a vast urban environment, creating their own narratives as they explore the space. But for all that open-endedness, the game still forces you to complete a series of pre-defined missions before you are allowed to enter new areas of the city. The very games that are supposed to be emblems of unstructured user control turn out to dangle rewards at every corner.

"Seeking" is the perfect word for the drive these designs instill in their players. You want to win the game, of course, and perhaps you want to see the game's narrative completed. In the initial stages of play, you may just be dazzled by the game's graphics. But most of the time, when you're hooked on a game, what draws you in is an elemental form of desire: the desire to *see the next thing*. You want to cross that bridge to see what the east side of the city looks like,

or try out that teleportation module, or build an aquarium on the harbor. To someone who has never felt that sort of compulsion, the underlying motivation can seem a little strange: you want to build the aquarium not, in the old mountaineering expression, because it's there, but rather because it's not there, or not there *yet*. It's not there, but you know—because you've read the manual or the game guide, or because the interface is flashing it in front of your eyes—you know that if you just apply yourself, if you spend a little more time cultivating new residents and watching the annual budget, the aquarium will eventually be yours to savor.

In a sense, neuroscience has offered up a prediction here, one that games obligingly confirm. If you create a system where rewards are both clearly defined and achieved by exploring an environment, you'll find human brains drawn to those systems, even if they're made up of virtual characters and simulated sidewalks. It's not the subject matter of these games that attracts—if that were the case, you'd never see twenty-somethings following absurd rescue-the-princess storylines like the best-selling *Zelda* series on the Nintendo platform. It's the reward system that draws those players in, and keeps their famously short attention spans locked on the screen. No other form of entertainment offers that cocktail of reward and exploration: we don't "explore" movies or television or music in anything but the most figurative

sense of the word. And while there are rewards to those other forms—music in fact has been shown to trigger opioid release in the brain—they don't come in the exaggerated, tantalizing packaging that video games wrap around them.

You might reasonably object at this point that I have merely demonstrated that video games are the digital equivalent of crack cocaine. Crack also has a powerful hold over the human brain, thanks in part to its manipulations of the dopamine system. But that doesn't make it a good thing. If games have been unwittingly designed to lock into our brain's reward architecture, then what positive value are we getting out of that intoxication? Without that positive value the Sleeper Curve is meaningless.

Here again, you have to shed your expectations about older cultural forms to make sense of the new. Game players are not soaking up moral counsel, life lessons, or rich psychological portraits. They are not having emotional experiences with their Xbox, other than the occasional adrenaline rush. The narratives they help create now rival pulp Hollywood fare, which is an accomplishment when measured against the narratives of *PacMan* and *Pong*, but it's still setting the bar pretty low. With the occasional exception, the actual *content* of the game is often childish or gratuitously menacing—though, again, not any more so than your average summer blockbuster. Complex social and historical simulations like *Age of Empires or Civilization* do dominate

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the game charts, and no doubt these games do impart some useful information about ancient Rome or the design of mass transit systems. But much of the roleplay inside the gaming world alternates between drive-by shooting and princess rescuing.

De-emphasizing the content of game culture shouldn't be seen as a cop-out. We ignore the content of many activities that are widely considered to be good for the brain or the body. No one complains about the simplistic, militaristic plot of chess games. ("It always ends the same way!") We teach algebra to children knowing full well that the day they leave the classroom, ninety-nine percent of those kids will never again directly employ their algebraic skills. Learning algebra isn't about acquiring a specific tool; it's about building up a mental muscle that will come in handy elsewhere. You don't go to the gym because you're interested in learning how to operate a StairMaster; you go to the gym because operating a StairMaster does something laudable to your body, the benefits of which you enjoy during the many hours of the week when you're not on a StairMaster.

So it is with games. It's not *what* you're thinking about when you're playing a game, it's *the way* you're thinking that matters. The distinction is not exclusive to games, of course. Here's John Dewey, in his book *Experience and Education*: "Perhaps the greatest of all pedagogical fallacies is the notion that a person learns only that particular thing he is studying at the time. Collateral learning in the way of

formation of enduring attitudes, of likes and dislikes, may be and often is much more important than the spelling lesson or lesson in geography or history that is learned. For these attitudes are fundamentally what count in the future."

This is precisely where we need to make our portrait of the rhinoceros as accurate as possible: defining the collateral learning that goes beyond the explicit content of the experience. Start with the basics: far more than books or movies or music, games force you to make *decisions*. Novels may activate our imagination, and music may conjure up powerful emotions, but games force you to decide, to choose, to prioritize. All the intellectual benefits of gaming derive from this fundamental virtue, because learning how to think is ultimately about learning to make the right decisions: weighing evidence, analyzing situations, consulting your long-term goals, and then deciding. No other pop cultural form directly engages the brain's decision-making apparatus in the same way. From the outside, the primary activity of a gamer looks like a fury of clicking and shooting, which is why so much of the conventional wisdom about games focuses on hand-eye coordination. But if you peer inside the gamer's mind, the primary activity turns out to be another creature altogether: making decisions, some of them snap judgments, some long-term strategies.

Those decisions are themselves predicated on two modes of intellectual labor that are key to the collateral learning of playing games. I call them *probing* and *telescoping*.

THE INTERNET

VIEWERS WHO GET LOST in *24*'s social network have a resource available to them that *Dallas* viewers lacked: the numerous online sites and communities that share information about popular television shows. Just as *Apprentice* viewers mulled Troy's shady business ethics in excruciating detail, *24* fans exhaustively document and debate every passing glance and brief allusion in the series, building detailed episode guides and lists of Frequently Asked Questions. One Yahoo! site featured at the time of this writing more than forty thousand individual posts from ordinary viewers, contributing their own analysis of last night's episode, posting questions about plot twists, or speculating on the upcoming season. As the shows have complexified, the resources for making sense of that complexity have multiplied as well. If you're lost in *24*'s social network, you can always get your bearings online.

All of which brings us to another crucial piece in the puzzle of the Sleeper Curve: the Internet. Not just because the online world offers resources that help sustain more complex programming in other media, but because the process of acclimating to the new reality of networked communications has had a salutary effect on our minds. We do well to remind ourselves how quickly the industrialized world has embraced the many forms of participatory electronic media—from

e-mail to hypertext to instant messages and blogging. Popular audiences embraced television and the cinema in comparable time frames, but neither required the learning curve of e-mail or the Web. It's one thing to adapt your lifestyle to include time for sitting around watching a moving image on a screen; it's quite another to learn a whole new language of communication and a small army of software tools along with it. It seems almost absurd to think of this now, but when the idea of hypertext documents first entered the popular domain in the early nineties, it was a distinctly avant-garde idea, promoted by an experimentalist literary fringe looking to explode the restrictions of the linear sentence and the page-bound book. Fast forward less than a decade, and something extraordinary occurs: exploring nonlinear document structures becomes as second nature as dialing a phone for hundreds of millions—if not billions—of people. The mass embrace of hypertext is like the *Seinfeld* "Betrayal" episode: a cultural form that was once exclusively limited to avant-garde sensibilities, now happily enjoyed by grandmothers and third-graders worldwide.

I won't dwell on this point, because the premise that increased interactivity is good for the brain is not a new one. (A number of insightful critics—Kevin Kelly, Douglas Rushkoff, Janet Murray, Howard Rheingold, Henry Jenkins—have made variations on this argument over the past decade or so.) But let me say this much: The rise of the Internet has challenged our minds in three fundamental and

related ways: by virtue of being participatory, by forcing users to learn new interfaces, and by creating new channels for social interaction.

Almost all forms of online activity sustained are participatory in nature: writing e-mails, sending IMs, creating photo logs, posting two-page analyses of last night's *Apprentice* episode. Steve Jobs likes to describe the difference between television and the Web as the difference between lean-back and sit-forward media. The networked computer makes you lean in, focus, engage, while television encourages you to zone out. (Though not as much as it used to, of course.) This is the familiar interactivity-is-good-for-you argument, and it's proof that the conventional wisdom is, every now and then, actually wise.

There was a point several years ago, during the first wave of Internet cheerleading, when it was still possible to be a skeptic about how participatory the new medium would turn out to be. Everyone recognized that the practices of composing e-mail and clicking on hyperlinks were going to be mainstream activities, but how many people out there were ultimately going to be interested in publishing more extensive material online? And if that turned out to be a small number—if the Web turned out to be a medium where most of the content was created by professional writers and editors—was it ultimately all that different from the previous order of things?

The tremendous expansion of the blogging world over

the past two years has convincingly silenced this objection. According to a 2004 study by the Pew Charitable Trust, more than 8 million Americans report that they have a personal weblog or online diary. The wonderful blog-tracking service Technorati reports that roughly 275,000 blog entries are published in the average day—a tiny fraction of them authored by professional writers. After only two years of media hype, the number of active bloggers in the United States alone has reached the audience size of prime-time network television.

So why were the skeptics so wrong about the demand for self-publishing? Their primary mistake was to assume that the content produced in this new era would look like old-school journalism: op-ed pieces, film reviews, cultural commentary. There's plenty of armchair journalism out there, of course, but the great bulk of personal publishing is just that, *personal*: the online diary is the dominant discursive mode in the blogosphere. People are using these new tools not to opine about social security privatization; they're using the tools to talk about their lives. A decade ago Douglas Rushkoff coined the phrase "screenagers" to describe the first generation that grew up with the assumption that the images on a television screen were supposed to be manipulated; that they weren't just there for passive consumption. The next generation is carrying that logic to a new extreme: the screen is not just something you manipulate, but something you project your identity onto, a place to work through the story of your life as it unfolds.

To be sure, that projection can create some awkward or unhealthy situations, given the public intimacy of the online diary, and the potential for identity fraud. But every new technology can be exploited or misused to nefarious ends. For the vast majority of those 8 million bloggers, these new venues for self-expression have been a wonderful addition to their lives. There's no denying that the content of your average online diary can be juvenile. These diaries are, after all, frequently created by juveniles. But thirty years ago those juveniles weren't writing novels or composing sonnets in their spare time; they were watching *Laverne & Shirley*. Better to have minds actively composing the soap opera of their own lives than zoning out in front of someone else's.

The Net has actually had a positive lateral effect on the tube as well, in that it has liberated television from attempting tasks that the medium wasn't innately well suited to perform. As a vehicle for narrative and first-person intimacy, television can be a delightful medium, capable of conveying remarkably complex experiences. But as a source of information, it has its limitations. The rise of the Web has enabled television to offload some of its information-sharing responsibilities to a platform that was designed specifically for the purposes of sharing information. This passage from Postman's *Amusing Ourselves to Death* showcases exactly how much has changed over the past twenty years:

> Television . . . encompasses all forms of discourse. No one goes to a movie to find out about government policy or the latest scientific advance. No one buys a record to find out the baseball scores or the weather or the latest murder. . . . But everyone goes to television for all these things and more, which is why television resonates so powerfully throughout the culture. Television is our culture's principal mode of knowing about itself.

No doubt in total hours television remains the dominant medium in American life, but there is also no doubt that the Net has been gaining on it with extraordinary speed. If the early adopters are any indication, that dominance won't last for long. And for the types of knowledge-based queries that Postman describes—looking up government policy or sports scores—the Net has become the first place that people consult. Google is *our* culture's principal way of knowing about itself.

The second way in which the rise of the Net has challenged the mind runs parallel to the evolving rule systems of video games: the accelerating pace of new platforms and software applications forces users to probe and master new environments. Your mind is engaged by the interactive content of networked media—posting a response to an article online, maintaining three separate IM conversations at the same time—but you're also exercising cognitive muscles

interacting with the *form* of the media as well: learning the tricks of a new e-mail client, configuring the video chat software properly, getting your bearings after installing a new operating system. This type of problem-solving can be challenging in an unpleasant way, of course, but the same can be said for calculus. Just because you don't like troubleshooting your system when your browser crashes doesn't mean you aren't exercising your logic skills in finding a solution. This extra layer of cognitive involvement derives largely from the increased prominence of the interface in digital technology. When new tools arrive, you have to learn what they're good for, but you also have to learn the rules that govern their use. To be an accomplished telephone user, you needed to grasp the essential utility of being able to have real-time conversations with people physically removed from you, *and* you had to master the interface of the telephone device itself. That same principle holds true for digital technologies, only the interfaces have expanded dramatically in depth and complexity. There's only so much cognitive challenge at stake in learning the rules of a rotary dial phone. But you could lose a week exploring all the nooks and crannies of Microsoft Outlook.

Just as we saw in the world of games, learning the intricacies of a new interface can be a genuine pleasure. This is a story that is not often enough told in describing our evolving relationship with software. There is a kind of ex-

ploratory wonder in downloading a new application, and meandering through its commands and dialog boxes, learning its tricks by feel. I've often found certain applications are more fun to explore the first time than they actually are to use—because in the initial exploration, you can delight in features that are clever without being terribly helpful. This sounds like something only a hardened tech geek would say, but I suspect the feeling has become much more mainstream over the past few years. Think of the millions of ordinary music fans who downloaded Apple's iTunes software: I'm sure many of them enjoyed their first walk through the application, seeing all the tools that would revolutionize the way they listened to music. Many of them, I suspect, eschewed the manual altogether, choosing to probe the application the way gamers investigate their virtual worlds: from the inside. That probing is a powerful form of intellectual activity—you're learning the rules of a complex system without a guide, after all. And it's all the more powerful for being fun.

Then there is the matter of social connection. The other concern that Net skeptics voiced a decade ago revolved around a withdrawal from public space: yes, the Internet might connect us to a new world of information, but it would come at a terrible social cost, by confining us in front of barren computer monitors, away from the vitality of genuine communities. In fact, nearly all of the most hyped

developments on the Web in the past few years have been tools for augmenting social connection: online personals, social and business network sites such as Friendster, the Meetup.com service so central to the political organization of the 2004 campaign, the many tools designed to enhance conversation between bloggers—not to mention all the handheld devices that we now use to coordinate new kinds of real-world encounters. Some of these tools create new modes of communication that are entirely digital in nature (the cross-linked conversations of bloggers). Others use the networked computer to facilitate a face-to-face encounter (as in Meetup). Others involve a hybrid dance of real and virtual encounters, as in the personals world, where flesh-and-blood dates usually follow weeks of online flirting. Tools like Google have fulfilled the original dream of digital machines becoming extensions of our memory, but the new social networking applications have done something that the visionaries never imagined: they are augmenting our people skills as well, widening our social networks, and creating new possibilities for strangers to share ideas and experiences.

Television and automobile society locked people up in their living rooms, away from the clash and vitality of public space, but the Net has reversed that long-term trend. After a half-century of technological isolation, we're finally learning new ways to connect.

FILM

HAVE THE MOVIES UNDERGONE an equivalent transformation? The answer to that is, I believe, a qualified yes. The obvious way in which popular film has grown more complex is visual and technological: the mesmerizing special effects; the quicksilver editing. That's an interesting development, and an entertaining one, but not one that is likely to have a beneficial effect on our minds. Do we see the same growing narrative complexity, the same audience "filling in" that we see in television shows today? At the very top of the box office list, there is some evidence of the Sleeper Curve at work. For a nice apples-to-apples comparison, contrast the epic scale and intricate plotting of the *Lord of the Rings* trilogy to the original *Star Wars* trilogy. Lucas borrowed some of the structure for *Star Wars* from Tolkien's novels, but in translating them into a blockbuster space epic, he simplified the narrative cosmology dramatically. Both share a clash between darkness and light, of course, and the general structure of the quest epic. But the particulars are radically different. By each crucial measure of complexity—how many narrative threads you're forced to follow, how much background information you need to interpret on the fly—*Lord of the Rings* is several times more challenging than *Star Wars*. The easiest way to grasp this is simply to re-