

From: A Whole New Mind by
Daniel Pink

Two

ABUNDANCE, ASIA, AND AUTOMATION

Return with me to the thrilling days of yesteryear—the 1970s, the decade of my childhood. When I was a kid, middle-class parents in the United States typically dished out the same plate of advice to their children: Get good grades, go to college, and pursue a profession that will deliver a decent standard of living and perhaps a dollop of prestige. If you were good at math and science, you should become a doctor. If you were better at English and history, become a lawyer. If blood gossed you out and your verbal skills needed work, become an accountant. A bit later, as computers appeared on desktops and CEOs on magazine covers, the youngsters who were *really* good at math and science chose high tech, while many others flocked to business school, thinking that success was spelled MBA.

ABUNDANCE, ASIA, AND AUTOMATION

Lawyers, doctors, accountants, engineers, and executives. The great Peter Drucker gave this cadre of professionals an enduring, if somewhat wonky, name: “knowledge workers.” Knowledge workers are “people who get paid for putting to work what one learns in school rather than for their physical strength or manual skill,” Drucker wrote. What distinguished this group from the rest of the workforce was their “ability to acquire and to apply theoretical and analytic knowledge.” (In other words, they excelled at L-Directed Thinking.) They might never become a majority, said Drucker, but they nonetheless “will give the emerging knowledge society its character, its leadership, its social profile.”¹

Drucker, as always, was spot-on. Knowledge workers and their thinking style have indeed shaped the character, leadership, and social profile of the modern age. Consider the tollbooths that any middle-class American must pass on his way to the land of knowledge work. Here are some examples: the PSAT, the SAT, the GMAT, the LSAT, the MCAT. Notice any similarity beyond the final two initials? These instruments all measure what is essentially undiluted L-Directed Thinking. They require logic and analysis—and reward test-takers for zeroing-in, computerlike, on a single correct answer. The exercise is linear, sequential, and bounded by time. You answer one question with one right answer. Then you move to the next question and the next and the next until time runs out. These tests have become important gatekeepers for entry into meritocratic, middle-class society. They’ve created an SAT-ocracy—a regime in which access to the good life depends on the ability to reason logically, sequentially, and speedily. And this is not just an American phenomenon. From entrance exams in the United Kingdom to cram schools in Japan, most developed nations have devoted considerable time and treasure to producing left-brained knowledge workers.

This arrangement has been a rousing success. It has broken the

stranglehold of aristocratic privilege and opened educational and professional opportunities to a diverse set of people. It has propelled the world economy and lifted living standards. But the SAT-ocracy is now in its dying days. The L-Directed Thinking it nurtures and rewards still matters, of course. But it's no longer enough. Today, we're moving into an era in which *R-Directed Thinking* will increasingly determine who gets ahead.

To some of you, this is delightful news. To others, it sounds like a crock. This chapter is mainly for the latter group of readers—those who followed your parents' advice and scored well on those aptitude tests. To persuade you that what I'm saying is sound, let me explain the reasons for this shift using the left-brain, mechanistic language of cause and effect. The effect: the diminished relative importance of L-Directed Thinking and the corresponding increased importance of R-Directed Thinking. The causes: Abundance, Asia, and Automation.

Abundance

Another vignette from the 1970s: every August my mother would take my brother, sister, and me to buy clothes for the new school year. That inevitably meant a trip to Eastland Mall, one of three big shopping centers in central Ohio. Inside the mall we'd visit a national department store such as Sears or JCPenney or a local one such as Lazarus, where the children's departments featured maybe a dozen racks of clothing from which to choose. The rest of the mall consisted of about thirty other stores, smaller in size and selection, lined up between the department store anchors. Like most Americans of the time, we considered Eastland and those other climate-controlled enclosed shopping centers the very zenith of modern plenty.

My own kids would consider it underwhelming. Within a twenty-minute drive of our home in Washington, D.C., are about forty different mega-shopping sites—the size, selection, and scope of which didn't exist thirty years ago. Take Potomac Yards, which sits on Route 1 in northern Virginia. One Saturday morning in August, my wife and I and our three children drove there for our own back-to-school shopping excursion. We began at the giant store on the far end of the site. In the women's section of that store, we chose from Mossimo designer tops and sweaters, Merona blazers, Isaac Mizrahi jackets, and Liz Lange designer maternity wear. The kids' clothing section was equally vast and almost as hip. The Italian designer Mossimo had a full line of children's wear—including a velour pants and jacket set for our two girls. The choices were preposterously more interesting, more attractive, and more bountiful than the clothing I chose from back in the seventies. But there was something even more noteworthy about this stylish kiddie garb when I compared it to the more pedestrian fashions of my youth: the clothes cost less. Because we weren't at some swank boutique. My family and I were shopping at Target. That velour Mossimo ensemble? \$14.99. Those women's designer tops? \$9.99. My wife's new suede Isaac Mizrahi jacket? Forty-nine bucks. A few aisles away were home furnishings, created by designer Todd Oldham and less expensive than what my parents used to pick up at Sears. Throughout the store were acres of good-looking, low-cost merchandise.

And Target was just one of an array of Potomac Yards stores catering to a mostly middle-class clientele. Next door we could visit Staples, a 20,000-square-foot box selling 7,500 different school and office supplies. (There are more than 1,500 Staples stores like it in the United States and Europe.) Next to Staples was the equally cavernous PetSmart, one of more than six hundred such pet supply

stores in the United States and Canada, each one of which, on an average day, sells \$15,000 worth of merchandise for nonhumans.² This particular outlet even had its own pet-grooming studio. Next to PetSmart was Best Buy, an electronics emporium with a retail floor that's larger than the entire block on which my family lives. One section was devoted to home theater equipment, which displayed an arms race of televisions—plasma, high-definition, flat panel—that began with a 42-inch screen and escalated to 47-inch, 50-inch, 54-inch, 56-inch, and 65-inch versions. In the telephone section were, by my count, 39 different varieties of cordless phones. And these four stores constituted only about one-third of the entire shopping facility.

But what's so remarkable about Potomac Yards is how utterly unremarkable it is. You can find a similar swath of consumer bounty just about anyplace in the United States—and, increasingly, in Europe and sections of Asia as well. These shopping meccas are but one visible example of an extraordinary change in modern life. For most of history, our lives were defined by scarcity. Today, the defining feature of social, economic, and cultural life in much of the world is *abundance*.

Our left brains have made us rich. Powered by armies of Drucker's knowledge workers, the information economy has produced a standard of living in much of the developed world that would have been unfathomable to our great-grandparents.

A few examples of our abundant era:

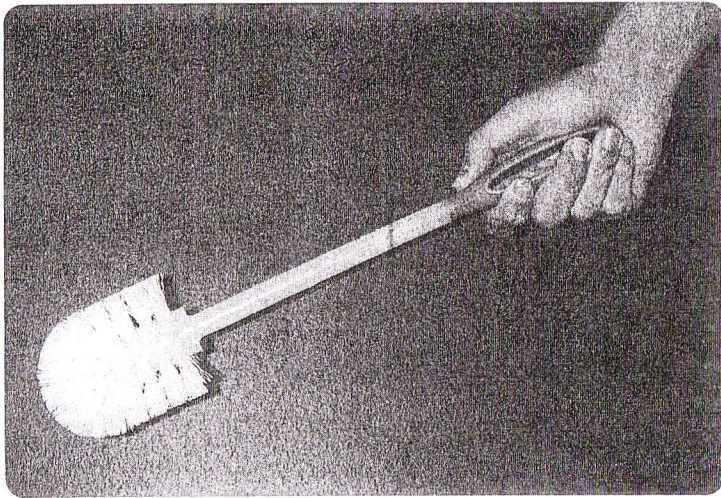
- During much of the twentieth century, the aspiration of most middle-class Americans was to own a home and a car. Now more than two out of three Americans own the homes in which they live. (In fact, some 13 percent of homes purchased today are *second* homes.³) As for autos, today the United States has

more cars than licensed drivers—which means that, on average, everybody who can drive has a car of his own.⁴

- Self-storage—a business devoted to providing people a place to house their extra stuff—has become a \$17 billion annual industry in the United States, larger than the motion picture business. What's more, the industry is growing at an even faster rate in other countries.⁵
- When we can't store our many things, we just throw them away. As business writer Polly LaBarre notes, "The United States spends more on trash bags than ninety other countries spend on *everything*. In other words, the receptacles of our *waste cost* more than all of the goods consumed by nearly half of the world's nations."⁶

But abundance has produced an ironic result: the very triumph of L-Directed Thinking has lessened its significance. The prosperity it has unleashed has placed a premium on less rational, more R-Directed sensibilities—beauty, spirituality, emotion. For businesses, it's no longer enough to create a product that's reasonably priced and adequately functional. It must also be beautiful, unique, and meaningful, abiding what author Virginia Postrel calls "the aesthetic imperative."⁷ Perhaps the most telling example of this change, as our family outing to Target demonstrated, is the new middle-class obsession with design. World-famous designers such as the ones I mentioned earlier, as well as titans such as Karim Rashid and Philippe Starck, now design all manner of goods for this quintessentially middle-class, middle-brow, middle-American store. Target and other retailers have sold nearly three million units of Rashid's Garbo molded polypropylene wastebasket. A designer wastebasket! Try explaining that one to your left brain.

Or how about this item, which I purchased during that same Target trip?



It's a toilet brush—a toilet brush designed by Michael Graves, a Princeton University architecture professor and one of the most renowned architects and product designers in the world. The cost: \$5.99. Only against a backdrop of abundance could so many people seek beautiful trash cans and toilet brushes—converting mundane, utilitarian products into objects of desire.

In an age of abundance, appealing only to rational, logical, and functional needs is woefully insufficient. Engineers must figure out how to get things to work. But if those things are not also pleasing to the eye or compelling to the soul, few will buy them. There are too many other options. Mastery of design, empathy, play, and other seemingly “soft” aptitudes is now the main way for individuals and firms to stand out in a crowded marketplace.

Abundance elevates R-Directed Thinking another important way as well. When I'm on my deathbed, it's unlikely that I'll look back on my life and say, “Well, I've made some mistakes. But at least I snagged one of those Michael Graves toilet brushes back in 2004.” Abundance has brought beautiful things to our lives, but that bevy of material goods has not necessarily made us much happier. The paradox of prosperity is that while living standards have risen steadily decade after decade, personal, family, and life satisfaction haven't budged. That's why more people—liberated by prosperity but not fulfilled by it—are resolving the paradox by searching for meaning. As Columbia University's Andrew Delbanco puts it, “The most striking feature of contemporary culture is the unslaked craving for transcendence.”⁸

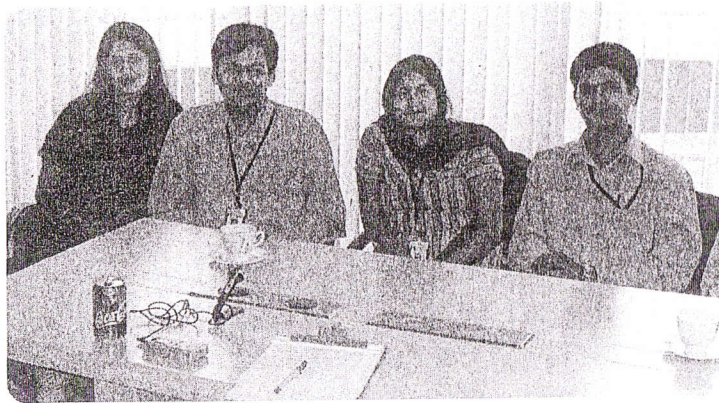
Visit any moderately prosperous community in the advanced world and along with the plenteous shopping opportunities, you can glimpse this quest for transcendence in action. From the mainstream embrace of once-exotic practices such as yoga and meditation to the rise of spirituality in the workplace and evangelical themes in books and movies, the pursuit of purpose and meaning has become an integral part of our lives. People everywhere have moved from focusing on the day-to-day text of their lives to the broader context. Of course, material wealth hasn't reached everyone in the developed world, not to mention vast numbers in the less developed world. But abundance has freed literally hundreds of millions of people from the struggle for survival and, as Nobel Prize-winning economist Robert William Fogel writes, “made it possible to extend the quest for self-realization from a minute fraction of the population to almost the whole of it.”⁹

On the off chance that you're still not convinced, let me offer one last—and illuminating—statistic. Electric lighting was rare a century ago, but today it's commonplace. Lightbulbs are cheap. Electricity is ubiquitous. Candles? Who needs them? Apparently,

lots of people. In the United States, candles are a \$2.4-billion-a-year business¹⁰—for reasons that stretch beyond the logical need for luminosity to a prosperous country's more inchoate desire for beauty and transcendence.

Asia

Here are four people I met while researching this book:



They are the very embodiment of the knowledge worker ethic I described at the outset of this chapter. Like many bright middle-class kids, they followed their parents' advice. They did well in high school, went on to earn either an engineering or computer science degree from a good university, and now work at a large software company, helping to write computer code for North American banks and airlines. For their high-tech work, none of these four people earns more than about \$15,000 a year.

Knowledge workers, meet your new competition: Srividya, Lalit, Kavita, and Kamal of Mumbai, India.

In recent years, few issues have generated more controversy or stoked more anxiety than outsourcing. These four programmers and their counterparts throughout India, the Philippines, and China are scaring the bejeezus out of software engineers and other left-brain professionals in North America and Europe, triggering protests, boycotts, and plenty of political posturing. The computer programming they do, while not the most sophisticated that multinational companies need, is the sort of work that until recently was done almost exclusively in the United States—and that provided comfortable white-collar salaries of upward of \$70,000 a year. Now twenty-five-year-old Indians are doing it—just as well, if not better; just as fast, if not faster—for the wages of a Taco Bell counter jockey. Yet, their pay, while paltry by Western standards, is roughly twenty-five times what the typical Indian earns—and affords them an upper-middle-class lifestyle with vacations and their own apartments.

The programmers I met in Mumbai are but four well-educated drops in a global tsunami. Each year, India's colleges and universities produce about 350,000 engineering graduates.¹¹ That's one reason that more than half of the Fortune 500 companies now outsource software work to India.¹² For instance, about 48 percent of GE's software is developed in India. The company employs a whopping twenty thousand people there (and has even posted signs in its Indian offices reading, "Trespassers will be recruited"). Hewlett-Packard employs several thousand software engineers in India. Siemens employs three thousand computer programmers in India and is moving another fifteen thousand such jobs overseas. Oracle has a five-thousand-person Indian staff. The large Indian IT consultancy Wipro employs some seventeen thousand engineers who do work for Home Depot, Nokia, and Sony. And the list goes on. As the chief executive of GE India told London's *Financial Times*: "Any job that is English-based in markets such as the U.S., the U.K. and Australia can be done in India."

The only limit is your imagination.”¹³ Indeed, active imaginations have already expanded India’s professional ranks well beyond computer programmers. Financial services firms such as Lehman Brothers, Bear Stearns, Morgan Stanley, and JPMorgan Chase have contracted out number crunching and financial analysis to Indian MBAs.¹⁴ The financial news service Reuters has offshored low-level editorial jobs. And throughout India, you’ll find chartered accountants who prepare American tax returns, lawyers who do legal research for American lawsuits, and radiologists who read CAT scans for American hospitals.

But it’s not just India. L-Directed white-collar work of all sorts is migrating to other parts of the world as well. Motorola, Nortel, and Intel operate software development centers in Russia, where Boeing has also sent a large portion of its aerospace engineering work. The computer services giant Electronic Data Systems has software developers in Egypt, Brazil, and Poland. Meantime, Hungarian architects are drawing basic blueprints for California design firms. Philippine accountants are performing audits for CapGemini Ernst & Young. And the Dutch firm Philips employs some seven hundred engineers in China, a nation that is now producing nearly as many engineering graduates each year as the United States.¹⁵

The main reason is money. In the United States, a typical chip designer earns about \$7,000 per month; in India, she earns about \$1,000. In the United States, a typical aerospace engineer earns about \$6,000 each month; in Russia, his monthly salary is closer to \$650. And while an accountant in the United States can earn \$5,000 a month, an accountant in the Philippines brings in about \$300 a month, no small sum in a country where the *annual* per capita income is \$500.¹⁶

For these battalions of international knowledge workers, this new world order is a dream. But for white-collar, left-brain workers in Europe and North America, the implications are more nightmarish. For example:

- One out of ten jobs in the U.S. computer, software, and information technology industry will move overseas in the next two years. One in four IT jobs will be offshored by 2010.¹⁷
- According to Forrester Research, “at least 3.3 million white-collar jobs and \$136 billion in wages will shift from the U.S. to low-cost countries like India, China, and Russia” by 2015.¹⁸
- Nations such as Japan, Germany, and the United Kingdom will see similar job loss. The United Kingdom alone will lose some 25,000 IT jobs and upwards of 30,000 finance positions to India and other developing nations in the next few years. By 2015, Europe will lose 1.2 million jobs to offshore locales.¹⁹

Much of the anxiety over this issue outstrips the reality. We are not all going to lose our jobs tomorrow. Outsourcing is overhyped in the short term. But it’s underhyped in the long term. As the cost of communicating with the other side of the globe falls essentially to zero, and as developing nations continue to mint millions of extremely capable knowledge workers, the working lives of North Americans, Europeans, and Japanese people will change dramatically. If standardized, routine L-Directed work such as many kinds of financial analysis, radiology, and computer programming can be done for a lot less overseas and delivered to clients instantly via fiber optic links, that’s where the work will go. This upheaval will be difficult for many, but it’s ultimately not much different from transitions we’ve weathered before. This is precisely what happened to routine mass production jobs, which moved across the oceans in the second half of the twentieth century. And just as those factory workers had to master a new set of skills and learn how to bend pixels instead of steel, many of today’s knowledge workers will likewise have to command a new set of aptitudes. They’ll need to do what workers abroad cannot do equally well for much less money—using R-Directed abili-

ties such as forging relationships rather than executing transactions, tackling novel challenges instead of solving routine problems, and synthesizing the big picture rather than analyzing a single component.

Automation

Meet two more people. One is an iconic figure who may have been real. The other is a real human being who, perhaps to his regret, may become iconic.

The first is this fellow, immortalized here on a U.S. postage stamp:



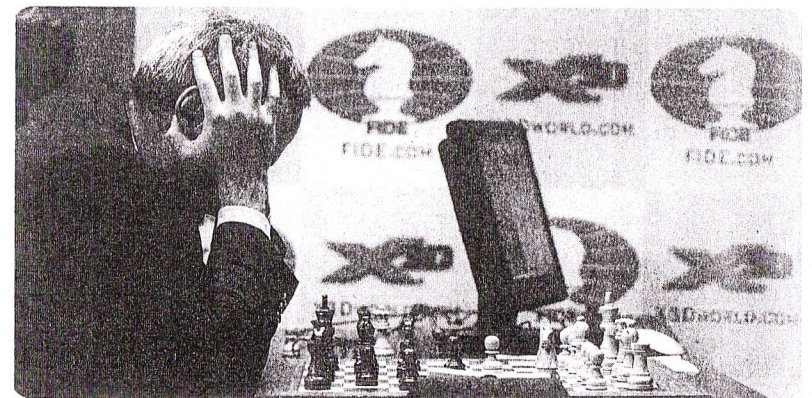
As most American schoolchildren could tell you, John Henry was a steel-driving man. Born with a hammer in his hand, he was a figure of immense strength and integrity. (Alas, nobody is certain whether he was an actual person. Many historians believe he was a former slave who worked on the railroads after the Civil War, though none have been able to verify his existence.) He was part of a team of workers who smashed through mountains to clear tunnels for laying railroad tracks. But John Henry was no ordinary laborer. He could drive

steel faster and more powerfully than any man alive, and his prowess soon became the stuff of legend.

One day, the tale goes, a salesman arrived at the workers' camp bearing a new steam-powered drill that he claimed could outperform even the strongest man. John Henry scoffed at the notion that gears and grease were any match for human muscle. So he proposed a contest—man vs. machine—to see which could blast through a mountainside the fastest.

The next afternoon, the race began—the steam drill on the right, John Henry on the left. The machine took the lead, but John Henry quickly rallied. Chunks of rocks fell as the duo bored through their tunnels. Before long, John Henry had closed in on his competitor. And in an instant before the end of the race, he surged past the steam drill and broke through the other side of the mountain first. His fellow workers cheered. But John Henry, exhausted by the superhuman effort, collapsed. Then he died. The story spread. In ballads and books, John Henry's demise became a parable of the Industrial Age: machines could now do some things better than human beings, and as a result a measure of human dignity had been sacrificed.

Now meet our second figure:



Mario Tanna, Getty Images

Garry Kasparov is a chess grand master—the finest chess player of his generation and perhaps the greatest of all time. He’s also the John Henry of our new age—a person whose seemingly superhuman prowess has been surpassed by a machine.

Kasparov won his first chess world championship in 1985, around the same time that several research teams began developing computer programs that could play chess. Over the next decade, Kasparov never lost a match. And in 1996, he defeated what was then the world’s most powerful chess computer.

But in 1997, Kasparov took on an even more powerful machine, a 1.4-ton IBM supercomputer called Deep Blue, in a six-game match that some dubbed “the brain’s last stand.”²⁰ To the surprise of many, Deep Blue defeated Kasparov, the consequences of which the cover of *Inside Chess* magazine reduced to a single word: “ARMA-GEDDON!”²¹ Seeking vengeance—for himself and for all flesh-and-blood L-Directed thinkers—Kasparov then arranged a rematch against another computer, Deep Junior, a still more potent Israeli computer that had thrice won the world computer chess championship.

Chess is in many ways the quintessential left-brain activity. It leaves relatively little room for emotion—and depends heavily on memory, rational thinking, and brute calculation, two things at which computers excel. Kasparov says that when he looks at the board, he can examine between one and three moves per second. Deep Junior is, uh, slightly more impressive. Each second, it analyzes between two and three *million* possible moves. Yet, Kasparov believed that human beings had other advantages that would level the sixty-four-square playing field.

On Super Bowl Sunday 2003, Kasparov strutted into the posh New York Downtown Athletic Club to begin another epic con-

test between man and machine—a six-game match with a million-dollar purse. Hundreds of fans watched in person. Millions more followed the action on the Internet. Kasparov won game one and settled for a draw in game two. In game three, he started strong, but on the edge of victory, he fell into one of Junior’s traps and lost. In game four, Kasparov played haltingly and eked out another draw, still so distraught over blowing game three that he admitted that he “couldn’t sleep and lost confidence.”²² Game five was another draw, leaving the outcome of the match to the sixth and final game.

Kasparov quickly took the lead. As *Newsweek* later reported, “Against any human player, he would have moved aggressively and gone for the win. But he wasn’t playing against a human.” In his tentativeness, he made a slight mistake and that left him

devastated in a way that an unfeeling machine would never be. Worse, having yielded the advantage he had no hope—as he would have against a human—that his well-programmed opponent might make its own mistake and let him back in the game. The realization paralyzed even the great Kasparov, and it haunted him for the rest of the match.²³

In the end, he settled for a draw—in this game and the entire match.²⁴

Human beings have much to recommend, but when it comes to chess—and increasingly other endeavors that depend heavily on rule-based logic, calculation, and sequential thinking—computers are simply better, faster, and stronger. What’s more, computers don’t fatigue. They don’t get headaches. They don’t choke under pressure or sulk over losses. They don’t worry what the audience thinks or

care what the press will say. They don't space out. They don't slip up. And that has humbled even the notoriously egomaniacal grand master. In 1987, Kasparov, then the chess world's enfant terrible, boasted: "No computer can ever beat me."²⁵ Today, Kasparov, now our modern John Henry, says: "I give us only a few years. Then they'll win every match, and we may have to struggle to win even a single game."²⁶

Last century, machines proved they could replace human backs. This century, new technologies are proving they can replace human left brains. Management meta-guru Tom Peters puts it nicely, saying that for white-collar workers "software is a forklift for the mind." It won't eliminate every left-brain job. But it will destroy many and reshape the rest. Any job that depends on routines—that can be reduced to a set of rules, or broken down into a set of repeatable steps—is at risk. If a \$500-a-month Indian chartered accountant doesn't swipe your comfortable accounting job, Turbo-Tax will.

Consider three heavily L-Directed professions: computer programmers, physicians, and lawyers. "In the old days," says computer scientist Vernor Vinge, "anybody with even routine skills could get a job as a programmer. That isn't true anymore. The routine functions are increasingly being turned over to machines."²⁷ Indeed, a small British company called Appligenics has created software that can write software. Where a typical human being—whether the Indians I met or their higher-paid counterparts in the United States—can write about four hundred lines of computer code per day, Appligenics applications can do the same work in *less than a second*.²⁸ The result: as the scut work gets off-loaded, engineers and programmers will have to master different aptitudes, relying more on creativity than competence, more on tacit knowledge than techni-

cal manuals, and more on fashioning the big picture than sweating the details.

Automation is also changing the work of many doctors. Much of medical diagnosis amounts to following a series of decision trees—Is it a dry cough or a productive one? Is the T-cell count above or below a certain level?—and honing in on the answer. Computers can process the binary logic of decision trees with a swiftness and accuracy humans can't begin to approach. So an array of software and on-line programs has emerged that allow patients to answer a series of questions on their computer screens and arrive at a preliminary diagnosis without the assistance of a physician. Health care consumers have begun to use such tools both to "figure out their risk of serious diseases—such as heart failure, coronary artery disease and some of the most common cancers—[and] to make life-and-death treatment decisions once they are diagnosed," reports the *Wall Street Journal*.²⁹ At the same time, there's been an explosion of electronic databases of medical and health information. In a typical year, about 100 million people worldwide go online for health and medical information and visit more than 23,000 medical Web sites.³⁰ As patients self-diagnose and tap the same reservoir of information available to physicians, these tools are transforming the doctor's role from omniscient purveyor of solutions to empathic advisor on options. Of course, the day-to-day work of physicians often involves challenges too complex for software alone—and we'll still rely on experienced doctors to diagnose unusual diseases. But, as I'll show later in this book, these developments are changing the emphasis of many medical practices—away from routine, analytical, and information-based work and toward empathy, narrative medicine, and holistic care.

A similar pattern is unfolding in the legal profession. Dozens of

inexpensive information and advice services are reshaping law practice. For example, CompleteCase.com, which calls itself “the premier on-line uncontested divorce service center,” will handle your divorce for a mere \$249. At the same time, the Web is cracking the information monopoly that has long been the source of many lawyers’ high incomes and professional mystique. Attorneys charge an average of \$180 per hour. But many Web sites—for instance, Lawvantage.com and USLegalforms.com—now offer basic legal forms and other documents for as little as \$14.95. As *The New York Times* reports, “Instead of asking lawyers to draft contracts at a cost of several thousand dollars,” clients now find the proper forms online—and then take “the generic documents to lawyers, who customize them at a cost of several hundred dollars apiece.” The result, says the *Times*, is that the legal industry “may be on the verge of fundamental changes . . . [that] could reduce the demand for traditional services and force lawyers to lower fees.”³¹ The attorneys who remain will be those who can tackle far more complex problems and those who can provide something that databases and software cannot—counseling, mediation, courtroom storytelling, and other services that depend on R-Directed Thinking.

TO RECAP, three forces are tilting the scales in favor of R-Directed Thinking. Abundance has satisfied, and even oversatisfied, the material needs of millions—boosting the significance of beauty and emotion and accelerating individuals’ search for meaning. Asia is now performing large amounts of routine, white-collar, L-Directed work at significantly lower costs, thereby forcing knowledge workers in the advanced world to master abilities that can’t be shipped overseas. And automation has begun to affect this generation’s white-collar

workers in much the same way it did last generation’s blue-collar workers, requiring L-Directed professionals to develop aptitudes that computers can’t do better, faster, or cheaper.

So what happens next? What happens to us as our lives get clipped by automation and Asia—and reconfigured by abundance? I’ll examine that in the next chapter.