THE SCENARIO-BUILDING ANIMAL

People have an innate ability to build scenarios, and to foresee the future. This has been suggested in the work of two well-respected neurobiologists, Dr. William Calvin and Dr. David Ingvar. According to their theories, our drive to tell ourselves stories about the future may well be "hardwired" into the human brain—closely linked to our abilities to speak and construct language. Planning ahead in other animals is a hormonal process, in which hoarding behaviors are triggered by, for example, shortening daylight hours. But we humans are capable of planning decades ahead, able to take account of extraordinary contingencies far more irregular than the seasons.

Dr. William Calvin, author of *The Cerebral Symphony* and *The Ascent of Mind*, offers a compelling explanation. The part of the human brain that controls speech, he says, is also the part involved with ballistics. Ballistic prowess—the ability to hit animals with thrown rocks—was apparently an important survival skill for early humans. Calvin posits that the abilities to think ahead and to make small talk are side-benefits of marksmanship. Anyone who has ever fired an arrow or spoken before a large group will confirm that a key aspect of both ballistics and language is *preplanning*—performing enough of a mental "dry run" in order to line up all the sequences of fine muscle movements required to perform the activity.

Calvin's hypothesis makes intuitive sense to me. I have always marveled at the sight of a great quarterback such as Joe Montana, dropping back, looking across the field forty yards away, seeing the opposing linemen closing in on him, and two or three receivers running downfield amid a dozen or so other people. The quarterback picks one of the receivers; while running himself, he

lofts a spiraling pass and drops it into the receiver's arms. Essentially, Montana has made a prediction about where he and his receiver would be several highly unpredictable seconds later. The equivalent problem in military ballistics—designing a machine to hurl a long-distance projectile from a moving source to a moving target—is so difficult that it took the first real computers to produce radar-guided anti-aircraft guns during World War II. With all the advances in robotics and computer control systems in the last twenty years, no human-designed system can yet duplicate the feats of Joe Montana.

To achieve those feats, Montana's mind—conscious and unconscious—must have an extraordinary ability to look ahead. We may not all have his level of skill, but each of us has the same neurological connection—between the ballistic-calculating abilities of the human brain and such other capabilities as imagination and foresight. This is closely tied to (or may, as Calvin suggests, have helped bring about) our capacity for self-awareness. We human beings can run through a motion in our minds alone, with our muscles detached from the circuit, and then run through it again for real, with the muscles actually carrying out the commands. We can simulate the past and future in our minds, practicing different acts and judging which is best. While hiking, for instance, we may hear a climber above us. It is part of our nature to imagine an accidental rockfall loosed by his or her boots, and therefore to stay out of the fall line.

It takes more effort, perhaps, to string these small intimations into scenarios. But we do it. For instance, we don't merely foresee the words we are about to speak. We construct sentences in our head, and often practice them inwardly, before uttering them. In dreams, Calvin asserts, we spin entire scenes in our sleep—in a sense, a dream is our unconscious rehearsal of a possible future. If this book seems to present a formal, overly explicit methodology for constructing scenarios, please remember that these techniques are an extension of a skill which people are extremely well equipped to exercise. Once you get used to the *idea* of scenarios, using them comes more easily.

Some people are immediately great at building scenarios. Others need more practice. But this difference in proficiency has nothing to do with peoples' character. It's the result of differences in training, experience, and intuition. Social scientists often have a hard time; they have been trained to stay away from "What if?" questions and concentrate on "What was?" Accountants and engineers typically have a hard time because their training is deterministic. An accountant's columns and rows must add up to a single answer for any accountant who tries it, or the work is "wrong."

In contrast, a cultural anthropologist knows clearly that what he or she sees in a particular village will be different from what another cultural anthropologist sees. The anthropologist is more attuned to uncertainty and multiple points of view, and can more easily accept the practice of scenarios. The same is true for historians. In business, the most attuned practitioners are people who have made mistakes—people who have gotten it wrong, and want to find other ways of dealing with their problems. Older business people are often more sensitive to the process.

Anyone can create scenarios, however; but it will be much easier if you are willing to encourage your own imagination, novelty, and even sense of the absurd—as well as your sense of realism.

Memories of the Future

The stories we tell ourselves are powerful. David Ingvar, a Swedish neurobiologist, has written of scenarios as "memories of the future." Ingvar studied the behavior of alcoholics, trying to understand the biochemical and psychophysiological processes operating in alcoholism. He concluded, as had William Calvin, that the mind constantly tells itself stories of the future. Sometimes these are stories about the next few seconds. At other times, they are stories about the next hours or weeks, from walking across the room to get a cup of coffee to paying the rent. Many of these are

subconscious or at the edge of awareness; sometimes they bubble up and we remember something we had planned to do. In his earlier work with brain-damaged patients he had observed that their inability to perceive the flow and interconnection of events was a function of their inability to imagine these micro-scenarios of the future. They could not understand the meaning of events. They had a hard time making choices and, as a result, acting.

To Ingvar, alcoholics suffer, in part, because their scenario-spinning processes break down. Because of a neurophysiological reaction to the drink, they lose their connection between imagination and action. Since they no longer use their imagination as much to look ahead, they lose their sense of the continuity of time. They become disoriented. The alcohol then helps them to feel comfortable in their disorientation. Thus, we often hear people say of an alcoholic, "He [or she] has lost touch with reality."

Consider the plight of someone close to an alcoholic (or an addict, or anyone who has lost touch in that way). It does no good to plead, preach, or nag; the other person may be trusted, but the alcoholic has no mental picture of tomorrow. Ingvar argues that alcoholics are literally unable to recognize the future as it unfolds in front of them. They cannot easily imagine what might happen to them under different situations: "What would happen if you could no longer buy alcohol? Or if you could no longer perform your job? Or if your body began to deteriorate?"

We all, of course, share that same blindness to reality as well. Arie de Geus, a pioneer in thinking about organizational learning, tells the story of a tribesman who was transported from a remote mountain wilderness (a society that had not yet discovered the wheel) to a large city. When he returned, he reported that the most significant thing he saw was somebody using a wheelbarrow to carry more bananas than he had ever thought possible. He literally did not see the significance of automobiles and skyscrapers. He was not prepared to see them, any more than an alcoholic is prepared to take note of the damage done by the addiction. But the tribesman *was* well prepared to see an unprecedented load of bananas.

Historian Barbara Tuchman puts it this way: “Men will not believe what does not fit in with their plans or suit their prearrangements.”

What sorts of things are reasonably healthy Westerners—presumably the readers of this book—unprepared to see? It varies from individual to individual, but there is no shortage of examples. In 1975, I led a team at SRI looking at potential future crises for the office of the White House science adviser. Our results were to be presented to the President’s Science Advisory Council, a group of highly distinguished scientists and businessmen. They were led by Dr. William Baker, then head of Bell Labs, and Simon Ramo, the founder of TRW; nuclear physicist Edward Teller; Edwin Land of Polaroid; Charles Townes, the inventor of the laser; Donald Kennedy, later president of Stanford University; and Carl Djerassi, an eminent pharmaceutical entrepreneur, inventor of the “pill.” The White House did not want America to be taken by surprise again, as the country had been by the oil price crisis.

So our team looked at a number of potential scenarios. Among the problems we anticipated, for example, was a much more stressful society. All of the scenarios led to much higher stress in the social environment—from crime, unemployment, inflation, psychological instability, or even the stress that comes from too much success. We plotted how these types of stress would probably lead to second-level unwanted effects: drug abuse, alcohol abuse, cancer and other health problems, homelessness, and social violence. We painted a picture, for instance, of street criminals with increasingly high-powered weapons, leading to the equivalent of armed forces in our cities by the 1980s.

The study was a miserable failure. The distinguished panel of scientists attacked each problem, one by one. “It’s impossible,” they said each time. “We won’t let those problems come up.” They meant both “we” as a people and “we” as a government. Today, crack dealers routinely patrol inner-city neighborhoods with Uzis.

We also did scenarios for the Department of Transportation, which ended in even bigger disaster. What might happen, we asked, if they didn’t build enough highways or public transportation? They could end up with massive gridlock in urban areas. Our project was

singled out by Senator William Proxmire for one of his "Golden Fleece" awards because no one would be stupid enough to do that he said. He ridiculed the process of considering these "implausible" possibilities. I concluded that the federal government in Washington, D.C., was systematically unable to think about the future. By definition all of their policies must be successful and they have foreseen every problem. To think about any other possibility is to imply the impossible, that they are less than all-knowing and powerful.

You can see the results of a similar resistance among American military leaders. I will show in Chapter 5 that it was possible to foresee perestroika and glasnost in the early 1980s, and, indeed, American intelligence and military agencies heard the prediction at least several times. But their leaders could not accept it. They had imagined every conceivable scenario about the Cold War—gradual arms buildup, new technologies, a freeze imposed by one or more nations, broken arms agreements, even the Armageddon of nuclear war. But they never asked themselves: "What if we won?"

After America *did* win the Cold War (or, at least, our purported enemies lost it) the U.S. military leaders had no idea of what to do. They had prepared no strategy for success. Thus, they now find themselves foundering, trying desperately to find new enemies. Some suggest fighting the drug lords, or turning the troops loose to "battle" environmental problems. (Never mind the fact that environmental problems can't be "solved" through military methods.) As I write this in August 1990 the military is rapidly building a new presence in Saudi Arabia, but is unable to implement the President's goal of driving the Iraqis out of Kuwait. The new military to cope with the Saddam Husseins of today and tomorrow will be very different from the military needed to contain a hostile superpower.

But the Pentagon brass are not the only group refusing to see reality; people who talk about the "peace dividend" have not considered whether bringing thousands of newly unemployed soldiers back to the United States would create any social problems. It's not clear whether there *will* be social problems as a result. One

plausible scenario suggests a severe skilled labor shortage in the United States during the 1990s, which many returning servicemen could help fill if other conditions are right. What's important is that people are refusing to think about the possibilities.

Chains of Perception

Scenarios are not about predicting the future, rather they are about perceiving futures in the present. In contemporary psychology one finds different theories describing how and why people deceive themselves about reality. *Denial*, for example, is the first of the psychological stages that we undergo to protect ourselves from bad news, such as the death of someone close to us. To Elisabeth Kübler-Ross, author of *On Death and Dying*, denial was the first stage of reaction, followed by anger, bargaining, despair, and ultimately acceptance.

When decision-makers begin to look at the future, denial acts as an automatic shut-off valve: "I can't consider that." With his book *On Thermonuclear War: Thinking About the Unthinkable*, Herman Kahn made his early reputation as a futurist through his public willingness to consider what most people were denying in the early 1960s: that nuclear war might actually take place between the United States and the Soviets. By raising the possibility publicly, he helped people see realistically what they had at stake, and arguably inspired many of the most successful disarmament initiatives. William Proxmire's ridicule was another example of denial. Too often, he fought not to cut unnecessary spending, but to deny unconventional thinking.

Stories can be a powerful way of avoiding the dangers of denial. In theater, the "willing suspension of disbelief" is what the play prompts from an audience. Everyone in the theater knows that he is seeing actors before a painted backdrop, but—for the purposes of emotion and understanding—the viewers react as if they are seeing

the real world. A good scenario, similarly, asks people to suspend their disbelief in its stories long enough to appreciate their impact. You know that a scenario is effective when someone, pondering an issue that has been taboo or unthinkable before, says, “Yes. I can see how that might happen. And what I might do as a result.”

“Scenarios deal with two worlds,” wrote Pierre Wack. “The world of facts and the world of perceptions. They explore for facts but they aim at perceptions inside the heads of decision-makers. Their purpose is to gather and transform information of strategic significance into fresh perceptions. This transformation process is not trivial—more often than not it does not happen. When it works, it is a creative experience that generates a heartfelt ‘Aha!’ from your managers and leads to strategic insights beyond the mind’s previous reach.”

Tell Me a Story; the Power of Narrative

Anthropologist Mary Catherine Bateson offers the story of her father, philosopher Gregory Bateson, who used to tell a joke about a man who asked a computer, “Do you compute that you will ever think like a human being?” After assorted bleeps and blinks, the answer appeared: “That reminds me of a story.”

It is a common belief that serious information should appear in tables, graphs, numbers, or at least sober scholarly language. But important questions about the future are usually too complex or imprecise for the conventional languages of business and science. Instead, we use the language of stories and myths. Stories have a psychological impact that graphs and equations lack. Stories are about meaning; they help explain *why* things could happen in a certain way. They give order and meaning to events—a crucial aspect of understanding future possibilities.

Stories are an old way of organizing knowledge, but their place in the world has been less visible since the rise of scientific philosophy

during the Enlightenment. Theories about, for example, the way gases respond to heat and pressure were provable, always correct, and often simple. Even outside the sciences, the paradigm for truth was that it should be law-like, preferably reduced to the form of a solvable equation. However, since complexity has emerged as a driving force in the way the world works, the dominant belief in a deterministic and reliably quantifiable truth has begun to yield. There are now many ways of knowing. Our need for realism and proof is as strong, but we can find and express that in this different way. If the planners of Three Mile Island had written a story about how things could go wrong, instead of a numeric analysis of possible fault sequences, they would have been better prepared for the surprise they actually encountered when their complex machine went astray.

Stories have many advantages. They open people to multiple perspectives, because they allow them to describe how different characters see in events the meaning of those events. Moreover, stories help people cope with complexity. In a famous essay called *The Hedgehog and the Fox*, historical philosopher Isaiah Berlin compared Tolstoy's *War and Peace* with conventional "scientific" histories of the Napoleonic invasion of Russia. Those histories presented only a succession of events. Tolstoy, by contrast, wrote history as a novel, using story-telling to arrange the facts in a way which gave them meaning.

Scenarios are stories that give meaning to events. This does not mean that they contain fictional characters, although sometimes we write scenarios with fictional characters to experiment with the ambience of the settings we are trying to imagine. "Isao Okimura was just about to board the new hypersonic Orient Express on his way from Tokyo to San Francisco," began one such scenario I wrote, about the possibilities of future widespread mergers between Japanese and American corporations. But inventing characters is neither necessary nor, in many cases, helpful: the point is to imagine attitudes of key players who will affect future events.

Scenarios Are Myths of the Future

Often, these key players are large collections of individuals in the form of institutions. The attitudes they embody are themselves stories—or, more precisely, myths. Indeed, histories with meaning that are shared very widely are often expressed as myths. The phrase "American Dream," for example, is a myth of our time. It embodies a mesh of feelings and beliefs, some of them contradictory, well known to Americans and to everyone else in the world. This myth influences goals in business and daily life (for instance, a decision to emigrate to the United States), and values passed on to our children. The "Myth of the Melting Pot" is one part of the American Dream, symbolized by the Statue of Liberty. Capitalism and democracy are other aspects, embodied in Horatio Alger and the Constitution. Values such as individualism and materialism are woven into the fabric of the mythos. What is the U.S. Constitution but the formal story of the political utopia the founding fathers designed?

The Japanese also have a national myth—based on resilience and self-reliance. Few Americans have paid enough attention to Japan to see it. In American business and government circles, the Japanese Ministry of International Trade and Industry (MITI) is seen as a masterful organizing force that mobilizes Japanese scientific and engineering enterprise in a way unmatched by other countries. It is a conspiratorial kind of mythology—unseen forces moving beneath the surface of events.

That's wrong. MITI is more of an expression of the underlying myth of Japan, a story that includes its history of rebounding back after repeated crises have struck its islands. The "four devils" that the nation has faced are earthquakes, great fires, hurricanes, and unwise leaders—cataclysms outside the population's control that often flattened them temporarily. A history of doing what is necessary to survive, even after extensive damage, is deep in the Japanese culture. People in Japan save money not because they are

trying to take over the world, but because they know they might have to rebuild after disasters. They value education as a form of cultural continuity and defense against future threats. All these cultural norms emerged over Japan's long history; they can be understood only as part of a story about Japan, just as the American Dream is part of a story about the United States.

How do these two national myths affect behavior? Consider the oil price crisis of 1973, in which a sudden jump in oil prices affected both nations dramatically. The Japanese reacted with their myth of resilience. Realizing that they were no longer living in a world of cheap energy, their leaders (with the support of their people) quickly understood that they would always depend on others for their energy lifeline. So the Japanese made themselves the most energy-efficient industrial economy on the planet in less than three years. That meant a severe recession in the Japanese economy while they rebuilt the capital structure. By 1976, their energy-efficiency had improved enormously.

The United States reacted differently. Politically, American leaders fought to preserve the country's "manifest destiny." Corporate leaders refused to believe that this would be any more than a temporary setback in the "Land of Opportunity." Individuals reacted, at first, with anger (at gas lines, at the Arabs, at the oil companies). Then, each according to his or her means and inclinations, we separately set about making our lives more energy-efficient—or not. The United States remains more vulnerable to oil crises than Japan despite the fact that Japan imports all of the oil it needs. The American myth was not "worse" than the Japanese; arguably, our attitudes about melting pots and individual fulfillment will serve us well in the years to come. But in this instance, the Japanese myth led to more economic success. The trick, in a situation like that, is to recognize the various myths in play.

Myths are a particular type of story. James Robertson, author of *American Myth, American Reality*, offers the best definition I've seen:

> *Myths are "the way things are" as people in a particular society believe them to be; and they are the models people refer to when*

> *they try to understand their world and its behavior. Myths are the patterns—of behavior, of belief, and of perception—which people have in common. Myths are not deliberately, or necessarily consciously, fictitious*.

The sources of myths are not easy to recognize in their own times. Indeed, the notion of studying myths through analytical means is a product of the modern era. The ancient Greeks probably did not think of their stories of Zeus and Hermes as myths. No one in 400 B.C. Athens would have said, "That's a very nice way to explain the prevalence of thunderstorms." Few probably realized that the stories of Zeus's many wives originated as cultural "glue"; when the horse-riding, war-making, worshipers of the patriarchal thunder god, Zeus, invaded the Peloponnesian peninsula, they conquered countless isolated valleys, home to matriarchal, agricultural worshipers of various earth goddesses. So Zeus simply married the local goddesses via mythical tales, and the conquered cultures joined the cultural family.

As James Robertson points out, American myths have similar roots. The story of George Washington and the cherry tree, for instance, solves a contradiction deep in the American character: the conflict between rebellion and innocence. A culture based on revolution must condone certain acts of violence. Yet America is also the land of the new, the young, and the innocent. The cherry tree story—violence against the father's possession followed by honest admission and the father's praise—fulfills the wish of every rebellious child that rebellion and independence will be met with approval and will result in being once again enfolded in the arms of the father. The literal truth of any of these stories—whether, for instance, George Washington *really* chopped down that tree—is far less important than its insight into the way Americans see their role in a moral universe. Years later, American movies such as *The Wild One, Rebel Without a Cause, The Graduate, Beverly Hills Cop*, and even the Star Wars trilogy played out the same theme, as did American behavior in the energy crisis.

Organizations have myths too—universally believed stories about their past and future. AT&T's view of "universal service" is an example. Beginning with that great servant to humanity Theodore Vail (goes the story), AT&T developed an overriding vision to reach out and touch *everyone*—to provide the same telephone service to all Americans even in the most remote locations. This gave AT&T a kind of organizing myth similar to the American folktale of Johnny Appleseed; telephone people were not just operators or technicians, but people working to plant the seeds of communication. When you look at AT&T's challenges today, it becomes clear that they are losing their old myth. The old goal of universal service clashes with the world after the breakup of AT&T and the need to become a competitive, high-technology company. Now people at AT&T find they don't all share a clear myth for the future. They are in the process of trying to rediscover their vision. Any scenario about the future of AT&T should help people understand the likely results of this clash of mythologies.

Thus, in writing scenarios, we spin myths—old and new—that will be important in the future. The "global teenager" of Chapter 7, for instance, is a mythic figure, representing no individual teenager in the world today, but symbolizing almost 2 billion of them. These myths in scenarios help us come to grips with forces and feelings that would not otherwise exist in concrete form. They help us describe them, envision them, bring them to life—in a way that helps us make use of them. Story-telling in the form of myths can reveal something about what we feel, hope, expect, fear for the future.