now the terrain, the altitude, and the heavy pack were taking their toll. He'd already given the tent to York to carry. York, a fellow firefighter and strong outdoorsman, repeatedly had to wait for Killip to catch up, and after five or six hours of that, York grew impatient and left Killip to fend for himself. Mismatching the abilities of people in the outdoors is a sure way to get into trouble. People routinely fail to realize that they have to travel at the speed of the slowest member, not the fastest.

Killip had been following York, who had been there before and knew the way. And although Killip had the map, York had the compass. They'd begun on a trail, but beyond the top of Mount Ida, it was a trailless wilderness, where you need both map and compass. Now, as he watched York disappear into the approaching weather, Killip didn't comprehend the insidious processes that were taking place. The world, though constantly changing, was the same as it had always been. The processes that would betray Killip were all taking place inside of him.

One type of mental model people form is a mental map: literally, a schematic of an area or a route. Killip had formed a sort of stochastic mental map of where he'd been since leaving his car. Because he'd been following York, he had not been checking his topographical map, and that is not a good way to create a reliable mental map. Now his brain was unconsciously trying to form a mental map of the route from a position he didn't really know to a destination he'd never seen before. That futile struggle contributed to his ill-defined anxiety.

In addition, a storm was rolling in, and Killip did not want to be the tallest object on the ridge. The area is well known for its afternoon lightning strikes. He decided to wait on the slope below the ridge until the thunderstorm passed. The multiple stresses of weather, fatigue, altitude, dehydration, and anxiety were closing in on Killip's ability to find that vital balance between useful emotion and reason.

As the storm began booming and flashing around him, it

increased his level of stress. Killip had time to reflect on his misgivings about the trip, but his thinking was already beyond detailed, accurate analysis. In addition, stress was eroding his ability to perceive. He saw less, heard less, began to miss important cues from his environment.

Four day-hikers came off the trail to join him and wait out the rain. They told Killip that they'd seen his friend. Grasping at the wished-for reality, Killip concluded that all he'd have to do was hurry on ahead, and he'd find York. When at last the lightning stopped, Killip pressed on in a driving rain, intent on salvaging the trip.

He was climbing a steep slope that he was sure must be Mount Ida—it just had to be. He'd been walking all day under his heavy pack. He knew he would soon get to head down toward a cool, clear river with a string of jewel-like lakes. He could drink. The perception that he was climbing Mount Ida gave a more settled feeling to the area of his brain that was trying to create a mental map. At last, the hippocampus had something to work with. Killip could picture Mount Ida and its relationship to his destination, and mental maps are images. Without images, we are lost.

He'd been in motion for more than twelve hours. It was after 5:00 P.M., and he'd drunk the last of his water at about two o'clock. The sun was going down; the temperature was dropping. The rain continued to torment him.

When Killip struggled to the top, he turned east and began the descent into the drainage, following his image of where Rock Lake should be. But he immediately knew that something was wrong: There was an unpleasant jolt from the amygdala. This was not the place. The river and the little lakes and the rock shelf that York had told him he would see weren't there. The image and the world didn't match.

Killip had not, in fact, reached the summit of Mount Ida. He was looking instead down a parallel drainage about a mile to the north. Killip now teetered on the invisible dividing line between

two worlds: He was in a state of only minor geographical confusion. He could have retraced his steps. He still had a grip on one route, but he didn't have the big picture. He knew what was behind him. He did not know what was ahead of him. He could see into his past, but he had lost that vital cortical ability to perceive the world and therefore to see into his own future.

PSYCHOLOGISTS WHO study the behavior of people who get lost report that very few ever backtrack. (The eyes look forward into real or imagined worlds.) In Killip's case, there were other factors, too. He'd walked all day, exhausted, dehydrated, cold, and wet, probably by now feeling like a fool in York's eyes. He'd come a very long way, and his gut told him that it would be a long and painful way back, which would not lead to water. Rock Lake (and rest and water) had to be close at hand. If he'd been able to reason more clearly, he could have understood that he was not on the route to Rock Lake. But logic was rapidly being pushed into the background by emotion and stress. So, by the simple act of putting one foot in front of the other, he was about to cross over from mild geographical confusion to a state of being genuinely lost.

Edward Cornell, one of the scientists who study the behavior of people who become lost, is a professor of psychology at the University of Alberta in Edmonton. "Being lost is a universal human condition," he told me. "But there is a very fuzzy area between being lost and not lost."

Until about half a century ago, there was a widespread belief among scientists that people had some sort of inherent sense of direction. The observation that certain peoples around the world were especially skilled at navigation in the absence of obvious cues was evidence for a magnetic sense. The Australian Aborigines and the Puluwat Islanders in the South Pacific were examples of peoples who seemed inexplicably good at navigating. But when they studied those peoples more closely, researchers realized that they had simply been trained from childhood to pick up very subtle cues from the environment and use them the way anyone else would use landmarks to find a route. Even those people can and do get lost. And after half a century of research, it turns out that their greatest skill lay in keeping an up-to-date mental map of their environment.

There is no agreement among scientists on an exact definition of being lost. William G. Syrotuck, a pioneer in the field, defined it as being the subject of a land search. But many land searches are initiated for people who are just not where they're supposed to be. Kenneth Hill, a teacher and psychologist who also manages search and rescue operations in Nova Scotia, built on Syrotuck's work. He defines being lost as "30 minutes of not knowing where you are." That would suggest that a number of pilots I know have been lost in local taverns. Scientists who study human spatial cognition define being lost as being unable to relate your position in space to known locations. But being lost includes a whole range of emotional and behavioral consequences as well.

Syrotuck was the first search and rescue expert to conduct systematic research on the behavior of people who become lost in the wilderness. In *Lost Person Behavior*, he writes that they tend to panic. "Panic usually implies tearing around or thrashing through the brush, but in its earlier stages it is less frantic. . . . It all starts when they look about and find that a supposedly familiar location now appears totally strange, or when they start to realize that it seems to be taking longer to reach a particular place than they had expected. There is a tendency to hurry to 'find the right place.' 'Maybe it's just over that little ridge.'"

Recent research in neuroscience has shed some light on how people navigate. The way we know where we are is complex, as are the parts of the brain we use—the hippocampus and its component parts (such as the subiculum, the entorhinal cortex, and CA-3 and CA-1 formations). Joseph LeDoux calls the hippocampus "a spatial cognition machine." Neuroscientists have described how the brain creates mental maps of the environment. Early research

with rats in the 1970s by John O'Keefe at McGill University, among others, provided the first neurophysiological evidence that the hippocampus creates "a spatial reference map" in the brain. In addition, there are cells that fire depending on the position of the head and others that track the position of the whole body or its parts. Still other cells fire only when traveling in one direction.

O'Keefe more or less accidentally found what he called "place cells" in the rat hippocampus. Place cells are individual neurons that get mapped to fire when the animal is at a specific place. Normally, hippocampal cells fire perhaps only once every second on average. But at that mapped place, they fire hundreds of times faster. In tests with monkeys at the University of Oxford, cells were found that fired only when the animal was looking at a certain view. A single cell can map more than one place.

So there is an elaborate system involving the hippocampus and other areas of the brain for creating an analog of the world and your motion, position, and direction of travel within it. It works in concert with other systems to locate you in your mind. For example, through information from the inner ear (the vestibular system), your brain is constantly telling you whether you're upright or not and whether you're leaning over or falling backward. Through the proprioceptive system, the brain is constantly reading signals from nerve cells throughout the body to tell you where the parts of your body are. That's why you can touch your nose with your eyes closed. Without those systems, you'd get lost every time you tried to go anywhere, as experimental animals do when researchers destroy the hippocampal area of the brain. Alzheimer's patients do, too.

Place cells and other cells involved in navigation are constantly being reprogrammed. It's called "remapping." Any time you go to a new place, the brain begins trying to create a new map. For some people, it takes only one trip; others have to repeat the route several times to remember it. (We've all had the experience of waking in a strange place and not knowing where we are.) The

hippocampus is associated with memory, and the maps appear to be stored in the same way as memory. You create not just routes but maps of areas of your environment, such as a room, your house, or your whole neighborhood. Many people find, for example, that they can easily navigate around their own bedroom or even large parts of their house without the lights on, because the mental map in their brain matches the real world. Blind people often get around just fine because they have excellent mental maps. Place cells in rats fire in the dark. But stress interferes with the work of the hippocampus, making it harder to make and revise your mental maps.

Interestingly, the hippocampus, which tells you where you are and where you're going (if the map is right), does not control the seeking of a goal. The urge to get to a specific place, the drive toward a goal, appears to be emotional. That makes sense, since the amygdala helps trigger action, especially as it relates to survival. Rats who have had the lateral nucleus of the amygdala destroyed lose their drive to get to a particular place. So, place and motivation are integrally connected, which may explain what keeps people moving when it would be safer for them to stay still.

When a person goes from a city to, say, Rocky Mountain National Park, it puts some unusual demands on the brain. In the city, all the visual cues are near and limited in number as well. You may see the inside of your home, the inside of your office, streets bordered by buildings, and so on. Rarely do most people get a sweeping panorama in a city. When you travel to the mountains, suddenly all the cues are different, as are all the requirements of mapping that are going on continuously and unconsciously in the brain. The brain is reaching out through the senses, bringing information in, attempting to grasp the environment and wire up a map. The input and output of the hippocampus and other areas are being sent to the amygdala to establish a drive toward beneficial things and an aversion to harmful things. The amygdala is set to respond with action. For a person displaced from his normal

environment, the task of mapping the unfamiliar and vast world might feel a bit overwhelming.

SO, WITH REASON pretty much out of the picture and emotion driving hard toward survival strategies, Killip started down the wrong drainage as darkness and rain fell around him. The absence of a mental map of the place in which he found himself caused the amygdala to begin sending signals of danger. People recognize as good such places as the location of food, water, and members of the opposite sex. That's a primary task of adaptation and survival. People also recognize dangerous places. And it makes perfect sense that a dangerous place to be is one for which you have no mental map, for then you'd be unable to find food, water, or a mate.

Killip's seemingly irrational behavior makes sense when viewed from the brain's point of view. The fact of not having a mental map, of trying to create one in an environment where the sensory input made no sense, is interpreted as an emergency and triggers a physical (i.e., emotional) response. In the emergency of being no place, Killip's action makes sense to the organism, even though it later seems illogical. The organism needed him to hurry up and try to get some place quickly, a place that matched his mental map, a place that would provide access to the essentials of survival. This impulse explains Syrotuck's observation that people panic when they become lost. It gives a working definition of being lost: the inability to make the mental map match the environment.

So it was that Killip found himself blundering through dense timber in total darkness with the creepy feeling of knowing that he was nowhere. A chance flicker of lightning ignited reflections on a pond. Parched with thirst, Killip headed for it. He drank his fill and prepared to spend the night. He had no choice now. But he wasn't thinking straight. He had food in his pack, but York had the tent. Killip had garbage bags but didn't use them for a makeshift

shelter. Although he needed a fire, wanted its warmth and light, he knew that open fires weren't permitted in this part of the park. As a firefighter, he felt he ought to follow that rule. (If he had made a fire, he might have been seen and rescued sooner.)

When a bear appeared, Killip got up and charged the animal, waving his jacket at it and shouting. The bear went away. Then Killip wondered what would have happened if he'd been injured so far from help.

He was able to heat a meal on his camp stove. Then he fell asleep.

When he awoke, he felt somewhat refreshed. But he would not recover from his fatigue and confusion that quickly. He still had the option of retracing his steps to his car. He could go back up the drainage. But he felt that he could not simply leave York and spoil the trip. York would be thinking: What a nitwit. And anyway, Killip didn't yet quite believe that he was lost.

Admitting that you are lost is difficult because having no mental map, being no place, is like having no self: It's impossible to conceive, because one of the main jobs of the organism is to adjust itself to place. That's why small children, when asked if they are lost, will say, "No, my Mommy is lost." The sense is: I'm not lost; I'm right here. But without a mental map, the organism can't go about its business and rapidly deteriorates. So to Killip, it seemed that he wasn't lost. Rock Lake was lost. It had to be just around the corner somewhere. Then everything would be all right. He had a firefighter's can-do persistence and a lost person's tendency to form a strategy, albeit a faulty one.

He began bushwacking through forest so dense he sometimes had to remove his backpack to squeeze between the trees. It didn't occur to him that this might be a bad sign. But anytime you find yourself thinking it's easier to go around a mountain than over one, you know there's trouble upstairs.

As Syrotuck writes, "If things get progressively more unfamiliar and mixed up, [the victim] may then develop a feeling of ver-

tigo, the trees and slopes seem to be closing in and a feeling of claustrophobia compels them to try to 'break out.' This is the point at which running or frantic scrambling may occur," as the organism frantically attempts to get a fix on an alien environment.

By afternoon, Killip's wanderings had severed all connection to the world he'd known. His circle of confusion had expanded so that he could no longer even retrace his steps: He was profoundly lost. And while the rational part of his brain remained convinced that he was getting close to Rock Lake, the emotional part was driving him on with more and more urgency. (He'd eventually pass within a quarter mile of Rock Lake, but not that day.)

As his brain continued the unconscious search for any cue with which to establish a mental map, the alarm signals grew more and more urgent: No place. No food. No people. *Get there, get there,* a voice seemed to say. *Hurry, hurry.*

Killip began scrambling up a steep scree slope to get a better view. Myabe if he just got up high . . . if he could just see the whole area, then everything would snap back into focus and he could calm down.

About halfway up, he lost his footing and couldn't self-arrest. He began to cartwheel down the long grade. When he came to a stop, he had suffered severely pulled muscles in his shoulder, ligament and cartilage damage in his knees, and two sprained ankles. He was lucky it wasn't fatal, as such a violent fall often is.

Killip dragged himself to a small pond, where he had no choice but to remain through another rainy night. He tried to reason, but something was wrong. He was cold and hurt but still believed he was forbidden from making a fire. He didn't even erect a shelter.

Killip awoke in pain and frustration. He'd had it with trying to find Rock Lake. He was definitely going back to the car, he decided. Although he had no idea what direction to go, because he didn't know where he was, he began limping through the forest, battering his way through the trees, wasting precious energy. But with no understanding of what was happening to him, he could not settle

down. Once again, he decided that the best strategy was to climb up and see if he could get an overall view of where he was.

As Syrotuck put it, "If they do not totally exhaust or injure themselves during outright panic, they may eventually get a grip on themselves and decide on some plan of action. What they decide to do may appear irrational to a calm observer, but does not seem nearly so unreasonable to the lost person who is now totally disoriented. Generally, they would be wiser and safer to stay put and get as comfortable and warm as possible, but many feel compelled to push on, urged by subconscious feelings." Urged on by the frustrating task that his unconscious brain activity had been trying to complete for so long now without success. The organism's main task is to map the self, map the environment, and keep the two in harmonious balance. Without the balance, the organism dies.

Killip began struggling up another steep and rocky slope. It was actually Terra Tomah Mountain, a 12,718-foot peak. But before he could get himself rim-rocked, a storm blew in and forced him back down toward the trees. He felt woozy. He felt strange. He knew he was in serious trouble, but there didn't seem to be anything he could do about it. He passed out with one arm slung around a tree trunk to keep himself from sliding down the steep rock.

It was past midnight when he awoke, wet and shaking uncontrollably. He looked around. The world was strange. Everything was white. After a moment, he realized what he was seeing: Hailstones covered the ground to a depth of 12 inches. He had slept through a big storm.

When he'd set out on August 8, Killip had been a healthy, competent, well-equipped hiker. His pack contained everything he needed to survive at least a week in the wild. Now, just over two days after taking a wrong turn off the Continental Divide, he was huddled on an icy mountainside, exhausted, hungry, badly dehydrated, injured, and dangerously hypothermic. What had begun as a small error in navigation had progressed, step by innocent step, to a grim struggle for survival.

. . .

SYROTUCK ANALYZED 229 search and rescue cases (11 percent of them fatal) and concluded that almost three quarters of those who died perished within the first forty-eight hours of becoming lost. Those who die can do so surprisingly quickly, and hypothermia is usually the official cause. Hypothermia is frighteningly insidious, but in some cases people just give up.

Anyone can get lost. I know. I have. But surprisingly few are genuinely prepared to live through the experience. I was staying at Many Glacier Hotel, in Glacier National Park, and decided to hike the half-hour nature trail with a friend before breakfast. But there was the air, and the view, and that spicy juniper smell of the mountains. There were those dizzying spaces and the Hansel and Gretel forest beckoning . . . Our experience of a week of hard hiking deep in the Montana wilderness had convinced us both that we knew our way around. We were fit and confident.

We left the little loop trail and followed a sign for Grinnell Lake. We took one fork, then another, then another. When the first drops of rain started falling, we slipped into our cheap gift-shop ponchos and hurried on with a growing sense of urgency. We didn't consider turning back.

At last, we stood on the shore of a lake, trying to remember why it had seemed so important to get there. The soft hissing of rain suddenly accelerated to a clattering of hailstones. I looked over at my companion and saw that her face was pale and blotchy. Her teeth had begun to chatter. I felt a cold dread set like plaster in my stomach as the realization hit me that we were standing in a hailstorm, dressed in cotton T-shirts and garbage bags, at least two hours from home with no map or compass. *What were we thinking?*

We took off down the trail at a dead run, but when we reached a fork, she went one way and I went the other. We turned back to look at each other in horrified amazement. We had no idea which way we'd come. We finally chose one of the paths and had just set

foot on it when we heard a human voice. We surged toward it, crashing through a few yards of dense forest, and found ourselves at a dock on another lake, where a tourist boat had just pulled up. Ice had already covered the windshield.

As we clambered aboard, we were told that it was the last boat of the day. I still sometimes wake up at night wondering what it would have been like if we had stayed on that path (which led deeper into the wilderness, as we later discovered from a glance at the map we'd left at the hotel) with no water, no fire, and no warm clothing, in what turned out to be a two-day ice storm.

In just a few hours, we'd gone from being carefree day hikers to panicked victims, saved only by dumb luck. Until that day in Glacier, I would not have believed how easily I could get lost or how quickly I could lose my ability to reason.

One of Kenneth Hill's experiments involves taking a group of his students into a small forest in Nova Scotia. "It's about the size of a large city park," he told me, "and notorious for its maze of poorly marked trails." He leads the students in and then asks them to lead him out. Only one person has ever succeeded. "If you ask hikers on a trail to point out where they are on a map at any given moment," Hill said, "they are usually wrong."

In daily life, people operate on the necessary illusion that they know where they are. Most of the time, they don't. The only time most people are not lost to some degree is when they are at home. It's quite possible to know the route from one place to another without knowing precisely where you are. That's why streets have signs. Nevertheless, most people normally have enough knowledge of a route to get them where they're going. If they don't—as in my case, and in Ken Killip's case—they get lost.

It's simple. All you have to do is fail to update your mental map and then persist in following it even when the landscape (or your compass) tries to tell you it's wrong. Edward Cornell once told me, "Whenever you start looking at your map and saying something like, 'Well, that lake could have dried up,' or, 'That boulder could

have moved,' a red light should go off. You're trying to make reality conform to your expectations rather than seeing what's there. In the sport of orienteering, they call that 'bending the map.'"

Killip was bending the map when he headed down the wrong drainage despite ample evidence that he was starting from the wrong place. But it's understandable how urgent it feels to make your mental map and the world conform. It's the essence of what every organism does, even those that don't have cognition as we know it.

If we persist in bending the map until we can no longer deny the evidence of our senses, it can be terrifying. "It's not something that happens immediately," Hill said. "First, it's a sense of disorientation: 'Uh-oh, I'm not in Kansas anymore.' Then the woods start to become strange; landmarks are no longer familiar."

Since the organism's survival depends on a reasonable match between mental map and environment, as the two diverge, the hippocampus spins its wheels and the amygdala sends out alarm signals even as the motivational circuits urge you on and on. The result is vertigo, claustrophobia, panic, and wasted motion. Since most people aren't conscious of the process, there's no way to reflect on what's happening. All you know is that it feels as if you're going mad. (And what else is insanity but a failure to match mind and world?) When at last the full weight of the incongruity hits you, the impact can be devastating. (Psychologists have observed that one of the most basic human needs, beginning at birth, is to be gazed upon by another. Mothers throughout the world have been observed spending long periods staring into the eyes of their babies with a characteristic tilt of the head. To be seen is to be real, and without another to gaze upon us, we are nothing. Part of the terror of being lost stems from the idea of never being seen again.)

People have known for ages that going from the protection of society into the wild can have a profound effect on the balance of

reason and emotion. It can induce altered states of consciousness, hallucinations, even death. The word "bewildered," with its definite, familiar Anglo-Saxon ring, dates from 1684 and comes from the archaic verb, "wilder." To "wilder" someone means to lead him into the woods and get him lost. But a recent Webster's dictionary definition retains much of the original Old English sense:

> **Bewilder,** *v.t.*; bewildered, *pt.*, *pp.*; bewildering, *ppr.* [Dan. *forvilde*, to bewilder; G. *verwildern*; AS. *wilde*, wild.]
> 1. to confuse hopelessly; befuddle; puzzle.
> 2. to cause (a person) to be lost in a wilderness. [Archaic.]
> Syn.—daze, dazzle, confound, mystify, puzzle, astonish, perplex, confuse, mislead.
>
> **Bewilderment,** *n.* 1. the fact or state of being bewildered; a chaotic state of the mental forces; perplexity.
>
> **Wild,** *a.* [ME. *wilde*, *wielde*, from AS. *wild*, wild, bewildered, confused.]

The more modern term "woods shock," which is used by psychologists, dates from at least 1873, where it appeared in the journal *Nature*. It refers to a state of confusion that can beset people in the wilderness.

"'Woods shock' is a term for the fear associated with complete loss of spatial orientation," Kenneth Hill told me. "None of the rational abilities that the victim had before being lost are useful to him anymore." In severe cases, the actions of even the most experienced outdoorsmen can seem inexplicable. Hikers have abandoned full backpacks; hunters have left their guns behind. Killip neglected to make fire or shelter.

But in the light of recent advances in neuroscience, woods shock can now be seen as an emotional survival response associated with the failure of the mental map to match the environment. Thrash-

ing does not save a drowning person either, but it's just as natural. Those who can float quietly have a better chance.

EVERYONE WHO dies out there dies of confusion. There is always a destructive synergy among numerous factors, including exhaustion, dehydration, hypothermia, anxiety, hunger, injury. So woods shock, which can now be explained in the more precise terms of neuroscience, led Ken Killip to frantic, poorly planned actions. Those stresses and actions incapacitated him even further in a tightening spiral until reason and emotion, instead of working in harmony to produce correct action, became like two drowning swimmers, dragging each other down.

Being lost, then, is not a location; it is a transformation. It is a failure of the mind. It can happen in the woods or it can happen in life. People know that instinctively. A man leaves a perfectly good family for a woman half his age and makes a mess of it, and people say, he got off the path; he lost his way. If he doesn't get back on, he'll lose the self, too. A corporation can do the same thing.

The research suggests five general stages in the process a person goes through when lost. In the first, you deny that you're disoriented and press on with growing urgency, attempting to make your mental map fit what you see. In the next stage, as you realize that you're genuinely lost, the urgency blossoms into a full-scale survival emergency. Clear thought becomes impossible and action becomes frantic, unproductive, even dangerous. In the third stage (usually following injury or exhaustion), you expend the chemicals of emotion and form a strategy for finding some place that matches the mental map. (It is a misguided strategy, for there is no such place now: You are lost.) In the fourth stage, you deteriorate both rationally and emotionally, as the strategy fails to resolve the conflict. In the final stage, as you run out of options and energy, you must become resigned to your plight. Like it or not, you must make a new mental map of where you are. You must become

Robinson Crusoe or you will die. To survive, you must find yourself. Then it won't matter where you are.

The stages of getting lost apply to more than just hiking in the woods. A company, such as Xerox, ignores cues from a changing world and from inside its own research facility in Palo Alto and nearly destroys itself. In 1959, Xerox introduced its 914 copier. *Fortune* said it was "the most successful product ever marketed in America." By 1969, Xerox passed $1 billion in sales. In 1971, flushed with success (an emotional state of high arousal), the company's officers were in a state of deep denial. The world was changing, and they weren't taking in any new information. Their cup was full. At the stockholders' meeting that year, these words, which would nearly destroy the company, were uttered: "We can handle all your information needs." Xerox's leaders had decided to take on IBM, despite all the clear evidence that it would most likely kill them to do so. They were like the snowmobilers, flushed with emotion, who went up that hill, despite the clear evidence that it would probably kill them. They were bending the map, too.

Xerox spent $1 billion to purchase a computer company. At the same time, the company opened the Palo Alto Research Center (PARC). It took only five years (which is like five days for a hiker) for the computer business to drag Xerox down by about $85 million in cash. In the meantime, scientists and engineers at PARC were inventing the mouse, Ethernet, the graphical user interface, the flat-panel display, and the laser printer. Others got rich off of those inventions. Xerox, busy with its mental models that did not match the real world, saw none of that profit.

Unlike Ken Killip, Xerox is still in the woods.

The stages of getting lost resemble the five stages of dying described by Elisabeth Kübler-Ross, the psychologist who wrote *On Death and Dying*: denial, anger, bargaining, depression, and acceptance. The end result is often the same. "Once the stage of psychological disintegration is reached, death is often not far away," John Leach writes in *Survival Psychology*. "[T]he ability

people possess to die gently, and often suddenly, through no organic cause, is a very real one." This suggests that some cases listed as hypothermia may not have been.

That's a lesson Kenneth Hill knows well. "I have photos of a man who settled into a cozy bed of pine needles after removing his shoes, pants, and jacket and setting his wallet on a nearby rock," he told me. "In the photos, he seems so peaceful; it's hard to believe he's dead. The photos have special significance for me, because I helped coordinate the search. Whenever I start to believe I'm some hot-shit SAR expert, I pull the photos out and I'm over it."

Consciousness is a murky, intermittent phenomenon that has yet to be debugged. It sees the world through a glass darkly, not face to face, as Paul the Apostle said. Many conditions influence how you perceive and how much you perceive, as well as what you do with that information. So you go unconsciously about your business, losing your keys and finding them right under your nose. Running red lights. Letting the pot boil over. Forgetting to pay the electric bill. The consequences are few. Then you go into the wilderness, where the consequences are many.

BY HIS third night lost in the wild, when Killip awoke amid the hailstones at the foot of Terra Tomah Mountain, he had arguably passed through the stages of denial (descending the wrong drainage), panic (climbing up the dangerous scree slope), and strategic planning (attempting to backtrack), and was well into the penultimate stage of deterioration. But he did not succumb to resignation.

That happens in a lot of cases (including big companies, troubled marriages, sick people, lost souls). There are great survivors and helpless victims on the curve of human ability. Most of us are neither. Most of us fall somewhere in between and may perform poorly at first, then find the inner resources to return to correct action and clear thought. If the object of the game is survival, that

will do. Or, as my father used to tell me about flying, "A good landing is any landing that you can walk away from."

Killip pulled himself together. He put on his fishing waders and started walking around to get warm. He made a fire and built a makeshift shelter using his garbage bags. (Both were things he should have done the first day, but better late than never.) For the next two days, he stayed put and attended to the business of adapting to the environment, keeping the organism in balance, the process called survival. Killip had entered the final stage that separates the quick from the dead: not helpless resignation but a pragmatic acceptance of—and even wonder at—the world in which he found himself. He had at last begun to model and map his real environment instead of the one he wished for. He'd worked out his own salvation. He had discovered the first Rule of Life: *Be here now.*

That final stage in the process of being lost can prove to be either a beginning or an end. Some give up and die. Others stop denying and begin surviving. You don't have to be an elite performer. You don't have to be perfect. You just have to get on with it and do the next right thing. Amen!

Having faced the reality of his situation, having created a mental map of where he was, not where he wanted to be, Killip was now able to function. On his fifth and final day, he watched as a helicopter passed right over him, so close that "I felt like I could throw a rock at him. Then it turned and flew away. It was almost breaking my spirit."

One of the toughest steps a survivor has to take is to discard the hope of rescue, just as he discards the old world he left behind and accepts the new one. There is no other way for his brain to settle down. Although that idea seems paradoxical, it is essential. I know that's what my father did in the Nazi prison camp: He made it his world. Dougal Robertson, who was cast away at sea for thirty-eight days, advised thinking of it this way: "Rescue will come as a welcome interruption of . . . the survival voyage."

The helicopter pilot had seen Killip's blue parka hanging on a

branch and directed the ground searchers to his location. "I lost thirty pounds in five days," Killip told me. His knee injuries required two operations. Today, he still goes into the wilderness, but "now I carry a survival pack and a map and compass everywhere. And I'm very careful about who I go out with. If I have a bad feeling about something, I don't go."

ONE OF the many baffling mysteries concerns who survives and who doesn't. "It's not who you'd predict, either," Hill, who has studied the survival rates of different demographic groups, told me. "Sometimes the one who survives is an inexperienced female hiker, while the experienced hunter gives up and dies in one night, even when it's not that cold. The category that has one of the highest survival rates is children six and under, the very people we're most concerned about." Despite the fact that small children lose body heat faster than adults, they often survive in the same conditions better than experienced hunters, better than physically fit hikers, better than former members of the military or skilled sailors. And yet one of the groups with the poorest survival rates is children ages seven to twelve. Clearly, those youngest children have a deep secret that trumps knowledge and experience.

Scientists do not know exactly what that secret is, but the answer may lie in basic childhood traits. At that age, the brain has not yet developed certain abilities. For example, small children do not create the same sort of mental maps adults do. They don't understand traveling to a particular place, so they don't run to get somewhere beyond their field of vision. They also follow their instincts. If it gets cold, they crawl into a hollow tree to get warm. If they're tired, they rest, so they don't get fatigued. If they're thirsty, they drink. They try to make themselves comfortable, and staying comfortable helps keep them alive. (Small children following their instincts can also be hard to find; in more than one case, the lost child actually hid from rescuers. One was afraid of "coyotes" when he heard the search dogs barking. Another was afraid of one-eyed monsters when he saw big men wearing headlamps. Fortunately, both were ultimately found.) The secret may also lie in the fact that they do not yet have the sophisticated mental mapping ability that adults have, and so do not try to bend the map. They remap the world they're in.

Children between the ages of seven and twelve, on the other hand, have some adult characteristics, such as mental mapping, but they don't have adult judgment. They don't ordinarily have the strong ability to control emotional responses and to reason through their situation. They panic and run. They look for shortcuts. If a trail peters out, they keep going, ignoring thirst, hunger, and cold, until they fall over. In learning to think more like adults, it seems, they have suppressed the very instincts that might have helped them. But they haven't learned to stay cool. Many may not yet be self-reliant. (One of my survival instructors told me that inner-city children did better in survival training than ones from the suburbs, "because the suburban children have no predators.") They have begun to learn to navigate, to make detailed mental maps; children that age trade secret routes and shortcuts. But a little knowledge is dangerous. A child that age will run across a road without stopping when lost.

We like to think that education and experience make us more competent, more capable. But it seems that the opposite is sometimes true. Ultimately, after years of chasing the ghost of the boy aviator who went on to become my father, I went to survival school to try to find out if there was a way to learn the skills of survival while retaining the instincts of a small child. I thought that perhaps through all the risk taking, the quest for cool, I had wandered off the path of life. I couldn't help thinking, then, of the Zen concept of the beginner's mind, the mind that remains open and ready despite years of training. "In the beginner's mind there are many possibilities," said Zen master Shunryu Suzuki. "In the expert's mind there are few."