"No, it is not," I told her. "It is an example of statistical coincidences. Let me ask you this: How many times did you go to the phone to call your friend and she did not call? Or how many times did your friend call you but you did not call her first?"

She said she would have to think about it and get back to me. Later, she found me and said she had figured it out: "I only remember the times that these events happen, and I forget all those others you suggested."

"Bingo!" I exclaimed, thinking I had a convert. "You got it. It is just selective perception."

But I was too optimistic. "No," she concluded, "this just proves that psychic power works sometimes but not others."

As James Randi says, believers in the paranormal are like "unsinkable rubber ducks."

"Why People Believe Weird Things"

Michael Shermer
(editor of "Skeptic" magazine)

5

Through the Invisible

Near-Death Experiences and the Quest for Immortality

I sent my Soul through the Invisible,
    some letter of that After-life to spell:
    And by and by my Soul return’d to me,
    And answer’d “I Myself am Heav’n and Hell.”

—Omar Khayyám, The Rubaiyat

In 1980 I attended a weekend seminar in Klamath Falls, Oregon, on "Voluntary Controls of Internal States," hosted by Jack Schwarz, a man well known to practitioners of alternative medicine and altered states of consciousness. According to literature advertising the seminar, Jack is a survivor of a Nazi concentration camp, where years of isolation, miserable conditions, and physical torture taught him to transcend his body and go to a place where he could not be hurt. Jack's course was intended to teach the principles of mind control through meditation. Mastery of these principles allows one to voluntarily control such bodily functions as pulse rate, blood pressure, pain, fatigue, and bleeding. In a dramatic demonstration, Jack took out a ten-inch-long rusted sail needle and shoved it through his biceps. He didn't wince and after he pulled it out only a tiny drop of blood covered the hole. I was impressed.

The first part of the course was educational. We learned about the color, location, and power of our chakras (energy centers intersecting the physical and psychospiritual realms), the power of the mind to control the body through use of these chakras, the cure of illnesses through visualization,
becoming at one with the universe through the interaction of matter and energy, and other remarkable things. The second part of the course was practical. We learned how to meditate, and then we chanted a type of mantra to focus our energies. This went on for quite some time. Jack explained that some people might experience some startling emotions. I didn’t, try as I might, but others certainly did. Several women fell off their chairs and began writhing on the floor, breathing heavily and moaning in what appeared to me as an orgasmic state. Even some men really got into it. To help me get in tune with my chakras, one woman took me into a bathroom with a wall mirror, closed the door and shut off the lights, and tried to show me the energy auras surrounding our bodies. I looked as hard as I could but didn’t see anything. One night we were driving along a quiet Oregon highway and she started pointing out little light-creatures on the side of the road. I couldn’t see these either.

I took a few other seminars from Jack and since this was before I was a “skeptic,” I can honestly say I tried to experience what others seemed to—but it always eluded me. In retrospect, I think what was going on had to do with the fact that some people are fantasy-prone, others are open to suggestion and group influence, while still others are good at letting their minds slip into altered states of consciousness. Since I think near-death experiences are a type of altered state of consciousness, let us examine this concept next.

**What Is an Altered State of Consciousness?**

Most skeptics would agree with me that mystical and spiritual experiences are nothing more than the product of fantasy and suggestion, but many would question my third explanation of altered states of consciousness. James Randi and I have discussed this subject at length. He, along with other skeptics like psychologist Robert Baker (1990, 1996), believes that there is no such thing as an altered state of consciousness because there is nothing you can do in a so-called altered state that you cannot do in an unaltered state (i.e., normal, awake, and conscious). Hypnosis, for example, is often considered a type of altered state, yet hypnotist “The Amazing” Kreskin offers to pay $100,000 to anyone who can get someone to do something under hypnosis that they could not do in an ordinary wakeful state. Baker, Kreskin, Randi, and others think that hypnosis is nothing more than fantasy role-playing. I disagree.

The expression _altered states of consciousness_ was coined by parapsychologist Charles Tart in 1969, but mainstream psychologists have been aware for some time of the fact that the mind is more than just conscious awareness. Psychologist Kenneth Bowers argues that experiments prove that “there is something far more pervasive and subtle to hypnotic behavior than voluntary and purposeful compliance with the perceived demands of the situation” and that “the ‘faking hypothesis’ is an entirely inadequate interpretation of hypnosis” (1976, p. 20). Stanford experimental psychologist Ernest Hilgard discovered through hypnosis a “hidden observer” in the mind aware of what is going on but not on a conscious level, and that there exists a “multiplicity of functional systems that are hierarchically organized but can become dissociated from one another” (1977, p. 17).

Hilgard typically instructed his subjects as follows:

> When I place my hand on your shoulder (after you are hypnotized) I shall be able to talk to a hidden part of you that knows things are going on in your body, things that are known to the part of you to which I am now talking. The part to which I am now talking will not know what you are telling me or even that you are talking.... You will remember that there is a part of you that knows many things that are going on that may be hidden from either your normal consciousness or the hypnotized part of you. (Knox, Morgan, and Hilgard 1974, p. 842)

This dissociation of the hidden observer is a type of altered state.

What exactly do we mean by an altered state or, for that matter, an unaltered state? Here it might be useful to distinguish between _quantitative_ differences—those of degree—and _qualitative_ differences—those of kind. A pile of six apples and a pile of five apples are quantitatively different. A pile of six apples and a pile of six oranges are qualitatively different. Most differences between states of consciousness are quantitative, not qualitative. In other words, in both states a thing exists, just in different amounts. For example, when sleeping, we think, since we dream; we form memories, since we can remember our dreams; and we are sensitive to our environment, though considerably less so. Some people walk and talk in their sleep, and we can control sleep, planning to get up at a certain time and doing so fairly reliably. In other words, while asleep we just do less of what we do while awake.

Still, sleep is a good example because it is so different that we do not normally mistake it for a waking state. The quantitative difference is so
great as to be qualitatively different and thus count as an altered state. Though the EEG readings in figure 7 are only quantitatively different, they are so much so that the states they represent may be considered as different in kind. If a coma is not an altered state, I do not know what is. And it cannot be duplicated in a conscious state.

Consciousness has two characteristics: 1. Monitoring ourselves and our environment so that perceptions, memories, and thoughts are accurately represented in awareness; 2. Controlling ourselves and our environment so that we are able to initiate and terminate the behavioral and cognitive activities (Kihlstrom 1987, p. 1445). Thus, an altered state of consciousness would have to interfere with our accurate monitoring of percepts, memories, and thoughts, as well as disrupt control of our behavior and cognition within the environment. An altered state of consciousness exists when there is significant interference with our monitoring and control of our environment. By significant, I mean a dramatic departure from "normal" functioning. Both sleep and hypnosis do this, as do hallucinations, near-death experiences, out-of-body experiences, and other altered states.

Psychologist Barry Beyrstein makes a similar argument in defining altered states of consciousness as the modification of specific neural sys-

The Near-Death Experience

One of the driving forces behind religions, mysticism, spiritualism, the New Age movement, and belief in ESP and psychic powers is the desire to transcend the material world, to step beyond the here-and-now and pass through the invisible into another world beyond the senses. But where is this other world and how do we get there? What is the appeal of some place we know absolutely nothing about? Is death merely a transition to this other side?

Believers claim that we do know something about the other side through a phenomenon called the perihanic or near-death experience (NDE). The NDE, like its related partner the out-of-body experience (OBE), is one of the most compelling phenomena in psychology. Apparently, upon a close encounter with death, some individuals' experiences are so similar as to lead many to believe that there is an afterlife or that death is a pleasant experience or both. The phenomenon was popularized in 1975 with the publication of Raymond Moody's book, Life After Life, and was
substantiated by corroborative evidence from others. For example, cardiologist F. Schoonmaker (1979) reported that 50 percent of the more than two thousand patients he treated over an eighteen-year period had NDEs. A 1982 Gallup poll found that one out of twenty Americans had been through an NDE (Gallup 1982, p. 198). And Dean Sheils (1978) has studied the cross-cultural nature of the phenomenon.

When NDEs first came into prominence, they were perceived as isolated, unusual events and were dismissed by scientists and medical doctors as either exaggerations or flights of fantasy by highly stressed but very creative minds. In the 1980s, however, NDEs gained credibility through the work of Elisabeth Kübler-Ross, a medical doctor who publicized this now-classic example:

Mrs. Schwartz came into the hospital and told us how she had had a near-death experience. She was a housewife from Indiana, a very simple and unsophisticated woman. She had advanced cancer, had hemorrhaged and was put into a private hospital, very close to death. The doctors attempted for 45 minutes to revive her, after which she had no vital signs and was declared dead. She told me later that while they were working on her, she had an experience of simply floating out of her physical body and hovering a few feet above the bed, watching the resuscitation team work very frantically. She described to me the designs of her doctors' ties, she repeated a joke one of the young doctors told, she remembered absolutely everything. And all she wanted to tell them was that they were doing the right thing, that they were doing the right thing. Then, in her own language, she “gave up” on them and lost consciousness. After they declared her dead, she made a comeback and lived for another year and a half. (1981, p. 86)

This is a typical NDE, characterized by one of the three most commonly reported elements: (1) a floating OBE in which you look down and see your body; (2) passing through a tunnel or spiral chamber toward a bright light that represents transcendence to “the other side”; (3) emerging on the other side and seeing loved ones who have already passed away or a Godlike figure.

It seems obvious that these are hallucinatory wishful-thinking experiences, yet Kübler-Ross has gone out of her way to verify the stories. “We’ve had people who were in severe auto accidents, had no vital signs and told us how many blow torches were used to extricate them from the wreck” (1981, p. 86). Even more bizarre are stories of an imperfect or diseased body becoming whole again during an NDE. “Quadriplegics are no longer paralyzed, multiple-sclerosis patients who have been in wheelchairs for years say that when they were out of their bodies, they were able to sing and dance.”

Memories from a previously whole body? Of course. A close friend of mine who became a paraplegic after an automobile accident often dreamed of being whole. It was not at all unusual for her to wake in the morning and fully expect to hop out of bed. But Kübler-Ross does not buy the prossaic explanation: “You take totally blind people who don’t even have light perception, don’t even see shades of gray. If they have a near-death experience, they can report exactly what the scene looked like at the accident or hospital room. They have described to me incredibly minute details. How do you explain that?” (1981, p. 90). Simple. Memories of verbal descriptions given by others during the NDE are converted into visual images of the scene and then rendered back into words. Further, quite frequently patients in trauma or surgery are not totally unconscious or under the anesthesia and are aware of what is happening around them. If the patient is in a teaching hospital, the attending physician or chief resident who performs the surgery would be describing the procedure to the other residents, thus enabling the NDE subject to give an accurate description of events.

Something is happening in the NDE that cries out for explanation, but what? Physician Michael Sabom, in his 1982 Recollections of Death, drew on the results of his correlational study of a large number of people who had had NDEs, noting age, sex, occupation, education, and religious affiliation, along with prior knowledge of NDEs, possible expectations as a result of religious or prior medical knowledge, the type of crisis (accident, arrest), location of crisis, method of resuscitation, estimated time of unconsciousness, description of the experience, and so on. Sabom followed these subjects for years, re-interviewing them as well as members of their families to see whether they altered their stories or found some other explanation for the experience. Even after years, every subject felt just as strongly about his or her experience and was convinced that the episode did occur. Almost all stated that the experience had a definite impact on their outlook on life and perception of death. They were no longer “afraid” of dying nor did they “mourn” the death of loved ones, as they were convinced that death is a pleasant experience. Each felt that he or she had been given a second chance and, although not every subject became “religious,” they all felt a need to “do something with their lives.”

Although Sabom notes that nonbelievers and believers had similar experiences, he fails to mention that we have all been exposed to the Judeo-Christian worldview. Whether or not we consciously believe, we have all heard similar ideas about God and the afterlife, heaven and hell. Sabom also does not point out that people of different religions see different religious
figures during NDEs, an indication that the phenomenon occurs within the mind, not without.

What naturalistic explanations can be offered for NDEs? An early, speculative theory came from psychologist Stanislav Grof (1976; Grof and Halifax 1977), who argued that every human being has already experienced the characteristics of the NDE—the sensation of floating, the passage down a tunnel, the emergence into a bright light—birth. Perhaps the memory of such a traumatic event is permanently imprinted in our minds, to be triggered later by an equally traumatic event—death. Is it possible that recollection of perinatal memories accounts for what is experienced during an NDE? Not likely. There is no evidence for infantile memories of any kind. Furthermore, the birth canal does not look like a tunnel and besides the infant's head is normally down and its eyes are closed. And why do people who are born by cesarean section have NDEs? (Not to mention that Grof and his subjects were experimenting with LSD—not the most reliable method for retrieving memories, since it creates its own illusions.)

A more likely explanation looks to biochemical and neurophysiological causes. We know, for example, that the hallucination of flying is triggered by atropine and other belladonna alkaloids, some of which are found in mandrake and jimsonweed and were used by European witches and American Indian shamans. OBEs are easily induced by dissociative anesthetics such as the ketamines. DMT (dimethyltryptamine) causes the perception that the world is enlarging or shrinking. MDA (methylenedioxymphetamine) stimulates the feeling of age regression so that things we have long forgotten are brought back into memory. And, of course, LSD (lysergic acid diethylamide) triggers visual and auditory hallucinations and creates a feeling of oneness with the cosmos, among other effects (see Goodman and Gilman 1970; Grinspoon and Bakalar 1979; Ray 1972; Sagan 1979; Siegel 1977). The fact that there are receptor sites in the brain for such artificially processed chemicals means that there are naturally produced chemicals in the brain that, under certain conditions (the stress of trauma or an accident, for example), can induce any or all of the experiences typically associated with an NDE. Perhaps NDEs and OBEs are nothing more than wild “trips” induced by the extreme trauma of almost dying. Aldous Huxley’s *Doors of Perception* (whence the rock group The Doors got its name) has a fascinating description, made by the author while under the influence of mescaline, of a flower in a vase. Huxley describes “seeing what Adam had seen on the morning of his creation—the miracle, moment by moment, of naked existence” (1954, p. 17).

Psychologist Susan Blackmore (1991, 1993, 1996) has taken the hallucination hypothesis one step further by demonstrating why different people would experience similar effects, such as the tunnel. The visual cortex on the back of the brain is where information from the retina is processed. Hallucinogenic drugs and lack of oxygen to the brain (such as sometimes occurs near death) can interfere with the normal rate of firing by nerve cells in this area. When this occurs “stripes” of neuronal activity move across the visual cortex, which is interpreted by the brain as concentric rings or spirals. These spirals may be “seen” as a tunnel. Similarly, the OBE is a confusion between reality and fantasy, as dreams can be upon first awakening. The brain tries to reconstruct events and in the process visualizes them from above—a normal process we all do when “decentering” ourselves (when you picture yourself sitting on the beach or climbing a mountain, it is usually from above, looking down). Under the influence of hallucinogenic drugs, subjects saw images like those in figure 8; such images produce the tunneling effect of the NDE.

Finally, the “otherworldliness” of the NDE is produced by the dominance of the fantasy of imagining the other side, visualizing our loved ones who died before, seeing our personal God, and so on. But what happens to those who do not come back from an NDE? Blackmore gives this reconstruction of death: “Lack of oxygen first produces increased activity through disinhibition, but eventually it all stops. Since it is this activity that produces the mental models that give rise to consciousness, then all this will cease. There will be no more experience, no more self, and so that . . . is the end” (1991, p. 44). Cerebral anoxia (lack of oxygen), hypoxia (insufficient oxygen), or hypercardia (too much carbon dioxide) have all
been proposed as triggers of NDEs (Saavedra-Aguilar and Gomez-Jeria 1989), but Blackmore points out that people with none of these conditions have had NDEs. She admits, “It is far from clear, as yet, how they are best to be explained. No amount of evidence is likely to settle, for good, the argument between the ‘afterlife’ and ‘dying brain’ hypotheses” (1996, p. 440). NDEs remain one of the great unresolved mysteries of psychology, leaving us once again with a Human question: Which is more likely, that an NDE is an as-yet-to-be explained phenomenon of the brain or that it is evidence of what we have always wanted to be true—immortality?

The Quest for Immortality

Death, or at least the end of life, appears to be the outer limit of our consciousness and the frontier of the possible. Death is the ultimate altered state. Is it the end, or merely the end of the beginning? Job asked the same question: “If a man die, shall he live again?” Obviously no one knows for sure, but plenty of folks think they do know, and many of them are not shy about trying to convince the rest of us that their particular answer is the correct one. This question is one of the reasons that there are literally thousands of organized religions in the world, each claiming exclusive knowledge about what follows death. As humanist scholar Robert Ingersoll (1879) noted, “The only evidence, so far as I know, about another life is, first, that we have no evidence; and secondly, that we are rather sorry that we have not, and wish we had.” Without some belief structure, however, many people find this world meaningless and without comfort. The philosopher George Berkeley (1713) penned this example of such sentiments: “I can easily overlook any present momentary sorrow when I reflect that it is in my power to be happy a thousand years hence. If it were not for this thought I had rather be an oyster than a man.”

In one of Woody Allen’s movies, his physician gives him one month to live. “Oh, no,” he moans, “I only have thirty days to live?” “No,” the doctor responds, “twenty-eight; this is February.” Are we this bad? Sometimes. It might be splendid if we were all to adopt Socrates’ reflectiveness just before his state-mandated suicide: “To fear death, gentlemen, is nothing other than to think oneself wise when one is not; for it is to think one knows what one does not know. No man knows whether death may not even turn out to be the greatest of blessings for a human being; and yet people fear it as if they knew for certain that it is the greatest of evils” (Plato 1952, p. 211). But most people feel more like Berkeley and his oyster, and thus, as Ingersoll was fond of pointing out, we have religion. But the quest for immortality is not restricted to the religious. Wouldn’t we all like to live on in some capacity? We can, indirectly, and, if science can accomplish what some hope it will, perhaps even in reality.

Science and Immortality

Because purely religious theories of immortality—based on faith, not reason—are not testable, I will not discuss them here. Frank Tipler’s Physics of Immortality is the subject of chapter 16 of this book, as Tipler’s work requires extensive analysis. Suffice it to say that by “immortality” most people do not mean merely living on through one’s legacy, whatever it may be. As Woody Allen said, “I don’t want to gain immortality through my work; I want to gain immortality through not dying.” Most people would not be content with the argument that parents are immortal in the sense that a significant part of their genetic make-up lives on in the genes of their offspring. From an evolutionary viewpoint, 50 percent of a person’s genes live on in their offspring, 25 percent in their grandchildren, 12.5 percent in each great grandchild, and so on. What most of us think of as “real” immortality is living forever, or at least considerably longer than the norm. The rub is that it seems certain that the process of aging and death is a normal, genetically programmed part of the sequence of life. In evolutionary biologist Richard Dawkins’s (1976) scenario, once we’ve passed reproductive age (or at least the period of intense and regular participation in sexual activity), then the genes have no more use for the body. Aging and death may be the species’ way of eliminating those who are no longer genetically useful but are still competing for limited resources with those whose job it now is to pass along the genes.

To extend life significantly, we must understand the causes of death. Basically there are three: trauma, such as accidents; disease, such as cancer and arteriosclerosis; and entropy, or senescence (aging), which is a naturally occurring, progressive deterioration of various biochemical and cellular functions that begins early in adult life and ultimately results in an increased likelihood of dying from trauma or disease.

How long can we live? The maximum life potential is the age at death of the longest-lived member of the species. For humans, the record for the oldest documented age ever achieved is 120 years. It is held by Shigechiyo Izumi, a Japanese stevedore. There are many undocumented claims of people living beyond 150 years and even up to 200 years; these
frequently involve such cultural oddities as adding the ages of father and son together. Data on documented centenarians (people who live to be 100 years old) reveal that only one person will live to be 115 years old for every 2,100 million (2.1 billion) people. Today's world population of slightly over five billion is likely to produce only two or three individuals who will reach 115 years old. Life span is the age at which the average individual would die if there were no premature deaths from accidents or disease. This age is approximately 85 to 95 years and has not changed for centuries, and probably millennia. Life span, like maximum life potential, is probably a fixed biological constant for each species. Life expectancy is the age at which the average individual would die when accidents and disease have been taken into consideration. In 1987, life expectancy for women in the West was 78.8 years and for men 71.8 years, for an overall expectancy of 75.3 years. Worldwide, in 1995 life expectancy was estimated at 62 years. The numbers are continually on the rise. In the United States, life expectancy was 47 years in 1900. By 1950 the figure had climbed to 68. In Japan, the life expectancy for girls born in 1984 is 80.18 years, making it the first country to pass the 80 mark. It is unlikely, however, that life expectancy will ever go higher than the life span of 85 to 95.

Though aging and death do appear to be certain, attempts to extend the biological functions of humans for as long as possible are slowly moving away from the lunatic fringe into the arena of legitimate science. Organ replacements, improved surgical techniques, immunizations against most major diseases, advanced nutritional knowledge, and the awareness of the salubrious effects of exercise have all contributed to the rapid rise in life expectancy.

Another futuristic possibility is cloning, the exact duplication of an organism from a body cell (which is diploid, or has a full set of genes, as opposed to a sex cell, which is haploid, or has only a half set of genes). Cloning lower organisms has been accomplished but the barriers to cloning humans are both scientific and ethical. If these barriers go down, cloning may play a significant role in life extension. One of the major problems with organ transplantation is the rejection of foreign tissue. This issue would not exist with duplicate organs from a clone—just raise your clone in a sterile environment to keep the organs healthy, and then replace your own aging parts with the clone's younger, healthier organs.

The ethical questions associated with this scenario are challenging, to say the least. Is the clone human? Does the clone have rights? Should there be a union for clones? (How about a new ACLU, the American Clone Liberties Union?) Is the clone a separate and independent individ-

ual? If no, then what about your individuality, since there is one of you living in two bodies? If yes, then are there two of "you"? For that matter, if you replace so many organs that all your original organs are gone, are you still "you"? If you believe in the Judeo-Christian form of immortality and you clone yourself, is there one soul or two?

Finally, there is the fascinating field of cryonic suspension, or what Alan Harrington calls the "freeze-wait-reanimate" process. The principles of the procedure are relatively simple, the application is not. When the heart stops and death is officially pronounced, all the blood is removed and replaced with a fluid that preserves the organs and tissues while they are in a frozen state. Then, no matter what kills us—accident or disease—sooner or later the technologies of the future should be equal to the task of reviving and curing us.

Cryonics is still so new and experimental that the ethical questions have yet to come to public attention. For now, cryonic suspension is considered by the government as a form of burial, and individuals are frozen after they are declared legally dead by natural means, never by choice. If cryonics could succeed in reviving someone, the distinction between the living and the dead would blur. Life and death would become a continuum instead of the discrete states they have always been. Certainly, definitions of death would have to be rewritten. And what about the problem of the soul? If there is such a thing, where does it go while the body is in cryonic suspension? If an individual chooses to be put into cryonic suspension before he is actually dead, then is the technician committing murder? Would it be murder only if the reanimation procedure failed to revive this suspended individual?

If cryonic suspension technology ever matches the hopes and expectations of cryonists, it may be feasible that someday one could choose to be frozen and reanimated at will, maybe even multiple times. Perhaps one could come back for ten-year stretches every century and essentially live a thousand years or more. Think of future historians able to write an oral history with someone who lived a thousand years before. But alas, as yet the entire field remains high-tech scientific speculation, or protoscience. Here are just a few of the problems:

1. We do not know whether anyone frozen to date or anyone who will be frozen in the foreseeable future will ever be successfully revived. No higher organism has ever been truly frozen and brought back alive.

2. The freezing technology appears to do considerable damage to brain cells, though the exact nature and extent of such damage have yet to be determined since no one has been revived to put it to the test. Even if the physical damage is slight, it still remains to be seen whether memory
and personal identity will be restored. Our scientific understanding of where and how memory and personal identity are stored is fairly unsophisticated. Neurophysiologists have come a long way toward an explanation of memory storage and retrieval, but the theory is by no means complete. It is possible, though seemingly unlikely, that complete restoration will still result in memory loss. We just do not know without an actual test case. If cryonic revival does not result in return of considerable personal memory and identity, then what's the point?

3. The entire science of cryonics presently depends on future technological developments. As cryonicists Mike Darwin and Brian Wowk explain, “Even the best known cryo-preservation methods still lead to brain injuries irreversible by present technology. Until brain cryo-preservation is perfected, cryonics will rely on future technologies, not just for tissue replacement, but also for repair of tissues essential to the patient’s survival” (1989, p. 10). This is the biggest flaw in cryonics. Ubiquitous in the cryonics literature are reminders that the history of science and technology is replete with stories of misunderstood mavericks, surprise discoveries, and dogmatic closed-mindedness to revolutionary new ideas. The stories are all true, but cryonicists ignore all the revolutionary new ideas that were wrong. Unfortunately for cryonicists, past success does not guarantee future progress in any field. Cryonics presently depends on nanotechnology, the construction of tiny computer-driven machines. As Eric Drexler (1986) has shown, and Richard Feynman demonstrated as early as 1959, “There’s plenty of room at the bottom” for molecular-size technologies. But theory and application are two different things, and a scientific conclusion cannot be based on what might be, no matter how logical it may seem or who endorses it. Until we have evidence, our judgment must remain, appropriately enough, suspended.

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**Historical Transcendence—Is It So Small a Thing?**

Given these prospects, where can the nonreligious individual find meaning in an apparently meaningless universe? Can we transcend the banality of life without leaving the body? History is the one field of thought that deals with human action across time and beyond any one individual's personal story. History transcends the here-and-now through its fairly long past and near limitless future. History is a product of sequences of events that come together in their own unique ways. Those events are mostly human actions, so history is a product of the way individual human actions come together to produce the future, however constrained by certain previous conditions, such as laws of nature, economic forces, demographic trends, and cultural mores. We are free, but not to do just anything. And the significance of a human action is also restricted by when in the historical sequence the action is taken. The earlier the action is in a sequence, the more sensitive the sequence is to minor changes—the so-called butterfly effect.

The key to historical transcendence is that since you cannot know when in the sequence you are (since history is contiguous) and what effects present actions may have on future outcomes, positive change requires that you choose your actions wisely—all of them. What you do tomorrow could change the course of history, even if only long after you are gone. Think of all the famous people of the past who died relatively unknown. Today, they have transcended their own time because we perceive that some of their actions altered history, even if they were unaware that they were doing anything important. One may gain transcendence by affecting history, by actions whose influence extends well beyond one's biological existence. The alternatives to this scenario—apathy about one's effect on others and the world, or belief in the existence of another life for which science provides no proof—may lead one to miss something of profound importance in this life. We should heed Matthew Arnold's beautiful words from his *Empedocles on Etna* (1852):

> Is it so small a thing, To have enjoyed the sun,  
> To have lived light in the Spring,  
> To have loved, to have thought, to have done;  
> To have advanced true friends, and beat down baffling foes—  
> That we must feign a bliss Of doubtful future date,  
> And while we dream on this, Lose all our present state,  
> And relegate to worlds ... yet distant our repose?