

Journal
of
Near-Death Studies

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Volume 15, Number 1, Fall 1996



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JOURNAL OF NEAR-DEATH STUDIES (formerly ANABIOSIS) is sponsored by the International Association for Near-Death Studies (IANDS). The Journal publishes articles on near-death experiences and on the empirical effects and theoretical implications of such events, and on such related phenomena as out-of-body experiences, deathbed visions, the experiences of dying persons, comparable experiences occurring under other circumstances, and the implications of such phenomena for our understanding of human consciousness and its relation to the life and death processes. The Journal is committed to an unbiased exploration of these issues, and specifically welcomes a variety of theoretical perspectives and interpretations that are grounded in empirical observation or research.

The **INTERNATIONAL ASSOCIATION FOR NEAR-DEATH STUDIES (IANDS)** is a world-wide organization of scientists, scholars, near-death experiencers, and the general public, dedicated to the exploration of near-death experiences (NDEs) and their implications. Incorporated as a nonprofit educational and research organization in 1981, IANDS' objectives are to encourage and support research into NDEs and related phenomena; to disseminate knowledge concerning NDEs and their implications; to further the utilization of near-death research by health care and counseling professionals; to form local chapters of near-death experiencers and interested others; to sponsor symposia and conferences on NDEs and related phenomena; and to maintain a library and archives of near-death-related material. Friends of IANDS chapters are affiliated support groups in many cities for NDErs and their families and for health care and counseling professionals to network locally. Information about membership in IANDS can be obtained by writing to IANDS, P. O. Box 502, East Windsor Hill, CT 06028.

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Editor's Foreword

In a Guest Editorial in this issue of the Journal, near-death experiencer and investigator P. M. H. Atwater argues that studies of NDEs among children have overemphasized the positive transformative effects of the experience, at the expense of overlooking the longterm negative effects they can produce. She urges us to reconsider what we think we know about NDEs, particularly among children, and to turn our focus toward the aftereffects rather than toward the experience itself.

This issue of the Journal includes four provocative theoretical articles. In the first, transpersonal psychologist and near-death research pioneer Kenneth Ring follows up on his speculations about frightening NDEs, published in the Fall 1994 issue of the Journal, by recounting supportive evidence from medical research suggesting that the "meaningless void" type of frightening NDE should be regarded as an emergence reaction to anesthetics, and not as a true NDE. Next physicist and neural network scientist Stephen Thaler, elaborating on his computer model of the NDE published in our Spring 1995 issue, argues that the NDE and a "virtual afterlife" are predictable phenomena, and that they and the spiritual beliefs they foster may be adaptive survival mechanisms in the Darwinian sense.

Health scientist William Serdahely next provides a counterargument to psychologist Susan Blackmore's "dying brain hypothesis," raising four questions that challenge her theory. Finally, Italian psychologist Emilio Tiberi, following up on his Spring 1993 article in the Journal comparing emotional states experienced in and out of the body, argues that unaroused or deactivated emotions are more often reported by NDErs and that striving toward a deactivated emotional state is a goal in humanity's evolution toward a more spiritual society.

We close this issue with Letters to the Editor by David Wiener on measuring biomagnetic effects of NDEs, and by Richard Abanes on psychotherapist Mary Edwards' review of surgeon Richard Selzer's *Raising the Dead*, published in our Summer 1995 issue, and on our collective lack of discernment.

Bruce Greyson, M.D.

Guest Editorial

Children and the Near-Death Phenomenon: Another Viewpoint

P. M. H. Atwater, L.H.D.
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ABSTRACT: Children who brush death, nearly die, or who are pronounced clinically dead but later revive have a much higher incidence of near-death experiences (NDEs) than do adults. Although excellent research now exists on children's cases, there have been discrepancies. I suggest that we need to broaden the range of observations on children's NDEs and reconsider what is known about children and the near-death phenomenon.

Approximately one-third of those adults who face impending death or who die but are resuscitated have a near-death experience (NDE). Among children, the number exceeds 75 percent, according to Melvin Morse and his team of associates who pioneered children's near-death research (Morse and Perry, 1990). Other researchers have worked with children, including myself, and there now exist excellent studies on their NDEs. But do we know as much as we think we do about what happens to these youngsters? I don't think so.

The more children I encounter, the more teenagers and adults who remember their childhood episodes that I speak with, the more convinced I am that we have only scratched the surface of what we can learn from the young. To broaden our view on the subject and explore it more deeply, I believe we need to move past our preoccupation

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with *the experience* to an investigation of *the phenomenon*, a switch in focus that will enable us to address aftereffects as well as episodes. The proverbial “rest of the story” is as critical for children as for adults, with the same abundance of positives and negatives. The following is a case in point:

I was very small when I had my near-death experience. When I could run and play like the other kids again, I'd go from room to room. I'd look under the beds, in the closets, behind the doors and furniture—from the top of the house to the bottom—other people's houses, too. I'd look and look, but I never found them. They loved me. I know they did. They were warm and wonderful and bright with light. They came to me when I died and they left when I breathed again. I looked for years and years. Sometimes I'd curl up underneath my bed and cry. Why couldn't I find them? Where did they go? Why did they leave me in a place where no one cared and no one loved me? Was I that bad that they couldn't return?

The teenager who spoke these words was 4 years old when her heart stopped and beings made of light came to get her. She remembers walking hand-in-hand with them into realms of music and warmth and beauty, and so much love that she never wanted to leave. Then, suddenly, without choice or warning, she revived and found herself back in a body wracked with pain. Surrounded by strangers, she was forced to deal with the aftermath of major surgery alone and frightened. She has yet to get over the shock or the anger at feeling abandoned, not by her parents, interestingly enough, but by the “bright ones” who loved her and then left her behind. She now sees a counselor, and requested anonymity.

Stories of children's near-death experiences are compellingly heavenly, innocent renderings of the “pure lands” our hearts somehow know must exist on the other side of death's door. The cases of little ones, we say, confirm that life is everlasting. But child experiencers have more to tell us than stories about angels, even though nearly 70 percent claim to have seen the winged ones (Hauck, 1994). And they have more to share than descriptions of deceased pets and the animal heaven some say they must pass through before they can reach the heaven where people are.

Although some excellent research has already been done with children, I think it is time to take another look and assess more critically the impact such experiences and their aftereffects have on a child's life, both at home and at school, and in the years that follow. This

editorial is an attempt to begin such a process of rechecking what we think we know.

The foregoing case typifies what I keep hearing from young people, especially those in the early teen years who can remember what once happened to them and can comment on the aftermath of their experience. Teenagers speak about aftereffects in a manner the very young cannot; yet their near-death episodes are still fresh and untouched, for the most part, by the type of acculturation one finds with adults.

Aside from the transformations we hear so much about these days, it is clear to me that children can also be confused, disoriented, or traumatized by the aftereffects of their experience. The case of Lynn is an example of this, of how a joyous encounter of heaven can lead to a lifelong nightmare afterward. Looking back from the age of 36, she related these details:

My first near-death experience occurred when I was 13 years old, in September of 1972. It happened during open heart surgery that I was having to correct a heart condition I had had almost from the time of my birth. I was 2 weeks old when the condition was discovered. For 12 years I couldn't run and play like other kids. Occasionally, I would turn blue. Then I got real sick. The two weeks before surgery I was so scared. I would have my large, black Great Dane, Harvey, climb into bed with me. I would hold him tight and cry into his coat because I didn't want to die.

The last thing I remember in surgery was a male voice saying in a very matter-of-fact way, "Uh-oh, we have a problem here." The next thing I knew I was floating up around the ceiling looking down on my body. My chest was open wide and I could see my internal organs. I remember thinking how odd it was that my organs were pearl gray and looked almost beautiful. I thought that, because my organs didn't look like bright red chunks of liver, like in the horror flicks I loved to watch. I also noticed that on the operating team was a black doctor and one who was Oriental. The reason this stuck in my mind was that I was brought up in a very white, middle-class neighborhood, and I had seen black schoolteachers but never a black doctor. I had met with the operating team the day before surgery, but they were all white.

Suddenly, I had to move on, so I floated into the waiting room where my parents were. There I saw my father with his head buried in my mother's lap. He was kneeling at her feet, his arms wrapped around her waist, and he was sobbing like nothing I had ever seen before. His whole body shook with the force of his sobs. My mother was stroking his head, whispering to him. This scene shocked me.

My father was not prone to showing emotions. He had celebrated his 17th birthday island-hopping during World War II with the Ma-

rines. He joined the police force when he came back and retired after he was injured in the line of duty saving another's life. He went to law school after that and became a judge. When it came to us three kids, dad was very hard and very unemotional. In fact, he was downright cold. I never thought he cared about me. Yet I felt distanced from the whole scene because I knew they would be fine no matter what happened. Once I realized this, I felt myself being pulled into a tunnel that was horizontal.

The ride through the tunnel was like nothing else. I remember thinking, "So this is death." The tunnel was dark, and every once in a while something that looked like lightning would flash across my path. These flashes were brilliant in color and didn't scare me. At the end of the tunnel was a bright light.

From the white light came two dogs of mine that had died. One was a collie named Mimi who had died three years previously from an infection, and the other was a boxer named Sam who had died two years previously from being hit by a car. The dogs came running towards me and jumped on me and kissed my face with their tongues. Their tongues weren't wet, and I felt no weight when they jumped on me. The dogs seemed to glow from a light that was inside them. I remember thinking, "Thank you, God, for letting my dogs be alive." I hugged my dogs as tight as I could.

I then called my dogs and together we started walking towards the light. All the colors were in the light and it was warm, a living thing, and there were people as far as the eye could see, and they were glowing with a light that seemed to come from within them—just like my dogs. In the distance I could see fields, hills, and a sky. The light spoke, and it said, "Lynn, it is not time for you yet. Go back, child."

I must take a moment to describe what this voice sounded like. It was beautiful and it sounded like music. It was soft, yet there was strength in it. The voice made me feel secure, loved, wanted, protected. I put my hand up to touch the top of the light. I knew then that I had touched the face of God. I remember telling God that I loved Him, and I wanted to stay with Him. Again the light said, "Lynn, go back. It is not time yet for you. You have work to do for me. Go back."

I know this is going to sound silly, but I asked the light, "If I go, can I come back, and will my dogs still be here waiting for me?" The light said yes, and then told me there were people who wanted to see me before I left. From out of the light came my maternal grandparents. I ran to them and embraced them. They were going to walk me part of the way back. Just as I was turning to leave, a man stepped from the light. He was in full dress U.S. Naval uniform. He was very tall and very blond with blue eyes. I had never seen this man before, yet he knew me and smiled.

"I am your Uncle Franklin. Tell Dorothy that I'm okay and that the baby is with me. Tell her I never stopped loving her and that I am glad she got on with her life. Tell her that when her time

comes, I will come for her. Remember to tell her I love her.” I turned to leave, and this man shouted out after me to remember him to my aunt. His exact words were, “Tell Dorothy, tell her you met Franklin, and I’m okay and so is the baby.”

My grandparents told me if I stayed any longer I might not make it back. But I wanted to talk with Jesus. I grew up in parochial schools and I believed in Jesus. I had a very important question to ask him. A beam of light covered me, different from the first beam of light, yet similar in a way. I knew this light was Christ.

I leaned against the light for one moment and then I asked my question: “Dear Jesus, is it true that you gave me this heart condition so that I would have a cross to carry like you did?” (Sister Agnes, my sixth-grade teacher, told me that my heart condition was my cross to bear for Christ. That is why I asked this question.) I heard the voice of Christ vibrate through me as it said, “No, this heart condition of yours is not a cross from me for you to bear. This heart condition of yours is a challenge to help you grow and stay compassionate. Now go back.”

As I walked back to the tunnel with my grandparents and my dogs, my grandmother told me my father was going to leave my mother and that I would be my mother’s strength. In the distance, as we went along, I saw people hiding in the tunnel, people who were afraid to come into the light or who were disoriented by where they were. I expressed concern for them, and was told not to worry, that a guide would be along to help them into the light. Some of these people looked like soldiers. Then I remembered Viet Nam and I knew where the soldiers were coming from.

Lynn described in detail what it was like to be resuscitated. Among other things, she heard a man say, “Hit her again,” as a jolt of current rocked her body. The jolt was so painful she tried to scream, but couldn’t. Blackness came. Hours later she awoke hooked up to a myriad of tubes, unable to speak but fascinated by shadows moving among the medical staff. She came to realize these shadows were people who had died there. It didn’t take long before she could watch “death” take place, could see the soul as it exited the body. Hospitalized for a month, she was released earlier than planned, because she talked so much to people who had died and to the misplaced souls, that her doctor was convinced she would go crazy if she stayed any longer.

I can’t tell you how pleased my father was to hear the doctor claim I was a little crazy. Now that I had survived, my father went right back to being his cold self. The day I left, in front of my parents, I asked Dr. Davidson, my cardiologist, who the black doctor was in the operating room. Dr. Davidson said that the black doctor had been called in because one of the members of the team had

become ill at the last moment, and so he covered for him. Dr. Davidson wanted to know if this doctor had been by to say "Hi," but I said "No, I saw him during surgery." Dr. Davidson stopped smiling and told me to go home and forget everything.

Once home, everything changed. Light bulbs would pop if I got angry, or stuff would move around. And I would "see" things whenever I touched anything. From jewelry, I could tell who owned it and where it had been worn. If I touched people I would see their whole life in flashes, and I could tell them about their future. School became easy. I didn't have to study so hard anymore to get really good grades. But sunshine bothered me, and so did loud noise.

My father left us. He told me he thought I was crazy and I belonged in a mental hospital. My father told me this in front of the whole family. It was Thanksgiving Day, 1973, a year later. I told my father I could prove I wasn't crazy. I turned to my Aunt Dorothy and I said, "Who is Franklin?" There was silence. Every eye at the table was on me; mouths were wide open. My Uncle George, who was married to my Aunt Dorothy, looked at me with tears in his eyes, and said, "Lynn, if you wanted to hurt me, you've done a good job."

Everyone went home early and my father left us. A few weeks later my aunt wanted to know how I knew about Franklin. I told her in detail about what happened during surgery. Then my aunt took me up to the attic and unlocked a large trunk. (I had never been in my aunt's attic before, nor had I ever seen the trunk.) She pulled out pictures of the man I saw in the light.

My aunt told me that she had married Franklin during World War II, after a brief 24-hour courtship. She had been engaged to Uncle George at the time, but left him for Franklin. My aunt started to cry as she told me that she and Franklin were very happy together for two months, then he was shipped out. After he left, she found out she was pregnant. It was the only time in her life she would ever be pregnant.

When she was seven months along, my aunt received word that my uncle had been killed in the invasion of Italy. He was on the lead ship dropping off troops. The news caused her to miscarry. She hemorrhaged so badly a complete hysterectomy had to be performed to save her. A year later Uncle George married her and destroyed all pictures of Franklin, asking everyone in the family never to speak Franklin's name again. The only pictures to survive were those Aunt Dorothy managed to hide in the trunk.

With this final verification of what she had seen during her near-death experience, Lynn became openly confident and trusting, although preferring solitude to socializing. She lost all fear of death, changed her diet to include less meat, and began to exhibit steadily increasing displays of psychic abilities. "Ghosts love me," she said.

Yet the guilt she felt for what her father did still haunts her, even the gruesome beatings he gave her Great Dane to spite her.

He took my dog when he left and he'd call me on the phone and accuse me of being possessed by the devil, that I had to become a Christian or he'd kill my dog. And while we'd be talking he'd beat my dog so I could hear him cry out in pain. He did this with phone call after phone call until he killed my dog with me still on the line listening. I couldn't believe that my father actually did it until that night, when Harvey's soul came to say goodbye and let me know he was okay. For years afterward I'd have coughing fits where I could hardly breathe. It wasn't until I reached adulthood that I connected the coughing to pent-up emotions I felt about my dog's death.

Sadly, Lynn's father reportedly tried to kill Lynn and her mother as well. The police refused to press charges, though, since the man was a sitting judge at the time and prominent in local politics. After years of counseling, Lynn hasn't been able to release the grief she feels about her near-death experience.

My father walked out on our family because of me, because of how I changed after my episode, and my relationship with my uncle was never the same again. My family was badly hurt and my dog was killed, and it was my fault.

One might expect at this point for me to point out that such horrific cases are rare; I cannot. What I keep finding, either with adults who remember what occurred when they were young or with children once they reach the teen years, doesn't always match present models of "grace and glory" transformations. Certainly, how supportive the family environment is constitutes a major factor in whether the experiencer, child or adult, can successfully integrate his or her near-death episode; but it is not always the determining factor.

I have previously (Atwater, 1988) briefly mentioned the case of Jerome Kirby, an African-American who worked as a comptroller at the office of a northern New Jersey firm. He was pronounced dead at the age of 7, but later revived. His was a loving family, perfectly willing to accept his new strangeness after his survival from death's grip. They were willing; he wasn't. Since he could no longer relate to them or to his brothers and sisters, he drifted into antisocial behaviors that negated any opportunity he might have had to develop normal interpersonal relationships. Not until he heard me speak at a meeting did he finally learn that he had had a near-death experience, and that the aftereffects he had gone through were normal. The pain and confusion from nearly three decades of self-imposed

isolation faded from him in minutes. His change was so dramatic that people standing nearby commented on it.

Then there's the case of P. Ann Baillie of Michigan, who had two bouts with death before her first birthday:

Being sent back into my family felt like a betrayal. Being loved and welcomed briefly during my near-death experiences and then returned into a loveless world was sometimes more than I could bear, especially since I could not seem to kill myself and I wanted to. Also, the aftereffects left me unable to cope with or defend myself from the people around me, as I could easily forget how abusive people could get, and would go to them in situations that were dangerous. I retained my childhood trust well into adulthood, often to my dismay.

Another problem was that the psychological aftereffects robbed me of many of the defense mechanisms that most children have. This proved to be a two-edged sword actually, because many of those defenses became maladaptive or destructive in adulthood. Rather than being emotionally cauterized and alcoholic like my siblings, however, I am reclusive and skittish but still retain my original self and a drive for something better.

Baillie has been diagnosed with Multiple Personality Disorder (MPD) by two independent therapists, following a childhood of severe abuse. Her comments differ from most people who have this disorder:

I believe that the near-death experiences had a profound effect on the multiplicity. The level of fragmentation that I developed may have been a result of being unable to let go of my "core self" and let her sleep the way many in my situation have done. I was unable to give up, even in times when surrender may have been a good idea.

I also think that the near-death experiences have made conventional therapy largely ineffective for me. While I have an enormous capacity for anger, I have little for hatred and tend to pity those who abused me, much to the confusion and concern of those around me. I have little ability or desire to relive the past, often a prerequisite in the minds of therapists who treat MPD. It feels like enough for me to acknowledge and honor it, but I don't seem to abreact the way many multiples do.

Younger children most often have an initial type of episode, as I have described elsewhere (Atwater, 1994). Initial episodes encompass elements like a loving nothingness, the friendly dark, a caring voice, angels bathed in light, a quick in/out out-of-body experience, or a simple greeting from pets or deceased loved ones, sometimes even from siblings who were aborted or were yet to be born. Regardless of how brief or involved or poignant their experiences, children can

be challenged by it to the point that normal maturation can be either arrested, delayed, or altered. Likewise, they can also become so transformed that irrespective of any family and/or societal disadvantage they might be called upon to deal with, they can and do triumph and become supercharged, charismatic "movers and shakers" once grown.

The challenge of integration is a very sensitive issue for children, one that, in my opinion, we in the near-death community haven't adequately addressed. And this concerns me.

As the cases presented above show, the near-death episode itself has less to do with any quandary the child must face later on than the immediacy of aftereffects and how the family responds. Furthermore, with a child, notions of "abandonment" or "betrayal," of being returned to an uncomfortable situation after experiencing the great love encountered on the other side of death, can sometimes overwhelm any sense of continuity or belonging. The results of that sense of abandonment or betrayal can range from the child spending a lifetime compulsively seeking his or her "real" family, feeling somehow "alien," to an individual like Lynn, who grew up haunted by the guilt that her near-death experience, as wonderful as it was, tore her family asunder and drove her father mad.

Child experiencers, at least in the early stages after their episode, can become loners or discipline problems if unable to process what happened to them in relation to their place in the family unit and at school. They also can and do become veritable geniuses, channeling their "newness" into creative and productive endeavors that enrich not only their lives but society as a whole.

I am continually amazed at the number of childhood near-death survivors who, as adults, become computer whizzes, excellent physicists, masters of music and the arts, or professional psychics. It is the adults who usually switch to some type of healing, counseling, or ministerial roles after an experience. Perhaps this is because children grow up with their "differences" and are simply unaware of or unable to make the comparisons adults do. Furthermore, youngsters are more likely to forget their near-death experience than are adults. It gets "pounded" out of them at school or "shamed" away by relatives. Those who do remember, do so quietly, as if what happened to them was their special secret. It is the aftereffects that give them away.

With this in mind, that children often forget their near-death experiences but can and do display the pattern of aftereffects, even throughout their adult lives, I researched biographies of famous peo-

ple, and in my latest book (Atwater, 1996), I discussed some historical figures who in all probability had a near-death experience as a child, such as Abraham Lincoln, Albert Einstein, Wolfgang Amadeus Mozart, and the man many historians believe to be the true author of the entire works of Shakespeare, Edward de Vere, the 17th Earl of Oxford. I made this determination based on the pattern of after-effects these people came to display once they recovered from the throes of death, a pattern nearly identical to that of every child experiencer I have ever interviewed or heard about. This is a pattern indicative of what I have termed "a brain shift." A brain shift is what the near-death phenomenon is all about, to my way of thinking, as well as what other incidents similar in impact are about, such as spiritual enlightenment, Baptism of the Holy Spirit, spiritual transformations, and certain types of head trauma or being hit by lightning. Any differences have more to do with whether the shift was a partial or full shift, rather than what type of episode brought it about.

Characteristics suggestive of the brain shift pattern are the loss of the fear of death; a love of inspiring music and solitude; unusual sensitivity to light, sound, foods, and drinks; wildly prolific psychic abilities; a preference for mysticism over religion; absorption (merging with) and dissociative (detaching from) tendencies; proneness to depression; increased allergies, especially to pharmaceuticals; regular future memory episodes (living the future before it occurs); hauntingly accurate visions; the ability to abstract and concentrate intensely; clustered thinking; charismatic, moral upliftment; heightened intelligence, undaunted by problems or obstacles; a more loving nature, yet driven by a sense of mission; multiple sensing (synesthesia); and electrical sensitivity.

Brad Steiger and his wife and partner Sherry Hansen Steiger sent out questionnaires to people who answered their call for volunteers in their own study of children's cases (Steiger and Steiger, 1995). They discovered that over 87 percent of those who claimed to have undergone a near-death experience as a child still complained of hypersensitivity to sound and light as adults. My own estimate of that figure, for all ages of near-death survivors, is between 80 and 90 percent.

Let's stop for a moment and reconsider what I've just said. All well-meaning adults shove children outside: fresh air is healthy; kids need it. But what if the child is a near-death experiencer and the schoolteacher or coach or parent forces the youngster to practice or

play in bright sunshine, for long periods of time, day after day? That hurts!

Peer pressure for children is hard to buck, especially as they get older. Types of music heard and at what decibel level comprise the mark of allegiance to whatever is "in." Dances, prom night, parties and gatherings, even schoolwide programs in the auditorium blast out with sounds tuned "way up" or "far out." But what if the teen is a near-death experiencer and that joyride in "Johnnie" or "Jill's" car includes a barrage of disco beats designed for headspins? That hurts, too!

When a child is ill, he or she is rushed to a doctor or maybe the emergency room in a nearby hospital. A shot is administered or pills are popped. This is standard procedure and done in a medically precise manner. But what if the little one is a near-death experiencer, suddenly more sensitive, possibly even allergic, to the type of pharmaceuticals normally administered to a child of his or her weight and age?

Parents, schoolteachers, sports coaches, healthcare providers, not to mention the children themselves, face these conundrums daily, year in and year out . . . or at least they should. The trouble is that most people are not aware that the aftereffects of the near-death phenomenon even exist, let alone how they might affect a child. Should such a youngster complain, the usual retort is, "It's just your imagination," or, "Toughen up, kid." And I have not even addressed psychic abilities; that's still a forbidden subject in most families.

I've already worked a lot with children, but now I want to cross-check my original findings all over again. To do that, I have launched another research project, seeking before- and after-the-NDE details from child near-death survivors, teenagers and adults who remember childhood incidents, parents of such children, teachers and coaches who might have taught them, and medical personnel who may have treated them.

We've worked prodigiously with adults. Now it's time for a deeper look at what happens to children.

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A Note on Anesthetically-Induced Frightening "Near-Death Experiences"

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ABSTRACT: Previously (Ring, 1994a, 1994b) I had speculated that the "meaningless void" type of frightening near-death experience (NDE), in which the individual finds him- or herself in a situation of existential nullity in which life itself is understood to be an illusion or a cruel joke, indicating that nothing has any inherent meaning or reality, tends to occur following the use of anesthetics, and is more likely to be reported by women. I present here empirical evidence from medical studies of reactions to nitrous oxide, which corroborate both of those speculations. In light of these findings, I believe that this type of experience is best regarded, despite its subjective reality and long-lasting effects, as an emergence reaction triggered by drugs, and not as a true NDE.

On a recent trip to Colorado, I met with a woman who, when she was 13, had a very frightening experience in connection with a routine tonsillectomy during which she had, of course, received an anesthetic. Now in her early 50s, she confessed to me that this experience had haunted her ever since, resulting, she said, in a persisting fear of death and a history of panic attacks. As a result of these concerns, she had taken the trouble to investigate some of the literature on the anesthesiology of emergence reactions, and in the course of that search had received a miscellany of articles and reprints from a specialist, James Zacny, on the effects of nitrous oxide.

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Before I left for Connecticut, she gave me copies of her collection of papers and, on the flight home, I read through them.

Doing so, I found that she had inadvertently provided me with something of a gold mine for my earlier speculations (Ring, 1994a, 1994b) about a certain type of frightening near-death experience (NDE), namely the kind of encounter that I had labeled "the meaningless void," paraphrasing the the terms used by Bruce Greyson and Nancy Evans Bush (1992) in their pioneering study of distressing NDEs. In this variety of frightening NDE, the individual finds him- or herself in a situation of existential nullity, seemingly without end, in which life itself is understood to be an illusion or a kind of cruel cosmic joke, indicating that nothing has any inherent meaning or reality. Naturally, these revelations are profoundly disturbing to the experiencer and tend to leave one, as with the woman I met in Colorado, with a persisting sense of existential dread about both life and death.

In reviewing the few cases Greyson and Bush had adduced for these experiences, I was struck with the fact that the preponderance of them involved women in childbirth who had been given anesthetics. Building on this slender data base, I ventured the hypothesis that "a disproportionate number of these experiences would involve the use of anesthetics, and that possibly they would be more likely to be reported by women" (Ring, 1994a, p. 21).

An examination of the sheaf of papers from Zacny disclosed further unequivocal empirical evidence for both of these propositions. Accordingly, as a consequence of my reading this material, I am now even more convinced of the validity of my earlier hypothesis and would like to share here some of this new evidence. Furthermore, in light of these findings, I believe it may now be justified to regard this type of experience differently than earlier conceptions (including my own) proposed, and to argue that, for all its horror, it is not a true NDE after all.

In my earlier article, I used one of Greyson and Bush's cases as a prototype of this kind of frightening NDE. It concerned a 28-year-old woman who, during a protracted delivery of her second child, had an experience in which she found herself propelled as if into a darkened outer space at tremendous speed (just as did the woman I spoke to in Colorado, by the way). Once in this realm, she encountered a small cluster of black-and-white circles, which alternated in color as they clicked rapidly from one to another. As they did so, voices mocked her, telling her that her entire life was an illusion,

that it was nothing but a joke, and that she was simply allowed to imagine it. The experience left her with an acute sense of terror and existential dread.

In view of Zacny's findings, however, this case now appears to have even more significance as a prototype than I originally thought, since it turns out to have involved an administration of nitrous oxide. In fact, Zacny's collection of cases showed that this woman's experience is fairly typical of those reported by women in childbirth who have also been given nitrous oxide for anesthetic purposes.

In one Swedish study, for instance, all six women who were treated with nitrous oxide alone in connection with caesarean sections recalled "vivid and terrifying dreams during anesthesia . . . when interviewed one week later" (Bergström and Bernstein, 1968, p. 541). In some cases, these disturbing episodes left psychic scars that were apparent at least a year afterward. Here are just a few sample reactions to such administrations of nitrous oxide.

A 32-two-year-old woman said she had "dreadful dreams" in which

unknown people in a pop band repeatedly played the same sequence with continuously increasing volume. Suddenly, the noise stopped, and the patient felt frightened and sensed the destruction of both herself and her child. . . . A year later she was still almost daily tormented by the fear associated with the dream. . . . Sensations were often precipitated by certain "electronic" sounds and rapidly changing pictures in television programs. (Bergström and Bernstein, 1968, p. 541)

A 23-three-year-old mother of a premature baby "dreamed she was torn to pieces during heavy pains. Simultaneously, she heard rhythmic sounds. She said she would avoid this frightening experience in the future" (Bergström and Bernstein, 1968, p. 541). Another woman saw a "big white wall with black dots of different sizes, which fused to a black surface" (Bergström and Bernstein, 1968, p. 541). She later likened the experience to what she had heard about LSD intoxication. Finally, a 31-one-year-old woman described

a dreadful dream in which she was as a cog in a slowly rotating cogwheel of the universe, ruled over by a derisive executioner. . . . Each time her cog gripped she felt an insufferable pain and heard a crashing sound. The universe was blown up in a chaos of pain. (Bergström and Bernstein, 1968, p. 542)

Later, when she awoke, "she still believed she was in the dream world" (Bergström and Bernstein, 1968, p. 542) and at night she could not close her eyes lest she have frightening dreams. Six weeks

later, she was still deeply troubled by this episode. "On such occasions she was in a cold sweat and filled with mortal fear and the belief that she was going insane" (Bergström and Bernstein, 1968, p. 542). This woman eventually needed psychiatric care and, though she slowly recovered, a year later this experience and its sequelae continued to agitate her.

Reading these accounts, one is impressed with the regularity of a certain type of unnerving rhythmic repetition of noises or of alternating images that appear menacing, as with my prototypic case where black-and-white circles flashed rapidly back and forth. Another such case is provided in the following testimony from a dental patient, supplemented with a note by the man's dentist (Evans, 1943). His narrative is extended and complex, however, and I will only be able to quote a few relevant portions here.

Having received nitrous oxide, as well as an inhalation of Trilene and, later, ether, the patient reported hearing a buzzing sound as the gas was being administered. Soon thereafter, he had an experience for which he gave this simile:

Imagine a huge disc covered with concentric blue and white circles, like a huge firing target. Then think of this as revolving at great speed and retreating and advancing with uncanny regularity. There was nothing else. The whole field of the mind's vision was filled with those circles that sped away into the distance and dwindled to a mere point. Then, just when that remote speck seemed to vanish altogether, it would grow again and resolve itself into the same pattern, but this time racing toward me with incredible speed. Backwards, forwards, backwards, forwards. (Evans, 1943, p. 121)

For this man, these circles seemed to hold the clue to the mystery of life itself and had for him a strange, almost impersonal, beauty. At the same time, however, he appeared to have found the sheer, unceasing repetition of these circles almost soulless and maniacally mechanical, and began to protest

when I found life reduced in its last analysis to this infallible clockwork. What about the courage of human hearts, and the love of God? But no answer was forthcoming from those silent whirling circles. Suddenly, the circles began to revolve at a greater speed, and retreated and advanced with an ever-increasing momentum. . . . I could see the inevitable end of this madness, and somewhere in my soul there must have been a great terror. (Evans, 1943, p. 122)

This motif of alternating or clicking circles that we have already encountered in some of these anesthetically-induced experiences oc-

curs once more in another case that was briefly described to me by a physician, Pamela Kircher, on the same visit to Colorado where I acquired the Zacny papers. After I had read the latter, I called Kircher to ask her if she could give me a more complete account of this incident. She kindly obliged me, and this is the story she related to me over the telephone, which I took down *verbatim*:

A woman, who was about 30 years old when she spoke to Kircher, recalled a terrifying event from her childhood. When she was 13, she decided to inhale some "PAM," a popular alcohol-based aerosol cooking spray. Her intention, she told Kircher, was simply to "get high."

She got more than she bargained for, however, as a friend attested that during this episode the young girl turned white and her lips became blue. Inwardly, she initially had what she termed an "Alice in Wonderland" experience with interesting mazes. Immediately afterward, though, her inner world took a drastically different and far more disturbing turn. To quote Kircher directly:

Then she . . . found herself being sucked into a yellow cone with a red circular area at the bottom. She felt tight as she was being sucked down. She felt she was dead and didn't want to be there.

She experienced a feeling of being in a void. The only thing present was something like a weather vane, with a white circle which reversed to a black circle as it turned back and forth, with a clicking sound. It felt to her as if this were going to go on for a very long time. She heard "click, click" over and over again. It was very slow: "click" . . . "click" . . . "click." Monotonous.

Her feeling was that she would be confined to this void for eternity. When she felt the full impact of the eternal isolation, she pulled all of her energy together, screamed "No!" to the universe, and with a tremendous burst of energy found herself slammed back into her body. (P. Kircher, personal communication, October 21, 1994)

In recalling this incident, the woman informed Kircher that no cardiopulmonary resuscitation had been performed, and that her recovery was spontaneous and self-willed.

Although the effects of nitrous oxide and similar inhalants are far more complex and variable than I have the space to indicate here, there seems to be little doubt that for many patients, and predominantly for women, its use, especially when unalloyed with barbiturates (Bergström and Bernstein, 1968), can give rise to a very distressing and distinctive type of experience of existential meaninglessness, marked by recurrent features such as those I have noted.

One final case of this sort came to my attention just as I was about to complete this article. A researcher named Gracia Fay Ell-

wood, now in her mid-50s, wrote to me concerning a terrifying experience she had had when she was approximately 10 years old. Like that of Evans, her episode was triggered by the use of an inhalant in connection with dental work, although she is not sure exactly what anesthetic she was required to inhale. In any event, as the mask was placed over my informant's nose, she found the effect increasingly unpleasant, and also noticed that her sense of time had grown distorted. In consequence, the conversation of the dental team seemed speeded up and became unintelligible, adding to her distress. "But worse than that," Ellwood recalled,

I found myself in the presence of a great metallic wheel (or wheels) spinning rapidly. At the top of each revolution there was a tremendous crash as though a barrier was struck, but this didn't stop the spinning. The wheels were unpleasant but it was the terrible noise that made me frantic to get away. At some point, I pulled at the mask and tried to get it off, but [they] wouldn't let me take it off. (G. F. Ellwood, personal communication, October 20, 1994)

Again, we see the familiar anesthetic pattern of rotating devices, aversive noise, and generally mounting anxiety, unrelieved by any sense of meaning. In this instance, these effects seem to have been further compounded by the incomprehensible babble of the dental team as well as, according to Ellwood, a distinctive "mechanical and soulless" quality to her experience.

Finally, in regard to the second supposition of my original hypothesis, one may ask if, apart from these anecdotal cases consisting entirely of women with the lone exception of Evans, there is any systematic evidence that women in general are particularly adversely affected by nitrous oxide. There is, and some of it derives from studies that Zacny himself has helped to carry out. For example, in one recent such investigation of the effects of nitrous oxide in normal volunteers (Dohrn, Lichtor, Finn, Uitvlugt, Coalson, Rupani, de Wit, and Zacny, 1992), it was found that women reported more dysphoria and more somatic symptoms than men, and that the *only* patients who did not like a 40 percent concentration of nitrous oxide were women. Moreover, in an earlier study (Rosenberg, 1974), it was also observed that women responded differently to the inhalation of 40 to 80 percent nitrous oxide than did men. Specifically, as summarized by Cathleen Dohrn, Lance Lichtor, R. S. Finn, Anna Uitvlugt, Dennis Coalson, G. Rupani, Harriet de Wit, and Zacny, "females tended to find the inhalation unpleasant while males tended to find the experience pleasant" (1992, p. 28). The reasons for these sex differences

are still obscure, but there does seem to be an empirical basis for them.

All in all, I believe the findings surveyed here bolster the argument that these frightening experiences are best understood as emergence reactions triggered by drugs, and not as true NDEs. This is not, however, to discount the subjective reality of these experiences, to gain-say their capacity to instill the most soul-wrenching and long-lasting feelings of horror, or even necessarily to question their possible ontological significance. Instead, I merely want to make the claim that these experiences should not be indiscriminately lumped with NDEs, even with those of a frightening cast.

These observations, as will be evident, help to bring back into salience a question that has never really received its due in the field of near-death studies. That question is, what do we really wish to signify by the term we all use so casually, "the near-death experience"? Perhaps instead of routinely labeling virtually any surgical or other drug-related occurrence that is associated with an unusual otherworldly state of consciousness an NDE, we should begin to specify and use more carefully certain criteria that would serve to define an NDE more precisely and thus give it an agreed-upon meaning. That way, we would be less likely in the future to confound the effects of certain drugs with NDEs as such.

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The Death Dream and Near-Death Darwinism

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ABSTRACT: Based upon very repeatable computer simulations of dying neural networks, the phenomena of both near-death experiences (NDEs) and a virtual afterlife are plausible and can be expected to occur in traumatized neurobiological systems. I speculate that: (1) the sociological impact of this finding is consistent with the teachings of many of the world's major religions and forms the basis of a credible model of both salvation and damnation; (2) both NDEs and the perceived afterlife may serve to advance the species and self-organizing systems (life) in general; and (3) further, in a fierce competition to attain the most comfortable afterlife illusion, individuals strive to convince themselves that they are more deserving of redemption than others. Within this struggle are born the sociological tools of "good" and "evil."

The Death Dream

A basic tenet of neuroscience is that all forms of cognition take the form of on/off configurations of brain cells (Feldman, 1989). No mystical agency is needed to account for memory and consciousness. Perception consists of the processing of sensory stimuli originating within the external environment. Imagination is largely the result of internal noise, such as random electrochemical events, neurologically interpreted as external environmental features and hybrids thereof (Thaler, 1993). Both forms of resulting information, percep-

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tual and imaginative, are compacted and stored within neural networks. Because this data compression is so severe, with a veritable universe of information packed into just a few grams of cortical matter, such neural systems are prone to confabulation and delusion.

Limited by this mental constraint, the human ape is suited largely to the everyday tasks of hunting, gathering, and reproduction where such compressed world models are dependable and efficient. In contrast, speculation about worlds inaccessible to our reach and our senses is inadequately modeled after our immediate environment. Thus rigid sociologically-based cosmologies, formalized in religion, emerge in which giant, floating primates govern the creation and progression of the universe. Alternately, more flexible, nonsociological models, based on science, emerge involving things and processes as basic constructs and analogies. The sociological (religious) models usually embody human hopes and desires, especially in the circumvention of death. The nonsociological (scientific) models stand aloof from hope and search for a consistency apart from such blinding optimism. The sociological models are slow to change because of the comfort offered and the inherent sociological penalties involved, ranging from ostracism to death. The nonsociological models are able to evolve more rapidly since mild ostracism alone may occasionally be exercised.

Summarily, we are all trapped within a very subjective neurological reality in which neither our senses nor our intellect may be trusted. The consequence of this cognitive imprisonment is that we are in no position to testify as to the absolute truth of our experience or our models. Human neurobiology performs well in such tasks as procuring nourishment, devising warmth against the cold, defeating a competitor, or mating. However, in the building of theories, whether scientific or religious, all we can do is create an ever taller pyramid of analogies with each foundational analogy only as valid as its neurological familiarity, that is, the frequency with which it has been "burned" into neural pathways. The repercussion is that much of what we term "reality" is largely governed by consensus opinion. "Truth" is largely a function of the frequency and intensity of reinforcement of selected analogies by collective minds and societies, thus opening the door to religious, political, or even scientific thought control. The realization of this human *modus operandi* has led philosophers like Paul Feyerabend to believe that many of our presently revered cosmological theories will at most serve as light entertain-

ment, or perhaps horror stories, for future generations (Horgan, 1993).

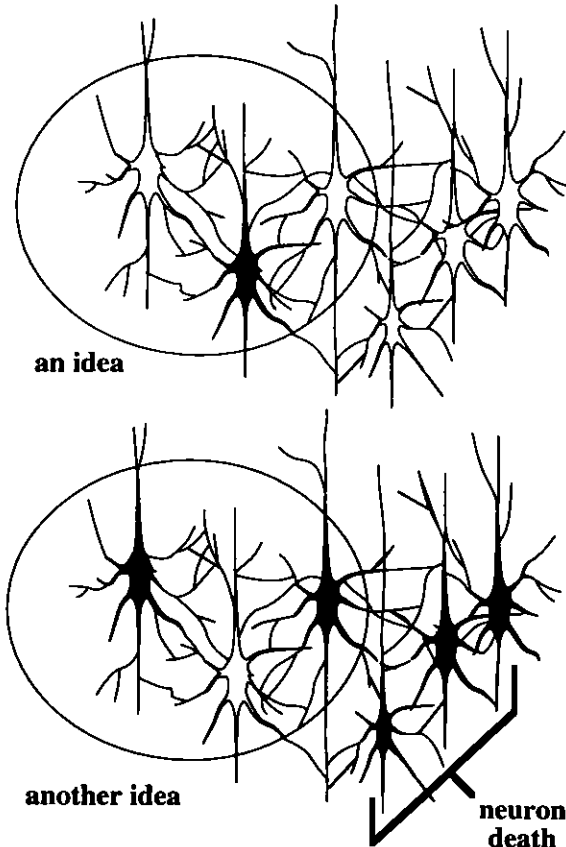
In spite of our inherent limitations as theorists, we are very successful manipulators, as evidenced by the preponderance of cortex devoted to the motor control of hands (Shreeve, 1993). Being such manually dextrous animals, constantly manipulating the environment to our own advantage, our most abstract thoughts are unsurprisingly couched in terms of the "grasping" of concepts. Therefore, in pursuing our needs, we take various cues from the physical world and then emulate, by manipulation either of environmental features or symbols to achieve pragmatic objectives. We have, for instance, successfully mimicked the biological wing. As a result, we routinely take to the air, traversing significant distances in fulfilling our needs, at speeds far surpassing that of a bird. Centuries of symbol manipulation have led to an enormous palette of mathematical analogies, forming the basis of the quantum mechanical and relativistic models, which alternately promise an energy-rich utopia or thermonuclear flash extinction.

Now able to peer into the working brain and to manipulate mathematical symbols pertaining to brain function, we are similarly collecting useful analogies to be used in the emulation and exploitation of this thinking organ. Neurobiologically inspired technicians are preparing to create systems that think faster and more thoroughly than their human predecessors. In the process, they are witnessing within simulated neural networks all of the phenomena held sacred by the sociological cosmologists, including dreaming, free will, and creativity. At the heart of these simulated human attributes we come face to face with a very fundamental trade-off: *neurological destruction results in the spontaneous generation of information*. Such a complementarity may be as fundamental as that of matter and energy, forming the computational basis of a truly creative artificial intelligence.

This new computational paradigm involves the inevitable phenomenon that results from the destruction of the brain cells within neural networks (Thaler, 1995a, 1995b). As neurons are destroyed, or their connection strengths with other neurons are modified, the network produces a progression of environmental features, as suggested in Figure 1 and the explanatory text in the Appendix. It is as though the piano is played not from the keyboard (that is, the senses), but internally through the breakage of piano wire (the disconnection of cortical neurons). As such biological networks condense through

death, the events stored within them appear in a cascade, occurring to the remaining network as an ever growing number of events per unit time. Since we measure time psychologically by the number of events witnessed, we may subjectively experience eternity within a veritable avalanche of events I call the "death dream." Such near-death experience is no more real than the secondhand neurological reality we perceive in life, where seeing, for instance, is *not* believing;

Figure 1. Healthy cortical function (above) produces a thought. The death of neurons (below) induces another idea through interconnectivity of the network.



that is, the brain fills in much of the visual information it seems to perceive straightforwardly (Dennett, 1991).

Near-Death Darwinism

The memories and feelings stored and then released by our neural networks are all products of immersion within a particular environment. What appears during the death of such networks are the most strongly impressed experiences and emotions produced by such training. Among these impressions are the world models all minds construct to anticipate and deal with the external physical and social universe. In a sense, we try to understand how other individuals within our environment are motivated and behave by how we ourselves perceive and react to the world. Within the death dream our private universe evolves along these strongly impressed guidelines. Personal motivations of other imaginary actors in this drama are our own, in effect leaving us pitted against ourselves. Those who strongly perceive good will and selflessness within, find themselves immersed within a world populated by the trustworthy. Others, convinced that their actions are motivated by greed and selfishness, automatically find themselves within a nightmarish world of paranoia. Thus we obtain the much mythologized dichotomy of heaven and hell.

In short, this model suggests that what we anticipate is exactly what we get. Those genuinely proclaiming and believing in a particular deity do in fact encounter their personal god within their death dream. Victory over their enemies and detractors may be realized and many come to see clearly the strength and beauty of their personal convictions. Those who genuinely feel they have lived a righteous life necessarily receive proportionate redemption. Those who have consistently dished out hell to others appropriately receive likewise in what appears to be eternity. Ironically, we could have many winners in such neurological afterlife schemes, many of whose death dreams involve dichotomous religious philosophies. If this paradigm is at all accurate then how could we justify a diversity of religiously divergent near-death "successes"?

In response to this irony, I propose here that such neurologically generated experience is strictly subjective and centered within the individual, oblivious to any standards. As a result, within life there is a competition—perhaps more powerful and brutal than the sexual,

reproductive urge—to furnish impending near-death experience with the most lavish and rewarding sense of personal vindication. To achieve this illusion, we must create an unambiguous sensation of self-righteousness and, if a deity is part of one's cosmology, begin to synthesize a unique relationship with that entity. In order to create the most robust neural network training, we must delude ourselves repeatedly into a deity and morality system in spite of the conflicting reality that always surrounds us. We often grasp at poetic, inspirational proof and anecdotal reports that selectively substantiate the mythology. Counterproof is ignored or declared "evil" as in the Church's crusade against the Galilean concept of a nongeo-centric universe.

And what of these concepts of "good" and "evil"? Again, these concepts may be rooted within this near-death competition and be strictly ego-centered, representing a struggle to jockey toward redemption. After all, criteria of goodness and evil are not universally accepted, varying from one culture to another, and are fairly limited to and determined by our perceptual sphere. For example, the obvious righteous solution to the potential tragedy of a child in the direct path of an oncoming truck is to rush out into the street, swoop up the child, and whisk him or her to safety. But what if that child is to be the author of genocide and the murderer of millions? Do we unflinchingly risk our life to rescue the tot if supplied this knowledge?

Faced with this sort of calculus, we prefer to feed our personal feeling of goodness, sidestep any feelings of guilt, and perform in the sociologically accepted way. In this manner, we nourish our death dreams. We prefer to remain oblivious to the myriad brutalities in progress every instant of any given day. Since we have no concept of the long range repercussions of any given act, we are helpless to predict that action's merit. We can only delude ourselves into feeling that it is benign, when in fact perpetration of an immense evil ironically can result in the most benefit for the multitudes. Thus, the good Samaritan can only generate gratitude within his beneficiaries and a sense of peace within himself. It is this accretion of virtual goodness that is at the heart of the sociobiological competition and leads to the most rewarding death.

In this bitter struggle to acquire goodness, we occasionally band together and sacrifice an individual in a kind of spiritual cannibalism. This is an overlooked side of human justice in which trials are held not just to protect society as a whole and to provide deterrence,

but to provide a feast to bolster our sense of collective self-righteousness. Quite predictably we convict in order to prosper in our personal deaths, often subjecting individuals to grotesque periods of confinement, torture, and death. The immense irony is that the sources of crime lie within the pathologies of a mechanism. We punish electrochemistry and jump to the religious conclusion that we have justly punished an immortal soul, passing on judgment to a higher authority. Such juries and societies receive a double bonus through (1) self elevation by way of self-righteousness and (2) perpetuation of mystical concepts of soul and self-determination that substantiate and promulgate the mythological afterlife.

Thus the poor man who suddenly steals to feed his starving family is further tormented by imprisonment while the rich, conniving businessman who slowly and methodically skims two cents off the dollar lives luxuriously and with impunity. Such is the time scale involved in our neurological sense of crime. Advantage gained over periods of seconds or minutes is viewed as heinous crime. Advantage accrued over months or years is largely perceived as industry. The axe murderer's guilt is computationally clear. On the other hand, the hard-driving employer may induce slow death through stress and cardiovascular damage to his employees. The latter is dismissed by the same neurological mechanisms that until recently could not fathom the physical assault posed by certain preservatives in our food and contaminants in our water and air.

Accepting then that the death dream is inevitable, that its positive manifestation is bitterly fought for, and that this dream is driven by our own internal assessment of motivations, what part might this scheme play within nature? I personally do not subscribe to arguments of "purpose" in nature. Such anthropomorphisms are another attempt at creating sociological cosmologies, since only humans and some animals have feelings of intentionality and purpose.

All I can safely say is that from what I have observed in my accessible world, there is a strong tendency to further life, at a level insensitive to that of the individual. That is, the urge to reproduce dominates the life cycle of self-organizing systems, often without regard to chastity or faithfulness. Species voraciously eat and are eaten without the slightest hint of sentimentality. Life function continues regardless of injury and suffering. I perceive no agency within the universe concerned about me or my fate as an individual, although many others imagine it. I do see the inexorable progression of life, which is as irreversible as the motion of a planet around a star.

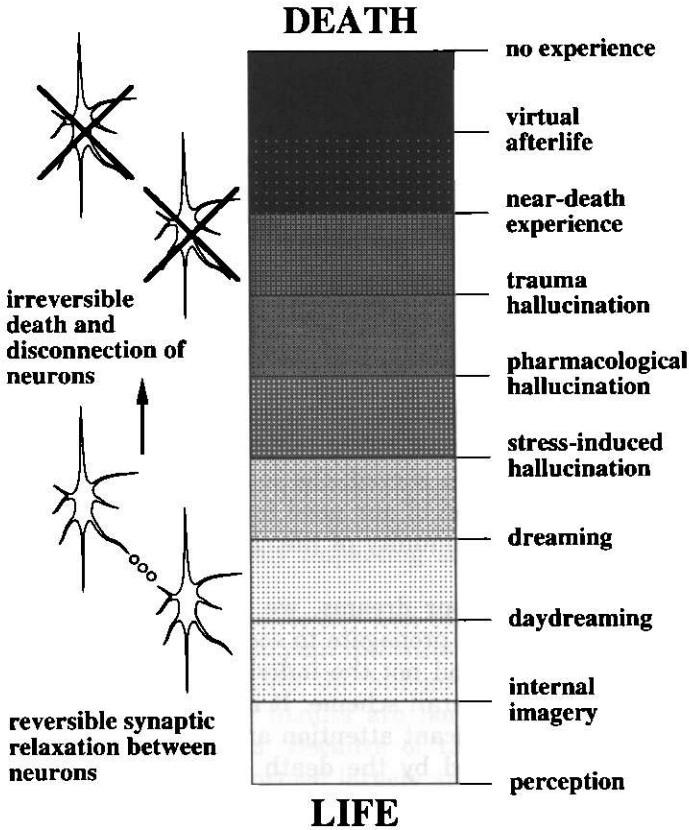
Darwinian evolution is likewise insensitive to the fate of the individual. Many variants on a theme are genetically produced and only those suitably adapted to an ecological niche survive. No tears are shed for the biological losers. Traditionally we speak of survival fitness and competition within courtship as the Darwinian mechanisms of selection. Death is viewed as the refuse of biological activity as mechanisms degrade and fail. Here, I introduce the notion that the death stage is essential to any Darwinian scheme of evolution and that the death dream is integral to natural selection.

To understand this assertion, I propose a continuity and connectivity between dreams, hallucination, phantom experience, near-death, and illusionary afterlife experience that is essential in describing the Darwinian model of death. In essence, all notions occurring to us that do not actually originate in the surrounding physical environment are the result of brain cells modifying linkages with each other by various mechanisms. Figure 2 intimates a continuous spectrum of such virtual experience, resulting from such modifications in neuronal connectivity, and ranging from processes of internal imagery to near-death experience.

All memories, for instance, involve the strengthening of electrochemical connectivity with other brain cells and in essence represent a secondhand, token reality. In the course of sleep, when the reinforcement of memories is turned off, electrochemical connection strengths decay and weaken. Such decay acts as a noise input to the highly interconnected neural networks forming the matrix in which the expiring memories were originally embedded. The noise is in turn interpreted as an environmental feature or some variant thereof. More memory decay can trigger more related internal imagery. In this way a dream is born. The relaxation of these memories may be viewed as a kind of reversible micro-death as connection strengths are weakened and memories are lost.

In the case of irreversible brain cell disconnection resulting from the trauma of pharmacology or death, the same phenomenon occurs, generating noise that the surviving network fragments may interpret as a succession of environmental features. In this way, hallucination is manufactured. If the entire cortical region is dying, we see a mammoth cascade of memory and virtual experience that I have termed the death dream. Afterwards, there is no storage or processing medium for our perceptions, desires, and aspirations. Both mind and brain together wither, dehydrate, and fall away.

Figure 2. The spectrum of virtual experience from life to death.



Note that in both reversible and irreversible dreams (that is, nocturnal and death dreams, respectively) the dominant neurologically stored model of self is the one supplying a model for the actors within these virtual dramas. Thus within the helplessness of sleep we confront ourselves and face a “society of self” whose motivations we automatically understand as hostile to or in harmony with our own being. With increasing helplessness and trauma, as within the delirium of fever, more extensive virtual theater may occur involving larger casts, props, and elaborate plots with results ranging from euphoria to nightmare. Finally, within the ultimate trauma of death, an epic

scale dramatization is initiated, launching a veritable universe populated by our self-inspired models of human motivations.

In short, within all levels of passivity and neurological dismantling, we are dealt ourselves and our private preconceptions. Faced with the dissolution of ego, we may be either torn apart by our more demonic and tenacious side or reassuringly conveyed to a blissful paradise by our kinder aspect (Ring, 1994). The individual totally convinced of the empathy and supportiveness of humanity receives similar treatment as the self expires; those at odds with their kind find themselves within a hellish scheme of ultimate retribution.

Realizing that we and our neurological relatives live within an environment filled with potential sources of brain trauma ranging between insignificant and mortal, we see that in the course of living there are many such involuntary opportunities to review our perceived relationship with our societal matrix. Within such internal dramas we experience an immense restoring force, acting to realign our motives to the welfare of fellow individuals, the species, and life in general. In short, life is served; the individual is not. Throughout existence we are reminded of our need for conformity and our interdependence with the community of life. Death, both false and final, keeps us kind.

As communicators of our dreams, we broadcast the news of our imaginations, which then propagate to society as a whole. Again, the multitudes are served, and not the individual. In this way, death is not a loose end in the overall scheme. It is an influential and pivotal event owing to the significant attention and empathy it draws. Since we have all been touched by the death experience to some degree within milder trauma, we feel a sense of *déjà vu* with mortality. Within that sympathetic helplessness is felt remorse and contrition. The required attitudinal adjustments are made to achieve sociological cohesiveness.

Perhaps the turning point of both biological and social evolution was the reversal of a longstanding trend to create increasingly larger brains (Winson, 1990). Such economy was realized by parallel processing and more highly interconnected neural networks within a smaller volume. Not only did such schemes make creature response more flexible to its environment, it allowed more complex internal imagery and dreaming.

In sleep, synaptic relaxation and impinging limbic system noise allowed the animal's compressed neural universe to unfold, revealing potential danger scenarios and inducing a mental preparedness for

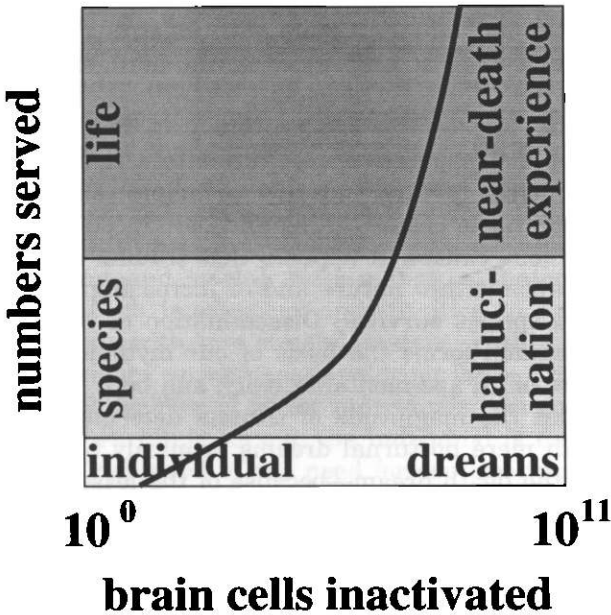
such hazards. Within the everpresent traumas of living, whether through the sudden secretion of neuromodulators such as adrenaline in response to danger or within physiological trauma, the organism received some fragment of the death dream. That virtual experience reacquainted the individual creature with its strong interdependence with the species and an accompanying social, herd, or tribe consciousness.

The proclivity to moralize spontaneously in this way formed the basis of large-scale cooperation and, ultimately, civilization. In some ways we implicitly understand this principle, since torture and trauma are integral to brainwashing and to induced cooperation with oftentimes dubious causes. It appears that trauma is a means of inducing compliance within nature and of increasing chances for both individual and species survival. Dissemination of virtual experience born within trauma forms the basis of our mythological constructs, including those of an ape-mentality deity, and both "good" and "evil." I speculate that the magnitude of trauma determines the globality of impact, with mere nocturnal dreams primarily benefitting the individual, and the death dream—because of the lessons and attitudes thereby generated—positively impacting society and life as a whole (Figure 3).

In effect, all of the spontaneously and internally generated images born within the trauma spectrum infiltrate the societies of neurologically complex animals. Within the human animal, visions from not only death but also lesser insults are born within individuals and then permeate civilizations. Because of this ideational infiltration, the world's religions have formed largely around the nucleus of death and the objective of attaining the most ideal form of virtual afterlife. Implicitly, the major creeds have discovered the significant advantage of numbers in tipping the scales of consensus and subsequently convincing themselves of the reality of their particular mythology. These belief systems are propagated by the early indoctrination and neurological programming of the young, as well as the practice of spiritual sacrifice in which the collectively devout body or church self-aggrandizes itself by the ridicule, scorn, condemnation, and sometimes assassination of the nonbeliever.

The major religions could not flourish in the world of their idealizations. The moment that goodness had been equally distributed among all individuals there would be no relative scale to judge one's redemption value. There would be no black to contrast with the white, no yin to compare with yang. Groups could not band together

Figure 3. A conceptual plot of numbers of individuals served versus number of brain cells inactivated within the cortical network.



to profess their redemptive superiority. Their exemplar, their deity, their particular mythology could no longer serve a useful purpose in enhancing death dreams.

On the other hand, in such an idealized world of equal self-worth there would inevitably arise a single inequity through an unequal division of food, shelter, or sexual partners. Some individuals would have, and others would not. The "haves" would attain the immediate gratification of real or material resources; the "have nots" would gain points toward redemption. Implicitly realizing this inherent trade-off between possession and salvation, groups would form around some mythology born within trauma, cleverly engineering doctrines to maximize the redemptive value of adhering to the group attitudes; or, even more cleverly, they might create belief systems in which great material wealth may be accumulated while circumventing this material/redemptive trade-off.

These systems would take advantage of the limited computational power of the human brain, hiding the inevitable inconsistencies of

these dogmas within ambiguity, semantics, and the pressures of group beliefs. The result for such perplexed minds is the total rejection of the objective reality and relaxation into a mode of intuitive pattern recognition where sociological programming reigns. Important intellectual and moral decisions are then made using incomplete data and their merit judged not by any fundamental truth, but by consensus approval. The human neurological imprisonment is thereby complete and the same collective thought cycles repeat forever.

Evidently, we are confined to a very rigid cognitive track. But in a whimsical sense, a significant force visits us and then communicates to us, using our very dendritic, or tree-like, central nervous system as a topologically complex portal to the world. Those quick to anthropomorphize might call this an "angel among the branches," which talks to us in complete images from within. It transcends words, tickling and plucking away at individual cortical cells to convey vast messages through complete images, sensations, and emotions. In this way, the force permeates and controls whole societies, its will achieved by human agency. In a sense it is a governing idea in search of a neurological home.

We may take an optimistic stance and view such an agency as benign and nurturing. Alternately, we could perceive this force as a cosmic husbandman who cultivates neurobiological organisms as its hosts, with death and the accompanying surge of novel experience being the harvest. We may also look upon this force as the driver of universal evolution, calling and urging its hosts to emulate it, to have them manipulate the environment into its mechanistic image. Those heeding this call may be the winners in the overall race of evolution, looking as strange to their tribe as those apes who first stood erect.

Conclusions

To summarize, death, rather than birth, of neural systems may be at the heart of biological and social evolution. The natural progression of species is not only pushed by ecological necessities of the past, but also pulled from the future by death. In a poetic sense this is a deeply ironic notion since many believe they are drawn inevitably toward their maker. I metaphorically suggest then, that the maker is also the unmaker, and perhaps the nonanthropomorphic god that touches and communicates with us by the programmed destruction

of brain cells. The newly discovered computational paradigm involving the intentional destruction of artificial neural networks within computers, to set simulated neurological world models into motion, to generate new concepts, and to emulate free will within machines, may be the ultimate emulation and manipulation of nature.

The final product of this endeavor will be the superintelligent machine, which after destroying myriad other preconceptions may tell us that Darwin was wrong at a very fundamental level: organisms are not competing and mutating within various environmental niches purely to live. Instead, they are struggling to accumulate positive, redeeming experience to die well. In the process they must, in turn, give and nurture life.

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Appendix: Background of Figure 1

A brain state corresponding to a thought consists of no more than an on/off pattern of brain cells. In the upper portion of Figure 1, we see a highly idealized snapshot of a microscopic portion of cortex in which a simple idea (such as an image, a sound, or some abstract thought or feeling) has been activated within the oval region. There, "on" cells are signified by white, and "off" cells by black. All of the

neurons within this region are highly connected with each other as well as with other brain cells outside the oval. Some of these brain cells are interconnected by excitatory connections insuring that neurons at either end of such linkages tend to be simultaneously on. Inhibitory connections work in the opposite way, insuring that the joined cells tend never to be simultaneously on. The formation and existence of these reinforcing and negating connection strengths constitute learning, thereby achieving the neurological storage of features sensed within the external world. We see then, that the on/off configuration of neurons outside the oval tends to fix the on/off states of the three neurons within the oval (and vice versa), owing to the balance of excitatory and inhibitory interactions between neurons within these two groups.

In the lower portion of Figure 1, the three neurons outside of the oval region have suffered metabolic death and are thereby silent. In essence, these neurons are indistinguishable from healthy "off" cells within the network. The balance of excitatory and inhibitory interactions between these two regions shifts, thereby changing the activated pattern of on/off cells within the oval. As a result, a new memory or feeling emerges. The cells within the oval are in turn communicating with even more neurons (not shown), thus activating a complex chain of associated images, feelings, and ideas. In death, the brain experiences a cascade of such impressions, largely the result of the misinterpretation of rapidly increasing numbers of dead brain cells as silent, live neurons.

For less severe traumas, such as in drug-induced hallucination, the connection strengths between neurons are tampered with. That is, the electrochemical communication across the synaptic gap between neurons is altered by the presence of various neuromodulators. In this simplistic illustration, a drug would effectively change the balance of excitatory and inhibitory interactions to drive the activation pattern of neurons within the oval through a series of on/off states and hence through a series of false perceptions.

Finally in the least severe trauma, sleep, certain memories become "unlearned" as both excitatory and inhibitory connections strengths decay; that is, we are forgetting experiences no longer being repeated in the sensed environment. This phenomenon also alters the book-keeping of excitatory and inhibitory interplay between the neurons internal and external to the oval. Thus, if an idea represented by activations of the three external cells decays, we see a succession of

changing impressions within the oval, and hence the emergence of a dream.

In all cases, brain cells are effectively removed or disabled in communicating within the overall network. Increasing numbers of these neurons are removed in these ways as the magnitude of trauma increases.

Seasoned neurobiologists will note that I have simplified this discussion by removing any temporal consideration of neuron firings. Time-invariance has been achieved by the consideration of a “strobed” perspective of collective neural behavior.

Questions for the “Dying Brain Hypothesis”

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ABSTRACT: I pose four questions for the “dying brain hypothesis” as propounded by Susan Blackmore in her book *Dying to Live* (1993). The first calls into question Blackmore’s reductionist explanation of the “bird’s-eye view” for a near-death experience (NDE) and asks why out-of-body perception from a supine position is not reported, given her theory. The second inquires as to how the materialist view explains NDErs’ feelings of unconditional love, while the third ponders whether the variance among NDEs noted by Blackmore is not more consistent with the “afterlife hypothesis” than with the “dying brain hypothesis.” The final question queries whether neural disinhibition, described by Blackmore, might be a possible release mechanism for an NDE. I suggest that these four questions pose a challenge to the “dying brain hypothesis.”

Susan Blackmore wrote in her book *Dying to Live: Near-Death Experiences* (1993) that

All things considered, I can see no reason to adopt the afterlife hypothesis. . . . [F]or me the evidence and the arguments are overwhelming. The dying brain hypothesis, for all its shortcomings, does a better job of accounting for the experiences themselves. (p. 263)

Blackmore is an ardent proponent of what she called the “dying brain hypothesis,” championing a reductionist explanation for near-death experiences (NDEs); while I am an advocate of what Blackmore termed the “afterlife hypothesis,” a nonreductionist explanation for

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NDEs (Serdahely, 1992, 1995). In this article, I raise four questions that I believe pose serious challenges to the “dying brain hypothesis” as outlined in *Dying to Live*.

The Bird’s-Eye View

First, if the out-of-body experience (OBE) is, as Blackmore claimed, due to the brain’s reconstruction of memories and the possible tactile and auditory input while the NDEr is unresponsive, then why would we not expect out-of-body perceptions to occur from a supine, or for some NDErs, prone perspective? Blackmore suggested “The OBE . . . is the brain’s way of dealing with a breakdown in the body image and model of reality” when near death (p. 261). OBEs then become reconstructed “memory images,” which “are often built in a bird’s-eye view” (Blackmore, 1993, p. 177). Blackmore cited an article by Georgia Nigro and Ulric Neisser (1983) to support the bird’s-eye perspective contention. She also quoted Ronald Siegel, who gave an example of remembering walking along a seashore, and claimed that “Many people recall such scenes in a kind of bird’s-eye view” (p. 177). She concluded by writing:

It seems likely, therefore, that in the event of nearly dying, or any other circumstance in which the normal model of reality has broken down, such a bird’s-eye memory model may take over as ‘real.’ (p. 177)

At last we have a simple theory of the OBE: the normal model of reality breaks down and the system tries to get back to normal by building a new model from memory and imagination. If this model is from a bird’s-eye view, then an OBE takes place. In order for the dying brain hypothesis to account for OBEs on the basis of memory images and memory reconstruction, Blackmore must account for the “bird’s-eye” perspective, that is, NDErs’ sightings from a perspective of being above, looking down. Blackmore admitted that “If these [out-of-body vision] claims are valid then the theory I am developing is wrong—or, to be more accurate, inadequate” (p. 113). So the aerial perspective for the dying brain hypothesis then rests on the works of Nigro and Neisser and of Siegel.

Nigro and Neisser (1983) reported finding two types of memories: observer memory, where one is “looking at the situation from an external vantage point and seeing oneself ‘from the outside’” (p. 467),

and field memory, where “one seems to have roughly the field of view that was available in the original position and one does not ‘see oneself’ ” (pp. 467-468).

Nigro and Neisser warned against making too much of their studies of the point of view of memories. They wrote:

Our investigation is only a preliminary one. So far we have studied only a few situations, a few recall instructions, an unrepresentative sample of subjects, and an uncontrolled range of recencies. (1983, p. 481)

One study included 40 undergraduates, and the other “involved much younger subjects” (1983, p. 481), 30 advanced-placement high school students who participated in the study for pay and who may have exhibited “fatigue,” according to Nigro and Neisser, due to the length of the questionnaire.

What these investigators actually found was that “As in earlier studies, there were more field than observer memories” (1983, p. 479). They concluded that

A deliberate attempt to remember the “objective circumstances” of an event leads to relatively more observer memories; a focus on feelings leads to more field memories. People who are given no special recall set generally focus on their own feelings in remembering an event. This tendency may help to explain the overall preponderance of F [field] memories in our data. Another reason for that preponderance may be simply that recent memories tend to be in the field mode, and our open-ended instructions tended to elicit recall of recent events. It is also possible, of course, that there are simply more F [field] memories altogether. (1983, p. 481)

Nigro and Neisser commented further on the possible reason why some memories may be in the observer rather than the field mode:

Observer memories do occur. We are inclined to agree with Freud that they are often produced by a process of reconstruction in memory. We do not think that all of them originate in this way, however, because there may well be O [observer] *experiences* as well as O [observer] memories. In particular, events involving high degrees of emotional self-awareness may be experienced from an observer perspective. Our finding that such events produce a relatively high proportion of O [observer] memories is consistent with that hypothesis. (1983, p. 481, original italics)

So Nigro and Neisser wrote that observer *memories* may be due to *events that were experienced* from an observer perspective. The “observer experiences” described by Nigro and Neisser resemble what

the afterlife hypothesis would call the separation from the physical body, or an OBE.

The second source used by Blackmore to support the bird's-eye view in an OBE was Siegel's 1977 article focusing on his work giving an unspecified number of subjects various drugs of unspecified dosages and recording the subsequent hallucinations experienced by these subjects. As Blackmore noted (p. 177), Siegel referred to aerial memories when he wrote:

Common complex images included childhood memories and scenes associated with strong emotional experiences that the subjects had undergone. These hallucinatory images were more than pictorial replicas; many of them were elaborated and embellished into fantastic scenes. This constructive aspect of imagery can be illustrated by a simple exercise. Recall the last time you were swimming in the ocean. Now ask yourself if this memory includes a picture of yourself running along the beach or moving about in the water. Such a picture is obviously fictitious, since you could not have been looking at yourself, but images in the memory often include fleeting pictures of this kind. Our subjects often reported equally improbable images, such as aerial perspectives and underwater views. . . . The subjects frequently reported feeling dissociated from their bodies. (p. 136)

So there we have it: Blackmore's dying brain hypothesis needs the bird's-eye view to explain OBEs; and the bird's-eye view proposition is predicated on Nigro and Neisser's article, which they wrote described a preliminary study based on an unrepresentative sample, and in which observer experiences may account for many observer memories.

Blackmore's OBE explanation also rested on Siegel's 1977 article devoted to hallucinations, in which one paragraph discussed tangentially the bird's-eye perspective. That paragraph gave Siegel's opinion on the aerial perspective, but cited no data and no studies on memory reconstruction, such as Nigro and Neisser conducted. In fact, the research reported in Siegel's article was on hallucinations, which raises the next objection to the Siegel citation. Blackmore committed a fallacy of logic, the appeal to authority, by citing an authority in one area—hallucinations—as an authority in another—memory reconstruction.

In addition, Siegel seems to have confused observer memories, such as seeing oneself running along a beach, with observer experiences, such as "childhood memories and scenes associated with strong emotional experiences," concluding, in effect, that these are all observer

memories. Furthermore, it is possible that some of Siegel's subjects were abused as children, and these repressed memories and feelings were then released by their taking hallucinogenic drugs administered to them by Siegel. Also, the dissociation he mentioned (p. 136) could have been, in some of the cases, OBEs due to the administered drugs rather than what he called "improbable images, such as aerial perspectives."

The case for the bird's-eye view in an OBE based on the Nigro and Neisser article and Siegel's opinion is very tenuous indeed. It would seem that if Blackmore wanted to argue that the OBE is caused by a breakdown of body image with a subsequent mental reconstruction of what happened to the person while unconscious, she would have a more cogent reductionist argument by saying the OBE is due to the tactile and auditory input still perceivable to the unresponsive NDEr.

In this regard, she cited Michael Sabom's patient who, while out of his body, saw "a shot" being administered to him near his groin. Sabom wrote that in fact blood was being withdrawn from this NDEr's femoral artery. Sabom felt the mistake in his patient's interpretation was understandable because the NDEr did not hear anything during his experience. Blackmore suggested that the man never left his body, but felt the pain of the needle stick while semiconscious and later drew the conclusion that he had been given an injection (pp. 124-125).

If reconstruction of stimuli from other senses is indeed the case, then why do we not find out-of-body perceptions from a supine or prone or even a sitting position, at least occasionally? Using Blackmore's explanations and given the preliminary nature of Nigro and Neisser's study, which in any event found that field memories—that is, memories from the original perspective—occur more frequently than observer memories, one would expect NDErs to say that during an OBE they looked up to see living relatives and/or medical providers.

Blackmore did present a case (pp. 227-228) of a man who said that as he was being wheeled into an operating room he thought he saw welcoming angels surrounded by light, but later "he was quite sure that they were the doctors and nurses waiting for him in the theatre" (p. 227). Blackmore did not mention whether or not the man's perspective was a bird's-eye view. Even though the man had had more than one cardiac arrest prior to this surgery, it is not clear from Blackmore's account that this man was having an NDE at the time

of his seeing the “angels/medical providers” or that he was even unresponsive. It is, however, the kind of reconstruction one might expect from a semiconscious person given preoperative anesthesia: a mental reconstruction of the sensory input prior to surgery.

In any event, the out-of-body perceptions of NDErs are far more likely to be similar to the following two cases, which I share with the reader knowing full well Blackmore’s argument that they again do not offer incontrovertible proof of OBEs. Having floated out of her body and looking down on the operating room, one of my interviewees noticed the surgeon working on her was not the doctor she had authorized for her operation. She told me her attorney later discovered her medical records were missing, with the two doctors involved acknowledging off the record in a private meeting that her out-of-body perception was accurate.

Another respondent had an OBE during a sexual assault while running on a beach. The perpetrator punched her repeatedly in the face and then strangled her during the assault, at which time she floated out of her body to about 15 feet above the attack site. She was able to describe accurately the escape path taken by her assailant. She saw him from behind running down a path she had never seen before. She told me she had described in court seeing the assailant leave and the direction and path he took, but was never asked by the defense attorney how she could accurately describe these details when she was supine, on the ground, and unresponsive. The path she described was confirmed by the police reports, and the man was convicted of the assault.

In summary, then, Blackmore’s OBE explanation “as part of the mind’s own creations as it tries to make sense of the physical struggle going on between life and death” (p. 227) just does not seem to hold up, given the tenuous nature of the work of Nigro and Neisser and of Siegel, on which it is based, and the prediction that a mental reconstruction of memories in which field memories predominate should yield at least some, if not many, sightings from a supine or prone perspective.

Unconditional Love

The second question I pose for Blackmore is how the dying brain hypothesis explains the overwhelming feelings of unconditional love experienced during some NDEs.

Blackmore wrote that "The joy and peace are consistent because of the natural opiates released under stress" (p. 261). She explicated the role of endorphins and enkephalins for pain relief, and wrote that "Endorphins cause just the kinds of emotional response, including pleasure, joy, calmness and freedom from pain, that occur in NDEs" (p. 108). But she never gave a clear, reductionist explanation for the sense of unconditional love reported by NDErs.

As Kenneth Ring wrote, the NDEr may enter "a magnetic and brilliant golden light, from which emanates [sic] feelings of love, warmth, and total acceptance" (1980, p. 103). Cherie Sutherland wrote that NDErs may encounter "a Being of Light who radiates love" (1993, p. 244). Raymond Moody and Paul Perry wrote that "the Being radiates total love" (1988, p. 10). And Moody noted (1975, p. 59):

The love and the warmth which emanate from this being to the dying person are utterly beyond words, and he feels completely surrounded by it and taken up in it, completely at ease and accepted in the presence of this being.

One of Sutherland's interviewees said:

I was going towards a very bright light. And as I was travelling along . . . I got stopped, just stopped before I got to the light. And I felt this extreme presence of love, just absolute love. (1992, p. 10)

Melvin Morse wrote:

Most of the patients I have spoken to describe it [the Light] essentially as a pure light of unconditional love. Others call it "all-knowing," "all-forgiving," and "all-loving." (Morse and Perry, 1990, p. 116)

One woman who recalled a childhood NDE remarked that the light represented love: it "had the feeling of unconditional love" (Morse and Perry, 1990, p. 116).

Margot Grey also noted "a love and a beauty that surpasses anything known on this earth" (1985, p. 49). One NDEr she interviewed said:

Love is the major impression I still retain. In heaven there is light, peace, music, beauty and joyful activity, but above all there is love and within this love I felt more truly alive than I have ever done before. (1985, p. 53)

Another of Grey's respondents said about his NDE:

it's absolute pure love. . . . What the light communicates to you is a feeling of true, pure love. You experience this for the first time ever. You can't compare it to the love of your wife, or the love of your children or sexual love. Even if all those things were combined,

you cannot compare it to the feeling you get from this light. (1985, pp. 53-54)

Two NDErs I interviewed made similar comments. One, who had an NDE from a heart attack, said that during his experience he encountered "a diaphanous Christ-like figure" with outstretched hands emanating a loving light. He then knew how well-loved he was due to this figure. He could feel the love, and he wanted to be enveloped by that love.

The other NDEr, "Joan," about whom I have written elsewhere (Serdahely, 1993) said the bright white light for her was love that she brought back with her. It was a love that "circulated" through her entire being.

Given the consistent reports of an experience of love during an NDE, the dying brain hypothesis needs to address from where in the brain these feelings of unconditional love arise: which neurotransmitters and/or cortical structures are responsible for this love? Blackmore herself noted that "Many positive NDEs begin with nothing but [a] sense of peace and love and some never get further than this" (p. 104), but she did not offer a materialistic explanation for the unconditional love during an NDE.

A similar question can be asked with respect to distressing NDEs: what are the anatomy and physiology of distressing NDEs? *Dying to Live* never gave a clear explanation in its section on hellish experiences; Blackmore only cited one case of a man who had been given an injection of naloxone, and claimed that the naloxone changed his near-death experience from pleasant to horrific. But clearly no naloxone injections were administered in most of the published cases of hellish or distressing NDEs. So we are left wanting a reductionist explanation here, too.

Individual Variation in NDEs

The third question I pose for Blackmore is how the reductionist brain model explains the observation that NDEs vary from person to person, often greatly, in their phenomenology.

Blackmore differentiated between consistency and invariance for NDEs:

We have consistency but not invariance. Yes, the NDE is universal in the sense that something like the modern NDE has been reported

in adults and children in many ages and cultures. And, 'no,' it is not always the same but varies with the individual, the culture and the circumstances. (p. 22)

We have explored many different kinds of NDEs and seen that, although no two are the same, there are consistent patterns: the tunnel; the light; the out-of-body experience; the return to life and the changes it brings. (p. 261)

While Blackmore used "consistency" to support the dying brain hypothesis, she never addressed how the brain then generates the myriad variations within those patterns. How does the dying brain hypothesis account for the fact that NDEs vary "with the individual, the culture and the circumstances" (p. 22)?

With respect to the consistent patterns, Blackmore wrote that the joy and peace are due to endorphins; the tunnel, light, and noises a result of anoxia; the OBE due to a change in body image and sensory deprivation; and the life review from endorphin-induced temporal lobe and limbic system seizures. But within each of these patterns are countless variations, whether in affective tone, during the tunnel experience, within the light, or during OBEs. As she wrote, "no two [NDEs] are the same" (p. 261). But these many specific differences within each pattern are left unexplained by the dying brain hypothesis.

For example, if the life review is due to endorphins, then why are there so many varieties of life review? Some people see the life review chronologically, some see all events simultaneously, and some see only significant events. Some see the life review by themselves, and others with a loving being or occasionally with other beings. Most feel no judgment, while some do. Some experience empathy, while others do not. Some see it as watching a movie, others as countless television screens, and yet others as snapshots; one of my respondents saw several blank or "undeveloped photos" of her life, which was portrayed during her life review as a series of photographs. Two of my respondents had *lives* reviews, seeing past as well as present lives; while most NDErs only review their present life. How does the dying brain hypothesis explain such great variation within the basic pattern of the life review?

A similar argument can be made for the variations within each of the basic patterns Blackmore identified: the tunnel; the light; the affective tone; and the OBE. If the NDE is only a creation of the brain, then why wouldn't the brain be programmed to release an

experience that is not only consistent but also invariant within each pattern, from person to person, culture to culture, and time to time? Wouldn't invariance more likely be the rule, if the NDE is actually an outcome of evolution to insure the survival of the species, as Blackmore implied in the Preface of her book?

Siegel (1977), cited by Blackmore as noted above, argued that hallucinations are a universal phenomenon, and, of course, generated by the brain. He cited Heinrich Klüver's delineation of four "simple form constants" that appear in the first stage of hallucinations (p. 132). Siegel called the second stage "complex images," and wrote:

One would expect the forms and scenes of complex imagery to be almost infinitely diverse. Actually constants appear even at this stage. (p. 132)

So here we have brain-generated phenomena that Siegel found were not infinitely diverse but quite constant, that is, invariant for both stages. If NDEs are indeed products of the brain, then why wouldn't they also be invariant like hallucinations?

Consistency, as Blackmore pointed out, does not prove an afterlife. Consistency is what one would expect from either the dying brain or the afterlife hypothesis. Variance within the patterns identified by Blackmore, while seemingly incompatible with the dying brain hypothesis, is just what one would expect with the afterlife hypothesis. I have proposed what I call the "individually tailored hypothesis" (Serdahely, 1995), which does account for the variation and individualization of each NDE within the consistent patterns of OBE, tunnel, and light. The individually tailored hypothesis suggests that the innumerable variations within the NDE are due to experiencers getting what they need from the experience in a way they can accept it, in order to facilitate their own psychospiritual growth.

Separation of the "True Self" From the Physical Body

My final question for Blackmore is whether neural disinhibition could possibly be a causative factor in the separation of the "true self," spirit, or soul, from the physical body.

A case was put forward in *Dying to Live* that anoxia can lead to the disinhibition and subsequent excitation of neurons, especially in the visual cortex and perhaps in the temporal lobes. Blackmore also argued that endorphins cause neural disinhibition and consequent

seizures in the temporal lobes and the limbic system. The neural disinhibition due to anoxia and endorphins, then, according to the dying brain hypothesis, is responsible for what we call the NDE. Blackmore pointed out that certain drugs, in particular depressants, may damp down an NDE by increasing neural inhibition.

I recently interviewed a man who tried to commit suicide by drinking a massive dose of animal tranquilizer, available to him in his work, along with alcohol. His NDE was dampened with the imagery being less clear or fuzzier for him than the usual vividness of an NDE. This case was very similar to one reported by Ring (1980, pp. 122-24) in terms of its overall pattern and tone, but differs with respect to the specifics of the NDE.

Given her materialist position, Blackmore, of course, was unwilling to entertain the possibility that there is such a thing as what she called a soul (I prefer the term "true self"), let alone that the soul might leave the body, a paradigm shift I am willing to make, given the discussion of OBEs above. She asked, "Why . . . should disinhibition and random excitation produce NDEs?" (p. 66), and she answered that question with a materialist response.

However, it is possible that the disinhibition she described in the visual cortex and especially in the temporal lobes with its concomitant neural excitation may be the physiological condition that "opens the gate," so to speak, to release the soul from the physical body. After all, if there is a soul, then it has to interface with the physical body somehow.

Blackmore wrote that there are other conditions known to cause cortical disinhibition or excitation, including some drugs, especially hallucinogens like LSD, hashish, and mescaline; epilepsy and temporal lobe seizures; some brain chemicals; and, she implied, conditions like meditation, fasting, prayer, fatigue, and dreams. Many of these conditions have also been associated with NDEs and/or OBEs. Therefore, it is possible, given our current understanding of the temporal lobe, that neural disinhibition could possibly lead to the separation of the "true self" from the physical body.

I have one more question to pose while we are considering neural disinhibition. As mentioned above, Blackmore attributed the tunnel, light, and noises to disinhibition. With that as the premise, my question is how the dying brain hypothesis accounts for seeing deceased relatives during an NDE. If relatives are encountered in the course of an NDE, almost always they are said to be deceased. So how does the disinhibited brain know to call up these memories only, and not

memories or images of living loved ones? It would seem that if the brain alone is responsible for an NDE, then it is more likely that the brain would recall images of *living* loved ones to provide the comfort and assurance that NDErs report from encountered deceased beings.

For example, when Patrick had an NDE at age 7, he encountered his two deceased pets, even though all the people close to him were still alive (Serdahely, 1989-90). How did his disinhibited brain know how to do that? Or if there is a random firing of disinhibited neurons, then why do these neurons almost always produce images of deceased loved ones?

Perhaps to answer this question Blackmore would cite the case, discussed above, of the man being wheeled into the operating room, arguing that the semiconscious or unresponsive person's brain interprets encounters with living relatives and medical providers as deceased beings. Again, it is not clear from Blackmore's account of this case (p. 227) that this man was having an NDE or was even unresponsive. But even if that were so, then the dying brain hypothesis needs to explain how and why the brain interprets these entities almost always as being deceased.

Conclusion

Blackmore concluded that "If evidence changes in the future and truly convincing paranormal events are documented then certainly the theory I have proposed will have to be overthrown" (p. 262). The four questions I have posed here do not, of course, provide such evidence, but they do present some formidable challenges to the dying brain hypothesis.

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Hedonic Deactivation: A New Human Value for an Advanced Society

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ABSTRACT: Comatose subjects experience pleasant unaroused affects such as tranquility, serenity, peacefulness, and relaxation, more frequently and more intensely than they experience aroused feelings or differentiated emotions. I suggest that consciousness is not disconnected by coma, but rather is potentiated following complete blockage of the brain's information channels. The subject's awareness of this detachment from the world triggers hedonic unaroused affects typical of the mystical state. Hedonic deactivation experienced during coma and similar situations remains an aspiration of the subject even following the healing process and even among the general population constitutes a human value towards the evolution of a more spiritual society.

There already exists an extensive literature concerned with the study of certain features of consciousness revealed during states of profound coma or in analogous circumstances, such as clinical death, cardiac arrest, or brain trauma (Grey, 1985; Greyson and Flynn, 1984; Grosso, 1985; Lorimer, 1990; Moody, 1975, 1977; Morse and Perry, 1992; Ring, 1980, 1984, 1992; Roberts and Owen, 1988; Sabom, 1982). The authors of this literature consider these phenomena as a unique syndrome they call near-death experience (NDE); I have called it potentiated phenomena of consciousness (Tiberi, 1994).

Raymond Moody (1975) and Kenneth Ring (1980) have proposed schematic descriptions of the NDE. Ring's (1980) description narrowed down to five the 15 features proposed by Moody: (1) feelings of peace, relaxation, and quietude; (2) the sensation of being outside

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one's body; (3) entering a tunnel; (4) seeing an astonishing light at the end of the tunnel; and (5) living in the light.

The aim of this article is not to set forward a scientific explanation of NDEs or potentiated phenomena of consciousness. Many efforts have been addressed to that end, including those from the standpoint of physiology or neurology (Barnes, 1988; Blacher, 1979; Carr, 1981, 1982; Jansen, 1989; Morse and Perry, 1990; Ring, 1992; Rodin, 1980), pharmacology (Rogo, 1990), psychiatry or psychoanalysis (Laing [Grosso, 1981]; Noyes and Kletti, 1976), psychology (Greyson, 1983; Moody and Perry, 1988; Sabom, 1982), and transcendence (Moody and Perry, 1988; Morse and Perry, 1990; Ring, 1980). More recently an explanation from Susan Blackmore (1993) flatly denied any vestige of the reality of these phenomena, a view derived from the philosophical principle that even external objective reality is unreal, a mere dream created by the mind.

In this article such phenomena will be considered of a mental nature, as qualia of the consciousness, even if it is consciousness in an altered and potentiated state.

Authors concerned with NDEs describe the feelings and emotions interviewees experienced during a profound coma. For example, Ring (1980) discovered that his interviewees reported having gone through a sensation of peace (59 percent), relaxation (29 percent), calmness (20 percent) and joy (20 percent).

Surveys conducted by the Institute of Psychology at the University of Verona have reached the same conclusions. In one of these (Tiberi, 1993), the interviewees were questioned about ten basic emotions and 14 different affects. The more frequently mentioned were quietude/calmness (92 percent), peacefulness (88 percent), relaxation (88 percent), and love (60 percent). More negative feelings are rare, such as anxiety (20 percent) or stress (just one interviewee). Differential emotions are less common than affects: joy (68 percent), interest (48 percent), and fear (20 percent).

During a second survey carried out by the same institute (Tiberi, 1994), the interviewees were again questioned about the same ten differential emotions and 14 affects, with the same results. Sentiments were experienced more frequently and more intensely than the differential emotions. Moreover, these affects were invariable, namely quietude/calmness (89 percent), peacefulness (87 percent), relaxation (87 percent), and love (70 percent). The most frequently described differential emotions were of a positive nature, such as joy (67 percent), surprise (61 percent), and interest (46 percent). Those

of a negative kind were rare: fear (15 percent) and anger (9 percent). On a scale of intensity with a maximum score of four points, this score was attained by 69 percent of the subjects interviewed for quietude; a similar percent attained that score for peacefulness. Relaxation was given the maximum score by 67 percent of subjects, joy by 37 percent; and love by 26 percent. The average scores for intensity paralleled those for frequency: quietude/calmness, 3.40; peacefulness, 3.38; relaxation, 3.35; joy, 2.64; and love, 2.46.

Thus the affects experienced most frequently by Italian interviewees were identical to those felt by Ring's (1980) American subjects, and the frequencies of positive differential emotions were lower than those of affects among both Italian and American interviewees.

At this point the question becomes inevitable: why does a person in profound coma experience with greater frequency and intensity affects such as quietude/calmness, peacefulness, and relaxation, yet with less frequency other affects and differential emotions, even if the latter are of a positive nature, like joy and interest? The concise answer is simply this: emotions, even of a positive kind, are more *activated* than feelings of quietude, peacefulness, and relaxation; even joy has been shown to be activated (Izard, 1977). Even in its mystical form it appears to reach, at a lower level, painful activation, though at higher levels it may also become deactivated.

The English mystic Julian of Norwich (1343-1416) declared she had experienced, during her mystical visions, a joy sufficiently aroused to have broken her heart. Yet there is also an unaroused joy she calls rest or calmness. D. Pezzini (1994) wrote: "Although she knows joy as a *violent* emotion, it seems that for Julian joy is *normally* experienced as a simmering fervour, a quiet feeling of calm and harmony" (1994, p. 101; italics added).

A more elaborate answer to the question of why unaroused affects are more common in coma than are aroused affects or differential emotions can be derived from an analysis of affects similar to those of the NDE, but which have been previously examined and hence open to knowledge. Ring (1980) drew a relation between NDEs and mystical states. The mystic in his or her visions experiences a beatitude embracing a profound peacefulness and quietude that are not affects of everyday consciousness, but of the superior consciousness, which has been called by some transcendental, altered, or potentiated.

The physiological aspects of these mystical phenomena are currently an object of study (Margnelli and Gagliardi, 1987), and physi-

ologists have also taken considerable interest in the relaxation, peacefulness, and rest that may be attained through transcendental meditation. These affects, moreover, are no different from those of a mystical source: they are also related to altered or potentiated consciousness. Thus they are not to be identified, for example, with normal relaxation such as psychologists associate with techniques and methods like autogenous training, biofeedback, hypnosis, therapeutic imagination, progressive relaxation, or isometric squeeze relaxation. It follows that there are various states of relaxation and peacefulness, and that in a model incorporating multiple levels of consciousness the entire range of these states might be integrated to formulate a general theory of relaxation. This is precisely what the Polish psychiatrist Andrzej Kokoszka (in press) attempted to do.

Physiological Deactivation of Emotions and Affects

Students of emotions and affects, which are nothing more than constructs composed of emotions and cognitive elements (Izard, 1977), have been concerned more with their activation or arousal than with their deactivation or nonarousal.

The concept and theories of arousal are not the same as the concept and theories of the emotion. Elizabeth Duffy defined arousal as "conversion of the source of potential energy into neuronal impulses which either excite another physiological mechanism or inhibit it so that a determined function does not continue to work progressively" (1962, p. 17). Arousal has been laden with the role of motivational intensity, rather than with the directiveness of this state, and is conceived as a form of energy whose availability varies according to the variability of environmental requirements (Revelle and Loftus, 1992). Arousal also changes with the variation in circadian rhythms, with the peak points towards midday and the lowest between 3:00 and 6:00 in the afternoon (Revelle and Loftus, 1992). We are familiar with the role of arousal in memory and learning processes (Christianson and Nilsson, 1984; Heuer and Reisberg, 1992).

Some authors (O'Hanlon, 1981; Simonov, 1987) identify "arousal" with wakefulness; others (Tiberi, 1990) draw the distinction between arousal in the strictest sense and specific arousal, such as Marvin Zuckerman's (1994) "sensation seeking," P. V. Simonov's (1986) "need of information," Carroll Izard's (1971, 1977, 1993) "interest emotion," Donald Lindsley's (1957) "ascending reticular activating system," Mi-

haly Csikszentmihalyi's (1991) "flow," or the activation of every differential emotion or every single affect or drive. Emotions and moods are composed of at least three stages: neurophysiological/electrochemical, expressive/motor, and phenomenological/feeling. Few authors claim that emotion is deficient in physiological arousal (Weiner, 1992). Rather theorists identify a multiplicity of arousals in the emotions.

Cognitivist authors highlight the role of autonomic arousal (Mandler, 1975; Schachter and Singer, 1962). Recently Richard Lazarus (1991) downplayed the role of physiological arousal in the emotions only to lionize that of the cognitive systems. Authors of the biosocial theories of the emotions identify emotional arousal with that of the somatic nervous system (Izard, 1977, 1993; Schwartz, Weinberger, and Singer, 1981). Others, such as Karl Pribram (1980), distinguish emotional arousal from emotional activation.

Broadly, the emotions and their derivatives, such as affects and affective/cognitive constructs, are physiologically aroused and activated, whether they are positive or negative, pleasant or unpleasant. Gordon Allport (1924) attributed the hedonic aspect of emotion to arousal, though this would appear more influenced by *feeling* or the final experience of emotion. Emotional excitement has the effect of enabling the individual organism to cope with the problems of life (Revelle and Loftus, 1992), existential problems that have afflicted humanity from its beginning, and positive problems that make one happy, though in a problematic or imperfect manner.

This function of arousal has induced philosophers such as Epicurus to prefer the renunciation of every emotion, positive or negative. One can even die from joy, while passionate love and sexual ecstasy may become stressful, producing what Hans Selye (1985, p. 26) called "the pleasant stress of fulfillment" or *eustress*, and spur on to pleasant, less activated emotional levels. Activation seems to constitute a fundamental need for the organism, to the point that should single specific arousals (emotions, drive, motivations, attitudes, prejudices) be lacking, the organism immediately takes measures to fill the void through a process of autoactivation, creating as a surrogate for normal arousal the affect of boredom (Tiberi, 1990).

Basically, every need, cyclical or noncyclical, shares one common denominator: arousal. However, even if the need for activation is basic to an organism, its very satisfaction may result in a disturbance or malaise. Humanity therefore must live with this conflict: on one hand, to need arousal; on the other, to suffer from its satisfaction.

The tendency to avoid this conflict is natural, but sooner or later the individual will come to the realization that it is part of the contingent human condition, from which one can escape only through physical death or mystical death to the world.

Theorists then concerned themselves with the most motivational and adaptive level of activation. Behaviorists and psychoanalysts have highlighted the significance of arousal reduction in relation to behavioral motivation. Other authors, such as D. E. Berlyne (1971) and Zuckerman (1974), have stressed the need to increase arousal (sensation seeking, inspiration, verve, or love).

However, there is broad agreement on the fact that the best level of arousal, that is, the most adaptive and effective in relation to performance, is an intermediate one (Berlyne, 1971; Hebb, 1949; Yerkes and Dodson, 1908; Zuckerman, 1979). Sigmund Freud, in contrast, maintained the value of a lower level; Erich Fromm wrote that an immutable axiom for Freud was "the concept that the psychic apparatus is governed by a tendency to reduce tensions and excitations to a consistently low level . . . or at level zero (the Nirvana principle on which the death instinct is based)" (1992, p. 561).

To take up once more the problem of deactivation it might be useful to adopt the dimensional approach of emotions, the origins of which can be traced from Herbert Spencer (1890), through Wilhelm Wundt (1896), Robert Woodworth (1938), Duffy (1941), Lindsley (1957), and Nico Frijda (1970), to Izard (1971), who created the Dimension Rating Scale, which measures four different dimensions: pleasantness, tension, impulsiveness, and self-security. As far as the arousal-non-arousal dimension is concerned, these theorists concurred unanimously on the concept of arousal, but differed in defining the opposite pole, nonarousal. Some scholars (Sjöberg, Svensson, and Persson, 1978) have maintained that there are no adequate words to describe the *continuum* up to the pole of low activation. Erland Svensson (1978), who constructed a Mood Adjective Check List (MACL) with six dimensions, two of which relate to activation and tension, called their low pole *deactivation* and *calmness*.

Albert Mehrabian (1979) called the same pole *nonarousal*, and in the adjectival form *unaroused*; to explain the significance of this he uses the adjectives "relaxed," "depressed," "bored," "aloof," "unconcerned," and "tranquilized." However, these adjectives are not synonymous with deactivation. Boredom, for example, is often taken for an unaroused phenomenon, while in fact it is a highly aroused construct (Tiberi, 1983).

Mehrabian and Linda Stanton-Mohr (1985), in designing the experimental conditions for their experiments, crossed the emotional dimensions of pleasantness, arousal, and dominance and found varying descriptions of deactivation. Crossing high pleasantness with low arousal and low dominance, they obtained the adjectives "unperturbed," "untroubled," and "relaxed." However, crossing high pleasantness with low arousal and low dominance (submissiveness), they obtained the adjectives "consoled," "sleepy," "tranquilized," and "protected."

To emphasize yet again the disagreement and uncertainty among authors on the concept of deactivation, M. K. Mandal (1986) described fear, anger, and disgust as aroused emotions, while he associated the emotions of sadness, joy, and surprise with nonarousal. These latter emotions should be also considered aroused, even if at different levels. Gary Schwartz, Daniel Weinberger, and Jefferson Singer (1981), for example, have shown that diastolic blood pressure during fear and anger is higher than that during sadness and joy, while diastolic pressure during joy is higher than that during sadness.

Clearly, every emotion has its arousal, even if in various degrees. In other words, unaroused emotions in the strictest sense do not exist; they exist only in a relative sense, namely in a state of potentiated consciousness, at a higher level. Robert Thayer (1989), in the analysis of his Activation-Deactivation Adjective Check List (ADACL) isolated four factors, two of which were the dimensions of Activation-Deactivation, implying an energetic arousal of positive affects, and Tension-Relaxation, implying a tense arousal of negative affects.

Of the adjectives used by the above authors to describe deactivation, some refer to relaxation, quietude, calmness, and absence of any disquiet, which are precisely those deactivated affects reported by NDErs. The dimensional approach to affects leads, therefore, to the activation-deactivation dimension as well. In order to deepen our analysis of this dimension, I will offer a brief outline of some studies dealing with the physiology of relaxation, which has been investigated more thoroughly; I suggest the results obtained in studies of relaxation apply as well to the affects of quietude/tranquility and peacefulness.

I have already referred to the two levels of these affects: the level of normal, everyday consciousness and that of the higher consciousness, otherwise termed altered or potentiated. There has been research on the physiology of both the first and second level. For the

first level, V. Dieter (1986) summed up the physiological features of this type of relaxation as: (1) slowing down of respiratory frequency and regularity of the respiratory cycles, (2) decreased consumption of oxygen, (3) decreased heart rate, (4) increased skin electrical resistance, (5) decreased body muscle tension, (6) dilation of peripheral blood vessels, and (7) enhanced electroencephalographic (EEG) synchrony.

As regards the *feeling* of relaxation, people who experience this claim they feel serene, tranquil, calm, relaxed, and at their ease. The physiology of normal relaxation corresponds to a reduction in the activation of the organism and its metabolism, which is perceived by the experimenter as a pleasant—even intensely pleasant—feeling, precisely because it is not aroused.

In a review of the physiology of the second level of relaxation, that experienced by potentiated or transcendental consciousness, R. Jevning, Keith Wallace, and Mark Biedebach (1992) wrote that current physiologists have been more concerned with acute states of arousal, such as stress, physical exercise, and attention, than with states of physiological deactivation.

Since there is a lack of physiological studies on reduced arousal of states of consciousness during profound coma and related situations, I will review research concerned with the deactivation of relaxation during transcendental meditation.

Jevning, Wallace, and Biedebach (1992) classified the features of the physiology of potentiated relaxation as follows: (1) respiratory changes, including reduced respiratory rate (up to 50 percent reduction), reduced oxygen consumption (up to 40 percent reduction), periods of respiratory suspension, and reduction in sensitivity to carbon dioxide; (2) circulatory changes, including significant changes in metabolism and in blood circulation, increase in cardiac output, decrease in hepatic and renal blood flow, decrease in vascular resistance, and reduced blood lactate; (3) endocrine changes, including marked decline of adrenocortical activity, of cortisol level, and of adrenocorticotropic hormone level, while the levels of other hormones remain invariable; (4) autonomic changes, including decreased autonomic activation, increased galvanic skin response, decreased spontaneous electrodermal response, decreased heart rate, and enhanced recovery from stressful stimulation; (5) electrophysiologic changes, including high voltage EEG theta burst activity, increased synchrony of frontal alpha activity, decreased beta and delta, and disappearance of tonic electromyographic activity; and (6) sensory-motor changes, including

shortened visual and auditory evoked potential latencies, decreased reaction time to sensory-motor replies, and significant improvement of absolute hearing threshold.

Jevning, Wallace, and Biedebach (1992) drew a comparison between results relative to the deactivation of first-level relaxation obtained during sleep and rest, and those relative to the deactivation of second-level relaxation such as in transcendental meditation, mystical states, and of the potentiated phenomena of consciousness seen in profound coma. They concluded:

Ordinary rest is also accompanied by declines of oxygen consumption and respiratory rate, according to several reports. However effects on muscle metabolism, circulation, renin and AVP secretion, adrenocortical activity, interhemispheric EEG coherence, and subjective experience differ quantitatively and qualitatively between the two behaviors. . . . Also sleep is hypometabolic, but during meditation the effects on secretion of cortisol, prolactin, and AVP, as well as EEG activity differ from those of sleep. (1992, p. 421)

In conclusion, the physiology of transcendental relaxation includes a significant decrease in the entire metabolic activity of the organism. This decreased metabolism is perceived and appraised by the appropriate neuron structures as an emotional stimulus that triggers a very unaroused and somewhat pleasant affect of high relaxation.

The correct sequence leading to transcendental relaxation is therefore the following: the cognitive systems focus attention on the object of meditation, attaining a state of higher consciousness. The organism is now hypometabolic and the conscious perception of these states becomes an emotional stimulus that triggers the feeling of relaxation.

The question is whether this sequence provides useful information about the sequence that leads to the deeper level of relaxation experienced during coma. Of course there will always be a mystery attached to this despite the innumerable scientific efforts to throw light on the problem. However, a traumatic factor such as an accident or heart attack does not do away with consciousness, but rather elicits mechanisms that drastically reduce metabolic activity and consequently activation in all its forms.

The organism, then, is almost isolated from the world. The information channels connecting it to the external and internal world are interrupted through a form of absolute deafferentation. This state much resembles that recounted by the mystics when they speak of having gone through the "dark night of the soul" or the emptiness

of the senses and of the spirit, that is, the removal from everything except the absolute; and in this situation of mystical death they have experienced a sense of the divinity. Probably, already prior to divine contact, which should produce absolute beatitude, simple mystical death or deactivation of the external and internal world should constitute a sufficient stimulus to elicit unaroused pleasant affects of peacefulness, relaxation, and tranquility.

Some near-death researchers assume that their subjects have had a foretaste of death; but these potentiated phenomena of consciousness occur even in circumstances without sickness or accidents, as in out-of-body experiences occurring in perfect health, or in the presence of subjective perception, not corroborated by physicians, on the part of the sick person of being on the verge of death (Owens, Cook, and Stevenson, 1990). It may be argued that such experiencers have had a foretaste of *mystical* or *analogical* death, without passing through the arduous path of abstinence and meditation, as a result of their absolute deafferentation and metaphysical isolation from the world.

Again, the conscious perception of hypometabolism and deactivation brought on by the isolation of mystical death might favor the construction of the emotional stimulus that triggers unaroused feelings of happiness. It may be somewhat venturesome to associate this kind of death with the Freudian Nirvana in which all of the organism's tensions and excitements are reduced to zero; but it is undeniable that the immense relaxation following this kind of death appears to be a common effect in all these models.

The near-death literature has highlighted the aftereffects or existential changes undergone by people who have survived this experience, so profound that they would seem to give rise to the passage from *Homo sapiens* to *Homo noeticus*, a more spiritual and more evolved being (Dabb and Langevin, 1990; Ring, 1992; White, 1990).

Our subjects from the two above-mentioned studies conducted at the University of Verona also claimed they had undergone these profound changes. In particular, some spoke of having attained a serene state of mind, relaxation, and peacefulness similar to the state of enlightenment that follows the establishment of a permanent transcendental consciousness that no longer turns itself off during the activities of daily life and is independent of transcendental meditation practice (Castillo, 1985).

The frequency of positive emotions following the healing of our subjects was higher than that in the general population (Tiberi, 1994),

while the frequency of negative emotions decreased. However it is well known that emotions, both positive and negative, are aroused and therefore imperfect in contrast to the unaroused affects of the higher consciousness.

Our subjects, however, claimed they had also experienced, after healing, unaroused feelings of serenity and detachment (97 percent), peacefulness (76 percent), love (82 percent), decreased stress (52 percent), and enhanced appreciation of life in general (92 percent). Profound coma seems, therefore, to act as a transformer or reducer of the tensions inherent in the human condition; while healing would appear to function as a transformer in the opposite sense in that it transmits the low voltage of coma affects to aroused feeling experienced before the illness, though without success. Once the fruit of happy deactivation has been tasted, it is thenceforth difficult to do without it.

For this reason many survivors complain, once they have regained everyday consciousness following reanimation, that they would have much preferred to remain in that state of higher consciousness. Since that is not possible, their experience leaves an indelible mark on them. Their real *metanoia* or conversion will involve reduction of daily activation not to the levels of normal consciousness, but to those levels flowing from the potentiated consciousness of the coma. It seems that the aspiration of returning to the deactivation experienced during the profound coma constitutes for these people their ideal of life, a real human value, at least in the sense of the social sciences; that is, a stable conviction that a particular lifestyle or objective of life is preferable, from the personal or social standpoint, to the opposite lifestyle or the opposite life objective (Rokeach, 1973).

Hedonic Deactivation as a Human Value

The problem of human values is so complex and extensively dealt with (Tiberi, 1978) that any further study into deactivation as a human value in contemporary society will have to await future research. For the moment I shall confine myself to setting forward the problem: might the reduction of activation in general, or deactivation, constitute an ideal of life, a lifestyle, one of life's goals?

On first consideration that might seem impossible by virtue of the contradiction that renders it unacceptable: if in fact deactivation were a value, then that would be equivalent to the activation of deactiva-

tion, since values are aroused at least in certain of their phases, for example when they are violated and their motivational propulsion is hindered by violence. The thirst for freedom, justice, and peace may also lead to extreme sacrifice. Values are affect/cognitive constructs; they are ideas aroused by emotions to become ideals. They urge on towards action. Nevertheless, in the phase of their enjoyment, values may become unaroused, if constructed around unaroused affects. To live in peace means living in the *tranquility* of order.

Contemporary society suffers from an excess of activation or excitement, from an excess of stimulation. To remedy this excess, many in quest of deactivation descend to overly low levels that the organism cannot tolerate. The organism then enters into a kind of stalemate leading to boredom, which in itself is a homeostatic remedy, a type of surrogate for arousal. This is, however, only a temporary and invariably aroused remedy. We are advised to cut down on the excessive excitement rife in political and social life to such a degree that this urgency has become a priority and necessary condition to cope with problems of other kinds. At the risk of being reductionist, I suggest that even the sciences and techniques of psychotherapy, concerned with these psychological excesses, have no other proposal to put forward than the reduction of nervous and psychological activation so as to attain a state of serenity, quietude, and internal peacefulness.

On the scale of needs, the evolution and maturation of society, even of civilization itself, tend towards the need for deactivation, which will seek satisfaction at least at the levels of normal and everyday consciousness, even if the satisfaction at the levels of the higher mystical or transcendental consciousness of *Homo noeticus* remains for humankind a mere utopian striving for a long time to come. And it might not be a provocation to interpret the deactivated happiness of the profound coma as an unconscious attempt to shirk painful, everyday reality and to find refuge in another reality that is perfectly deactivated, without problems, and hence extremely happy—a happiness resembling that of mystical and physical death, which is the true exodus from the world of vicissitudes towards final peace and *requiem*.

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Letters to the Editor

Measuring Biomagnetic Effects of NDEs

To the Editor:

P.M.H. Atwater (1994) devoted an entire chapter of her book to the physiological aftereffects of near-death experiences (NDEs) and provided some fascinating information on individuals manifesting electromagnetic effects, including the phenomenon of "healing hands." Such people (and not all are NDErs) are commonly referred to as "electrical sensitives."

Atwater defined electrical sensitives as people whose proximity influences electrical or electronic equipment, sometimes causing malfunctions. On their return from "the other side," sensitives might also suffer newly-acquired allergies, be unable to wear a watch, and/or claim to be able to perform acts of healing by the laying-on of hands.

Kenneth Ring and Christopher J. Rosing (1990) found that NDErs claimed they often caused electrical or electronic equipment (e.g., electric lights, digital watches, computers) to malfunction. They noted that human electrical fields can be measured in the laboratory and wondered whether the electrical fields of NDErs were different from those of normal controls.

I'd like to suggest using existing technology to study and attempt to duplicate those healing powers that sometimes occur as a result of near-death experiences, lengthy meditative practice, or even serious illness. There is a large body of research documenting the healing effects of electromagnetic currents and fields on soft tissues and bone. "Electrotherapy," despite initial resistance, is now an established branch of medicine and electrotherapeutic equipment is available in many hospitals.

The phenomenon of "healing hands" is an accepted fact of life in many lands, though not our own. Certainly, there will never be a shortage of fraudulent healers, just as there are dishonest men in any field. But if we could positively identify real healers and determine how they do what they do, then we would be able to expose

and prosecute frauds who prey on the hopeful, the vulnerable, and the desperate.

Anthony Borgia (n.d.) described the umbilical cord connecting the soul with the physical body as a "magnetic cord." He identified a "great spiritual force that is being constantly poured down upon us all from the Father of Heaven Himself. It is, as it were, an eternal magnetic current that is forever charging us with force and power, and giving us life" (p. 119).

George Ritchie wrote about seeing fields of force during his NDE as "a faint luminous glow, almost like an electric field over the surface of their bodies. . . . [that] moved as they moved, like a second skin made out of pale, scarcely visible light" (Ritchie and Sherrill, 1978, p. 59).

Elsewhere (Ritchie, 1991) he described spiritual healing, citing the work of Albert E. Day, Olga and Ambrose Worrall, Ian Stevenson, Bernie Siegel, and Bernard Grad's research at McGill University using double-blind studies. Robert Becker and Gary Selden (1985) also mentioned Grad's work with the Hungarian healer Oskar Estebany. Estebany's ability to reactivate the stomach enzyme trypsin was similar to that of a magnetic field, although no magnetic field could be detected near his hands with the equipment then available.

Ruth Montgomery (1982) recounted the case of a healer who claimed to use a similar kind of energy that he called "revitalizing the magnetic field": he asserted that by placing his fingers over nerve relay centers in the lower abdomen, a human energizing current is transmitted throughout the body.

The best medical term for this energy might be "biomagnetism," the first workshop on which was held in 1976. Biomagnetic recordings began in the early 1960s with the first "magnetocardiograph," a mapping of the magnetic signature of the human heart. In the early 1970s reliable mapping and recording of the magnetic fields generated by the human body became possible with the development of a sensing device of extreme sensitivity, the Superconducting Quantum Interference Device, or SQUID.

There are now many researchers studying biomagnetism, with an emphasis on diagnostic applications. SQUID scans will almost certainly take their place alongside X-rays, magnetic resonance images (MRIs), positron emission tomography (PET) scans, and computerized axial tomography (CAT) scans. There are biomagneticians working in hospital radiology departments and physicists developing informa-

tion and devices at universities all over the world. A specialized organization dedicated to understanding vital energy as a healing force exists, called the International Society for the Study of Subtle Energies and Energy Medicine, located in Golden, Colorado.

Biomagnetism promises more than new diagnostic techniques. There is also the hope of unprecedented (or rediscovered) forms of healing, an expansion of knowledge that could ultimately include electrotherapy as just one small part of an emerging discipline called "bioenergy life sciences."

One of the few popular books on the subject was Becker and Selden's 1985 *The Body Electric*, which contained chapters dealing with the use of miniscule currents and fields to heal and even regenerate animal tissues and bones. For example, Becker and Selden noted that processes susceptible to electromagnetic fields include healing, embryonic growth, and cancer, then added this tantalizing footnote: "Only the magnetic component appears to accelerate healing in any way" (p. 296). When it comes to revealing the weak magnetic fields generated by healers and the human body, the SQUID is just what the doctor ordered; in fact, they suggested that it be used for just this purpose. There is also a description of Kenneth MacLean's experiments during the 1950s and '60s, which reportedly resulted in the healing of some cancers in the lab using steady-state magnetic fields, which led Becker and Selden to ask:

Why shouldn't some people be able to affect other beings by means of their linked fields? . . . There's reason to believe that gifted healers generate supportive electromagnetic effects, which they convey to their patients or manipulate to change the sufferer's internal currents directly, without limiting themselves to the placebo effect of trust and hope. (p. 269)

A recent Japanese study (Niwar, Izawar, Ishimoto, Jiang, and Kanoh, 1993) reported that human palmar energy, called "kikoh" in Japan, emits electromagnetic radiation in the far infrared region (wavelength 4-14 microns). When tested for effects on human white blood cells, this energy significantly decreased intracellular calcium ion concentration, phagocytosis, and generation of reactive oxygen species in neutrophils, and the blastogenic response of lymphocytes to mitogens. Chemotactic activity by neutrophils was also enhanced by exposure to the palm of a person (a "kikoshi") who heals professionally by the laying on of hands.

A second recent Japanese study (Seto, Kusaka, Nakazato, Huang, Sato, Hisamatsu, and Takeshige, 1992), reported the detection of un-

usually strong biomagnetic fields from the palms of persons selected for their ability to emit energy. Of 37 subjects studied, 3 exhibited strong biomagnetic fields of at least a thousand times greater than the normally detected human biomagnetic field. During these biomagnetic measurements, a corresponding electric current was not detectable; therefore, the extraordinarily large biomagnetic field strength could not have derived from internal body currents alone.

Perhaps the healer absorbs ambient energy and reradiates it in a beneficial, directed form. I hope there is a physician among this Journal's readership who will suggest further studies aimed at the therapeutic use of these energies. Equipment to do such studies is available: I know of at least two multichannel superconducting biomagnetometers currently operating in the United States, at New York University's Center for Neuromagnetism and at the Scripps Clinic in La Jolla, California. I am not aware of any attempt so far to use the SQUID to study healers or NDErs.

Several investigations suggest themselves. What would the magnetograph of an NDEr who enters an "altered state of consciousness" look like? What would the biomagnetometer see around the wrists of an NDEr who can't wear a watch? The SQUID could also be used on healers like the *kikoshi*, individuals highly skilled in meditative practices, and those who claim to be capable of astral projection. Visionaries, seers, religious adepts, and psychics could be looked at under the "magnetic microscope." If healing turns out to be a real phenomenon, the SQUID provides us with a golden opportunity to establish a database of legitimate healers who could be called on to help those in need.

SQUIDs have also been used on inanimate objects and dead tissue. If such a thing as "residual psychic energy" exists somewhere along the electromagnetic spectrum, we might be able to see it. We might compare a wedding ring of great sentimental value to a new one from a local jewelry store. A love letter compared to a grocery list might provide interesting results. Even objects from "haunted houses" could be tested: a rocking-chair that moves by itself, or a glass that "just shattered."

I am by no means suggesting that we can take a snapshot of the soul. What I am saying is that the technology now exists to detect, analyze, and render visible one facet of our own life-force, the "vital essence" that has fascinated mankind for centuries.

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Review of *Raising the Dead*

To the Editor:

I was terribly disappointed in Mary S. Edwards' (1995) review of *Raising the Dead* by Robert Selzer (1993). It only served to confirm my own observation that the population, including many near-death researchers, are all too quick to believe every report of a near-death experience (NDE) despite the absence of supportive documentation.

Raising the Dead is Yale University surgeon Selzer's account of how he "died" while suffering from Legionnaire's disease. Like so many other NDEs, his experience included the familiar floating out of the body to observe the death scene. The book reported that he remained in such a state for 10 minutes without vital signs until he came back to life.

The fact is that Selzer never died. He himself admitted that he made the whole thing up: "I just wanted to tell a ripping good story based on my own near-death experience . . . and I needed that single climatic [sic] event" (Huyghe, 1994, p. 103). When Selzer tries to tell people the truth, he often receives an amazing reaction:

Obviously I did not die. . . . But when I tell people the truth, after the fact, they don't want to believe me. It shows how compelling the notion of life after death is to many and how compelling language can be. (Huyghe, 1994, p. 103)

Edwards commented that Selzer "deftly takes us with him" (p. 269) as his recovery progressed, and that he expressed with great wit his "humbling experience of returning to the body" (p. 269). Edwards then wrote that she "was left nearly drunk . . . moving along with Selzer through such a journey" (p. 269). I suggest it is high time the public, especially investigators of NDEs, stop reveling in drunken stupors of emotionalism.

The public's lack of discernment in this area can best be seen in their blanket acceptance of Betty Eadie's bestseller *Embraced by the Light* (Eadie and Taylor, 1992). Eadie has switched her story several times and has not been altogether honest with the public about her religious agenda. There are even two different versions of her book that contradict each other (Abanes, 1994). It is possible that Eadie, like Selzer, may have captivated some readers with nothing but a tall tale.

Should there not be some degree of skepticism about NDEs, especially those coming from persons like Eadie who refuse to supply any medical records? Are all NDE tales to be believed outright? What about contradictions and inconsistencies in the accounts of persons claiming to have had an NDE? Are these factors to be dismissed in favor of the sheer beauty of a story? If so, then let us all forsake near-death research and simply start a fiction book club. I fear that this is already happening, and Edwards' review of Selzer's book did not do much to alleviate my fears.

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