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Introduction

The following series of articles, written by members of the research team at the Institute of Noetic Sciences and contributors from other fields of study, represents a variety of perspectives and topic areas in the program area that IONS calls “extended human capacities,” which include such little-understood phenomena as ESP, distant healing, near-death experiences (NDEs), mind-matter interactions, and subtle energies. They were published over the last few years in the quarterly magazine *Shift: At the Frontiers of Consciousness*. This IONS members-only publication, discontinued in the summer of 2009, featured news, opinions, and research from the multidisciplinary field of consciousness studies.

Each article examines a different aspect of the mystery of human consciousness, drawing from existing research (both IONS-specific and others) while also speculating on what this research implies and where it might be taking us. From mind-matter interactions that directly challenge the current materialistic model of the universe to psi phenomenon for which there is no clear explanation in the dominant paradigms of traditional physics, these pieces will challenge you to think differently about your world and your place in it.

–Matthew Gilbert, editor (2010)
The Noetic Sciences
by Cassandra Vieten, PhD, and Marilyn Schlitz, PhD

noëtic: From the Greek noësis/ noëtikos, meaning inner wisdom, direct knowing, or subjective understanding.

science: Systems of acquiring knowledge that use observation, experimentation, and replication to describe and explain natural phenomena.

noëtic sciences: A multidisciplinary field that brings objective scientific tools and techniques together with subjective inner knowing to study the full range of human experiences.

For centuries, philosophers from Plato forward have used the term noetic to refer to experiences that William James (1902) described as:

…states of insight into depths of truth unplumbed by the discursive intellect. They are illuminations, revelations, full of significance and importance, all inarticulate though they remain; and as a rule they carry with them a curious sense of authority.

The term noetic sciences was first coined in 1973 when the Institute of Noetic Sciences (IONS) was founded. Two years earlier, with nations throughout the world galvanized around the exciting frontier of space exploration, Apollo 14 landed on the moon. The potential for expanding our scientific understanding of the universe seemed unlimited to a naval air captain named Edgar Mitchell, chosen to join the Apollo team. He was a pragmatic young test pilot, engineer, and scientist; a mission to the moon was his “dream come true.” Space exploration symbolized for Dr. Mitchell what it did for his nation—technological triumph of historical proportions, unprecedented mastery of the world in which we live, and extraordinary potentials for new discoveries.

But it was the trip back home that Mitchell recalls most. Sitting in the cramped cabin of the space capsule, watching Earth float freely in the vastness of space, he was suddenly engulfed by a profound sense of universal connectedness—what he later described as a samadhi experience. In Mitchell’s own words, “The presence of divinity became almost palpable, and I knew that life in the universe was not just an accident based on random processes. . . . The knowledge came to me directly.”

Mitchell now faced a critical challenge. As a physical scientist, he had grown accustomed to directing his attention to the objective world “out there.” But the experience that came to him in space led him to a startling hypothesis: Perhaps reality is more complex, subtle, and inexorably mysterious than conventional science had led him to believe. Perhaps a deeper understanding of consciousness (inner space) could lead to a new and expanded view of reality in which objective and subjective, outer and inner, are understood as co-equal aspects
of the miracle of being. It was this intersection of knowledge systems that led Dr. Mitchell to found IONS.

**Why Consciousness Matters**

There are several ways we can know the world around us. Science focuses on external observation and is grounded in objective evaluation, measurement, and experimentation. This is useful in increasing objectivity and reducing bias and inaccuracy as we interpret what we observe. But another way of knowing is subjective or internal, including gut feelings, intuition, and hunches—the way you know you love your children, for example, or experiences you have that cannot be explained or proven “rationally” but feel absolutely real. This way of knowing is what we call *noetic*.

From a purely materialist, mechanistic perspective, all subjective—noetic—experience arises from physical matter, and consciousness is simply a byproduct of brain and body processes. But there is another perspective, suggesting a far more complex relationship between the physical and the nonphysical. The noetic sciences apply a scientific lens to the study of subjective experience and to ways that consciousness may influence the physical world, and the data to date have raised plenty of provocative new questions.

Consciousness has been defined in many ways, but in the context of the work at IONS, consciousness is awareness—how individuals perceive, interpret, and direct their attention and intention toward their environment. Collective consciousness is how a group (an institution, a society, a species) perceives, attends to, and makes meaning of the world. In its largest, most universal sense, consciousness has been referred to as a “milieu of potential,” the shared ground of being from which all experiences and phenomena arise and eventually return.

The essential hypothesis underlying the noetic sciences is simply that consciousness matters. The question is when, how, and why does it matter? These issues are the focus of exploration at the Institute of Noetic Sciences.

**What is the Institute of Noetic Sciences?**

From its inception in 1973, the Institute of Noetic Sciences (IONS) has explored the big questions: Who are we? What are our potentials and how can we achieve them? What leads to personal and societal healing and transformation? Our work rests on the notion that limitations in human consciousness and in our understanding of it underlie many of the most pressing problems that face us as a global society (violence, inequity, misuse of resources). Our premise is that current paradigms are inadequate to explain the full range of human experience, and that gaining a more complete understanding of the nature of consciousness will reduce suffering and enhance quality of life for all. Therefore, our research has focused on the fundamental nature of consciousness and its interaction with the
physical world. Our mission is to “advance the science of consciousness and human experience to serve individual and collective transformation.”

Scientific exploration of the mind/body relationship has been a primary focus of IONS. While our early investigations were directed at verifying the importance of the link between mind and body through biofeedback, hypnosis, and other techniques, our work soon expanded to encompass the study of the mechanisms of the healing response. What are the innate processes within us that stimulate recovery and natural self-repair? Is there an unknown “healing system” that promotes remission from normally fatal illness? These efforts influenced the groundbreaking book-and-television series, Healing and the Mind with Bill Moyers, and formed the basis for the Turner Broadcasting Network series The Heart of Healing, co-produced by IONS and based on the same-titled IONS book. Both series were broadcast in 1993 and viewed by millions, helping to legitimize mind-body medicine in the mainstream culture.

Other contributions to the birth of what is now a thriving field of mind-body medicine included support for the early work of Herbert Benson at Harvard, who helped launch the science of meditation. Sponsorship of meetings such as the Pursuit of Wellness at the University of California, San Francisco in the mid-1980’s helped to advance the nascent field of psychoneuroimmunology. Publication of the world’s largest database of cases of reported spontaneous remission, Spontaneous Remission: An Annotated Bibliography (O’Regan, 1993) and research on long-term cancer survivors (Killoran, Schlitz and Lewis, 2002) helped shift a research and clinical focus from disease to healing. More recently we compiled one of the world’s largest collections of (searchable) citations on the science of meditation (upgraded and updated in 2009), and wrote Consciousness and Healing: Integral Approaches to Mind-Body Medicine.

IONS is well-known for conducting and supporting frontier research in areas that are underexplored and often considered taboo in mainstream science. From supporting remote viewing research at the Stanford Research Institute (now SRI International) in the mid-1970’s to collaborating on studies of anomalous interactions between consciousness and matter by Roger Nelson at the Princeton Engineering Anomalies Research Laboratory at Princeton University in the mid-1990’s, IONS has championed open-minded and rigorous scientific exploration of phenomena that cannot be easily explained by our current models of understanding, but are nonetheless worthy of investigation, in part because they call the dominant paradigms into question.

As well, IONS has been involved in essential field formation efforts in a variety of domains relevant to the noetic sciences. The Causality Project, for example, brought together respected scientists and philosophers to address ways in which the basic assumptions of science—from biology and physics to neuroscience and systems theory—must now expand and deepen to include human consciousness, unexplained anomalies in the various disciplines, and the underlying role of causality. A program on distant healing and subtle
energies included scientific meetings and collaboration among scientists from many disciplines. It sought to develop rigorous methods for studying nonspecific effects in health and healing, and led to the development of several funded basic science and clinical programs.

IONS Today

The Institute’s basic science research program continues to shed important light on the powers and potentials of consciousness. Our double-slit experiment, for example, addresses a fundamental question in quantum theory: What is the nature of intuition and role of mind in the physical world. These studies show the relevance of IONS work to our basic understanding of the very fabric of reality.

Applications-oriented research addresses real-world issues related to health, healing, and the promotion of human flourishing. A recent clinical study of distant healing for wound repair was funded by NCCAM and conducted in partnership with researchers and clinicians at the California Pacific Medical Center. The results of this pilot study, which will soon be published, reveal no easy answers but raise provocative new questions about the role of expectancy effects in healing and disease.

For over a decade, IONS researchers have engaged in a systematic examination of how individual consciousness transforms, utilizing surveys, interviews, and longitudinal studies of transformational experiences and practices and their impact on well-being. Other clinical and applied studies are testing the effectiveness of specific consciousness-based interventions and practices. This work has led to the development of a model of consciousness transformation that explores both the catalysts of transformation as well as the barriers to consciousness change. This “noetic sciences change model” has been adapted to a curriculum on worldview literacy for high school students. It is also being applied to the development of continuing education programs for health and healing practitioners, including Clinical Applications of Cosmologies of the Afterlife and Integral Nursing.

We also advance the study of consciousness by training young scientists through our internship program and by facilitating strategic collaborations and invitational meetings among scientists and clinicians to accelerate development of new, cross-disciplinary studies. We communicate and disseminate the findings of our research and these collaborative initiatives in peer-reviewed scientific journals and scholarly meetings as well as to the general public through a variety of publications.

IONS sees noetic science growing as a valid field of inquiry. Every new discovery leads to more questions as the mystery of human consciousness slowly unfolds. In the areas of consciousness and healing, extended human capacities, and worldview transformation, IONS keeps pushing the boundaries of what we know. Through our newly designed website and a growing global community of members, we are advancing our shared understanding of consciousness and why it matters to life in the 21st century.
Early one Saturday morning, the telephone rang. My patient Christine’s boyfriend had found her unconscious on the floor in her apartment. After taking an overdose of pills, some of which I had prescribed, she was in a coma in the intensive-care unit at a nearby hospital in Los Angeles.

I was stunned. For a few minutes I just sat there immobilized. How could this be? Nothing in my sessions with Christine had pointed to a suicide attempt. That is, nothing my medical education had prepared me for. Still, I agonized, filled with self-reproach. Then suddenly I realized that a part of me had expected it all along. A premonition had warned me, but I hadn’t trusted it; I hadn’t chosen to listen. When I first met Christine I’d been practicing as a psychiatrist for just six months. I prided myself on making choices based on clinical data, and that’s what I intended to do with Christine. For years, she’d gone from psychiatrist to psychiatrist, seeking relief from depression, without success. She was skeptical about taking still another medication, but when I told her about a new drug that had worked well with other patients, she reluctantly agreed to give it a try.

Over the next few months, Christine’s depression gradually began to lessen. One day she told me, “The medication has really helped. I’m not feeling so cut off or afraid of everything anymore.” I recalled how she had looked on earlier visits: slump-shouldered, eyes downcast, monotone voice. Today she sat up straight, eyes animated. There were other positive signs too. Her improvement had been slow but steady, a good indication that the antidepressant had taken effect. Christine was determined to get well and was making positive choices for the future.

As she spoke, I glanced out the window and noticed a billowy white cloud formation. I got lost watching it changing form across the sky. Momentarily, I stopped hearing Christine. Her voice sounded miles away, speaking in slow motion. Yet my mind was perfectly lucid. I breathed easily and my body softened. In a state of deep quiet and despite everything she was saying, it hit me: Christine was about to make a suicide attempt.

I knew that it was true, exactly as I had known that many of my childhood premonitions had been true. It felt on target like an arrow that had directly hit bull’s-eye or a chord that had
been struck that was clear and pure. But it had been a long time since I’d had a premonition; it felt alien and threatening.

It was Friday. I spent the weekend reviewing my choices about Christine. Armed with the Diagnostic and Statistical Manual, a compendium of every known psychiatric diagnosis and the bible of the American Psychiatric Association, I tried to convince myself that my choices with Christine had been right. And yet, although it made no sense, the chance that Christine was going to make a suicide attempt gnawed at me.

There was no hard evidence to support that Christine would end her life. Even so, I decided that in our next session I’d gently broach the subject of her possible suicide, if just to lessen my own anxiety.

Christine never made it to her next appointment; the next time I saw her she was hooked up to life support in a stark, airless ICU following a medication overdose. On the surface, I strained to remain professional, but my mind was reeling. By discounting my premonition I had betrayed Christine and myself.

For nearly a decade I had worked night and day. I knew the medical literature backwards and forwards. I knew all the signs that indicated when a person was getting better, and the danger signals when they were not. I kept asking myself what I had missed. How could my choices have been different? My entire professional foundation was crumbling beneath me.

It wasn’t my medical competence that concerned me. I was shocked by my blatant disregard of the intuitive information that could have benefitted Christine. But because it hadn’t fit the traditional medical model that I’d adopted, I had not only ignored it: I had actually chosen not to act on it. During my medical training, I had chosen to trust the scientific method above my intuition, which seemed inexact in comparison.

For nearly a month I visited Christine daily, watching the still shallowly breathing form on the white bed, the sheets pulled over her body with hardly a wrinkle. I listened to the wheeze and chug of the respirator beside her; I watched the drip of the IV. There were many days when I pulled the curtains around her bed and quietly sat beside her, questioning my choices. I realized that during my medical education I’d become distrusting of my intuitions. To rely on premonition in making clinical choices would have been sacrilege.

**Serving the Unconscious**

We had been taught that many people don’t consider suicide on a conscious level until the last moment. Such thoughts may churn in their minds, unnoticed, breaking through only when they are alone, beyond the reach of a therapist. So, it was on an unconscious level that my intuitive abilities could have best served Christine. If I’d acknowledged the information I had received and acted on it, I might not only have averted this crisis, but I could also have brought new vitality into our therapy, nourishing a closer bond between us. Sitting at
Christine’s bedside, I was reminded why I’d initially gone to medical school: to legitimize the use of intuitive abilities in medicine. But I’d lost touch with that vision. So much time had passed. I’d grown far away from the person I used to be. Suddenly, it was as if two distinct parts of me had now collided. I could see my face as a young girl looking at me, overlayed on the outline of my own face now: two disjointed images, positioned one on top of the other, about to merge. I felt a fluttering in my chest, a cold, still tension. I became rigid inside, afraid that if I moved I might shatter into a thousand pieces of broken glass.

The truth of my premonition both validated and frightened me: It was a signal that I had to change the way I made medical choices. I had to reopen a part of myself that had been shut down. I knew that it would be difficult, especially when I thought I had put it behind me. But it was time. I had to acknowledge the facts of Christine’s case. By drawing on both intuitive and medical knowledge, I had the tools to stay one step ahead of a patient, keeping tabs on feelings before they became irreversible actions. When used with care, I was certain that my intuitive abilities would do no harm and might very well prevent suffering.

Christine came out of her coma after two long months. During that time, I wasn’t sure if she would live or die. I had tried to prepare myself for the possibility that she wouldn’t survive. But the reality of her death would have devastated me. It was as if we both had been given a reprieve. And when we resumed our work together, my approach as a psychiatrist had changed.

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Fields of Form
by Rupert Sheldrake

MORPHIC FIELDS: influences that extend through time and space, organizing coherent systems and patterns.

Editor’s Note: Rupert Sheldrake’s 1981 hypothesis of “morphic fields” has continued to stir a lot of excitement in research at the frontiers of consciousness. “Morphic” comes from the Greek word morphe, meaning “form.” According to Sheldrake, morphic fields of form provide structure or order to biological organisms, as well as to nonbiological entities, such as crystals. Every kind of molecule—proteins, for example—has its own particular kind of morphic field that organizes form and behavior. Thus there is a hemoglobin field, an insulin field, a collagen field, and so forth.

For Sheldrake, even our mental experience can be affected by morphic fields of behavior. By understanding his morphic field theory, we might even come to a new view of the nature of the mind.

The Hypothesis

All self-organizing systems are wholes made up of parts that are in turn lower-level wholes themselves—such as organelles in cells, cells in tissues, tissues in organs, organs in organisms, organisms in social groups. At each level, a morphic field gives each whole its characteristic properties, and coordinates the constituent parts.

The fields responsible for the development and maintenance of bodily form in plants and animals are called morphogenetic fields. The existence of these fields was first proposed in the 1920s, and this concept is widely used within biology. But the nature of these fields has remained obscure. I suggest they are part of a larger family of fields called morphic fields. Other kinds of morphic fields include behavioral and mental fields that organize animal behavior and mental activity, and social and cultural fields that organize societies and cultures. All of these organizing fields are different kinds of morphic field.

Morphic fields are located within and around the systems they organize. Like quantum fields, they work probabilistically. They restrict, or impose order upon, the inherent indeterminism of the systems under their influence. For example, of the many directions in which a fish could swim or a bird fly, the social fields of the school or flock restrict the behavior of the individuals within them so that they move in coordination with each other rather than at random.

The most controversial feature of this hypothesis is that the structure of morphic fields depends on what has happened before. Morphic fields contain a kind of memory. Through repetition, the patterns they organize become increasingly probable, increasingly habitual. The force these fields exert is the force of habit.
What do magnets, flatworms, and willow trees have in common?

—Adapted from an article by Rupert Sheldrake, first appearing in the Noetic Sciences Review, Summer 1989.

In biology since the beginning of this century, it’s become clear to many people that embryological development can’t be understood just in terms of the material components of the organisms. Since the twenties, the idea that organisms are organized by fields, morphogenetic fields, has been quite widely discussed. These fields are supposed to be within and around these organisms that they organize. There are hierarchies of fields within fields. So in our bodies there is a liver field, a kidney field, an eye field, and so on. Within those fields are the fields for the tissues and fields of the cells—nested hierarchies of fields within fields.

Morphic Resonance

The means by which information or an activity-pattern is transferred from a previous to a subsequent system of the same kind is called morphic resonance. Any given morphic system, say a squirrel, “tunes in” to previous similar systems, in this case previous squirrels of its species. Morphic resonance thus involves the influence of like upon like, the influence of patterns of activity on subsequent similar patterns of activity, an influence that passes through or across space and time from past to present. These influences do not fall off with distance in space or time.

The greater the degree of similarity of the systems involved, the greater the influence of morphic resonance. Morphic resonance gives an inherent memory in fields at all levels of complexity. In the case of squirrels, each individual squirrel draws upon, and in turn contributes to, a collective or pooled memory of its kind. In the human realm, this kind of collective memory corresponds to what the psychologist C.G. Jung called the collective unconscious.
Long-established systems, such as zinc atoms, quartz crystals, insulin molecules and muscle cells are governed by strong morphic fields, with deep grooves of habit established over millions of years, and consequently little change can be observed over a few weeks, or even years, of research. They behave as if they are governed by fixed laws.

By contrast, new systems should show an increasing tendency to come into being the more often they are repeated. They should become increasingly probable; they should happen more easily as time goes on. For example, when a new chemical compound is synthesized by research chemists and crystallized, it may take a long time for a crystal to form for the first time. There is no pre-existing morphic field for the lattice structure. But when the first crystals form, they will make it easier for similar crystals to appear anywhere in the world. The more often the compound is crystallized in one place, the easier it should be to crystallize elsewhere.

New compounds do indeed tend to crystallize more easily the more often they are made. Chemists usually explain this effect in terms of crystal “seeds” from the new crystals spreading around the world as invisible dust particles in the atmosphere, or chemists learning from others how to do it. But the hypothesis of morphic fields predicts that this should happen anyway under standardized conditions, even if dust particles are filtered out of the air.

**Testing for Morphic Fields**

Morphic resonance should be detectable in the realms of physics, chemistry, biology, animal behavior, psychology, and the social sciences.

There are several possible ways in which the hypothesis of morphic fields can be, and has been, investigated by experiment. Some tests attempt to detect the fields as they link together different parts of a system in space; others look for the effects of morphic resonance over time.

The easiest way to test for morphic fields directly is to work with societies of organisms. Individual animals, for example, can be separated in such a way that they cannot communicate with each other by normal sensory means. If information still travels between them, this would imply the existence of interconnections of the kind provided by morphic fields. The transfer of information through morphic fields could help provide an explanation for telepathy, which typically takes places between members of groups who share social or emotional bonds.

One promising area for this kind of research concerns telepathy between people and domesticated animals, as discussed in my 1999 book *Dogs That Know When Their Owners Are Coming Home*. For example, many dogs and cats seem to know when their owners are returning, even when they come at non-routine times in unfamiliar vehicles such as taxis, and
when no one at home knows when they are on the way. The animals seem to be responding telepathically to their owners’ intentions.

The unsolved problems of animal navigation, migration, and homing may also depend on invisible fields connecting the animals to their destinations. In effect, these could act like invisible elastic bands linking them to their homes, which serve as “attractors.” (In the branch of mathematics known as dynamics, attractors represent the limits toward which dynamic systems are drawn.)

**Morphic Resonance In Development and Behavior**

The build-up of habits can be observed experimentally only in the case of new patterns of development and of behavior.

There is already evidence from experiments on fruit flies that morphic resonance occurs in developing organisms. When fruit fly eggs were exposed to a chemical (diethyl ether), some of them developed abnormally, turning into flies with four wings instead of two. When this treatment was repeated generation after generation, more and more flies developed four wings, even if their ancestors had never been exposed to the chemical.

There is much circumstantial evidence that animal behavior can evolve rapidly as if a collective memory is building up through morphic resonance. In particular, large-scale adaptations have occurred in the behavior of domesticated animals all over the world.

One example that I have written about (in New Scientist in 1988) concerns cattle guards. Ranchers throughout the American West have found that they can save money on cattle guards by using fake ones instead, consisting of stripes painted across the road. Real cattle guards are made of a series of parallel steel tubes or rails with gaps in between, which make it difficult for cattle to walk across them, and painful to try. However, present-day cattle do not usually even try to cross them. The illusory guards work just like the real ones. When cattle approach them, they “put on brakes with all four feet,” as one rancher expressed it to me. Even calves encountering them for the first time avoid them just as much as cattle previously exposed to real guards, even if they have never seen cattle guards before. This aversion may well depend on morphic resonance from previous members of the species that have learned to avoid cattle guards the hard way.

“Any given morphic system, say a squirrel, ‘tunes in’ to previous similar systems—in this case previous squirrels of its species.”
There are also data from laboratory experiments on rats and other animals implying that such effects occur. In one series of experiments rats learned how to escape from a water maze. New batches of rats were tested month-by-month, year-by-year. As time went on, rats in laboratories all over the world escaped more and more quickly.

**Connections with Quantum Physics**

Some physicists have been intrigued by the possible connections between morphic fields and quantum theory, including John Bell (of Bell’s theorem) and David Bohm, whose theory of the implicate order, based on the non-locality of quantum systems, turned out to be extraordinarily compatible with the idea of morphic fields. These connections have also been explored by the American quantum physicist Amit Goswami and by the German quantum physicist Hans-Peter Dürr. But it is still not clear exactly how morphic fields might fit in with quantum physics, if only because the implications of quantum theory for complex systems like cells and brains are still unknown.

**Implications for Human Behavior and Creativity**

Morphic resonance has many implications for the understanding of human learning, including the acquisition of languages. Through the collective memory on which individuals draw, and to which they contribute, it should in general be easier to learn what others have learned before.

Morphic fields could revolutionize our understanding of cultural inheritance, and the influence of ancestors. Richard Dawkins, in his book *The Selfish Gene*, has given the name “meme” to “units of cultural transmission,” and memes can be seen as cultural morphic fields. Morphic resonance also sheds new light on many religious practices, including rituals.

“The hypothesis of morphic fields points to an understanding of mind—which no longer needs to be seen as confined to the inside of the head.”

The hypothesis of morphic fields has far-reaching implications in all branches of science. In particular, it points to a new understanding of the nature of the mind, which no longer needs to be seen as confined to the inside of the head. Just as magnetic fields extend beyond the surface of a magnet, and electromagnetic fields beyond a cell phone, so the mind extends beyond the brain through mental fields. When we look at something, say a tree, the image of the tree is projected out through these fields to the place where the tree actually is. Our minds touch what we are looking at. This provides an explanation for our ability to sense when someone is looking at us from behind. There is now much evidence for the reality of this sense, discussed in my recent book *The Sense of Being Stared At, And Other Aspects of the Extended Mind.*
The hypothesis of morphic fields, however, has an inherent limitation. It helps explain how patterns of organization are repeated; but it does not explain how they come into being in the first place. It leaves open the question of evolutionary creativity. This hypothesis is compatible with several different theories of creativity, ranging from the idea that all novelty is a matter of chance, to explanations relating to divine creative power. Evolution, like our own lives, is an interplay between habit and creativity.

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We Are All Savants
by Diane Powell, MD

How is it that after 100-plus years of careful research documenting evidence of parapsychology, it has yet to gain scientific acceptance? We all have the capacity for psi, and when pressed, many naysayers admit they have had an experience or two that qualify as psi. So why the continued skepticism? A primary reason is that the current scientific model for the brain provides no mechanism by which these phenomena could occur. And yet while this model doesn’t explain how consciousness could arise from something material like the brain, no one questions whether there is consciousness. I thus suggest that the model, and not psi, is what needs to be questioned.

When the Only Tool Is a Hammer, Screws Become Nails

Science relies upon the scientific method, so when there was no “adequate” method for studying consciousness, it became a taboo subject for scientific inquiry. The taboo arose under the influence of John Watson, an American psychologist who believed that only behavior could be studied scientifically. By the 1920s his “behaviorism” came to dominate psychology, and as a result, consciousness was not even mentioned in leading psychology texts between 1930 and 1950.

Consciousness research became respectable when it was tied to research on the brain. This was assisted by several major technological advances in the 1970s and 1980s. Imaging technology enabled scientists to look at color-coded pictures of a subject’s brain activity, the electron microscope allowed a more detailed look at neurons, and radioactive tracers enabled neural interconnections to be better defined. Additionally, biochemical techniques helped identify more than 100 chemical messengers in the brain. The underlying hope was that consciousness could be understood by studying our gray matter, a belief that is analogous to understanding music by disassembling a CD player.

Nevertheless, contemporary science has come to assume that consciousness is generated by the brain. The substrate for our memory is thought to be the complex pattern of networking among the brain’s 100 billion neurons, each of which has an average of 50,000 connections with other neurons. During learning we select and reinforce specific connections and pathways in this network. Communication among neurons relies upon chemical messengers and electrical impulses between adjacent neurons. Since neurons in one person’s head can’t send messages via chemicals or electrical impulses to neurons of another person, the model doesn’t allow for psi.

Another Copernican Revolution

We are on the verge of another scientific revolution because scientists can no longer ignore data that are shifting their paradigm away from the “neurocentric” model of consciousness.
In fact, the greatest challenge to the current model comes from research on scientifically accepted phenomena that are raising questions with no easy answers. An example of such research concerns “the savant syndrome.”

Savants demonstrate remarkable abilities that are not understood by conventional theories about consciousness and the functioning of the brain. These skills can appear and disappear suddenly and without explanation. Their skills are all the more remarkable because the savants lack the education and cognitive abilities normally associated with their talents. Many of these skills involve their amazing memories, which are so profound that they have difficulty forgetting anything.

Daniel Tammet, a 26-year-old autistic savant, can speak seven languages, recall the constant pi to 22,514 decimal places, and figure out cube roots as fast as a calculator. Kim Peek, the man on whom the movie *Rain Man* was based, can read two books simultaneously—one with each eye—and recite in detail the 7,600 books he has read.

Leslie Lemke is a blind savant who played Tchaikovsky’s Piano Concerto no. 1 after he heard it the first time. Like most musical savants, he never had a piano lesson. Stephen Wiltshire is an artistic savant who drew a highly accurate map of the London skyline from memory after a single helicopter trip. The twins in Oliver Sacks’s book *The Man Who Mistook His Wife for a Hat* (Touchstone, 1998) amused themselves by calling out six-digit prime numbers that just appeared in their minds; they also had calendar-calculating skills that spanned over 8,000 years.

No one has understood how the savants perform their feats, but an important clue lies in the fact that the savant syndrome is vastly over-represented in autism. In fact, the savant syndrome is over 100 times more prevalent in autism than in other forms of mental retardation or mental illness; almost 10 percent of autistic individuals have some savant skill(s). What is it about autism, which otherwise severely impairs functioning, that can lead to such seemingly superhuman abilities?

One approach to answering this question has been to look at the second-by-second activity of brain regions in autistic subjects, using functional MRI (magnetic resonance imaging). In two studies, autistic individuals and IQ-matched controls were given identical memory and attention tasks. Both groups performed at equal levels, but they used different sections of their brains. The controls activated several areas of their left and right neocortices in an integrated fashion, whereas the autistic subjects preferentially activated a small portion of their right neocortex and/or both sides of their visual cortex.
What is the significance of these studies? The current model of brain functioning had led to the expectation that individuals with savant skills would have greater or more complex connectivity within their brains’ circuitry. However, rather than having more connectivity, these studies show that they have less. In fact, Rainman’s Kim Peek has no corpus callosum, which is the band of fibers that connects the left and right brains. This may be why he is able to read two books simultaneously. Also, because the left brain inhibits the right brain through the corpus callosum, this finding suggests that savant skills might be assisted when the left brain can’t interfere with the right brain.

Other evidence that damage to the neocortex—the evolutionarily newest region of our brain—assists savant abilities comes from another neuropsychiatric disorder: fronto-temporal dementia (FTD). Musical talents and artistic gifts have arisen *de novo* in patients with FTD who had no interest or talent in the arts prior to the deterioration of their frontal and temporal lobes.

More clues to the savant puzzle were provided by Temple Grandin, the high-functioning autistic professor of animal science who coauthored *Animals in Translation* (Scribner, 2004). The recent neuroimaging findings fit what she tells us about the inner experience of people with autism. For example, the preferential use of the visual cortex for processing information that was found in the studies is consistent with Grandin’s description that she “thinks in pictures.” Her statement that she doesn’t “abstractify” the way nonautistic people do could be due to the underfunctioning of her neocortex. She states that when people think abstractly, they see what they expect to see rather than what actually is. They form concepts of reality and respond to those rather than consciously processing all of the details. Animals, for example, can use the subtle differences between trees to aid in their navigation. Humans generally just see “trees” and need to physically create their own trail markings in order not to get lost. The research findings on autism and savants have far-reaching implications, suggesting that we all have the capacity for savant-like abilities that we don’t experience or develop because our neocortex gets in the way.

**The Ghost In the Machine**

I’ve been collaborating with Ken Hennacy, a physicist with expertise on quantum mechanics and artificial intelligence, to create a new model for understanding savant abilities. Our model suggests that there are two modes of processing information within the human brain. The processing we are consciously aware of is what we call “classical.” It is slow, linear, and capable of handling only a limited amount of information. It solves problems by using abstract concepts, relies upon neural network connectivity, and occurs in the neocortex. “Quantum” processing, by comparison, is extremely rapid, parallel, and capable of handling exponentially more information than classical processing, but it usually operates outside of
conscious awareness. It takes place in all brain regions and becomes more evident when classical processing is turned down or off.

We chose the terms “classical” and “quantum” in reference to different branches of physics. However, the word “quantum” also refers to the quantum computers that are currently under development. Like the quantum processing in our brains, these supercomputers will capitalize on quantum mechanical principles. Their computational capacities will be exponentially greater than those of modern computers because the quantum wave function of their subatomic particles will enable a vast sea of values to participate in calculations simultaneously, rather than sequentially.

Quantum processing in the brain could explain how savants perform calculations so rapidly and without their conscious awareness. It could also explain those abilities that appear to be related to psi. In order to understand these, one must include a discussion of the quantum phenomenon known as “entanglement.” Physicists have found that two particles can be entangled, or capable of influencing one another instantaneously while separated at vast distances. Entanglement provides a means for consciousness to be coupled to other locations in space-time or for consciousness between individuals to be coupled—in short, a mechanism for telepathic communication.

The existence of free will may also be better understood by quantum processes. One criticism for the neural network model of consciousness is that the brain is portrayed as a biological machine. But what runs the machine? And is it possible for a machine to be conscious? Clearly something directs our thoughts and actions. We call that something “free will.” But can we have free will in a machine? Some theorists have drawn a parallel between free will and what happens before and after measurement of the quantum wave function. In other words, before measurement an electron’s location cannot be specified. Its location has to be represented as a wave of possibilities. This wave “collapses” after measurement into a discrete location. Thus, our conscious experience of the world may constitute the action of free will continually collapsing the quantum wave function into discrete experiences from a sea of possibilities.

**Living In a Nonlocal Reality**

Our model of savant abilities suggests that our brains operate at two levels, the quantum and the classical. These two levels are no more exclusionary than classical (or Newtonian) physics and quantum mechanics. One major difference between them is that the forces in classical physics operate locally, whereas forces in quantum physics operate nonlocally. Both types of forces operate in our brains, which is why our brains can process consciousness both locally and nonlocally. Some people have conditions such as autism that shift the balance between local and nonlocal processes by knocking out the functioning of the neocortex. The rest of us can decrease this classical dominance by such mind-quieting practices as meditation. Hence, as we become more consciously aware or awake, we use nonlocal processes more.

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and more. Along the way, we will progressively see the world less abstractly. We will see it more as it really is.

“We Are All Savants” by Diane Powell, MD, was published in *Shift: At the Frontiers of Consciousness* (No. 9, December 2005 – February 2006, pp. 14-17); all rights reserved, © 2005 Institute of Noetic Sciences.
Few topics generate more false confidence or genuine bewilderment than the nature of consciousness. At scientific conferences, debates about the origins of consciousness—especially the purposeful, intentional aspects of consciousness—resemble professional wrestling matches more than sober academic affairs. Skeptics hold meetings where they fervently reinforce their belief that intentions (like consciousness) are mere illusions manufactured by the brain. Popular books and movies promoting the power of intention, such as The Secret, are runaway bestsellers.

Why all the fuss? Because without conscious awareness there would be no science, no literature, no art, and no civilization—no one would be aware of anything. And without intention, the concepts of free will and creativity, central to the experience of being human, would reduce us all to purposeless automatons. Most ordinary people don’t like the idea of being machines; most scientists apparently do. I think this culture split may have arisen because it absolves scientists from any blame about their choice of clothes and whether or not their socks match. Machines can’t be held responsible for their fashion sense, so ipsa facto we are machines.

Understanding consciousness and intention is also important because they are closely related to our conceptions of reality. If consciousness is literally caused by brain activity, then the universe begins to look like a clockwork machine. The behavior of machines is fully determined: They don’t have free will, they’re independent of observers, and they have no intrinsic purpose or meaning. By contrast, if consciousness is fundamental and in some way gives rise to matter and energy, then the brain is more like a “receiver” of a distributed awareness, and the universe becomes permeated with meaning, volition, and intention. These two approaches lead to radically different worldviews about who and what we are. Which is more plausible?
“...there is substantial evidence in favor of intentional mind-matter interactions with random events, photons, cell cultures, and human physiology and behavior.”

impossible to see outside a box while still confined within it. This of course hasn’t stopped anyone from trying. If machine intelligence evolves beyond human intelligence, which is not inconceivable, then one day it may fully understand why scientists can’t dress properly, but ironically we won’t be capable of understanding its explanation.

**Mind as Machine**

Given the success of mechanistic models used in physics, biology, and the neurosciences, many scientists today view consciousness and intention as by-products of the marvelous machine called the human body. This machine is still mystifying in many ways but regarded in principle as no different than a fancy clock radio or a Buick. Radios and cars do not have teleological ghosts within them that care about creativity or free will, and so, according to the mainstream mechanistic view, neither do we.

This model has a great deal of persuasive evidence in favor of it. We know that brain injury, disease, and psychedelic drugs can generate dramatic changes in one’s behavior, perception, and sense of self. Computer simulations demonstrate that massively parallel neural computation can account for some aspects of the amazing pattern recognition and associative memory capacities of the human mind. Brain imaging devices reveal tight correlations between our intentions and patterns of electrical and hemodynamic activity in the brain. Technologies relying on these observations are leading to new forms of “augmented cognition”—ways of artificially enhancing mental capacities. Rising interest is reflected in the growth of published articles, from a handful in the 1980s to more than a hundred in 2006 alone. Such advances suggest that mechanistic models of consciousness are pointing in the correct explanatory direction.

In light of this, the mechanistic paradigm has become the leading scientific contender for understanding consciousness. But successful paradigms tend to erect blinders against countervailing evidence. A few such challenges can be dismissed as minor annoyances that will probably go away if ignored. But if numerous challenges persist and evidence continues to support them, then the foundational assumptions underlying the leading paradigm will eventually crack. A case can be made that we are headed in that direction.
Challenging the Machine Paradigm

Challenges to a clockwork view of the mind include the phenomena of extended perceptual and cognitive capacities such as intuition, genius, psychic and mystical experiences, and extended intentional capacities such as direct mind-matter interactions.

Consider intuition, which is widely regarded as the source of creative genius in scientific discovery, technological innovation, business decisions, medical diagnoses, and artistic achievement. Based on comparative reviews of the lives of scientific icons, scholars agree that nearly without exception the greatest mathematicians and scientists have relied more on intuition than on rational inference. Given its central role in advancing science and civilization, one might expect that science has thoroughly investigated intuition, but until very recently this area of inquiry has been carefully avoided. Perhaps this is because the quasi-magical aura associated with intuition has been an embarrassment to science, which prides itself on methodical, rational knowing.

While rare genius can be found at the far edges of intuition, nearer to everyday experience are more common forms of nonsensory, nonrational ways of knowing, including psychic phenomena such as clairvoyance and precognition. These forms of knowing appear to be incompatible with mechanistic, sensory-based, computational models of mind, and indeed it is difficult to imagine how one might build a machine that can sense what is happening at a distance in space or time without the use of known signals or forces. This failure of imagination underlies many scientists’ rejection of these phenomena. Despite such discomforts, experiments continue to demonstrate that these phenomena stubbornly remain.

Extended mental and cognitive capacities provide a formidable challenge to the machine-mind model, but an even greater challenge is intention. If mind is a machine, then free will is an illusion, and illusions cannot extend beyond the body. Yet here too there is substantial evidence in favor of intentional mind-matter interactions with random events, photons, cell cultures, and human physiology and behavior. The existence of such effects presents an annoying challenge to mechanistic models, and it suggests that reality itself may be more fluid than commonly supposed.

Putting Intention To the Test

To give a flavor for how the power of intention is being studied in the laboratory, let’s briefly consider two experiments recently conducted at IONS. The first explored the quantum observer effect—modern physics’ “skeleton in the closet” suggesting that consciousness is inextricably wound into the fabric of reality. Experienced meditators and nonmeditators were asked to imagine that they could intuitively perceive a low-intensity laser beam in a distant, shielded Michelson interferometer. If such nonlocal observation were possible, it would theoretically “collapse” the photons’ quantum wave-functions and change the pattern of light produced by the interferometer. The optical apparatus we used was sealed inside the double steel-walled, shielded chamber in the IONS laboratory while
participants sat quietly outside the chamber with their eyes closed. Light patterns created by
the interferometer were recorded by a cooled digital camera once per second, and the
average illumination levels of these images were compared in counterbalanced distant
observation versus no-observation periods. According to the design of the study, a lower
overall level of illumination was predicted to occur during the distant observation condition.

The outcome of the experiment was in accordance with the prediction, with odds of 500 to
1. This result was primarily due to nine sessions involving the experienced meditators, who
together had combined odds against chance of over 100,000 to 1. We examined many
conventional explanations and potential artifacts that might have accounted for these results
and found them to be implausible. The study suggests that intuitive perception and
intentional action are fundamentally linked at the quantum level. It also supports time-
honored meditation lore about the *siddhis*, or mental powers, associated with highly trained,
tightly focused intentions.

The second experiment involved the role of intention in food. The motivation for this
study was the possibility that good intentions in cooking might do more than simply
make the chef feel good—they might act as a form of intentional ingredient that affects
the people who eat that food. To test this idea, we used a double-blind, randomized,
placebo-controlled protocol to see if chocolate exposed to “good intentions” would
enhance peoples’ mood more than unexposed chocolate. We assigned volunteers to one
of four blinded and matched groups, three of which would eat intentionally treated
chocolate and one which would eat the same but untreated chocolate as a placebo
control. We asked participants to record their mood each day for a week using a standard
questionnaire; on three of those days, each person ate a half-ounce of dark chocolate
twice a day at prescribed times. The intentions were applied by Tibetan Buddhist monks,
a Mongolian shaman, and an intention-imprinted device similar to those tested by
Stanford Professor Emeritus William Tiller and his colleagues. Measurements focused on
changes in participants’ sense of energy, vigor, and well-being.

The results showed that on the third day of chocolate eating, the average mood reported by
the intention groups had improved significantly more than the same measure in the control
group, with odds against chance of 25 to 1 and a rise in absolute mood of 67 percent.
Analysis of a planned subset of study participants who on average eat less than 3 ounces of
chocolate a week, and were thus more likely to be psychoactively sensitive to this food,
showed a stronger improvement, with odds against chance of 10,000 to 1 and an
improvement in mood of about 1,000 percent.

**A Malleable Reality**

The results of the preceding experiments suggest that physical and mental realities are related
to each other in some essential way. This implies that the *symbols* we use to mentally
represent the world may also be related to our understanding of physical reality. Nobel
Laureate physicist Eugene Wigner marveled over the astonishing ability of mathematics, the symbolic language of science, to accurately describe the behavior of the physical world. He noted that in spite of the baffling complexities of the world, some aspects are sufficiently stable that we’ve been lucky enough to identify “laws of nature.” Without those regularities science would never have developed. Wigner believed it was not at all natural that such laws of nature should exist, much less that we’ve been able to discover some of them.

Like Wigner, mathematician Sir Roger Penrose noted that some of the basic physical laws “are precise to an extraordinary degree, far beyond the precision of our direct sense experiences or of the combined calculational powers of all conscious individuals within the ken of mankind.” Penrose mentioned as an example Newton’s gravitational theory as applied to the movements of the solar system, which is precise to one part in 10 million. Einstein’s theory of relativity then improved on Newton by another factor of 10 million, and it also predicted bizarre new effects such as black holes and gravitational lenses. When astrophysicists went looking for these unexpected phenomena, to everyone’s astonishment (except perhaps Einstein’s) they found them.

Penrose offered that the amazing accuracy of the mathematical predictions “was not the result of a new theory being introduced only to make sense of vast amounts of new data. The extra precision was seen only after each theory had been produced . . .” One way of interpreting this is that pure mathematics is in contact with the realm of Platonic ideas and forms. This implies the independent existence of a purely mental or symbolic reality.

For those who insist that mind is nothing more than brain, then mathematics is nothing more than the brain’s representation of our observations of a preexisting physical world. This seems reasonable until we unpack the argument: Mathematical symbols generated by three pounds of clockwork tissue somehow describe not only vast swatches of the physical universe to an inconceivable degree of precision but they also predict phenomena that strongly contradict common sense, such as quantum entanglement and black holes. Those same mathematical equations must necessarily include the behavior of the very brains that created the mathematics in the first place. How is it possible for this tissue to describe itself and far more exotic realms with such dazzling accuracy?

One possibility is that the universe is composed of a complementary substance that has both physical and mental aspects, similar to physicist David Bohm’s idea of coexisting explicate and implicate orders. Within this view, scientists seeking to confirm theoretical predictions based on pure mathematics discover that the observable universe closely matches their predictions not because the mathematics was miraculous, but because their expectations literally caused physical reality and its “laws” to manifest.

“Perhaps the fabric of reality is woven from the woof of matter/energy and the warp of mind.”
This outrageous idea borders on the solipsistic “New Age” fantasy that if we only wish hard enough, we can create our own reality. Hardly anyone takes radical solipsism literally, except that it just might contain a small kernel of truth. Perhaps some aspects of physical reality really are shaped by our expectations and intentions. Perhaps the fabric of reality is woven from the woof of matter/energy and the warp of mind. Instead of giving us grandiose superpowers, we have individual “micropowers” that in the collective scale up to shape the world we experience.

Beyond such speculations, one thing is certain: Gaining a deeper understanding of consciousness will play an increasingly important role in twenty-first-century science. If the evolution of knowledge in this century exceeds that of the last, which seems likely, then we can look forward to a future that’s likely to redefine our concepts of reality far more than any of the strangest concepts we’ve encountered so far.

“Intention and Reality: The Ghost In the Machine Returns” by Dean Radin, PhD, was published in Shift: At the Frontiers of Consciousness (No. 15, June – August 2007, pp. 22-26); all rights reserved, © 2007 Institute of Noetic Sciences.
Neurotechnology’s Shadow

by Byron Belitsos

This is your brain as seen by you: that familiar seat of ideas, notions, images, and dreams—the locus of your ordinary sense of self.

This is your brain as seen by someone with common sense: the physical location of intuition, reason, imagination, and will.

This is your brain according to the U.S. Constitution: the sacrosanct site of thought and choice—the inviolable domain of the personal discovery of truth and the private pursuit of happiness.

And this is your brain in the hands of those with dubious agendas: a nexus for conducting warfare; a target for mind control in times of political turmoil; a bull’s-eye for manipulation by Big Media, Big Business, and Big Pharma.

Hidden dangers lurk among the otherwise exciting advances in neuroscience, perils that may grow without a broader awareness of their social and political implications. “While genetics has spawned a robust watchdog industry, neuroscience has received far less scrutiny,” writes Kathryn Schulz in a major review article in The Nation. An editorial in Scientific American quipped: “The list of moral and social issues attached to neurotechnologies is long enough to position ethicists . . . on a list of hot jobs that appears in the U.S. News and World Report annual career guide.”

In 1990 President George H.W. Bush declared the nineties to be “the decade of the brain,” and yet until a few years ago the National Institute of Mental Health had established no budget for the study of neuroethics, and few universities had pursued the subject. The discipline’s true inauguration may have been in 2002 when Stanford University cosponsored a pioneering conference with the Dana Foundation, which published the proceedings in the book Neuroethics: Mapping the Field (Dana Press, 2004). The conference sparked a surge in academic papers, and the Neuroethics Society was established in 2006 (www.neuroethicssociety.org).

But more than mere academic debate is needed within the paradigm of mainstream science. Keeping powerful new neurotechnologies out of the wrong hands will, first of all, require careful journalistic scrutiny. Increased public awareness will hopefully lead to

1 Kathryn Schulz, “Brainstorming,” The Nation (January 9, 2006).
improved democratic oversight, especially of the far-reaching military and law-enforcement applications of neurotechnology noted later in this article. Just as important will be the pursuit of a more holistic model of the brain and its relationship to consciousness and the mind.

**Gaining Knowledge of the Brain, Did We Lose Our Soul?**

Finally, this is your brain according to the study of consciousness and informed by the world’s wisdom traditions: the physical vehicle of the mysterious endowments of consciousness and cognition; the temporary biological partner of each person’s uniqueness and creativity; the locus of one’s soul and essential self.

The seventeenth-century scientist-philosopher René Descartes once thought that the pineal gland was the seat of the soul, a notion that neuroscientists today may find rather quaint. Indeed, a scan of the vast literature of neuroscience reveals that the field has swung to the opposite extreme, dispensing with any mention of the soul and rarely referring to the independent existence of the mind or psyche. It is in fact de rigueur among the majority of neuroscientists to believe that the brain is the mind. And someday, no doubt, we will think this belief to be quaint.

To its (and Descartes’) credit, current science has shown that the pineal gland probably produces DMT, a chemical agent linked to mystical states, and a subset of neuroscience research has been accumulating evidence that the brain is somehow wired for “God experience.” But contemporary mainstream science was born through a violent break with such metaphysical visions of human potential and God-given faculties, and the well-meaning quest for scientific objectivity has turned the human subject into an object. At the same time, radical reductionism applied to neuroscience has become a pretext for denying the very existence of human—or any—consciousness outside of the physical brain.

**Behold the Neuromachines**

Today’s practical uses of neuroscience can be roughly divided into technologies that seek to map the brain and those that seek to alter it.

For more than a century, brain research was hamstrung by ethical restraints on experimenting with living human subjects. Not so in the past decade, when relatively noninvasive machines for measuring brain activity began to change all that. Among the most important is functional magnetic resonance imaging (fMRI), which employs magnetic fields to monitor changes in blood flow associated with specific neural activity.

For example, an fMRI can illustrate how the amygdalae of depressed people behave differently from non-depressed people. (The amygdala is a center of emotion in the brain, especially as related to memories.) When read a list of words that convey sadness, for example, the amygdalae of depressives showed more than three times the duration of
increased blood flow than those of their nondepressed counterparts. In other words, depressed folks ruminate on sadness while well-adjusted others simply move on.

Significantly, the brain locations for the cognitive difference between truth-telling and lying are now well known. A proper scan can quickly reveal someone pretending to have impaired memories under police interrogation (or during an appearance before a Congressional committee!). Such scans are a distinct improvement over standard lie-detector tests and are leading to the development of new detection devices that monitor telltale involuntary electrical activity in the brain when a suspect is being shown images relating to a crime.³

Other scientists have identified the neurocorrelates of traits such as forgetfulness, empathy, extroversion, and aggression. Revealing an aggressive tendency in someone, for example, could help identify a better CEO or salesman or screen out employees likely to engage in violent acts.

In fact, one can imagine all sorts of useful applications like these, but one can expect that all sorts of disquieting issues will also arise:

- How far should authority figures, such as police, psychiatrists, or judges, be permitted to go in screening people’s brains?
- Once such data have been mined, who should have access to it? College admissions committees? Human resources departments? Health insurers? The FBI?

³ Becky McCall, “Brain Fingerprints under Scrutiny,” BBC News (February 17, 2004).
Where do the rights of corporations and the state begin and our cognitive liberties end? Shall we permit brain scans to violate our Fifth Amendment right against self-incrimination or to gut our right to privacy?

As Jonathan D. Moreno, PhD, puts it in his book *Mind Wars* (Dana Press, 2005), “Activity in a certain neural pathway cannot be deliberately controlled by a subject; thus, nonvoluntary disclosure is possible. In this respect, even physical coercion could be less invasive (although more frightening and injurious) than a valid fMRI scan.”

The newest applications of neuromachines can now outsmart even the most sophisticated brains. From the brave new world of neuromarketing, we learn that the taste of Coke “lit up” a section of the frontal cortex that controls higher thinking in subjects, revealing that even though these consumers said they preferred Pepsi, their brain actually liked Coke.\(^4\) (The researcher concluded that they were unduly influenced by the effectiveness of the brand marketing of Pepsi.) Another researcher imaged brains of voters before the 2004 presidential election and learned that some held fast to a candidate against their brain’s better judgment. The scans showed that they suppressed their own cognitive dissonance in the face of facts contrary to their conscious preferences.\(^5\)

It is evident in such examples that brain scans screen out subjectivity, rendering real persons into less-than-human objects. But will such “objective measures” of who we are—as opposed to what we or our peers say we are—become the new standard of personal identity? Will “brain fingerprints” become the new markers of individuality, setting aside one’s own personally discovered claims of intimate personal facts? In the future will our children no longer dip deeply within their minds and hearts to discover who they are but rather let scientists discover their real selves by “objective” means? In short, will our subjective inner worlds become increasingly marginalized?

The peril rises when the stakes rise: When national security is threatened, or a large insurance payment is hanging in the balance, or a murder charge is being contested, who’s to deny authorities access to our brain states? If, after all, the brain really is the mind, wouldn’t it be better to go straight to the “facts”?

But then, what if future discoveries reveal just how complex and subtle our brains (and thus our minds) really are, with the result that previous interpretations of brain scans are shown to have been little more than Rorschach tests of the neuromachines’ operators?

In addition to mapping the brain, neurotechnology is making strides in the area of brain alteration. Here we find techniques such as repetitive transcranial magnetic stimulation (rTMS), a noninvasive method of exciting neurons in the brain that shows promise for the treatment of mental disorders. Amazingly, treating depression with rTMS entails simply holding a magnetic coil over someone’s skull in just the right place (be sure to calibrate


properly!). The procedure is painless. In more severe cases, the direct insertion (into the same spot) of a neural implant also does the trick—and has been repeatedly shown to work.6

Once a person has been “cured” by rTMS sessions, though, what now happens to their unique or even heroic story of struggle in the face of an arguably crazy society, largely not one of their own making? (Michael Moore’s polemic Sicko, for example, demonstrates that the system itself—in this case, the medical system and its byzantine insurance structure—may be helping to produce neurologically treatable conditions in the first place.) What about the unseen habiliments of the patient’s private world, in and through which the patient is evolving and growing? The inexorable “objectivity” of neurological treatments is exacerbating the current trend—already ingrained by pharmaceuticals like Ritalin and Prozac—toward rendering us as passive objects, and no longer conscious subjects, of our own healing and growth.

Other obvious ethical questions arise: Will neurointerventions reduce the ways it is acceptable to be a person? If ordinary maladies such as forgetfulness, aggression, or depression become optional traits because treatments to remove them are one day made possible by advances in neurotechnology, will people be inclined to discriminate against the bearers of those traits? And if only the wealthy are able to afford such treatments, the dawning era of brain transformation will only increase the gap between rich and poor, privileged and not.

Yet another front contributing its share to the debate is the new field of “neurolaw.”7 To convict a suspect, criminal law traditionally requires that evidence of commission of the crime be linked to facts pointing to the specific mental (or brain) state of the suspect. This is known in legal parlance as mens rea, or literally, “the guilty mind.” Did the suspects act in self-defense or under external coercion? Did they do the deed of their own free will? Neuroscientific reductionism answers as follows: Brain states cannot be controlled; on the contrary, they control us. Strictly speaking, then, there are no free-will acts; thus there are no corrupted souls and no guilty minds.

The Militarization of Neuroscience

The bizarre years of Cold War mind-control research between the 1950s and 1970s were epitomized by the CIA’s notorious MK-ULTRA program, an attempt to narrow the gap against the Soviet’s sophisticated psychtronics research. Now well documented, this and other programs laid the foundation over the next four decades for generous and largely covert federal funding of neuroscience research managed by the Defense Advanced Research Projects Agency (DARPA). Supported by this infusion, the long-term trend toward the weaponization of brain research recently culminated in breakthrough discoveries on how

to create and deploy EM (electro-magnetic) weapons targeted at the human nervous system.\(^8\) Here is some of the evidence:

**Neuroscience-Based EM Weapons Debut in Iraq**

According to reliable reports, GIs faced with restive Iraqi neighborhoods are sometimes directed to install hidden transmitters that saturate areas with pacifying or disorienting EM frequencies.\(^9\) For more targeted crowd control, less sophisticated weapons mounted on Humvees are now being used to beam microwaves that flash-burn exposed flesh.\(^10\)

**Israelis Use Acoustic Weapon to Disorient Protesters**

As reported by the Associated Press and in the *Toronto Star,* demonstrators in a West Bank village were subjected to periodic blasts of sound emanating from a white Israeli military vehicle, causing them to fall to their knees, unable to maintain their balance. A professor of neurobiology at Israel's Technion Institute likened the effect to seasickness: “The combination of low frequencies at high intensities can create discrepancies in the inputs to the brain.”\(^11\) A variety of such exotic weapons were also widely reported to have been used by the Israelis in the 2006 Lebanon war.\(^12\)

**Air Force Tests Weapons on U.S. Civilians**

Air Force Secretary Michael Wynne stated that “nonlethal weapons should be tested on U.S. civilians before being used on the battlefield,” referring to the use of EM weapons in crowd-control situations. “The object is basically public relations,” said Wynne. “Domestic use would make it easier to avoid questions from others about possible safety considerations.”\(^13\)

Department of Defense spending on this category of technology, generically known as directed-energy weapons (DEWs), has reached half-a-billion dollars a year, according to former Pentagon analyst William Arkin, now with the *Washington Post.*\(^14\) Although rarely reported to Americans, the field is large and growing. DEWs are now a routine part of

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defense establishment strategy. The website for a recent trade show held near the Pentagon in Arlington, Virginia, touted the show’s “unparalleled speaker faculty” and its dozens of displays of the newest technologies. A new book entitled *The E-Bomb* by Doug Beason (Da Capo Press, 2005) argues in favor of these technologies and states that directed energy will “revolutionize warfare.”

According to researcher Nick Begich, PhD, executive director of the Lay Institute on Technology, Inc., and author of *Controlling the Human Mind: The Technologies of Political Control or Tools for Peak Performance* (Earthpulse Press, 2006), painstaking efforts in recent years at forcing public disclosure of these programs have revealed that, “the new weapons are unlike anything ever contemplated by mankind. These are weapon systems which pierce the very integrity of the human being . . . [and] are frightening in their implications.” Begich’s research has uncovered such chilling statements as the following, excerpted from a document released in 1996 by the U.S. Air Force:

> One can envision the development of electromagnetic energy sources, the output of which can be pulsed, shaped, and focused, that can couple with the human body in a fashion that will allow one to prevent voluntary muscular movements, control emotions (and thus actions), produce sleep, transmit suggestions, interfere with both short-term and long-term memory, produce an experience set, and delete an experience set.\(^{15}\)

**Preparing for the Future**

The various perils noted in this article make neurotechnology appear to be the captive of today’s materialistic, warlike, profit-driven culture, and indeed an almost pathological hubris does seem to hold sway with some neuroscientists and their corporate, government, and military sponsors. But if the will is there, this state of affairs should be just a passing phase in the evolution of neuroscience. To this end, much wider study of neuroethics is going to be crucial in the coming years. More important will be gaining greater public oversight at the national and global levels of these technologies and their applications. But perhaps most critical will be our common work of creating a great cultural shift, one that involves replacing brain-science reductionism with an expanded and holistic picture of human consciousness.

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“Mom, when you were a little girl and I was your daddy, you were bad a lot of times and I never hit you!”

With these words, William, then a rambunctious three-year-old responding to his mother’s warning about a spanking, proclaimed that he had been his maternal grandfather, John. His mother, Doreen, was initially taken aback by this, but as William talked more, she began to feel comforted by the idea that her father had returned. John had been close to his family and had frequently told Doreen, “No matter what, I’m always going to take care of you.” William talked a number of times about being his grandfather and also discussed his death. He demonstrated knowledge that amazed his mother, such as the nickname only his grandfather used for a family cat and the day of the week when his grandfather had died. William also talked about the period between lives. “When you die, you don’t go right to heaven,” he told his mother. “You go to different levels—here, then here, then here,” he explained, with his hand moving up at each level. He said that animals are reborn as well as humans and that he saw animals in heaven that did not bite or scratch. John had been a practicing Roman Catholic, but he had believed in reincarnation and had said he would take care of animals in his next life. William said he would be an animal doctor and would take care of large animals at a zoo.

William also had a birth defect that seemed to match the fatal wound his grandfather had suffered. John was a retired New York City policeman working as a security guard when he stopped at an electronics store after work one night. He saw two men robbing the store and pulled out his pistol. Another thief behind a counter began shooting at him. John was hit six times. One of the bullets entered his back and sliced through his left lung, his heart, and the main pulmonary artery—the blood vessel that carries blood from the right side of the heart to the lungs to receive oxygen. He was rushed to the hospital but did not survive.

Five years after John died, Doreen gave birth to William. William began passing out soon after he was born. Doctors diagnosed him with a condition called pulmonary valve atresia, in which the inadequately formed valve of the main pulmonary artery prevents blood from traveling through it to the lungs. In addition, his heart’s right ventricle had not formed properly as a result of the valve problem. William underwent several surgeries. Although he will need to take medication indefinitely, he has done quite well.
Researchers at the University of Virginia have been studying cases like William’s for more than 45 years. Ian Stevenson, who passed away in 2007, started the work when he was chairman of the Department of Psychiatry. When he came to the university, Stevenson had published extensively in medical and psychiatric journals, but he also harbored an interest in parapsychology. After he learned of five cases in India of young children claiming to remember previous lives, Stevenson went there in 1961 to investigate. He stayed for four weeks and discovered 25 cases. He achieved similar results in nearby Ceylon (now Sri Lanka) and realized that this phenomenon was much more common than anyone had known.

Stevenson investigated more of these cases from various parts of the world, and in 1966 the American Society for Psychical Research published his first book on them, Twenty Cases Suggestive of Reincarnation. The title reflects Stevenson’s even-handed approach: He did not accept that reincarnation occurred and did not take the cases at face value; instead, he attempted to document the cases as carefully as possible—at times in exhaustive detail.

Stevenson stepped down as chairman of the Department of Psychiatry in 1967 to focus full time on this research and created the Division of Perceptual Studies at the University of Virginia to carry on the work of reincarnation research. Over the past four decades, researchers associated with the Division have investigated more than 2,500 cases of children who say they remember previous lives.

Typical Features

The cases seem to occur most often in cultures with a belief in reincarnation. India, Sri Lanka, Turkey, Lebanon, Thailand, and Burma (Myanmar) have revealed most of them. However, cases have been found wherever anyone has looked for them: Stevenson published a book of European cases, and numerous ones have been found in the United States as well. They often share several features:

1. Past-life statements. When they are two- or three-years-old, the children in these cases often begin to describe a previous life and usually stop by the age of six or seven. They talk about their memories spontaneously, without the use of hypnotic regression. Some are able to recall the memories on demand, but others need to be in a certain frame of mind to access them. They describe recent lives—usually quite ordinary and in the same country—with the median interval between the death of the previous individual and the birth of the child at only 16 months. The one part of the remembered life that is often out of the ordinary is the mode of death: 70 percent recall death by unnatural means.

Like William, some children say they were deceased family members, while others say they were strangers in another location. When those children give enough details—such as the name of that location—people have gone there and indeed identified a deceased individual, the previous personality, whose life appears to match the child’s report.
Some children talk about their memories with detachment, but many show strong emotions. They may cry and beg to be taken to what they say is their previous family. Others show intense anger, particularly toward their killers in those cases in which the previous personality was murdered. And yet, even the children with strong emotions may show great intensity one moment and then engage in ordinary play a few minutes later.

2. Birthmarks and birth defects. Like William, many of the children have birthmarks or birth defects that appear to match wounds, usually fatal ones, suffered by the previous personalities. Stevenson published a two-volume set of more than two hundred such cases. For example, a girl who was born with markedly deformed fingers remembered the life of a man whose fingers were chopped off. A boy with only stubs for fingers on his right hand remembered the life of a boy in another village who had lost the fingers of his right hand in a fodder-chopping machine. A boy with a birthmark on the back of his head (which was small and round, like an entry wound) and a birthmark toward the front of his head (which was larger and more irregularly shaped, like an exit wound) remembered the life of a teacher who had been shot from behind and killed. Another girl who remembered the life of a man who had undergone skull surgery had what Stevenson called the most extraordinary birthmark he had ever seen—a 3-cm-wide band of pale, scar-like tissue that extended around her entire head.

3. Themes of past-life statements. When children talk about a previous life, they tend to discuss events at the end of the life, and almost three-quarters of them give details about the death. They are also more likely to talk about people from the end of that life, rather than earlier, so a child who describes dying as an adult is more likely to talk about a spouse or children than about parents. In addition, 20 percent of the children in these cases describe memories of events between lives. Some say they stayed near to where the previous personality had lived or died, and they may describe a funeral or other events involving the family. One girl in Thailand, Ratana Wongsombat, complained that “her” ashes had been scattered rather than buried. In fact, the previous personality had wanted her ashes to be buried under the bo tree at her temple, but the tree’s root system was so extensive that her daughter had been unable to bury the remains and scattered them instead. Another child, Bongkuch Promsin, said he spent seven years hovering over a bamboo tree near where the previous personality’s body had been dumped after he was killed. One day he tried to go to his previous mother but got lost in the market. While there, he saw the man who became his current father. Bongkuch followed him home to join his family. Bongkuch’s father had in fact attended a meeting on a rainy day in the area Bongkuch reported, during the month when Bongkuch was conceived. Like William, some children have also talked about going to realms such as heaven and seeing other beings there.

4. Past-life behaviors. Many of these children act in ways that appear connected to the lives they describe. Some show emotions toward various members of the previous family that are appropriate for the relationships that the previous personality had with them. The children
may be deferential toward previous parents or a spouse but bossy toward younger siblings of the previous personality, even though those siblings are presently much older than the child. These emotions usually dissipate as the children grow older, but there are exceptions. In at least one case, Maung Aye Kyaw of Burma, the child grew up and married the widow of the previous personality.

Many of the children exhibit phobias toward the mode of death of the previous personality, especially in cases involving a death by unnatural means. These are particularly common in drownings, with 31 out of 53 showing a fear of being in water. Some show likes and dislikes that are similar to those of the previous personality. For example, when Stevenson and Jürgen Keil studied 24 cases of Burmese children who claimed they had been Japanese soldiers killed in Burma during World War II, they found that some of them complained about the spicy Burmese food and asked for raw fish instead. Some of the children also show an unfortunate interest in addictive substances, such as alcohol and tobacco, if the previous personality consumed them.

Children often play in ways that seem connected to their past-life reports, and this usually involves the occupation of the previous personality. One boy became preoccupied with his play as a biscuit shopkeeper and neglected his schoolwork to the point that his academic performance never recovered. Occasionally, children will repeatedly reenact the death scene of the previous personality, appearing to show the same kind of play as children with posttraumatic stress disorder. When children report past lives as members of the opposite sex, they often show behaviors appropriate for that sex. At times, the behaviors are extreme enough to warrant a diagnosis of gender identity disorder. Although the cross-gender behavior may continue into adulthood, most of these children grow up to lead perfectly ordinary lives.

**Recent Work**

In recent years the research has expanded beyond individual cases to include examinations of groups of cases. At the University of Virginia, each case is rated on two hundred variables, and this information is then entered into a database. This is a long-range, ongoing project, but enough cases have been entered so that certain features can be analyzed.

One scale measuring the strength of a case is based on four features: children’s statements about the previous life; the presence of birthmarks or birth defects; behaviors that appear related to the previous life; and the distance between the child’s family and the family of the previous personality.
apparent strength of cases was not affected by the initial attitude the parents had toward their child’s statements—meaning that parents’ enthusiasm did not make a case appear stronger than it actually was. It also showed that in the stronger cases, children started talking earlier about a past life, were more emotional when discussing their memories, and showed more facial resemblance to the deceased individuals.

Another study involved the reports some children made about events occurring during the interval between the death of the previous personality and their own birth. It showed that compared to those who did not have such memories, the children who described these “interval memories” made more statements about the previous life that were verified to be accurate, recalled more names from the previous life, had higher scores on the strength-of-case scale, and were more likely to give the name of the previous personality and accurate details about the death.

Close analysis of 35 such cases in Burma showed that these interval memories could be broken down into three parts: a transitional stage, a stable stage in a particular location, and a return stage involving a choice of parents or conception. The descriptions by the Burmese children were compared to reports of near-death experiences (NDEs) made by patients; they overlapped in many ways with Asian NDEs and had features that were similar to the transcendental feature of Western NDEs. The study suggested that interval memories and NDEs can be considered examples of the same overall phenomenon of reports about an afterlife.

Another area of recent research has involved psychological testing of the children. Erlendur Haraldsson has published studies of two groups of subjects in Sri Lanka and one in Lebanon. The Sri Lankan children performed better in school than their peers but showed some mild behavioral problems. The children in Lebanon seemed to daydream more and show more attention-seeking behavior than their peers. Testing showed that the children in both places were not unusually suggestible. Psychologist Don Nidiffer has evaluated 15 American children reporting past-life memories, and in yet-to-be-published data, he finds them to be quite intelligent and psychologically healthy. None of these studies indicated any mental illness.

**Future Research**

Studies of this phenomenon are continuing in several areas. Haraldsson is conducting a long-term follow-up study of adults who were studied when they reported past-life memories as children. He has interviewed subjects in Sri Lanka and will be doing the same in Lebanon. This will produce a systematic assessment of how the subjects develop after childhood, which has not yet been done.

At the University of Virginia, work with the database will continue, allowing for further analysis of particular aspects of the cases. In addition, researchers are focusing more on American cases, with a goal to collect more and stronger cases. They also plan further
psychological assessment of American cases. Thus the work goes on, continuing the effort that Ian Stevenson began 45 years ago, to understand the unusual phenomenon of these apparent memories of previous lives.

Talking to the Dead: Laboratory Investigation of Mediumship

by Julie Beischel, PhD

The survival of consciousness—that is, the continuation of life after death—is a vital issue to many people. The public’s growing fascination with survival and mediumship is illustrated by recent popular television shows such as *Medium* and *Ghost Whisperer*, movies such as *White Noise* and *The Sixth Sense*, and dozens of books.

Historically, the study of mediumship served as a primary focus for such key players in early parapsychological research as the Society for Psychical Research and J.B. Rhine and his colleagues at Duke University. However, progress in the quantitative evaluation of the information provided by mediums soon lagged behind innovations in research on telepathy, clairvoyance, and precognition as interest shifted toward those phenomena. In addition, historical mediumship research often lacked the proper protocol design, statistical power, and elimination of potential sources of error for current researchers to value even “positive” studies.

The mediumship studies performed in the past decade do, however, generally confirm and extend the conclusions of earlier studies: Certain mediums can report accurate and specific information about the deceased loved ones (termed “discarnates”) of living people (termed “sitters”) even without any prior knowledge about the sitters or the discarnates and in the absence of any feedback. Moreover, the accuracy of the information cannot be explained as a result of fraud or “cold reading” (a set of techniques used by psychic entertainers in which feedback from the sitter is used to fabricate “accurate” readings).

As with the study of any natural phenomenon, bringing mediumship into the regulated environment of the laboratory allows for the controlled and repeated examination of the mediumship process. Beyond the public’s interest in mediumship, this analysis is important for several reasons:

- Investigating the phenomenon of mediumship may aid in understanding the mind’s processing of nonlocal, nonsensory information.
- There may be socially useful tasks that mediums can perform (for example, finding missing persons or participating in criminal investigations) that require an extensive understanding of the information they report in order to sensibly utilize it.
- Survival and mediumship studies provide unique evidence for an issue central to consciousness science: the relationship between the mind/consciousness and the brain. That is, is consciousness a product of the brain or somehow mediated or transformed by the brain?
Ideally, laboratory-based mediumship research should include two equally important factors: (1) research methods that maximize the experimental blinding of the medium, the sitter-rater, and the experimenter in order to eliminate all conventional explanations for the information, and (2) a research environment that optimizes the mediumship process for both the medium and the hypothesized discarnate. This maximizes the ability of a phenomenon, if it exists, to be seen in a laboratory setting and limits the explanations for positive results. One cannot study football on a basketball court using baseball players and the rules for hockey. In order to meet these research goals, the research methods used by the Windbridge Institute for Applied Research in Human Potential include (1) the thorough screening of all research subjects; (2) specific research-reading protocols; (3) the pairing and formatting of research readings; (4) experimental blinding, including five levels of blinding; and (5) a specific scoring method used by raters that includes both item-by-item and whole-reading scores. Modern mediumship studies can also take advantage of technological advances such as digital recording devices and the Internet, which were not available to historical researchers.

**Subject Screening**

**Sitter-Raters**

Sitter subjects are initially chosen based on their affirmative answers to questions regarding the closeness of their relationship with the discarnates they have lost, their willingness and ability to participate in readings and scoring, and their beliefs about mediumship and survival. Limiting the sitter pool to individuals interested in and open to the possibility of mediumship optimizes sitter-rater motivation and hypothesized discarnate participation. During sitter screening, specific information about one discarnate with whom the sitter was close is also gathered for use in the pairing of readings (described below).

**Discarnates**

During a mediumship reading, there are three people potentially participating: medium, sitter, and discarnate. Therefore, investigators take into account factors such as motivation, fatigue, and communication abilities when choosing hypothesized discarnate participants and designing research protocols. For example, to honor their participation, we write discarnate-specific instructions for each experiment and include them with those for the mediums and sitters. Final decisions concerning which discarnates are chosen for specific studies are based on the pairing method.

**Mediums**

In addition to optimal experimental conditions and well-chosen sitter and purported discarnate participants, the quality of the medium subjects is of paramount importance for a
successful mediumship study. Before participating in formal research, each prospective medium is screened over several months using an intensive screening and training procedure. The screening steps include questionnaires and phone interviews regarding the mediums' histories, training, and experiences of communication with discarnates. The most important screening step involves test readings performed by the medium. Testing mediums’ abilities before they participate in research ensures that they are capable of reporting relatively accurate, consistent, specific, and scorable information under various experimental conditions while following detailed instructions. After successfully completing the test readings, mediums are trained in the basics of mediumship research and the psychological process of grief. The extensive screening of prospective mediums helps ensure a subject population that is reliable, skilled, dedicated, and professional.

**Research Readings**

Study readings performed by Windbridge most often take place over the phone between the medium and a blinded experimenter who acts as a proxy for the actual sitter, who does not hear or participate in the reading. The medium, the absent sitter, and the proxy sitter are often in different cities, if not states, during the reading. The proxy-sitter paradigm is used to mimic the reading practices with which mediums feel comfortable (that is, with a sitter on the phone and at a time and location of the medium’s choosing) while blinding the medium to cues from the absent sitter and the blinded experimenter and blinding the absent sitter to the reading during scoring.

Experimental reading protocols include both Discarnate-Directed and Questions sections. During Discarnate-Directed sections, the medium is provided with the first name of the discarnate and asked to report any information they receive about or from the discarnate. This mimics what is often the format of a real-world reading between a client and a medium, serves to focus the medium, and allows for the production of similar one-discarnate readings across a study.

During Questions sections of a reading, the medium is asked specific Life Questions about a discarnate’s physical life (for example, physical and personality descriptions and cause of death) and for any message(s) the discarnate may have for the absent sitter (Reverse Question). The Reverse Question (which asks, “Does the discarnate have any questions, comments, or requests for the sitter?”) is included in all question-based protocols to ensure discarnate and sitter motivation and to show respect and compassion for the discarnate and the sitter.

The use of questions during a reading increases the probability of obtaining information related to the identification of the discarnate, further focuses the medium, and emulates normal human communication.
Pairing and Formatting of Research Readings

Pairing
In order to maximize sitter-rater blinding, research readings are paired, and each paired rater scores two readings—one that was intended for that rater and one that was intended for the other rater in the pair—without knowing which is which. This is possible because the sitters are not present during the readings. Raters have a tendency to score a reading as either more or less accurate than it is in reality if they know the reading was intended for them. Rater bias is limited by having raters score their own reading as well as a control reading intended for someone else. Having raters score readings intended for someone else is also a useful test of the generality or specificity of the medium’s statements and has been used throughout the history of mediumship research. After item-by-item and wholereading scoring (described later), raters are asked to choose which reading they believe was intended for them and which for the other rater’s discarnate. This forced-choice method is a common endpoint in mediumship studies as well as other parapsychological tests. However, to maximize each rater’s ability to discriminate between the two readings, the discarnates in our studies are paired before the readings to optimize their recognizable differences while still maintaining rater blinding. This is in stark contrast to historical mediumship studies, in which discarnates that were similar (for example, in age and cause of death) were paired or in which discarnates were randomly grouped or paired.

To prevent any obvious gender-based clues, paired readings in our research are for discarnates of the same gender, but the discarnates are paired to be as different as possible in age at passing, physical appearance, personality, cause of death, and favorite hobbies or activities. Both discarnates in a pair are read by the same medium to ensure that the two readings contain similar wording and types of information.

Formatting
Formatting mediumship readings optimizes both the clarity of the items and the rater’s capacity to score them objectively, ensures rater blinding, and unifies the quality of the information across readings and mediums. During formatting, a blinded experimenter removes all references to the discarnate’s name and assigns a number to each reading. The experimenter then organizes the items into single, direct statements and replaces any weak or uncertain associations with clear statements. For example, the medium’s statements, “I think Judy might have had a scar on her face . . . I feel like it was on the left side;” would be provided to the rater as the formatted items:“(1) She had a scar; (2) It was on her face; (3) It was on the left side.” This optimizes the rater’s ability to objectively score each individual piece of information that the medium provides while still maintaining rater blinding.

It is important to note that the items are not randomized during formatting. The interdependence of scorable items has been commonly and historically viewed as a limitation of the scoring of mediums’ readings; thus, they were often randomized prior to scoring. However, the context of items in a reading contains information potentially
relevant to the rater that would be lost if the items were randomized. Their interdependence is a necessary component of the processing of information that occurs during normal human communication.

**Blinding**

Numerous nonparanormal psychological processes are at work during a sitter’s unregulated interaction with a medium, and these processes can be solely responsible for a “successful” reading. Therefore, blinding the medium to feedback from the sitter is essential for eliminating such factors as fraud, cold-reading, and unintentional cueing as explanations for the accuracy of the information a medium provides. Additionally, blinding the rater to the origin of the readings (that is, “mine” or “not mine”) is important in preventing bias on the part of the rater during scoring.

In quintuple-blind protocols, (1) the medium is blinded to information about the sitter and the discarnate (other than their first names) before and during the reading; (2) the raters are blinded to the origin of the readings during scoring; (3) the experimenter who screens, pairs, and trains the sitter-raters (Experimenter 1) is blinded to which mediums read which sitter pairs and which blinded readings are intended for which discarnates; (4) the experimenter who interacts with the mediums and formats the readings into item lists (Experimenter 2) is blinded to any information about the sitters and the discarnates (beyond the discarnates’ first names); and (5) the experimenter who interacts with the raters during scoring (Experimenter 3) is blinded to all information about the discarnates, which medium performed which readings, and which readings were intended for which discarnates and sitters.

This entire scenario eliminates fraud, cold-reading, rater bias, experimenter cueing, and perhaps even telepathy between the blinded experimenter and the mediums as plausible explanations for the accuracy and specificity of the information the mediums provide during the readings.

**Scoring**

Although the scoring of the mediumship readings is the last event to take place during a study, it is obviously the most important step from a data-collection standpoint. During scoring, one blinded rater in the pair is given their reading first and one is given the control reading first in order to balance order-based biases. They both score each item in the two gender-matched and blinded readings by contemplating the question “How well does the piece of information fit?” and then choosing one of the following five options:

- **4:** Obvious fit
- **3:** Fit requiring interpretation
- **2:** Other fit (used if the item does not fit the named discarnate or the rater, but it does fit someone else who the rater is or was close to and who is likely to be the subject of the statement)
1: No fit
0: Don’t know (used if the rater does not understand the item or does not have enough information to judge its accuracy)

After all the items in both of the paired readings are scored, the raters give each full list of items a global numerical score from 0 (essentially no correct information) to 4 (essentially no incorrect information) and are asked to “pick the reading that seems to be more applicable to you.” This complete scoring system brings clarity, reliability, and validity to the scoring of mediumship readings.

What Next?
The use of the specific subject-screening techniques and the reading protocol, pairing, formatting, blinding, and scoring practices employed by the Windbridge Institute during its investigation of mediumship reflect methodological and conceptual innovations beyond both historical research and modern studies.

A recent peer-reviewed phone study illustrates how these methods can come together during mediumship research and provides positive and significant data (Explore: The Journal of Science and Healing 3, no. 1 [2007]: 23–27). Specifically, the findings in that study included statistically significantly higher whole-reading scores for readings intended for the sitter versus readings intended for the paired control rater, as well as significant forced-choice results when the raters were asked to choose which readings were intended for them.

The survival question—Is there life after death?—and methods to address it were challenges in earlier mediumship research and remain difficult in modern studies. The goals of future research at Windbridge will continue to address the survival question and other important issues by asking the following:

- Do mediums get their information telepathically, or are they communicating with the deceased?
- Do measurable changes occur in the environment when a discarnate is present?
- Is a medium’s neurophysiology different from a nonmedium’s?
- Does participating in a mediumship reading help in the grief recovery process?
- Can mediumship be learned?
- What is the afterlife like?

These and similar questions can be answered only with further investigation. For more information, please go to www.windbridge.org.

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The Institute of Noetic Sciences, founded in 1973 by Apollo 14 astronaut Edgar Mitchell, is a 501(c)(3) nonprofit research, education, and membership organization whose mission is supporting individual and collective transformation through consciousness research, educational outreach, and engaging a global learning community in the realization of our human potential. “Noetic” comes from the Greek word nous, which means “intuitive mind” or “inner knowing.” The Institute’s primary program areas are consciousness and healing, extended human capacities, and emerging worldviews. The specific work of IONS includes the following:

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