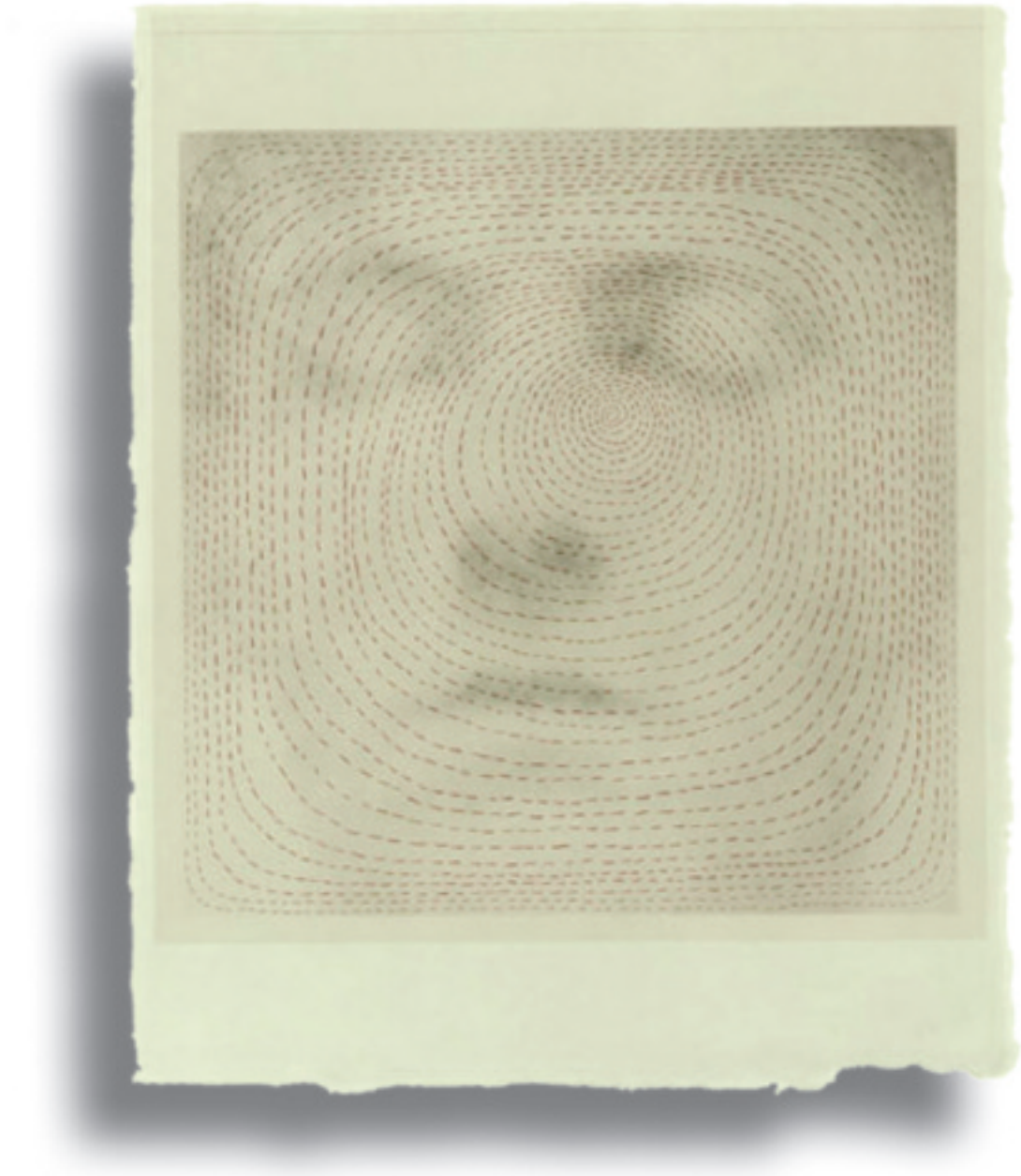

MARIE NAVARRE

To ascribe intention to chance is either
the height of absurdity or the depth of profundity,
according to the way in which we understand it.

—Arthur Schopenhauer

Intention and Reality
The Ghost in the Machine Returns

DEAN RADIN

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 ipso 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?

It may be that, as in the myth of Tantalus, a fully adequate answer is doomed to remain enticingly close but beyond our grasp. Achieving an adequate solution may require something greater than human intelligence. As Einstein noted, and Kurt Gödel demonstrated through his famous Incompleteness Theory, it is (in essence) 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.

. . . there is substantial evidence in favor of intentional mind-matter interactions with random events, photons, cell cultures, and human physiology and behavior.

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.

Perhaps the fabric of reality is woven from the woof of matter/energy and the warp of mind.

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.

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.

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