

Why Are Scientists Afraid of Daryl Bem?

“When one village dog barks, the rest take up the howl.”

—Zen saying

“If I want to stop a research program I can always do it by getting a few experts to sit in on the subject, because they know right away that it was a fool thing to try in the first place.”¹

—Charles F. Kettering, Head of research, General Motors, 1920-1947

Prejudice: from the Latin, “judgment in advance”²

Prejudice is never far from the experience of most readers of *Explore*, concerned as we are with concepts of healing that are frequently outside the mainstream. Over the years we learn to expect prejudice and we become somewhat inured to it. But sometimes prejudice is so blatant, so in your face, it is shocking and cannot be ignored.

I’m referring to a recent event in the field of consciousness research, which is one of the main focus areas of *Explore*. Bias against this field is nothing new, but in this instance it was more vehement than usual and achieved national attention.

This conflict is an example of the “denier movements” that are currently rampant in our culture, and which have recently been described by *Explore* columnist Stephan A. Schwartz. In his seminal report in May 2010,³ Schwartz specified the denial of the concept of non-local consciousness as one of the most im-



Daryl J. Bem, PhD

portant issues of our time. I hope the following discussion will help readers understand that consciousness manifests nonlocally in ways that defy the limitations of space and time, why this concept is so offensive to many scientists, and why it is likely to become, at long last, a part of the scientific worldview.

SCIENTISTS AND POLITICS

In 2009, the Pew Research Center released a report on scientists and politics, conducted in collaboration with the American Association for the Advancement of Science. The study involved a survey of 2,500 American scientists. They found that only 9% of the scientists considered themselves politically conservative, and that only 6% identified themselves as Republicans. The most frequent reason given for this dramatic skewing is that sci-

entists have become hostile toward what they consider Republicans’ contempt for the basics of modern biology, anthropology, evolutionary theory, geology, cosmology, stem cell research, and climate change.⁴

The Pew findings imply that scientists are liberal, progressive thinkers who are tolerant of new ideas. Unfortunately, this is not always the case.

BEM’S BOMBSHELL

Flagrant prejudice among scientists erupted in early 2011, when Cornell University psychology professor Daryl Bem had a paper accepted for publication in the elite *Journal of Personality and Social Psychology*. Bem’s paper is titled “Feeling the Future: Experimental Evidence for Anomalous Retroactive Influences on Cognition and Affect.”⁵ Bem is no ordinary psychologist. He is widely respected for his clear, creative thinking and his meticulous, original research.

His study was an eight-year project involving more than a thousand Cornell students in nine separate experiments. In one of the experiments, the subject sits in front of a computer screen on which pictures of two curtains appear. Behind one of the curtains is a picture of an erotic nature; behind the other curtain is a blank wall. The subject’s task is to indicate which curtain conceals the erotic photo. At the time of the subject’s choosing, however, neither curtain conceals the photo. It is only *after* the subject chooses that the computer makes a random choice and assigns the erotic picture to one of the curtains. If the

subject merely guesses, he or she should be right 50% of the time. But that is not the way the experiment turns out. The hit rate for the erotic stimulus was 53.1%—not a huge departure from chance but statistically significant nonetheless. It was as if the subjects were seeing the future, or that information from the future was perhaps traveling backward in time to the present.

In another experiment, students were shown a list of words and were then asked to recall words from it, after which they were told to type the words that were randomly selected from the same list. Oddly, the students were better at recalling words that they would *later* type, as if reinforcement from typing acted backward in time.

In an additional study, Bem employed research on “priming”—the effect of a subliminally presented word on a subject’s response to an image. For example, if someone is momentarily flashed the word “ugly,” it will take her longer to decide that a picture of a kitten is pleasant than if “beautiful” had been flashed. Running the experiment backward, Bem found that the priming effect seemed to work backward in time as well as forward.

All the nine experiments were variations on this general theme. All but one were statistically significant. Eight of the nine seemed to indicate that an effect could come before its cause.

SHOOTING FROM THE LIP

Bem’s study prompted a hissy fit among scientists. When an article about his results appeared on the front page of the *New York Times* on January 6, 2011, the controversy was suddenly thrust before the nation.⁶ The following day, additional outbursts from several scientists and philosophers were featured in the *Times* in the “Room for Debate” section. There was almost no debate, however, because nearly all the experts whose opinions were solicited by the *Times* were hostile to Bem’s findings.

Cognitive scientist Douglas Hofstadter of Indiana University predicted disaster, wailing, “If any of [Bem’s] claims were true, then all of the bases underlying contemporary science would be toppled, and we would have to rethink everything about the nature of the universe . . . There has to be a common sense [sic] cutoff for craziness . . . Otherwise, the floodgates will be open to crackpots of all stripes—

and opening the floodgates to the frequent publication of crackpot ideas in top-notch journals would . . . spell the end of science as we know it.”⁷

Columbia University astronomer David Helfand thundered that Bem’s findings were “an assault on science and rationality.” Breezily ignoring more than a century of experimental investigation, Helfand questioned “whether ESP is even amenable to scientific inquiry.” He compared Bem’s study to “the memos describing the weapons of mass destruction in Iraq, the rantings of Senator Jim Inhofe on climate change, and the triple-A ratings of collateralized debt obligations.” He charged that Bem’s paper, like these examples, had not been “subjected to rigorous and impartial peer review,” and would therefore cause similar mischief—an accusation that is vigorously disputed by psychologist Charles Judd of the University of Colorado, the editor of the journal that accepted Bem’s paper. Helfand cheekily suggested that psi may deserve “the same exalted status as belief in the Pastafarian Flying Spaghetti Monster.”⁸

Physicist Lawrence M. Krauss, of Arizona State University, excoriated Bem’s paper as an example of “bad research [which] gets happily buried in the dustbin of history, which is what I expect will happen in this case,”⁹ although he gave no specific reasons why Bem’s research was “bad.”

Philosopher Anthony Gottlieb, a visiting scholar at N.Y.U.’s philosophy department, amazingly suggested that Bem’s evidence simply does not matter, no matter how solid it might be: “But even if Daryl Bem’s study . . . turns out to be gold-standard science and breaks none of the standard procedural rules, one can still be confident that its findings are incorrect.”¹⁰ (If Gottlieb is correct and he is indeed capable of seeing through air-tight evidence, he must be psychic, thereby defeating his own argument.) In a shameless display of ignorance of the research in nonlocal knowing, Gottlieb stated, “It’s very suspicious that hard evidence of paranormal powers only ever seems to show up in laboratories. If people really can predict the future in extrasensory (and extrarational) ways, how come they only seem to manage it when ESP researchers ask them to do something trivial, like guess a playing card or a picture?”¹⁰ Gottlieb seems blissfully

unaware that precognition, or future knowing, usually takes place not in labs but in free-range humans in the wild. He displays not a glimmer of awareness of the hundreds of experiments in remote viewing at the Princeton Engineering Anomalies Research lab and elsewhere,^{11,12} which also take place outside the lab in the real world, and that most of these results are precognitive in nature. He has apparently never heard of entire books devoted to locating sunken ships and buried or inundated archaeological sites by extrasensory means.^{13,14} Or that psychics in several real-world experiments have made considerable sums of money predicting the silver futures market, one study of which was featured on the front page of the *Wall Street Journal*.^{15,16} Or that a 10-year study of 385 chief executive officers of US corporations found that 80% of executives whose companies’ profits had more than doubled in the past five years had above-average precognitive powers on ESP tests; and that the correlations were so definitive that the researchers were able to examine financial reports and predict *in advance* how a given CEO would do in ESP experiments.¹⁷

Ray Hyman, a retired psychologist at the University of Oregon, who for decades has been a voluble, dedicated foe of such findings, screeched that Bem’s work and its imminent publication are “craziness, pure craziness. I can’t believe a major journal is allowing this work in. I think it’s just an embarrassment to the entire field.” Hyman even suggested the Bem’s paper might be a hoax. “He’s got a great sense of humor,” he said. “I wouldn’t rule out that this is an elaborate joke.”¹⁸

Hyman had said in 1985, as if unconsciously describing himself, “The level of the debate [about these kinds of findings] during the past 130 years has been an embarrassment for anyone who would like to believe that scholars and scientists adhere to standards of rationality and fair play.”¹⁹ Hyman’s comment still seems true, because in all the statements of the “experts” whom the *Times* recruited to comment on Bem’s paper, not a single one appeared even minimally knowledgeable of the field they so enthusiastically disparaged.

Against this barrage, editor Judd stood firm. “Four reviewers made comments on the manuscript,” he said, “and these are very trusted people.”²⁰

In story after story, journalists implied that Bem's conclusions were almost certainly incorrect, and that in any case the verdict would eventually depend on whether other researchers could replicate them, an assertion with which Bem agrees.²¹ Although giving no details, the *New York Times* article said almost jubilantly, "So far, at least three efforts to replicate the experiments have failed."²⁶ *New Scientist* magazine also reported a failed attempt at replication that was conducted online,²² although Bem argues that online attempts to replicate his findings are inconclusive, because it is impossible to know whether volunteers have paid sufficient attention to the task.²²

Science journalist Jim Schnabel saw many of the scientists' comments as flagrant attempts to suppress free inquiry. He wrote:

But how shall we account for the Inquisitional outbursts from scientists that appeared in the [*New York Times*] . . . ? I mean the calls by prominent academic researchers to effectively suppress the findings of a scientific colleague, the eminent psychologist Daryl Bem, essentially because his findings threatened their reality Note the absence of scientific reasoning in these statements, and its replacement by fear and loathing Modern [science's] ideals prohibit it from rejecting ideas just because its elites find them threatening or ontologically untidy. Science is supposed to let the chips fall where they may. As historians and sociologists of science have been pointing out for decades now, it appears to be human nature to want a relatively stable reality, and even scientists will defend their reality instinctively, by fair means or foul . . . This begs the question of whether academic science is even the place for truly innovative, reality-disturbing research.²³

Not all the media response to Bem's study was negative. A more open-minded analysis was offered by science commentator Robert Krulwich of NPR: "Maybe psychologists, like quantum physicists, will have to deal with the deep strangeness of our universe. Maybe time doesn't behave properly. Maybe it makes little leaps . . ."²⁴

EVIDENCE IGNORED

Quite apart from the uninformed rants of critics from within science, one of the more irritating features of this debate has been the journalists' appalling ignorance of the field they are attempting to cover. They appear to be completely in the dark about the existing experimental data that support Bem's findings. Neither the *New York Times* nor the *New Scientist* reporters—nor any others, as far as I know—mentioned that many studies in the field of presentiment research have *already* confirmed what appear to be retrocausal effects, in which physiological arousal occurs *before* the stimulus for such.²⁵ Retrocausal effects in about a score of additional experiments were reviewed in 2000 by researcher William Braud in the journal *Alternative Therapies in Health and Medicine*.²⁶ But of all this, both the critics and journalists are silent. They behave as if Bem's study is a completely new species—an alien one at that.

The unwillingness of mainstream scientists to consider that Bem's findings might possibly be valid is an old pattern. Intolerance predictably surfaces anytime data is presented suggesting that consciousness can act in ways that transcend mediation by the physical senses. Such phenomena are generally considered paranormal and are relegated to the purview of parapsychology or psi. These "para" terms are inappropriate, however, because abundant evidence suggests these phenomena are common in all cultures;²⁷ and if they exist, as copious evidence demonstrates, they are presumably a part of nature, not outside or "para" nature.

"ASTONISHINGLY UNDETERRED AND UNEMBARRASSED"

One of the unique features of these phenomena is their capacity to elicit overheated, hysterical responses from scientists. Many scientists, who are willing to entertain hypotheses in other areas of science that are so breathtakingly bizarre they can hardly be imagined—for example, an infinite number of alternate or parallel universes; string theory, which many scientists consider to be unproven and unprovable, requiring eight extra dimensions that have no basis whatever in human experience, and which cannot be experimentally verified in any way; or a Big Bang, out of which an entire universe arose from

nothingness²⁸—lapse into fevered frenzy when confronted with so-called paranormal events. They simply ignore the research validating these phenomena²⁹⁻³¹ and resort to the "everybody knows" argument—because "everybody knows" these things cannot happen, they do not happen. This condescending, pompous attitude is described by former NIH bioscientist Sarah S. Knox, of the University of West Virginia Medical School, in her admirable book *Science, God and the Nature of Reality: Bias in Biomedical Research*:

Since [critics contend] there is no plausible mechanism within a materialist frame of reference to explain them, paranormal phenomena can't possibly be valid. This is the same reasoning that the learned men of Galileo's day used when they refused to look in the telescope.

This attitude is nowhere more evident than in the number of scientists who are willing to volunteer as "expert" commentators on television programs about paranormal phenomena, astonishingly undeterred and unembarrassed by their complete lack of knowledge concerning the existing experimental data. These "experts" smile condescendingly as they explain that the phenomena under discussion can be explained by chance occurrence, brain abnormality, etc, depending on the topic at hand. Since the belief that causality can only be found in matter reigns supreme, there doesn't seem to be any requirement that these "experts" support their claims with actual data. They need only introduce the possibility that the same outcome might have been achieved through some other means, to convince their naïve audience that it is all "hocus pocus."³²

"FUNDAMENTAL NOVELTY IS BARRED"

Why are scientists willfully blind to the hundreds of experiments validating so-called paranormal events?²⁹⁻³¹ Why do they pretend this evidence does not exist? It is as if the scientific community has developed a herd immunity against anything that violates the tenets of materialism. The immunity is so effective that in many scientists not even a twinkle of curiosity surfaces toward the kind of phenomena Bem reports. The faculty that generates wonder

and stirs the scientist to ask whether something extraordinary *could* be true seems to have been almost completely stifled. This deadening of wonder, so clearly unmasked by Bem's paper, was lamented by Alfred North Whitehead in 1948 in his *Essays in Science and Philosophy*, and his words still apply:

The Universe is vast. Nothing is more curious than the self-satisfied dogmatism with which mankind at each period of its history cherishes the delusion of the finality of its existing modes of knowledge. Sceptics and believers are all alike. At this moment scientists and sceptics are the leading dogmatists. Advance in detail is admitted: fundamental novelty is barred. This dogmatic common sense is the death of philosophical adventure. The Universe is vast.³³

BEM'S CARDINAL SIN

Professor Bem has poked the dragon of materialism, and the dragon is lashing out. His unforgivable transgression is that he has dared to suggest a primary role for consciousness in the elaboration of reality. His experiments suggest that consciousness can acquire information without mediation by the physical senses, outside the present, with the reversal of cause and effect. Consciousness, therefore, cannot be a slave to matter or time. To those who worship at the altar of materialism, this is blasphemy.

But in condemning Bem, his critics also manage in the process to denounce some of the patriarchs of modern science.³⁴ As described in Ken Wilber's book *Quantum Questions: The Mystical Writings of the World's Great Physicists*,³⁴ many pioneers of the quantum-relativistic worldview such as Erwin Schrödinger, Sir Arthur Eddington, and Sir James Jeans held opinions about the nature of consciousness that are a far cry from the knee-jerk materialism of Bem's critics. Jeans, for example, was forthright in championing a primary role for consciousness in physics:

It is difficult for the matter-of-fact physicist to accept the view that the substratum of everything is of mental character. But no one can deny that mind is the first and most direct thing in our experience, and all else is remote inference Probably it would never have occurred to us (as a

serious hypothesis) that the world could be based on anything else, had we not been under the impression that there was a rival stuff with a more comfortable kind of "concrete" reality—something too inert and stupid to be capable of forging an illusion.³⁵

Nobel physicist Eugene Wigner expressed the situation pointedly, saying that it is "not possible to formulate the laws of [physics] in a fully consistent way without reference to the consciousness [of the observer]."³⁶

The most cursory reading of the history of modern science reveals that there have been rumblings from physics for nearly a century that we have underestimated consciousness in our account of what's real. Moreover, actual experiments suggest that the actions of consciousness are not limited to the present. For example, in so-called delayed choice experiments consciousness seems to operate outside the present, affecting events that have already happened—a cause coming after an effect, as suggested in Bem's studies.³⁷ It would be wrong to suggest there is agreement on what these experiments mean. But the fact that there *is* controversy and that fundamental issues in physics remain unsettled suggests that the presumptuous, full-bore criticisms of Bem's findings are inappropriate.

Bem's critics are simply wrong. He is not trying to smuggle consciousness into the physical sciences; it is already there, installed by many of the architects of quantum physics nearly a century ago. Denying this fact has led to pernicious results. "One of [the] most destructive consequences [of this denial] has been what can only be considered an all-out assault on parapsychological research, chiefly because it threatens to expose the deficiencies in the assumptions of materialism," says philosopher Keith Chandler, author of *The Mind Paradigm: A Central Model of Mental and Physical Reality*.³⁸

"CONCEITED IGNORAMUSES"

But passion can also cloud the judgment of proponents as well as critics. C.D. Broad (1887-1971), the eminent Cambridge philosopher, knew this. Broad was keenly interested in "psychical research," and he served as president of Britain's Society for Psychical Research in 1935 and 1958—a courageous act for an academic

philosopher, then as now. As if fed up with the fiery debates that swirled from both sides, Broad stated in his 1962 *Lectures on Psychical Research*, "And anyone who at the present day expresses confident opinions, *whether positive or negative*, on ostensibly paranormal phenomena, without making himself thoroughly acquainted with the main methods and results of the careful and long-continued work may be dismissed without further ceremony as a conceited ignoramus [emphasis added]."³⁹

Bem's critics might consider the openness of Thomas Henry Huxley, Darwin's great champion, who said, "I am too much of a skeptic to deny the possibility of anything."⁴⁰ Huxley spoke from his understanding of what a genuine skeptic is—not someone who reflexively says no, but someone who suspends judgment until the facts are in. Unfortunately, many of Bem's critics seem to equate skepticism with "against-ism." But authentic skepticism, from a Greek word meaning "inquiry" and "doubt," is a noble position to take, requiring the dispassionate, unemotional weighing of evidence in the search for truth. This is a difficult position to maintain because, as the kerfuffle over the work of Bem reveals, genuine skepticism is easily derailed by fear, loathing, and passion.

OPENNESS OVERRATED?

Sociologist Marcello Truzzi, a keen analyst of skepticism, elaborated on the intellectual narrowness demonstrated by Bem's critics: "Scientists are not the paragons of rationality, objectivity, open-mindedness and humility that many of them might like others to believe."⁴¹ Nobelist James D. Watson, codiscoverer of the structure of DNA, agreed: "One could not be a successful scientist without realizing that, in contrast to the popular conception supported by newspapers and mothers of scientists, a goodly number of scientists are . . . narrow-minded and dull" ⁴² As psychologist Hans Eysenk observed, "Scientists, especially when they leave the particular field in which they have specialised, are just as ordinary, pig-headed and unreasonable as anybody else, and their unusually high intelligence only makes their prejudices all the more dangerous" ⁴³

THE PEOPLE SPEAK

Perhaps the most intriguing part of the *New York Times* article about Bem's findings was the thoughtful comments posted by readers online.⁶ A typical response was that of Bob in Rochester, who wrote:

[N]ew discoveries like this may not "defy" laws of science, but simply illustrate forces that exist, that can be part of science, but which we cannot currently detect based on the sophistication of our current tools. Black holes existed even before we could measure them, and so of course do all sorts of other forces . . . and once understood could then be re-categorized as our new "updated" science . . .⁴⁴

Caleb in Illinois:

If rigorously quantitative observations indicate the true existence of mental phenomena commonly classified as psychic, the publication of those observations in a peer-reviewed scientific journal is absolutely warranted. The fact is that a great many scientists mistake scientism for science. Scientism is a quasi-religious belief in the necessity of a particular form of reality, namely, a linear universe of strict cause and effect, where consciousness is a mere epiphenomenon with no real significance. Scientism is not science, nor is it necessary for science.⁴⁵

Seth Segall in White Plains:

It's interesting that the *Times* could not locate a scientist willing to seriously entertain that Bem's results could conceivably turn out to be true. Such scientists do exist, as witnessed by the landmark book *Varieties of Anomalous Experience* published in 2000 by the American Psychological Association and edited by Etzel Cardeña, Steven Jay Lynn, and Stanley Krippner.³⁰ That book contained a review of psi-related research by Elizabeth Targ, Marilyn Schlitz, and Harvey Irwin that fairly reviewed the conceptual and methodological issues involved in psi-related research as well as the results of psi research up until that date. Bem's research will no doubt be subject to replication many times over, and we will be able to tell in a short period of time whether it opens up new possibilities or proves

to be a dead end. In the meantime, the *Times* should have made more of an effort to locate someone with a genuinely different opinion. I am more worried about the difficulty in finding open-minded commentators than I am about the publication of Bem's research causing science any irreparable harm.⁴⁶

Pat in California:

Interesting. Dr. Daryl Bem's paper embraces at least the possibility of extrasensory perception and David Helfand thunders that the study is "an assault on science and rationality," as though Dr. Bem is an evil man plotting to overthrow the entire scientific community. . . . [I]f Dr. Bem's study does not stand up under tighter scrutiny, then, fine, it doesn't and it's back to the drawing board. But I'm a bit skeptical of Mr. Helfand's group, the Committee For Skeptical Inquiry. They seem to be on such a fierce mission to eradicate anything they deem unscientific or irrational that they come across like science jihadists, and to me that's worrisome.⁴⁷

CRUNCHING THE NUMBERS

The debate over Bem's findings has evolved into a heated argument about how best to analyze his data.⁴⁸ Are conventional statistical methods adequate, or is a Bayesian⁴⁹ statistical approach better? Although statistical precision is mandatory, the statistical argument is a fig leaf covering the nakedness of materialism. This spat will not be resolved by statistics, because the basic argument is not about how to massage the numbers, but hinges on fundamental differences in worldview.

Even if Bem's findings are validated by statistical analyses acceptable to critics, the critics can always dismiss them by resorting to another of their favorite bolt-holes, that of "theoretical implausibility." This is a go-to objection when all else fails. This argument says that some experimental findings are so counterintuitive and nonsensical they should be rejected in principle, damn the evidence. This is essentially the criticism of philosopher Anthony Gottlieb, mentioned above. To reiterate, "But even if Daryl Bem's study . . . turns out to be gold-standard science and breaks none of the standard procedural rules, one can still be confident that its

findings are incorrect."¹⁰ Or as one scientist smugly declared when faced with similar findings, "This is the sort of thing I would not believe, even if it existed."⁵⁰

This ploy—ensuring that the evidence can never be good enough—is a time-worn tactic of materialists who are not prepared to give an inch. Researchers in nonlocal consciousness face the ever-lengthening playing field and the raising of the goalposts, no matter how strong their evidence may be. These shifting demands are often seasoned with accusations of shoddy work, as we've seen. This objection is ironic, because the use of controlled, double-blind experimental procedures are higher in psi-type experiments than in any other discipline, including medicine, psychology, biology, and the hard sciences such as chemistry and physics. In fact, no other discipline comes close.⁵¹

A CANDIDATE FOR BURNING

The tantrums provoked by Bem's paper are nothing new. A similar episode occurred in 1981 when Sir John Maddox, the late editor of *Nature*, one of the most prestigious science journals in the world, attacked British biologist Rupert Sheldrake when his ideas of morphic fields and morphic resonance were introduced in his book *A New Science of Life*.⁵² Maddox, as editor of *Nature*, was considered one of the elite arbiters of science. He suggested that Sheldrake's book should perhaps be burned. As he fumed in *Nature*, "This infuriating tract . . . is the best candidate for burning there has been for many years."⁵³ Maddox's indignation toward Sheldrake continued to fester over the years. In an interview broadcast on BBC television in 1994, he continued, "Sheldrake is putting forward magic instead of science, and that can be condemned in exactly the language that the Pope used to condemn Galileo, and for the same reason. It is heresy."⁵³ Maddox would not let up. In *Nature*, in 1999, he reviewed Sheldrake's book *Dogs That Know When Their Owners Are Coming Home and Other Unexplained Powers of Animals*,⁵⁴ saying, "Rupert Sheldrake is steadfastly incorrigible in the particular sense that he persists in error. That is the chief import of his eighth and latest book. Its main message is that animals, especially dogs, use telepathy in routine communications. The interest of this case is that the author was a regular scientist, with a Cam-

bridge PhD in biochemistry, until he chose pursuits that stand in relation to science as does alternative medicine to medicine proper.”⁵⁵ (Note the drive-by shot at alternative medicine. We always make tempting targets.) Maddox seemed not to care that Sheldrake’s hypothesis is buttressed by dozens of experiments that have been done over the years. Dr. Sheldrake’s impeccable response to Maddox can be found on his Website at <http://www.sheldrake.org/D&C/controversies/maddox.html>.

Maddox’s crusade against Sheldrake lasted for more than two decades, until Maddox’s death in 2009. His condemnation of Sheldrake rested on his status as editor of *Nature*. He did not concern himself with evidence; he believed his authority sufficed. His criticism began with ridicule and degenerated into ad hominem attacks. A similar attitude toward Professor Bem can be detected in the disparaging comments of some of his critics.

If a Skeptic’s Museum is ever built, Maddox’s tirades should be put under glass on prominent display as a prototypical example of the hostility of “experts” toward unconventional findings in science, where mind and consciousness are concerned.

DESPERATION

The passion of the anti-Bem blather suggests desperation and panic. Panic is an emotion that characterizes a retreating army that has lost the battle and perhaps the war. You would not know it, however, by the self-satisfied certainty and the triumphal rhetoric of many materialistic scientists. But as renowned physician and cell biologist Robert Lanza and astronomer Bob Berman report in their book *Bio-centrism*, the reality within materialistic science is far different:

Our understanding of the universe has reached a dead end But it’s worse than that. Until recently, we thought we knew what the universe was made of, but it now turns out that 96 percent of the universe is composed of dark matter and dark energy, and we have virtually no idea what they are Our understanding of the fundamentals of the universe is actually retreating before our eyes. The more data we gather, the more we’ve had to juggle our theories

or ignore findings that simply make no sense.²⁸ . . . [S]ome scientists . . . insist that a “theory of everything” is just around the corner, and then we’ll essentially know it all—any day now. It hasn’t happened, and it won’t happen. The reason is not for any lack of effort or intelligence. It’s that the very underlying worldview is flawed This is the underlying problem: we have ignored a critical component of the cosmos, shunted it out of the way because we didn’t know what to do with it. This component is consciousness.⁵⁶

The fact that 96% of the universe is comprised of dark matter and dark energy, the nature of which is a big fat mystery, means that materialistic scientists are ignorant of 96% of their subject matter. They are in no position to lecture Professor Bem and other researchers concerned with the nonlocal manifestations of consciousness about how the universe does or does not work.

It is as if I, as an internal medicine physician, said to you, “I would like to be your doctor. While it’s true I know nothing about 96 percent of the organs in your body, trust me.” You would probably consider me an impertinent fool who is unworthy of your trust, as you should. Why should the supercilious materialists who denounce Bem’s consciousness-related experiments, and whose subject matter is literally in the dark and almost wholly unknown, be regarded otherwise?

Neal Grossman, professor emeritus of the University of Illinois at Chicago, is a rare academic philosopher and historian of science who is well informed about the research surrounding the nonlocal expressions of consciousness. He suggests that materialism is hopelessly incapable of accounting for these events and deserves a decent burial:

Materialism—the belief that consciousness is produced by or is the same thing as the physical brain—is one of those beliefs that have already been proved false by science. However, . . . it will take another generation before these facts are recognized by mainstream academia. Old paradigms never go gently into the night: they go screaming and kicking. And the defenders of materialism today are indeed screaming and kicking ever more loudly, perhaps because of

total lack of evidential support for their respective ideology Today the collective evidence is conclusive: I know of no responsible investigator who has concluded otherwise The situation for the materialist is logically the same as that of the creationist. Both materialist and creationist must ignore, debunk, and ridicule the scientific findings that have refuted their beliefs.⁵⁷

A “BAGHDAD BOB” SCENARIO

The evidence favoring Bem-type phenomena is neither rare, marginal, nor inaccessible. Despite the squawking by pseudoskeptics who claim otherwise, this research has been replicated by researchers around the world and is freely available for anyone who cares to look. The time-worn, perennial objections to this material have been eviscerated recently by more scholarly books and treatises than I can name here.⁵⁸⁻⁶⁰ This situation is summarized by researchers Adrian Parker, of the Department of Psychology, Goteborg University, and Göran Brusewitz, of the Swedish Society for Psychical Research, in their paper “A Compendium of the Evidence for Psi”: “It appears quite clear . . . that irrespective of what interpretation is given to specific research reports, the overall results . . . are indicative of an anomalous process of information transfer, and they are not marginal and neither are they impossible to replicate. In the face of this, the critic who merely goes on asserting there is no evidence . . . is using a tactic reminiscent of Mohammed Saeed al-Sahhaf, Iraq’s former Information Minister, in blindly asserting there are no American troops in Baghdad.”⁶¹

Al-Sahhaf gained prominence during the 2003 American invasion of Iraq for his sunny, bombastic, daily press briefings in Baghdad. He was given the moniker “Baghdad Bob” by Western observers. On April 7, he told the world that Americans were committing suicide by the hundreds at the gates of the city, and that there were no American troops in Baghdad, although American tanks were cruising the streets a few hundred yards from the site of his press conference.⁶²

Baghdad Bob would make an excellent patron saint for those scientists who doggedly deny the evidence for the nonlocal expressions of consciousness. The Baghdad Bob scenario is a modern version of

the fairy tale of the emperor's new clothes, in which the king's admirers pretend not to notice his nakedness. As Lanza and Ber- man put it, "It's one thing to respect au- thority, [but people are beginning to no- tice that] the emperor seems to have skimped on his wardrobe budget."⁶³

VIOLATIONS OF PREJUDICE, NOT THE LAWS OF NATURE

The materialistic assumptions that under- lie the denunciations by Bem's critics are already being abandoned. During the 20th century, the goal of neuroscience was to understand the workings of the mind in terms of the physical laws governing the material brain. It was an article of faith that a thorough understanding of the brain's atoms and molecules would lead to an understanding of consciousness itself. In short, the working assumption, which still widely prevails, was that mind equals brain. As astronomer Carl Sagan said, "[The brain's] workings—what we some- times call mind—are a consequence of its anatomy and physiology, and nothing more."⁶⁴ Or, as Nobelist Francis Crick ob- served, "... a person's mental activities are entirely due to the behavior of nerve cells, glial cells, and the atoms, ions, and molecules that make up and influence them."⁶⁵

These confident assertions disregard warnings from within physics itself that the materialistic approach may be funda- mentally irrational. One example will make the point. In his famous 1969 essay "Are We Machines?" Nobel physicist Eu- gene P. Wigner observed that in quantum physics, "The primitive facts in terms of which the laws are formulated are not po- sitions of atoms but the results of observa- tions. It seems inconsistent . . . to explain the state of the mind of the observer, his apperceptions of the result of an observa- tion, in terms of concepts, such as posi- tions of atoms, which have to be ex- plained, then, in terms of the content of consciousness." This circular reasoning is simply ignored by the Crickish dogma that "the atoms, ions, and molecules" ac- count for mind itself. Wigner would have none of it, going on to say, "[W]hen it [quantum mechanics] uses the concept of observations as the basic concept in terms of which it formulates its laws, quantum mechanics is 'passing the buck': the con- cept of observations is outside the realm of

physics and its analysis is left to other dis- ciplines. This is unsatisfactory . . . It may well be . . . that present-day physics repre- sents . . . a limiting case—valid for inani- mate objects. It will have to be replaced by new laws, based on new concepts, if organ- isms with consciousness are concerned."⁶⁶

The bankruptcy of the materialistic ap- proach to consciousness is now being openly admitted. As the theoretical biolo- gist and complex systems researcher Stuart Kauffman puts it, "Nobody has the faint- est idea what consciousness is . . . I don't have any idea. Nor does anybody else, in- cluding the philosophers of mind."⁶⁷ Phi- losopher Jerry A. Fodor expressed a similar opinion, saying, "Nobody has the slightest idea how anything material could be con- scious. Nobody even knows what it would be like to have the slightest idea about how anything material could be conscious. So much for the philosophy of conscio- ousness."⁶⁸ Theoretical physicist Freeman Dyson agrees: "The origin of life is a total mystery, and so is the existence of human consciousness. We have no clear idea how the electrical discharges occurring in nerve cells in our brains are connected with our feelings and desires and actions."⁶⁹

The materialistic approach to con- sciousness requires a one-way, forward- acting view of the mind and time, which prohibits the possibility of future knowl- edge and the retrotemporal flow of infor- mation. But the laws of physics do not prohibit information moving from the fu- ture to the present. As Columbia Univer- sity physicist Brian Greene says, "No- where in any of these laws do we find a stipulation that they apply one way in time but not the other . . . in theory events can unfold in reverse order."⁷⁰ In other words, Bem's findings violate not the laws of nature, but the ingrained prejudices of his critics about how the world *should* work.

Brian Josephson, a Nobel physicist at Cambridge University, is among the phys- icists who have probed experiments such as Bem's, in which physiological changes occur in the subject before the stimulus happens. He concludes, "So far, the evi- dence seems compelling. What seems to be happening is that information is com- ing from the future. In fact, it's not clear in physics why you can't see the future. In physics, you certainly cannot completely rule out this effect."⁷¹

"[I]t is difficult to overstate the impor- tance of research into these phenomena," states physicist Richard Shoup of the Boundary Institute, which is dedicated to researching nonlocal phenomena related to consciousness.⁷² "Progress in this area," Shoup states, "may well lead to a reformu- lation and re-interpretation of quantum theory . . . and thus to deep reconsidera- tion of some parts of physics. Even the scientific method itself, based largely on a concept of limited causality and forward influence, may be in need of re-examina- tion."⁷³

In addition to Greene, Josephson, and Shoup, many outstanding physicists have essentially asked, what's the big deal about the sort of phenomena Bem reported? For example, the eminent physicist Gerald Feinberg stated, "If such phenomena in- deed occur, no change in the fundamental equations of physics would be needed to describe them."⁷⁴ French theoretical phys- icist O. Costa de Beauregard agreed, ob- serving, "Today's physics allows for the existence of so-called 'paranormal' phe- nomena of telepathy, precognition, and psychokinesis . . . The whole concept of 'non-locality' in contemporary physics re- quires this possibility."⁷⁵ Yale University physicist Henry Margenau concurred, say- ing, "Strangely, it does not seem possible to find the scientific laws or principles vi- olated by the existence of [psi phenom- ena]. We can find contradictions between [their occurrence] and our culturally ac- cepted view of reality—but not—as many of us have believed—between [their occur- rence] and the scientific laws that have been so laboriously developed."⁷⁶

When materialistic scientists condemn Professor Bem's findings as "craziness, pure craziness;" when they expatiate sagely on the essential nature of con- sciousness by alluding to neuronal activ- ity, neurotransmitters, receptor sites, and functional magnetic resonance imaging patterns; when they triumphantly pro- claim that it is now proved that mind equals brain; when they confidently as- sure us that the overall picture of con- sciousness is known, and that only the fine details remain to be filled in—when they say these things, the tendency has been to assume that they understand what they are talking about and to give them the benefit of the doubt. However, Bem's findings and the accumulated data from a century

of consciousness research suggest that their buoyant pronouncements represent not understanding but a clotted intellectual enterprise that has foundered from its own inertia. The result is the *illusion* of understanding, illustrated in the following story:

[Once upon a time] in an isolated village there was a small Jewish community. A famous rabbi once came to the neighboring city to speak and, as the people of the village were eager to learn what the great teacher would say, they sent a young man to listen. When he returned he said, "The rabbi spoke three times. The first talk was brilliant—clear and simple. I understood every word. The second was even better—deep and subtle. The third was by far the finest—a great and unforgettable experience. I understood nothing, and the rabbi himself didn't understand much either."⁷⁷

Or as psychologist C. G. Jung put it, "This extreme uncertainty of human comprehension makes the intellectual hubbub not only ridiculous, but also deplorably dull."⁷⁸

Despite this situation, many scholars are beginning to agree, at least privately, that the materialistic approach to consciousness is incomplete. In one survey of more than 1,100 college professors in the United States, 55% of natural scientists, 66% of social scientists (psychologists excluded), and 77% of academics in the arts, humanities, and education reported believing that extrasensory perception or ESP is either an established fact or a likely possibility.^{79,80}

BEM AND SAGAN

Materialists *do* sometimes change their views, at least somewhat. As related by Stephan A. Schwartz in his inspiring book *Opening to the Infinite*,¹⁴ one such instance involved Bem himself, when in 1994 he spoke with Cornell fellow faculty member Carl Sagan. Sagan was well known as a popularizer and communicator of the space and natural sciences, famous for his 1980 television series *Cosmos: A Personal Voyage*. He was also a prominent cheerleader for a materialist view of consciousness and a brutal critic of parapsychology. As Bem and Sagan talked, Sagan repeated the skeptics' perennial complaint that

there are no replicable findings in parapsychology. Bem asked Sagan whether he had taken the time to take a look at the contemporary research findings. When Sagan admitted he had not, Bem suggested he do so before continuing to make such an assertion. Sagan promised he would, and asked Bem to send him a copy of a research paper Bem had recently completed with Charles Honorton, Director of the Psychophysiological Laboratory in Princeton, New Jersey, which Bem did shortly afterward.⁷⁹ The subject of the paper was a meta-analysis of a host of Ganzfeld studies, in which an individual who is experiencing mild sensory deprivation attempts to describe information being sent to him in ways that do not involve sensory mediation. The paper made an impact. Sagan called Bem and invited him to present the data and arguments to Sagan's senior seminar called "Critical Thinking." Bem complied shortly thereafter. The next thing Bem heard of their discussion was the following passage which appeared in Sagan's last book, *The Demon-Haunted World*:

[T]here are three claims in the ESP field which, in my opinion, deserve serious study: (1) that by thought alone humans can (barely) affect random number generators in computers; (2) that people under mild sensory deprivation can receive thoughts or images projected at them; and (3) that young children sometimes report the details of a previous life, which upon checking turn out to be accurate and which they could not have known about in any other way than reincarnation.⁸¹

If this sounds like a radical conversion, it was not, for Sagan's next words were: "I pick these claims not because I think they're likely to be valid (I don't), but as examples of contentions that *might* be true. [These] . . . three have at least some, although still dubious, experimental support. Of course, I could be wrong."⁸¹ Although a minimal concession, it was at least a departure from dogmatic absolutism. It's Sagan's "might" that's important.

THE CATHEDRAL OF SCIENCE

The conflict over Bem's findings reveals an unfortunate development—science, which fought for centuries to free itself from the dogma of the Church, is now

mired in its own dogma, scientism. Bem's experiments are the modern equivalent of Galileo's telescope, down which the authorities refuse to peer. As bioscientist Knox describes the current situation:

Recall the learned men of Galileo's time who refused to look in the telescope. They were of the opinion that data from telescopes was not relevant. The same thing is happening today, except that the limiting doctrine is not coming from the Catholic Church. It is coming from science—the new religion of the 21st century. The dogma of this new religion is as rigid as that of the earlier church in dictating what is and is not acceptable in the scientific purview.⁸²

Knox points to an announcement in the journal *Science* in 2009 for plans for a new medical research facility in London that was being called the "Cathedral of Science."⁸³ The language is revealing: Science has its own dogma; now it will have its own church. Knox says sadly, "We have finally come full circle."⁸²

A PERSONAL NOTE

When I entered the University of Texas at Austin in my late teens, I fell in love with science. During that period of my life, materialistic explanations were for me the answer to everything. But by the time I finished medical school, my love affair with materialism had begun to fade. Too many questions relating to the nature of consciousness and how it behaves seemed unanswered and unanswerable from a materialist perspective. Moreover, the dedicated materialists I knew seemed incurious and intellectually lazy and cowardly, ignoring entire bodies of evidence as if they did not exist, and willing to condemn these areas with essentially no knowledge of what they were about.

During the years of postgraduate training and internal medicine practice that followed, questions relating to the nature of consciousness took on clinical significance. Sometimes consciousness-related events were of life-and-death importance. Examples of nonlocal knowing, such as precognitive dreams of clinical events, appeared in my own experience and that of physician and nurse colleagues of mine, who would share them with me. One physician revealed that she routinely dreams

the precise values of her patients' lab tests—before she orders the tests. My patients, as well as individuals who read my books on these issues, flooded me with their accounts, often beginning with, "I've never told anyone this, but . . ." Some patients' lives were saved because they "just knew" they had a problem, although physical exams and exotic tests proved normal. One woman dreamed the winning lottery numbers—not once, but twice.

Over the years I devoured the rich literature in this field, in which research began in earnest in the late 19th century. These efforts have attracted men and women of the keenest intellect and abilities, a few of whom I have been privileged to know. Gradually for me, the intellectual burden of materialism simply became too great. I bailed out.

So, having temporarily given my heart to materialism as a young man, I understand its seductions. I also understand the desire of critics to protect the traditions of science, so hard-won over centuries, from being cheapened and polluted. However, although I respect the sincere efforts of Bem's critics in defending the noble traditions of science, I say to them: In excluding empirical findings you find distasteful, such as Professor Bem's, you are not defending science but degrading it. Science does not need the kind of protection you are attempting to provide.

I suspect Professor Bem looks on the hornet's nest he has stirred up with a bit of detached amusement. He happens to be, after all, a stage magician who has a keen sense of humor.⁸⁴ He might even agree with some of the accusations. Is he a heretic, as his critics suggest? Of course. As astrophysicist Thomas Gold put it, "Heresy [in science] is thought of as a bad thing, whereas it should be just the opposite."⁸⁵ Is Bem foolish? Certainly. As Whitehead stated, "Almost all really new ideas have a certain aspect of foolishness when they are first produced."⁸⁶ Has he violated current theories? Absolutely, and proud of it: "The farther the experiment is from theory, the closer it is to the Nobel Prize," said Nobel chemist Frédéric Joliot-Curie.⁸⁷ Has Bem broken the rules? It depends on how you look at it. As the great inventor Thomas Edison said, "There ain't no rules around here! We're trying to accomplish something!"⁸⁸

LESSONS FROM THE BIRDS

In recent years, ornithologists have discovered that songbirds sing louder and at a higher frequency in noisy urban environments than in quiet rural settings. The reason, the experts believe, is that they are competing with background noise to be heard. This pattern is widespread, having been documented in London, Paris, Prague, Amsterdam, and other cities. But there's a catch: in singing louder, the quality of the song is degraded, with fewer syllables per second.⁸⁹⁻⁹¹

I mean no disrespect to the birds, but certain humans, as we've seen, have recently been behaving in the same way. Offended by experimental findings they find offensive, their strategy has been to shout louder.

Perhaps critics and proponents alike could simply take a deep breath and realize that we're all in the same boat. Our understanding will always be partial, no matter how far science progresses. Our worldviews will always be in need of renovation and updating. This realization might help us turn down the volume. It might mean more civility, tolerance, and humility in both politics and science.

We might draw inspiration from novelist Aldous Huxley, who understood these inevitable uncertainties, saying, "I am entirely on the side of the mystery. I mean, any attempts to explain away the mystery is ridiculous . . . I believe in the *profound and unfathomable mystery of life* . . . which has a . . . divine quality about it."⁹²

—Larry Dossey, MD
Executive Editor

REFERENCES

1. Kettering CF. Quoted in: Quotes on truths and beliefs. [Typology.net](http://www.typology.net/quotes/maria.html). Available at: <http://www.typology.net/quotes/maria.html>. Accessed February 9, 2010.
2. Apple Dictionary. Macintosh OS X. January 23, 2011.
3. Schwartz SA. The denier movements critique evolution, climate change, and non-local consciousness. *Explore (NY)*. 2010;6:135-142.
4. Benen S. Most scientists politically liberal (reality must have a liberal bias). [altnet.org](http://www.alternet.org/blogs/peek/141264/most_scientists_politically_liberal_reality_must_have_a_liberal_bias/). July 13, 2009. Available at: http://www.altnet.org/blogs/peek/141264/most_scientists_politically_liberal_reality_must_have_a_liberal_bias/. Accessed January 25, 2011.

5. Bem D. Feeling the future: experimental evidence for anomalous retroactive influences on cognition and affect. Available at: <http://dbem.ws/FeelingFuture.pdf>. Accessed January 22, 2011.
6. Carey B. Journal's paper on ESP expected to prompt outrage. [nytimes.com](http://community.nytimes.com/comments/www.nytimes.com/2011/01/06/science/06esp.html). Available at: <http://community.nytimes.com/comments/www.nytimes.com/2011/01/06/science/06esp.html>. Accessed January 22, 2011.
7. Hofstadter D. A cutoff for craziness. New York Times online. Available at: <http://www.nytimes.com/roomfordebate/2011/01/06/the-esp-study-when-science-goes-psychic/a-cutoff-for-craziness>. January 7, 2011. Accessed February 2, 2011.
8. Helfand D. An assault on rationality. New York Times online. Available at: <http://www.nytimes.com/roomfordebate/2011/01/06/the-esp-study-when-science-goes-psychic/esp-and-the-assault-on-rationality>. January 7, 2011. Accessed February 2, 2011.
9. Krauss LM. No sacred mantle. New York Times online. Available at: <http://www.nytimes.com/roomfordebate/2011/01/06/the-esp-study-when-science-goes-psychic/publication-is-not-a-sacred-mantle>. January 7, 2011. Accessed February 6, 2011.
10. Gottlieb A. A miracle, if true. New York Times online. Available at: <http://www.nytimes.com/roomfordebate/2011/01/06/the-esp-study-when-science-goes-psychic/esp-findings-a-miracle-if-true>. January 7, 2011. Accessed February 6, 2011.
11. Jahn RG, Dunne BJ. *Consciousness and the Source of Reality*. Princeton, NJ: ICRL Press; 2011.
12. Jahn RG, Dunne BJ. *Margins of Reality: The Role of Consciousness in the Physical World*. New York: Harcourt Brace Jovanovich; 1987.
13. Schwartz SA. *The Secret Vaults of Time*. Charlottesville, VA: Hampton Roads Publishing Company; New Edition; 2005. Original publication: New York, NY: Grosset & Dunlap; 1978.
14. Schwartz SA. *Opening to the Infinite: The Art and Science of Nonlocal Awareness*. Buda, TX: Nemoseen; 2007.
15. Larson E. Did psychic powers give firm a killing in the silver market? *Wall Street Journal*. October 22, 1984.
16. Dossey L. *The Power of Premonitions: How Knowing the Future Can Shape Our Lives*. New York, NY: Dutton; 2009:54–56.
17. Dean D, Mihalasky J. *Executive ESP*. Englewood Cliffs, NJ: Prentice-Hall; 1974.
18. Hyman R. Quoted in: Carey B. Journal's paper on ESP expected to prompt outrage. [nytimes.com](http://community.nytimes.com/comments/www.nytimes.com/2011/01/06/science/06esp.html). Available at: <http://community.nytimes.com/comments/www.nytimes.com/2011/01/06/science/06esp.html>. Accessed January 22, 2011.

19. Hyman R. A critical overview of parapsychology. In: Kurtz P, ed. *A Skeptic's Handbook of Parapsychology*. Buffalo, NY: Prometheus Books; 1985:89.
20. Judd C. Quoted in: Carey B. Journal's paper on ESP expected to prompt outrage. [nytimes.com](http://community.nytimes.com). Available at: <http://community.nytimes.com/comments/www.nytimes.com/2011/01/06/science/06esp.html>. Accessed January 22, 2011.
21. Aldhous P. Is this evidence that we can see the future? [newscientist.com](http://www.newscientist.com). November 11, 2010. Available at: <http://www.newscientist.com/article/dn19712-is-this-evidence-that-we-can-see-the-future.html>. Accessed February 4, 2011.
22. Galak J, Nelson LD. A replication of the Procedures from Bem (2010, Study 8) and a failure to replicate the same results. [SSRN.com](http://papers.ssrn.com). October 31, 2010. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1699970. Accessed February 4, 2011.
23. Schnabel J. Don't mess with my reality. hereticalnotions.com. Available at: <http://hereticalnotions.com/2011/01/16/dont-mess-with-my-reality/>. Accessed January 22, 2011.
24. Krulwich R. Could it be? Spooky experiments that "see" the future. [npr.org](http://www.npr.org). Available at: <http://www.npr.org/blogs/krulwich/2011/01/04/132622672/could-it-be-spooky-experiments-that-see-the-future>. Accessed January 22, 2011.
25. Radin D. *Entangled Minds*. New York, NY: Paraview/Simon & Schuster; 2006:161-180.
26. Braud W. Wellness implications of retroactive intentional influence: exploring an outrageous hypothesis. *Altern Ther Health Med*. 2000;6:37-48. Available at: <http://inclusivepsychology.com/uploads/WellnessImplicationsOfRetroactiveIntentionalInfluence.pdf>. Accessed January 5, 2011.
27. Cardeña E, Lynn SJ, Krippner S., eds. *Varieties of Anomalous Experience: Examining the Scientific Evidence*. Washington, DC: American Psychological Association; 2000: 222.
28. Lanza R, Berman B. *Biocentrism: How Life and Consciousness are the Keys to Understanding the True Nature of the Universe*. Dallas, TX: BenBella Books, Inc.; 2009:1-9.
29. Radin D. *The Conscious Universe*. San Francisco, CA: HarperSanFrancisco; 1997.
30. Radin D. *Entangled Minds*. New York, NY: Paraview/Simon & Schuster; 2006.
31. Kelly EF, Kelly EW, Crabtree A, Gauld A, Grosso M, Greyson B. *Irreducible Mind: Toward a Psychology for the 21st Century*. Lanham, MD: Rowman and Littlefield; 2007: 645-655.
32. Knox SS. *Science, God and the Nature of Reality: Bias in Biomedical Research*. Boca Raton, FL: Brown Walker Press; 2010:117-118.
33. Whitehead AN. *Essays in Science and Philosophy*. New York: Philosophical Library; 1948:129.
34. Wilber K, ed. *Quantum Questions: The Mystical Writings of the World's Great Physicists*. Boston, MA: Shambhala; 1984.
35. James J. *The Mysterious Universe*. New York, NY: MacMillan; 1932:168.
36. Wigner E. Quoted in: Lanza R, Berman B. *Biocentrism: How Life and Consciousness are the Keys to Understanding the True Nature of the Universe*. Dallas, TX: BenBella Books, Inc.; 2009:81.
37. Cho A. After a chort delay, quantum mechanics becomes even weirder. [Sciencemag.org](http://news.sciencemag.org). February 16, 2007. Available at: <http://news.sciencemag.org/sciencenow/2007/02/16-04.html>. Accessed February 7, 2011.
38. Chandler K. *The Mind Paradigm: A Central Model of Mental and Physical Reality*. San Jose, CA: Author's Choice Press; 2001.
39. Broad CD. *Lectures on Psychical Research: Incorporating the Perrott Lectures given in Cambridge University in 1959 and 1960*. New York, NY: Humanities Press; 1962:6.
40. Huxley TH. Quoted in: [QuoteWorld.org](http://www.quote-world.org). Available at: <http://www.quote-world.org/quotes/6974>. Accessed September 22, 2007.
41. Truzzi M. On the reception of unconventional scientific claims. In: Mauskopf SH, ed. *The Reception of Unconventional Science, AAAS Selected Symposium 25*. Boulder, CO: Westview Press; 1979:130.
42. Watson JD. *The Double Helix*. New York, NY: Touchstone; 2001:14.
43. Eysenck H. Quoted in: Koestler A. *The Roots of Coincidence*. New York, NY: Random House; 1972:15.
44. Bob. Comment on: Carey B. Journal's paper on ESP expected to prompt outrage. [nytimes.com](http://community.nytimes.com). Available at: <http://community.nytimes.com/comments/www.nytimes.com/2011/01/06/science/06esp.html>. Accessed January 22, 2011.
45. Caleb. Comment on: David Helfand, An assault on rationality. New York Times online. Available at: <http://www.nytimes.com/roomfordebate/2011/01/06/the-esp-study-when-science-goes-psychic/esp-and-the-assault-on-rationality>. Accessed February 6, 2011.
46. Segall S. Comment on: David Helfand, an assault on rationality. New York Times online. Available at: <http://www.nytimes.com/roomfordebate/2011/01/06/the-esp-study-when-science-goes-psychic/esp-and-the-assault-on-rationality>. Accessed February 6, 2011.
47. Pat. Comment on: David Helfand, an assault on rationality. New York Times online. Available at: <http://www.nytimes.com/roomfordebate/2011/01/06/the-esp-study-when-science-goes-psychic/esp-and-the-assault-on-rationality>. Accessed February 6, 2011.
48. Carey B. You might already know this . . . [nytimes.com](http://www.nytimes.com). Available at: <http://www.nytimes.com/2011/01/11/science/11esp.html>. Accessed January 23, 2011.
49. Bayesian probability. Wikipedia. Available at: http://en.wikipedia.org/wiki/Bayesian_probability. Accessed January 29, 2011.
50. Targ R, Puthoff H. *Mind-Reach. Scientists Look at Psychic Ability*. New York, NY: Delta; 1977:169.
51. Sheldrake R. How widely is blind assessment used in scientific research? *Altern Ther Health Med*. 1999;5:88-91.
52. Sheldrake R. *A New Science of Life: The Hypothesis of Formative Causation*. London: Blond and Briggs; 1981.
53. Sheldrake R. Sir John Maddox—book for burning. [Sheldrake.org](http://www.sheldrake.org). Available at: <http://www.sheldrake.org/D&C/controversies/maddox.html>. Accessed January 22, 2011.
54. Sheldrake R. *Dogs That Know When Their Owners Are Coming Home*. Reprint edition. New York, NY: Three Rivers; 2000.
55. Maddox J. Quoted in: Sheldrake R. Sir John Maddox—book for burning. [sheldrake.org](http://www.sheldrake.org). Available at: <http://www.sheldrake.org/D&C/controversies/maddox.html>. Accessed January 22, 2011.
56. Lanza R, Berman B. *Biocentrism: How Life and Consciousness are the Keys to Understanding the True Nature of the Universe*. Dallas, TX: BenBella Books, Inc.; 2009:8.
57. Grossman N. Foreword to: *Science and the Near-Death Experience by Chris Carter*. Rochester, VT: Inner Traditions; 2010:x-xi.
58. Carter C. *Parapsychology and the Skeptics*. Pittsburgh, PA: Sterlinghouse; 2007.
59. Tart CT. *The End of Materialism: How Evidence of the Paranormal is Bringing Science and Spirit Together*. Oakland, CA: New Harbinger; 2009.
60. Kelly EF, Kelly EW, Crabtree A, Gauld A, Grosso M, Greyson B. *Irreducible Mind: Toward a Psychology for the 21st Century*. Lanham, MD: Rowman and Littlefield; 2007.
61. Parker A, Brusewitz G. A compendium of the evidence for psi. *Eur J Parapsychol*. 2003; 18:33-51.
62. Muhammad Saeed al-Sahhaf. Wikipedia. Available at: http://en.wikipedia.org/wiki/Muhammad_Saeed_al-Sahhaf. Accessed February 4, 2011.
63. Lanza R, Berman B. *Biocentrism: How Life and Consciousness are the Keys to Understanding the True Nature of the Universe*. Dallas, TX: BenBella Books, Inc.; 2009:6
64. Sagan C. *The Dragons of Eden*. New York, NY: Random House; 1977:7.

65. Crick F. *The Astonishing Hypothesis*. New York, NY: Simon & Schuster, 1994.
66. Wigner EP. Are we machines? *Proc Am Philos Soc*. 1969;113:95-101.
67. Kauffman S. God enough. Interview of Stuart Kauffman by Steve Paulson. *Salon.com*. Available at: http://www.salon.com/env/atoms_eden/2008/11/19/stuart_kauffman/index1.html. Accessed January 30, 2010.
68. Fodor J. The big idea: Can there be a science of mind? *Times Literary Suppl*. July 3, 1992:5-7.
69. Dyson F. How we know. *The New York Review of Books*. March 10, 2011; LVIII:8-12.
70. Greene B. *The Fabric of the Cosmos*. New York, NY: Vintage; 2005:145.
71. Josephson B. Is this really proof that man can see into the future? *Daily Mail* (London). [dailymail.co.uk](http://www.dailymail.co.uk/sciencetech/article-452833/Is-REALLY-proof-man-future.html). May 4, 2007. Available at: <http://www.dailymail.co.uk/sciencetech/article-452833/Is-REALLY-proof-man-future.html>. Accessed January 26, 2011.
72. Boundary Institute. Available at: <http://www.boundaryinstitute.org/bi/index.html>. Accessed January 25, 2011.
73. Shoup R. Physics without causality—theory and evidence. Paper presented to the Society for Scientific Exploration, 26th Annual Meeting, East Lansing, Michigan, May 30-June 2; 2007:12.
74. Feinberg G. Precognition—a memory of things future. In: Oteri L, ed. *Quantum Physics and Parapsychology*. New York, NY: Parapsychology Foundation; 1975.
75. De Beauregard OC. The paranormal is not excluded from physics. *J Sci Explorat*. 1998; 12:315-320.
76. Margenau H. Quoted in: LeShan L. *The Science of the Paranormal*. Northamptonshire, UK: Aquarian Press; 1987:118.
77. Petersen A. In: French AP, Kennedy PJ, eds. *Niels Bohr: A Centenary Volume*. Cambridge, MA: Harvard University Press; 1985:299.
78. Jung CG. *Psychology and the Occult*. Princeton, NJ: Princeton University Press; 1977: 136.
79. Wagner MW, Monnet M. Attitudes of college professors toward extra-sensory perception. *Zetetic Scholar*. 1979;5:7-17.
80. Bem DJ, Honorton C. Does psi exist? Replicable evidence for an anomalous process of information transfer. *Psychol Bull*. 1994; 115:4-8.
81. Sagan C. *The Demon-Haunted World*. New York, NY: Random House; 1996:302.
82. Knox SS. *Science, God and the Nature of Reality: Bias in Biomedical Research*. Boca Raton, FL: Brown Walker Press; 2010:140.
83. Travis J. Plans for London 'cathedral of science' unveiled. *Science*. 2009;326:1468-1469.
84. Daryl Bem reenacts Stanford prison experiment with a twist. *YouTube.com*. Available at: <http://www.youtube.com/watch?v=DeUbEuj1B-Q>. Accessed February 9, 2011.
85. Gold T. Quoted in: Quotes on truths and beliefs. Available at: [Typology.net](http://www.typology.net/quotes/maria.html). <http://www.typology.net/quotes/maria.html>. Accessed February 9, 2011.
86. Whitehead AN. Quoted in: Quotes on truths and beliefs. [Typology.net](http://www.typology.net/quotes/maria.html). Available at: <http://www.typology.net/quotes/maria.html>. Accessed February 9, 2011.
87. Joliot-Curie F. Quoted in: Quotes on truths and beliefs. [Typology.net](http://www.typology.net/quotes/maria.html). Available at: <http://www.typology.net/quotes/maria.html>. Accessed February 9, 2011.
88. Edison TA. Quoted in: Quotes on truths and beliefs. [Typology.net](http://www.typology.net/quotes/maria.html). Available at: <http://www.typology.net/quotes/maria.html>. Accessed February 9, 2011.
89. Potvin DA, Parris KM, Mulder RA. Geographically pervasive effects of urban noise on frequency and syllable rate of songs and calls in silvereyes (*Zosterops lateralis*). *Proceedings of the Royal Society B online*. [Royaletsocietypublishing.org](http://rspb.royalsocietypublishing.org/content/early/2011/01/05/rspb.2010.2296). Available at: <http://rspb.royalsocietypublishing.org/content/early/2011/01/05/rspb.2010.2296>. Accessed January 20, 2011.
90. Brumm H. The impact of environmental noise on song amplitude of a territorial bird. *J Anim Ecol*. 2004;73:434-440.
91. Highfield R. Palace great tits learn to sing louder to cope with the noise of city life. *The Telegraph online*. Available at: [telegraph.co.uk](http://www.telegraph.co.uk/news/uknews/1536010/Palace-great-tits-learn-to-sing-louder-to-cope-with-the-noise-of-city-life.html). <http://www.telegraph.co.uk/news/uknews/1536010/Palace-great-tits-learn-to-sing-louder-to-cope-with-the-noise-of-city-life.html>. December 4, 2006. Accessed January 20, 2011.
92. Huxley A. Quoted in: Bedford S. *Aldous Huxley: A Biography*. Chicago, IL: Ivan R. Dee; 1974:727.