Journal of Scientific Exploration, Vol. 24, No. 1, pp. 109–158, 2010 0892-33101/10

BOOK REVIEWS

The End of Materialism: How Evidence of the Paranormal Is Bringing Science and Spirit Together by Charles T. Tart. New Harbinger Publications and Institute of Noetic Sciences, 2009. 240 pp. $29.95 (hardcover). ISBN 978-1572246454.

Someone who picks up Charles Tart's latest book, *The End of Materialism* (*TEOM*), will see a subtitle that reads *How Evidence of the Paranormal Is Bringing Science and Spirit Together* and reasonably expect an evidence-based argument for compatibilism—an argument that attempts to convince the reader of the compatibility of science and spirituality on the basis of parapsychological research *alone*. Few would be more qualified than Tart to make such a case. He has fifty-plus years of experience *doing* basic research on the transcendental aspects of the human psyche, and, more importantly, of *defending* this research to the general public and scientific community alike. Thus you may be surprised to hear Tart confess some sixty pages in, "While this may seem odd to say, I've been personally bored for decades with the controversy about whether or not psi perceptions . . . provide a sound basis for openness to the reality that at least some spiritual aspects really existed." Odd indeed!

Don't get us wrong, you'll certainly find an engaging survey of the evidence for various kinds of psi phenomena. Personally bored or not, fully two-thirds of Tart's book is so devoted, including Chapters 5–16. Consequently, in the next section of this review we'll be taking a closer look at his presentation of that evidence. That said, the evidence-based argument isn't the only aspect of Tart's argument for compatibilism. The opening section of *TEOM* introduces us to a different and relatively novel strand of argumentation that Tart will carry throughout the book. This argument, like the evidence-based one it supports, is an attempt to persuade us that our deeply held spiritual yearnings and experiences are compatible with a properly scientific understanding of ourselves and the world (p. 6). Yet rather than addressing the various *scientific* roadblocks to compatibilism, this strand of the argument addresses *ideological* ones instead. We'll spend the remainder of this section explaining how Tart thinks these sorts of roadblocks differ, and why they often constitute a more significant hurdle.

Tart expresses his personal fatigue with the psi controversy at the beginning of a section entitled "Skepticism and Pseudoskepticism". His characterization of the *pseudoskeptic* provides some insight into his motivation for shifting his argumentative focus:

> The proper understanding and functioning of skepticism is greatly confused . . . by the existence and activities of numerous *pseudoskeptics*, people who claim to be skeptics—people interested in getting at the truth while doubting that current explanations are adequate—but who are really adherents to and advocates of some other belief that, they believe, already has all the necessary truth. . . . They're debunkers, missionaries, advocates. The typical pseudoskeptic will argue that your parapsychological results must be wrong and the result of sloppy experiments, wishful misinterpretations, or downright dishonesty by your subjects or even by you, because what you're claiming is scientifically impossible. (pp. 64–65)

What this makes clear is that Tart has no objection to skepticism per se. In fact, he considers himself *to be* a skeptic, characterizing it as a perfectly "rational and sensible strategy in life," and an essential one for scientists like himself (p. 64). What he has grown tired of is not honest skepticism of his experimental methods and interpretations, but of having his research so often opposed on purely ideological grounds by pseudoskeptics. These *sciencier-than-thou* folk are convinced a priori that there can be no evidence supporting a spiritual reality, and so, to the extent that Tart has claimed otherwise for his research, they are antecedently convinced he *must* be either a bad scientist or a good liar. Tart has observed in their resistance an overall pattern of opposition that is more deeply rooted than your typical, healthy, form of skepticism. So Tart has adapted his strategy in *TEOM* accordingly; he has extended his evidenced-based argument to those who are otherwise interested in the spiritual but, because of ideological roadblocks, are apt to follow the pseudoskeptic in objecting to his even making a scientific case in the first place.

Tart's basic strategy is to show that science, in and of itself, is *not* incompatible with spirituality: "…the conflict," he contends, "is actually between second-rate spirituality and second-rate science" (p. 37). Yet he is keenly aware that many in our culture, especially those coming out of academia, have been led to believe otherwise. They are under the impression that "science" tells anyone seeking the spiritual that they're "at best, softheaded folks, unwilling to be completely scientific and, at worst, superstitious fools, perhaps having a serious psychopathology that drives them to seek the "spiritual" (p. 5). For him, this conflates what is really and truly essential to science, namely, its basic empirical methodology, with *scientistic materialism*, a distorted, ideological interpretation thereof. Since only the latter is incompatible with spirituality, he devotes several chapters to isolating the one from the other in order to dissolve the apparent conflict and pave the way for his evidenced-based argument.

Before summarizing his effort, we should note that the two argumentative goals just mentioned are ultimately subservient to Tart's humanistic aim in *TEOM*. As a transpersonal psychologist,[1] his primary concern is the threat scientistic materialism (or *scientism*, for short) poses to our psychological well-

being. And in his experience, our well-being depends on our having a healthy spiritual life—one that enriches the spiritual dimensions of our humanity by fostering our transcendental values and validating our transcendental experiences. Thus his concern is motivated by his having witnessed many spiritual seekers react to the spirit-vs.-science conflict in detrimental ways: by "converting" to materialism, or arbitrarily compartmentalizing these two aspects of their lives (p. 34). Tart contends that even though these "solutions" bring a certain amount of conscious reprieve from the conflict, a high price is nevertheless exacted on less-than-conscious levels; you cannot simply suppress the spiritual side of your humanity—a source of deep meaning and satisfaction in life—and expect no adverse psychological effects. Thus, his primary concern is that, "Until we learn to distinguish essential science from scientism, we remain vulnerable to false invalidation, which seems to have the full power and prestige of science behind it but is really an arbitrary, philosophical opinion" (p. 38).

It is in the central section of Chapter 2, "Ways of Knowing," that Tart begins to provide the reader with an account of *essential science*. He prefaces this by detailing four traditional methods of gaining knowledge about things: by experience, from authority, with reason, and via revelation (pp. 38–41). His distinctions are aimed to show that the basic scientific method is little more than "refined common sense"—that it is simply a combination of these traditional methods, organized to enhance each's strengths, while minimizing their weaknesses (p. 42). Not all are equal though, because, as he explains, ". . . the most essential aspect of science (as opposed to scientism) is this insistence on *direct experience*—on *observation*, *data*, and *facts*—as having the ultimate priority in understanding, even though supplemented and interpreted by reason" (p. 42). The "way of experience" should take precedence over any preconceived notion of what can or cannot be understood by the basic method. Tart emphasizes this point by repeating the popular notion that modern science was created in opposition to the Roman Catholic Church, with its overemphasis on the ways of authority and reason. These ways had "established," for example, that heavier bodies fell faster than lighter bodies. "Science was a rebellion against oppressive authority," he suggests, "because it asked: 'Can't we actually *look* at some falling bodies and see if heavy ones actually fall faster than light ones?'" (p. 42).

After providing the reader with a nice diagram of how the basic scientific method is used (Figure 2.1 in the book), Tart cleverly illustrates the process by showing how one might design a research program to test a hypothetical holy woman's reputation for the ability to heal others (pp. 44–46). So not only do we get a clear demonstration of how essential science is carried out, we also get to see why the (ostensibly) spiritual nature of a phenomenon is no bar to its methods. The very same techniques used to test and isolate various alterna-

tive *naturalistic* explanations, can ultimately be used to control for them all. His hypothetical scenario thus shows how it is possible to establish, scientifically, whether a psychic (or non-naturalistic) component of the healing *might be* causally efficacious. Not coincidentally, Tart returns to the issue of psychic healing in Chapter 10 and presents what he takes to be evidence from actual experiments employing similar methods, that there is *in fact* such a component.

Though Tart never makes the contrast explicitly, there is an interesting analogy to be drawn between his characterization of the early renaissance Catholic Church and contemporary scientism. Just as the combination of Aristotelian physics, Ptolemaic cosmology, and Church dogma had ossified into a rigid, unchallengeable belief system, so too has essential science degenerated into an equally rigid ideology of its own. The strategies of "naturalizing" the elements in our theories and of offering reductive explanations have both been undeniably fruitful (especially early on, as natural philosophers sought to distinguish themselves and their methods from their classically trained brethren). Yet we contend it would be a mistake to think these strategies are inextricably linked with essential science. The special sciences have progressed quite well in the absence of widespread reductions to physics or chemistry. Moreover, we are quite confident that when the evidence for psi phenomena gains a wider acceptance, then like so many "occult" phenomena before it—Newton's action at a distance, Einstein's time-dilation, and Bell's action irrespective of distance—these too will be eventually considered quite "natural." Thus, to anyone under the impression that "science" can't study the paranormal, we find ourselves sympathizing with Tart's implicit question: "Can't we just *look* at ostensible cases of healing, and see if there is a psychic component to them?"

It isn't until the end of Chapter 3, "Ways of Not Knowing", that Tart finally defines the metaphysical (or philosophical) component of materialism, by contrasting it with a dualist's view of the mind. Again, his explications are accompanied by useful diagrams (Figures 3.1 and 3.2 in the book). And while the explications themselves are rather cursory—he is forced to gloss over nuances that are likely to make any professional philosopher wince—they do the job admirably given their peripheral role in the book. Most importantly, the reader is introduced to the reductive structure of the materialist's worldview:

> . . . *everything* arises from the laws governing matter, energy, space and time, so the best understanding of all of life that we can ever get will spring from our understanding of these most fundamental factors. . . . Life simply means that when you get just the right combinations of physics and chemistry, you get self-sustaining, self-reproducing actions that constitute life as we know it. . . . Eventually, that life electrochemical reaction gets complex enough that we talk of . . . the human brain . . . . (pp. 68–70)

This sets up Tart's discussion of consciousness and what materialist phi-

losophers now call "the hard problem", or that of reducing the phenomenal features of consciousness to the physical operations of the brain (p. 70).[2] He notes that there does not exist a materialist account of consciousness, nor, for that matter, is there any idea what such a theory might look like; hence, among contemporary materialist scientists it is simply a matter of *faith* that their aging promissory note[3] will be paid in full (p. 70). Tart uses this "explanatory gap" to paint dualism as a viable alternative to the materialist's philosophical interpretation of the mind and its relationship to the brain. He says: "What we know in terms of essential science, of course, is that the brain is importantly involved in consciousness as it manifests in ordinary life, but that's not the same thing as knowing that the brain *creates* consciousness" (p. 70). In other words, the widespread assumption that consciousness is only a "creation" of the brain, a mere *epiphenomenon*, is a matter of "philosophical opinion", as opposed to a scientific fact.[4]

We agree with Tart's basic point here, that the essential science is *neutral* between materialism and dualism. The dualist need only contend the mind is not *wholly* reducible to the physical brain and its functions. This assumption is perfectly compatible with the ever-growing body of evidence that consciousness depends in many ways on what the physical brain is and does. This assumption does not preclude the possibility that the mind depends *in still other ways* on a spiritual/psychic reality that extends beyond, but causally interacts with, the physical. The additional theoretical structure may look unlovely to the materialist, and so get rejected on a purely meta-scientific principle of theory choice like Ockham's. But the dualist multiplies entities *unnecessarily* only if there is no evidence for psi phenomena.

This simple point itself should pave the way for Tart to present his evidence-based argument. However, it is not materialism, *the philosophical view*, which Tart regards as the psychologically harmful roadblock to compatibilism. He says:

> If ideas like this were strictly a matter of formal philosophical and scientific *theories*, all believed, disbelieved, or argued about quite consciously and logically, they wouldn't have too much of a pathological effect on our lives. But when *any* philosophy or belief system, spiritual or materialistic, sinks below consciousness in much of its operation, simply shaping our perceptions and thoughts without our being aware of it, we tend to become enslaved by it. This is especially true because modern psychology has demonstrated over and over again that much of what we call "perception" is not a straightforward taking in of what's actually in the world around us, of reality, but rather a form of automatized, very rapid "thinking," a processing of perception that can be strongly biased by our beliefs and conditioning so that perception is slanted or biased to apparently validate what we already believe. (pp. 20–21)

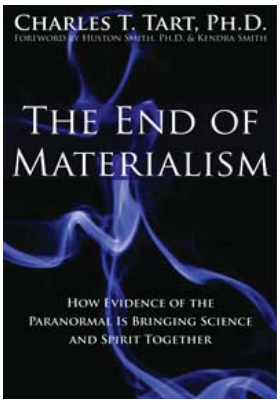
Thus, he makes an important distinction between the metaphysical view,

and the way that view is transformed into an ideology. The former is less of a problem because it is *held* consciously, and *justified* rationally. Simply *recognizing* that metaphysical dualism is logically compatible with the essential science would be all one needed to give Tart's presentation of the evidence an unprejudiced look. But when certain features of materialism become ideologically entrenched, then this simple recognition becomes much more difficult to make, whatever the logic.

Fortunately, Tart goes beyond simply defining the ideology and its manner of operation; he also supplies the reader with two useful methods for identifying scientism's effect on themselves, so as to counteract its unconscious influence. The second of these is a fairly extensive sample of what Abraham Maslow called *pathologies of cognition*.[5] These are ways we have of *not* knowing: We use these methods to prevent ourselves from getting at the truth about ourselves and our reality in order to preserve the "truths" which already bring us great comfort. As Tart (paraphrasing Maslow) points out: "Used correctly, science can be an open-ended, error-correcting, personal-growth system of great power. Used incorrectly and inappropriately, science can be one of the best and most prestigious neurotic defense mechanisms available" (p. 54). Pseudoskepticism results when the normal tools of good common sense and healthy skepticism are unconsciously exaggerated, employed in inappropriate contexts, or otherwise twisted by an underlying ideology.

The other method Tart offers is particularly clever in our opinion. It is, as Tart describes it, a "belief experiment",[6] which is intended to test whether or not you have unwittingly inculcated the materialist ideology. The exercise was originally designed by Tart in the early '80s "to sensitize spiritual seekers to some of the major cultural attitudes and obstacles we moderns share in our search" (p. 23). The idea was to empower them by providing insight into the ideology's perception-shaping effects they may have been otherwise unaware of. The experiment works by requiring you to recite aloud "the Western Creed"—a mock religious creed that affirms many of the basic tenants of the materialistic ideology and its primary implications—and then to observe your emotional and bodily reactions thereto. The key is to momentarily suspend disbelief and any conscious tendency you might have to want to intellectualize its content. This is supposed to enable you to bypass any defense mechanisms you might have that would prevent you from noticing that, on some level, you are under the sway of the materialist ideology or are comforted by its direct ethical and spiritual implications.

We decided that before moving on to the next section, I (Hafiz) would wrap up this section on something of a personal note. What I want to say speaks to Tart's humanistic aim in writing *TEOM*. At one point, Tart counts himself as one of the "lucky" ones for having discovered the scientific literature on



parapsychology when he was relatively young. Others less fortunate are left to confront the conflict between spirit and science in ignorance. I myself had no idea that such a body of literature even existed. Consequently, my own struggle with the conflict led down one of the two major paths Tart observes: I ended up "converting" to scientific materialism.What initially started as a deeply felt need to better understand and justify my religious beliefs and experiences, evolved over time into a desire to figure out how I and so many others could be so completely deluded into actually taking such beliefs and experiences seriously. Thus I entered my Ph.D. program under the full sway of scientism, and with an ambitious plan to "naturalize" religion. Before that plan came to fruition, however, I took an epistemology seminar led by Professor Grossman and was finally introduced to the research on phenomena such as OBEs, NDEs, reincarnation, and mediumship. Unsurprisingly, I was in full-on debunking mode for much of the semester. It wasn't until the end of the section on NDEs, when Neal brought in a friend and actual NDEr to speak to the class, that the ideological basis of my own resistance became apparent to me. Like a road-rager, extracted from his two-ton isolation tank and forced to confront the object of his scorn face to face, I was forced to confront the NDE phenomenon stripped of my ideological defenses. It's one thing to dismiss dry, second-hand reports of NDEs or publications on large-scale prospective studies—anyone sufficiently clever can find ideology-preserving lifelines in even the most evidential of these; it's quite another to tell someone to their face that *they* should dismiss the most profound experience of their life, simply because, according to my philosophy, it can't possibly be any more than an illusion "created by chemicals in the brain." From that point on, I stopped tacitly assuming the phenomena false, automatically seeking to confirm my ideological prejudices; instead, I started taking the evidence at face value, as it were, and asking genuinely skeptical questions which neither precluded nor presumed a spiritual interpretation.

All this is to say I'm acutely aware of the perception-changing effects of an ideology. If there is any book that can have the same impact on the reader as meeting the NDEr had on me, it's Tart's *TEOM*. His presentation is nothing if not up close and personal. In the next section of the review you'll see that he always includes a behind-the-scenes look at his own research. Even though it means he often forgoes a look at more recent or more impressive studies, it enables him to show the reader that no one is more skeptical of this research than he is himself. His candor, perhaps more than any explicit argument he

could make, is likely to disarm the reader with ideological reservations and open them to the possibility that spirituality is compatible with science.

We now turn to a discussion of Tart's presentation of the parapsychological data. Most people have had spontaneous psi experiences, such as thinking about a friend just prior to receiving a phone call from the friend, having a "dream" that comes true in some way, or having a premonition about something or other. Tart shares one such personal experience with his readers. But such reports can easily be dismissed by skeptics as just "coincidences" or "lucky guesses", and so forth. This motivates a discussion of the importance of bringing objective science into the picture, and then to a presentation of what Tart calls the "Big Five". The Big Five are the areas of parapsychology that have produced incontrovertible scientific evidence, under controlled laboratory conditions, for the reality of psi phenomena. The five areas are: telepathy, clairvoyance (remote viewing), precognition, psychokinesis (PK), and psychic healing. After devoting a chapter to each of the Big Five (which we will return to momentarily), Tart turns to a discussion of what he calls the "Many Maybes". These consist of areas of research that Tart believes constitute significant evidence for dualism, but which he regards as less solid, less strong, than the evidence for the Big Five. The Many Maybes include the out-of-body experience (OBE), near-death experience (NDE), after-death communications (ADC), mediumship research, and reincarnation cases. And, as with the Big Five, Tart devotes a chapter to each of the Maybes. Let's first examine the Big Five.

One of the many strengths of this book is the commendable clarity with which Tart schematically describes the experimental conditions under which data was obtained, together with the actual data. The experimental conditions of course meet the very strident scientific criteria of being objective and repeatable, which makes it impossible for the skeptic to use words such as "coincidence" and "lucky guess" to explain away the data. For each of the Big Five, the percipient (or recipient, in the case of healing) is carefully shielded from any and every possible physical influence. This means that the data cannot be explained in terms of physical processes, and hence the phenomena are irreducibly mental. I should mention that the data cannot be properly evaluated without understanding some very basic concepts from elementary statistics, such as the probability of getting a result by chance, which Tart explains very clearly. Each of the chapters on the Big Five contain (i) an outline of the basic experimental design, (ii) data obtained, and (iii) the author's personal involvement in the research described. Let's take a closer look at just one of the Big Five: precognition.

In a typical precognition experiment, the subject (percipient) is asked to state the outcome of some future, yet-to-be-determined process. For example, the percipient is asked to state what card will turn up *before* the deck is exten-

sively shuffled and cut. After explaining the concept of a *meta-analysis*, Tart cites a meta-analysis of all such precognition experiments over a period of 50 years, with odds against chance of 10 septillion to one (septillion = 10 followed by 24 zeroes). Tart also mentions successful precognitive experiments using remote viewers, where the target is not selected until *after* the recipient has drawn a picture of what the target, to be determined by a random number generator, will be. In the context of discussing one of his own experiments, he explains the fascinating concept of "psi-missing."

The basic idea of *psi missing* is that results that are significantly below chance are just as important as results that are significantly above chance. If I can accurately "guess" the results of 10 successive coin-flips, the probability of that happening by chance is less than one in a thousand. But if I were to get 10 consecutive misses, the probability of that happening by chance is also less than one in a thousand. In either case, we have to conclude that psi is functioning. Tart cites an experiment in which subjects, prior to being tested for psi, were asked to state whether or not they believed in psi. Those who said they did believe scored significantly better than chance, whereas those who said they did not believe scored significantly below chance. How are the negative results to be explained? Tart suggests, and we agree, that the skeptic is subconsciously using ESP to validate his belief that there is no such thing as ESP! "I know that in ordinary psychological functioning, we often show distorted perceptions and thoughts that uphold our beliefs and prejudices. Here, in extraordinary functioning, or psychic functioning, the mind unconsciously manifests a 'miracle', ESP, to support its belief that there are no miracles and no ESP" (p. 138).

But Tart is as relentless on himself as he is on the pseudoskeptic, and in so doing models the ideal of a scientist, who, unlike the pseudoskeptic, is more concerned with objective truth than with validating his prior beliefs. Tart shares with his readers that he has "personal difficulties with precognition" (132) " . . . my bias is that at some deep level I find the idea of precognition, where the inherently unknowable future can sometimes be known, so incomprehensible that I just never think about precognition in a serious way. I say the words about it that the evidence logically compels me to say, but the idea doesn't really touch me or affect my way of living. And even though I've long accepted the idea that precognition could be real, I've never let it affect my living my life on the assumption that free will is a reality. To reason that we don't have free will, that it's all an illusion, makes life both senseless and boring" (p. 136). Here Tart lays his emotional cards on the table. He doesn't really want to believe in precognition, because he thinks it would mean we don't have free will.

Now, our purpose here is not to discuss the problem of free will,[7] but rather to show how science ideally works. This book, as we have said, is as much

about the process of doing science as it is about the findings of parapsychology. So what does a conscientious scientist do when confronted with data he doesn't particularly like? " . . . in essential science, data is always primary over theory and belief, over expectations about what *should* happen. So I had to work with this data; I couldn't just ignore it because it didn't fit with my ideas of how reality worked" (p. 139). So he scrupulously goes over his experimental design, finds a potential weakness, gets a computer expert to re-analyze all his data, and discovers that the weakness does not invalidate the main results. He then discusses briefly his own concept of "transtemporal inhibition", which we shall not discuss, and concludes the chapter with a brief discussion of the politics and sociology of parapsychological research. All this in one chapter just 18 pages in length![8]

The author segues from the Big Five to the Many Maybes with a chapter on the out-of-body experience (OBE), followed by short chapters on the near-death experience (including an excellent discussion of the Pam Reynolds case), after-death communications (ADC), mediumship, and reincarnation. In these chapters, the presentation of the data and evaluation of its evidential force is somewhat less satisfying than for the previous phenomenologies (the Big Five), although references are given to sources and websites that would fill in the gaps. We found ourselves asking the question: What is Tart's basis for claiming that the Big Five are evidentially superior to the Many Maybes? Before addressing this question, we want to model Tart by sharing with the reader our own personal involvement with this material. We came to this material first through a study of the NDE, followed by mediumship and then reincarnation cases. We became totally convinced, based on these three phenomenologies alone, that materialism is empirically false and that we survive the death of our bodies. It also seemed to us, and still does, that the evidence meets the "beyond a reasonable doubt" standard, not just the more modest "more likely than not" standard. Thus it was not until we were already convinced of the falsity of materialism that we began to examine ordinary parapsychological research, the Big Five. So we found ourselves bristling a bit at Tart's implication that we became convinced based on some mere Maybes. Here's how Tart describes the evidential import of the two groups:

> When we look at paraconceptual phenomena in detail….we find…two categories. Group one, the Big Five . . . are psi phenomena whose existence is supported by hundreds of rigorous experiments for each phenomena. Group two, the many maybes, are phenomena that have enough evidence that it would be foolish to simply dismiss them as unreal, but not enough evidence, in my estimate, to make them foundational realities for further research as the Big Five are. (p. 291)

This quote identifies Tart as the experimental psychologist that he is. Something can be regarded as evidentially certain only if it can be observed in the laboratory under tightly controlled experimental conditions. The Many Maybes, for the most part, cannot be brought into the lab and studied under controlled conditions. One has to study NDEs, reincarnation cases, etc., as they occur naturally. But it seems to me that the ability to do controlled laboratory experiments, although obviously desirable and important, ought not to be the final arbiter of evidential strength. One cannot, after all, do controlled experiments on many things . . . black holes, distant galaxies, dinosaurs . . . the existence of which is not in doubt. So I wish to suggest that evaluating the strength of evidence for any given phenomenon ought not to be tied to whether or not that phenomena can be studied under controlled laboratory conditions. The epistemologist Robert Almeder came to the conclusion that it is irrational not to believe in reincarnation, based only on an examination of some of the stronger Stevenson cases.[9] And Greyson et al. come to the conclusion that the NDE is a "head-on, profound, and inescapable" challenge to the materialist paradigm.[10] Moreover, mediumship *has* been brought into the lab, and studied under controlled conditions that eliminate every possible alternative to the hypothesis of survival (Schwartz,[11] independently duplicated by Greyson[12]), with probabilities against chance estimates every bit as high as the ones cited for the Big Five.

But there is something else involved here (there is always "something else", which makes this research endlessly fascinating). The concept of "evidence" requires the concept of a theory, belief, or hypothesis, for or against which certain data are alleged to be evidence. Consider the following two hypotheses: (1) human beings can send and receive messages in ways that are independent of their physical bodies, (2) human beings survive the death of their bodies. Although it may perhaps be argued that (2) can be derived from (1), the argumentation would not be simple, and the two should be treated for now as independent hypotheses. This means that evidence for (1) is not also automatically evidence for (2). The Big Five clearly establish (1) beyond a reasonable doubt. But they do not directly establish (2). Conversely, the evidence adduced under (2) has direct bearing on hypothesis (1). The body's senses are, after all, definitely *not* involved in the alleged reception of information from past lives (reincarnation), or deceased loved ones (ADCs, NDEs, mediumship). So if we accept that all the evidence for (2) supports (1) directly, and that the evidence for (1) supports (2) only indirectly, then one can acknowledge some truth to Tart's claim that the hypothesis that consciousness can send and receive information independently of the physical body (the Big Five) is perhaps more firmly established than the hypothesis that our consciousness survives the death of the body (the Many Maybes).

Nevertheless, the NDE directly challenges our usual epistemic conventions (good evidence must be objective, repeatable, publicly observable, etc.) as strongly as it challenges the materialists' paradigm. For the NDE is a mystical experience, and the mystical experience, as William James observed and Tart agrees, is noetic. That is to say, the truth of the experience is internal to the experience itself; it is self-validating. Philosophers should notice the Platonic distinction involved in the use of the terms "knowledge" and "belief" in the following passages. In his account of his mystical experience, Richard Bucke tells us "that he did not (merely) come to *believe*, (but rather) he saw and *knew* (i) that the cosmos was not dead matter but a living Presence, (ii) that the soul of Man is immortal, (iii) that the universe is so ordered that all things work together for the good of each and all, (iv) that the foundation principle of the world is love, and (v) that the happiness of everyone is, in the long run, absolutely certain" (quoted in Tart, 1975, p. 330, italics and parentheses mine).

The NDE literature contains innumerable passages similar to Bucke's,[13] and it is somewhat puzzling that Tart does not include any such experiences in his discussion of the NDE, especially given his obvious regard for the content of Bucke's experience (i–v) which he so effectively contrasts with the "Materialists' Creed". But, getting back to the epistemology, Tart sums it up as follows: "After direct, personal experience of mentally functioning while experientially separated from our physical body, the typical attitude (of the NDEer) is something like, 'I don't just *believe* I'll survive death; I *know* it. I've been there'. . . . " (p. 248, parentheses mine). Tart, along with James, seems to agree that the first-person experience of the mystic/NDEer is sufficient, for them, to make the typical knowledge claims that mystics make [(i)–(v) above], but, again following James, the noetic, truth-certifying experience of mystics and NDEers is not sufficient for the those of us who have not had such an experience. For the rest of us, all we can do is "accept as data the fact that people experiencing these phenomena claim to have direct knowledge of survival . . . we can rationally accept it only as evidence, not final proof"[14] (p. 248). So it is "evidence" for us, but "proof", or rather, conclusive evidence for those who are fortunate to have had the experience. Fair enough, but then the question becomes, how do we evaluate, as evidence for (i)–(v), the universal testimony of mystics/NDEers? It must count for something, as Tart suggests, even if we can't take NDEers into the lab to do controlled repeatable experiments on them, which is Tart's, and every other scientist's, preferred way of gathering evidence.

We'll make a radical suggestion here. Turn the question upside down. The question is: What are the epistemological grounds, for those of us who have not had an NDE or mystical experience, for believing that the content of the experience (i)–(v) is true? The reverse is: What are the grounds for doubting that mystics and NDEers are not really experiencing what they claim to be expe-

riencing? After all, in normal human interactions, we need a reason to doubt what someone is saying to us, not a reason to believe. As Kant and Spinoza long ago observed, social functioning depends on trusting that people really experience what they say they experience, and this trust is called into question only when there are good reasons to doubt what another is saying. So what is the basis for doubting the truth of the NDE/mystic experience? There are of course ideological reasons: The NDE/mystic experience is not consistent with materialism, nor is it compatible with many of the world's organized religions. But are there any empirical, that is, nonideological reasons to doubt that what Bucke experienced is literally the way things are? Perhaps the reason for doubt is merely the fact that one has not, oneself, had such an experience. But this seems to be a very poor reason to doubt, especially when one considers that (i) the NDE can happen to anyone and (ii) the NDE removes all doubt in everyone who has the experience.

Tart begins and ends his book by effectively juxtaposing the materialist worldview with that of the mystic/NDEer, represented by Richard Bucke. The former worldview is one of ultimate meaningless, devoid of purpose . . . it is a worldview according to which "*my* life, and *my* consciousness have no objective purpose, meaning or destiny" (p. 296). By contrast, the worldview of the mystic/NDEer is meaningful through and through . . . "the foundation principle of the world is love". According to Tart, the data from parapsychology, the Big Five, effectively refutes materialism. Tart does not go so far as to claim that the data from the Many Maybes actually establishes the truth of the mystics' worldview, but rather that the door is left open to its truth. But we are urging a stronger conclusion: There are simply no good reasons for doubting the truth of what mystics have been telling us for centuries and what NDEers are telling us now. This is, indeed, "The End of Materialism".

I (Grossman) will now add a brief personal statement. I have been immersed in this research (mostly the Many Maybes) for 30 years or so, and have been incorporating this material in my courses. I have seen the effect that just reading this material has had on the lives of my students. I have seen suicidal impulses dissipate, relationships with family healed, and directionless students acquiring a sense of direction. I have seen students who were motivated primarily by the desires of the "Materialist Creed" (greed, fame, pleasure, power) begin to think seriously about living according to the Golden Rule. The overwhelmingly positive reaction of my students to this material has made it psychologically impossible for me to doubt its veracity. And of course, this material has had, and is having, a profound effect on me. Recently, my five-year-old granddaughter asked me, out of the blue, "Grandpa, do you like getting old?" This is not a question that one can prepare for; I found myself saying, with a big smile, "Yes, I like getting old *very much."* Those words could not have fallen out of my

mouth had I not been a student of this research for so many years. I also want to thank Tart for writing this book. By writing this book, he has made teaching this material much easier for me, as I will be using it regularly in my courses.

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Notes

[1] According to Tart, transpersonal psychology is a field of psychology inspired by Abraham Maslow's insistence that "psychology shouldn't look only at the worst in human behavior, psychopathology, but at the best, the functioning of exceptionally mature people (p. 369 [a paraphrase of Maslow, 1964]). You can learn more about it from Tart's own book, *Transpersonal Psychologies* (1975), which helped launch the field, or from Appendix 4 of *TEOM*.

[2] See David Chalmers (1995) "Facing Up to the Problem of Consciousness" for a nice overview of the hard and easy problems of consciousness from the philosopher who first explicitly characterized the distinction.

[3] You can find Sir Karl Popper's infamous characterization of "promissory materialism" in a book written jointly with the neurophysiologist and Nobel laureate John Eccels, *The Self and Its Brain: An Argument for Interactionism* (1984, p. 96ff).

[4] William Lycan, a prominent philosopher and long-time materialist, has candidly conceded this point in his *Giving Dualism Its Due* (Lycan, 2009, p. 15). He does so in response to Paul Churchland, who defends materialism on the grounds that in comparison to neuroscience, dualism is explanatorily impotent (Churchland, 1984, pp. 18–21). Lycan echoes Tart's point in noting that "the comparison is misplaced. Dualism competes, not with neuroscience (a science), but with materialism, an opposing philosophical theory. Materialism per se does not explain very much either." (Lycan, 2009, p. 15)

[5] Maslow, A. (1966) *The Psychology of Science: A Reconnaissance.* Gateway.

[6] You can try this experiment at www.alternativedesignsolutions.com/itp/Tart_ITP.html

[7] Tart seems to believe that Dualism entails free will. It does not; Spinoza is an example of a nonmaterialist philosopher who rejects the concept of free will. But Tart is right in that (i) materialism precludes free will and (ii) dualism is a necessary, but not sufficient, condition for free will to exist.

[8] To complete this discussion of precognition, we wish to mention the more recent and rather astounding findings of Dean Radin. Although Tart refers to Radin's work as "authoritative", he doesn't tell us what it is, and a footnote would be useful. Here

is that footnote: In Radin's experiments, a subject is shown images that are either emotionally charged or emotionally neutral. The image is chosen by a random number generator at time T. The subject's brain is wired up, and its responses to the images are measured. Although the bulk of the brain's response occurs after T, there is a small but detectable response at a time prior to T. That is, the brain begins to respond to the image before the image has been selected.

[9] Robert Almeder, *Death and Personal Survival*, Littlefield, 1992, p. 65.

[10] The full quote is: This conflict between current neuroscientific orthodoxy and the occurrence of NDEs under conditions of general anesthesia and/or cardiac arrest is head-on, profound, and inescapable. In our opinion, no future scientific or philosophic discussion of the mind–brain problem can be fully responsible, intellectually, without taking these challenging data into account." Kelly et al., *Irreducible Mind*, Rowman & Littlefield, 2007.

[11] *The Afterlife Experiments* by Gary Schwartz, Atria, 2003.

[12] Personal communication.

[13] See, for example, Chapter 13 in *Lessons from the Light*, by Kenneth Ring, Moment Point Press, 2000.

[14] The word *proof* is entirely inappropriate here, as it would be in any discussion of empirically based hypotheses. Proof is a concept of logic and mathematics, and nothing in science is ever "proven" in the logical or mathematical sense of the word. The term *conclusive evidence* or *evidence regarded as conclusive* should be substituted for the word *proof*.

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Philosophy of Personal Identity and Multiple Personality by Logi Gunnarsson. New York/London: Routledge, 2010. 230 pp. $110, £70.00 (hardcover). ISBN 978-0-415-80017-4.

It has been repeatedly stated that the "hard problem" in consciousness is explaining the jump from electrochemical impulses to *qualia*, but a no less daunting task faces the adventuresome soul who tries to make sense of what most of us experience as a continuous identity (Natsoulas, 1981). Is it a mere fiction, does it imply some kind of transcendental organizing system, or even a soul? Even in the apparently unproblematic example of normal, waking identity in industrialized societies, there are phenomena that resist most challenges. How can we speak of a continuous identity when about one third of our lives is spent in states in which we are usually not aware of this identity, or experience ourselves as someone different in our dreams? When we become even more daring and visit the realm of phenomena where individuals experience identity discontinuities even in their waking state, the issue becomes almost incomprehensible. How to make sense of mediums who communicate through "controls" nonsense blabber side by side with accurate information that their normal identities could not know through the senses or reason (Gauld, 1969)?

Philosophy of Personal Identity and Multiple Personality (PPI) is an analytical philosophy discourse on the nature of altered identity, especially as related to dissociative identity disorder (DID), erstwhile known as "multiple personality." The book starts with an introduction to the main topics covered: whether more than one entity (a more overarching concept than "personality" or "self") can coexist in one body, the nature of personal identity, and DID. Throughout the book, the author seeks to defend various "theses," among them: 1) that cases of DID experience themselves as multiple entities in one body, 2) that each one of us is a fundamental entity, of which there could be two or more in one body, and 3) that this possibility does not become actualized in reality. Already from the start we are heading the wrong way. The first "thesis" is just a description of what individuals with DID (and other phenomena such as "spirit possession", see Cardeña, in press) experience, not a thesis to be defended. The third thesis presents an empirical statement, even though the author makes clear from the start that his book is not an empirical enterprise. And in another thesis, he comes as close to a tautology as I think one can get, namely that DID subsumes philosophical concepts that are important to understand it. Although a book on the philosophy of identity and multiplicity does not require a thorough review of the literature on DID, the author's discussion of the nonphilosophical literature on DID is very limited, missing such relevant topics as current clinical conceptualizations of DID (e.g., the view that the problem is that the person does not have *one* integrated personality, rather than having many), or recent

neuroscientific and cognitive work validating DID experience (for a review, see Cardeña and Gleaves, 2007).

In the second part of the book, the author discusses philosophical concepts of personal identity, and how they relate to being in a body. The final section of PPI focuses on the nature of DID using as springboard the analysis of Morton Prince's foundational case written at the beginning of the 20th century. Professor Gunnarsson also delves into philosophical, autobiographical, and fictional treatments of DID in the last chapters of his book. As appealing as the listing of the book's contents seem, I was disappointed because overall the book comes across as a philosophical exercise to spend idle hours rather than as a treatise on a topic that really engaged the author. It is hard to believe that he would devote his time to a phenomenon (DID) whose validity he does not even commit himself to, as he makes clear on page 11. In a famous quote, Wittgenstein proposed that philosophy's aim is to "show the fly the way out of the fly-bottle (Wittgenstein, 1953, p. 309)", but it seems that the author is not even sure whether there is a fly in the bottle. This equivocation persists in the book, quite densely written, in which his analysis of fictional and nonfictional sources entertains different possibilities, constantly vacillating among them. Also, the author intersperses passages in which he feigns another personality or entity who is writing through him (e.g.: "Logi is a murderer! I am not Logi!"). I found these gratuitous and unfunny, disrespectful of the people who actually experience themselves in this way. With all of these considerations in hand, I predict that the audience for this book will be quite small, even before considering its steep price. I would instead recommend to those interested in a philosophical discussion of multiplicity the more readable and compelling books by Braude (Braude, 1995) and Radden (Radden, 1996).

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Eusapia Palladino and Her Phenomena by Hereward Carrington. New York: B. W. Dodge, 1909, 353 pp. (hardcover). General Books, 2009, 208 pp., $20.98 (paperback), ISBN 978-0217474610. BiblioLife, 2009, 384 pp., $26.99 (hardcover), ISBN 978-1103457489. PDF of original 1909 version free at http://books.google.com/books?id=oNhAAAAAYAAJ&dq=eusapia+palladino+and+her+phenomena.

In *Eusapia Palladino and Her Phenomena,* psychical researcher Hereward Carrington (1880–1958) presented an overview of the career of Italian medium Eusapia Palladino, who lived between 1854 and 1918. In addition to providing us with one of the best general sources of information about this medium up to 1908, the book is still important today for several reasons. Carrington included: (1) a summary of particular incidents of Palladino's mediumship of relevance to the history of psychical research; (2) biographical material about the medium; (3) examples of the phenomena reported around her; (4) an overview of seances with Palladino up to 1908; (5) a report of his sittings with the medium in 1908; (6) an overview of attempts to explain physical phenomena through conventional processes; (7) a review of explanations of Palladino's phenomena through various unorthodox concepts of force (including the author's speculations); and (8) arguments defending the reality of the medium's phenomena. In addition, the book has other valuable lessons for us today that I will comment on later.

Although Palladino produced mental phenomena, she was mainly a physical medium. In addition to a variety of movements of objects, such as table levitations, and to the materializations of limbs, the phenomena reported to take place in her presence included temperature changes, sounds, direct writing, imprints on plaster, and luminous manifestations. Although these phenomena are rare today, they were once widely discussed in the literature of spiritualism and psychical research.

Palladino was brought to the attention of the world beyond small spiritistic

circles in 1891 when Cesare Lombroso sat with her and became convinced of the genuineness of her phenomena (Ciolfi, 1891). Soon after, in 1892, the medium was investigated in Milan by a variety of researchers, producing a report that circulated through Europe and in the United States. The report included a description of the use of instruments to measure the forces applied to the table and changes of weight of the medium (Aksakof et al., 1893). This was followed by many investigations that made Palladino well-known in psychical research. Some of them were those discussed in such works as Albert de Rochas' *L'Extériorisation de la Motricité* (1896), Jules Courtier's "Rapport sur les Séances d'Eusapia Palladino à l'Institut Général Psychologique" (1908), and Enrico Morselli's *Psicologia e "Spiritismo"* (1908), among many other sources. Although Palladino persuaded many of the reality of her phenomena, she was caught in fraud on several occasions.

Palladino's mediumship, Carrington argued in his book, was very important. He wrote:

> Eusapia Palladino holds almost a unique place in the history of spiritualism, and for several reasons. The chief reason is this: That in her may now be said to culminate and focus the whole evidential case for the physical phenomena of spiritualism. If it could be shown that—in spite of all these years of work, in spite of the elaborate precautions taken, in spite of the testimony of the numerous scientific men who have carefully investigated her, and brought in favorable reports—her performances were fraudulent throughout, and that nothing but fraud entered into the production of these phenomena—then the whole case for the physical phenomena would be ruined—utterly, irretrievably ruined. . . . If, on the other hand, it becomes evident that fraud will *not* cover all the facts, and that genuine phenomena do occur in her presence—phenomena as yet inexplicable by science—then it will be proportionately more probable that many of the historic cases were genuine also. . . . (p. 4)

The section of the book reporting Carrington's seances with this medium referred to seances held with his colleagues Everard Feilding and W. W. Baggally. They were all commissioned by the Society for Psychical Research (SPR) to study the medium. Extracts of the report published by the SPR (Feilding, Baggally, and Carrington, 1909) appears in Chapter 4. To assess the importance of these seances for Carrington, and to understand why he included them in his book, we need to see the issue in its historical context. Palladino was at Cambridge in 1895 and had seances with SPR members. Their official report was negative, concluding that the phenomena were fraudulent and that the SPR would not have anything further to do with the medium (Sidgwick, 1895). Some criticized this conclusion (e.g., Ochorowicz, 1896). Because of the accumulation of independent positive testimony in favor of the medium in later years, and the good impression Carrington and Feilding had in preliminary seances

with her, the SPR decided to sponsor another investigation. As Carrington had stated in a previous book (Carrington, 1907), he was skeptical of Palladino's phenomena. He summarized his view in the work commented on here:

> As for myself, I can but say that, during ten years continued investigations of the physical phenomena of spiritualism, during which period I have sat many score, if not hundreds of times, with mediums, and traveled many hundreds of miles in order to see genuine physical phenomena, if such existed—I had invariably been disappointed, and until I had attended my first seance with Eusapia, had *never seen one single manifestation of the physical order which I could consider genuine.* On the contrary, I had always detected fraud, and, being an amateur conjurer myself, was enabled in nearly every instance to detect the *modus operandi* of the trick, usually the first time I saw it. In my *Physical Phenomena of Spiritualism* [Carrington, 1907] I devoted more than three hundred pages to the psychology of deception, and to a detailed exposure of the tricks and devices of fraudulent mediumship. (p. 154)

The report of the 1908 sittings at Naples was unique in the Palladino literature for several reasons. First, it was more detailed than previous reports, consisting of stenographic notes dictated by the researchers. Second, the report included descriptions of control at the same time that the phenomena were described. Third, Feilding, Baggally, and Carrington were all highly experienced in the investigation of mediums and the tricks many of them employed.

Carrington not only became convinced, but he became the champion defender of the medium, as seen in the book commented on here and in other publications I have listed elsewhere (Alvarado, 1993). But his conversion took place gradually. He wrote: "Seance after seance, we remained doubtful, until the sixth, when we felt that we had become finally and irrevocably convinced. The facts had at last found lodgment in our minds, and we felt that our observations had not been mistaken" (p. 323). This is a reminder of the way many psychical researchers have become convinced of the existence of mediumistic phenomena, a process that involves a measure of familiarity with unusual phenomena achieved through repeated exposure to them, combined with personal involvement with the precautions taken to control the medium. Such observations should be of interest to current researchers of dramatic physical phenomena.

Referring to further studies with the medium, Carrington wrote:

> It is earnestly hoped that sufficient money and sufficient interest will soon be raised in this country to bring Eusapia to America, and to study her by means of a long series of experiments; and, when once the facts have been established (as I feel certain they would be), to begin a scientific investigation . . . of the medium and her phenomena. Certain it is that the present state of things is a disgrace to science—particularly in a country which boasts of its wealth, its progress, and its openmindedness! (pp. 336-337)

Carrington brought the medium to New York, where many seances were held between November 1909 and June 1910. Although there were phenomena that could not be easily explained, as argued by Carrington throughout his career, and as seen in one of his last books (Carrington, 1954), the New York seances were disastrous for the reputation of the medium. Unfortunately, rather than helping to get Palladino's phenomena accepted or better understood, the New York seances were not systematically conducted and ended up creating a media circus (see Alvarado, 1993). The seances generally did not reach the stage of scientific investigations referred to by Carrington. The attendees were mainly inexperienced sitters and journalists who were more interested in reporting to the public than in understanding the phenomena. To this day the seances remain a good example of the need to separate systematic research from media-laden environments. Furthermore, a factor contributing to the controversies was that Carrington was believed by some to have had financial interests in the venture and was publicly perceived as the medium's "manager."

In the book discussed here, Carrington also reviewed various explanations offered to explain the medium's phenomena. Among the conventional ones, he mentioned hallucination and fraud. Carrington did not believe hallucination explained anything, pointing to the instrumental recording of some of the phenomena. In addition to photographs of the manifestations, particularly table movements, Carrington wrote: "Additional evidence is furnished by those cases in which records of the phenomena have been obtained by instrumental means. The actual *occurrence* of a phenomenon has been proved, e.g., by means of revolving cylinders, electrical apparatus, and other devices which have checked the progress of the phenomena by purely automatic means" (pp. 243-244).

Fraud, Carrington stated, was a more serious objection, and one he had documented through personal experience with Palladino. But he refused to accept the idea that her case had to be rejected on the basis of some instances of trickery. A good part of the phenomena, he stated, simply could not be explained by the simple tricks the medium was well-known to perform. He assured his readers:

> In our own seances I am absolutely certain that fraud was not and could not have been employed in the vast majority of cases. Not only did we feel the hands controlled by us, not only did we encircle them with our hands, trace the arm to the body, and ascertain from the relative position of the thumb and fingers which hand we were holding, but we could frequently *see*, as well as feel, the medium's hands resting in ours upon the table or stretched before us perfectly visible. (pp. 246-247)

Furthermore, Carrington pointed out that there were many instances in the séance records in which movement of objects and other phenomena took

place at a distance and out of reach of the medium. There were also particularly impressive incidents under conditions that Carrington considered to be fraud-proof. The following, from his seances with Feilding and Baggally was an example:

> During the ninth seance, the small stool which we had placed just outside the cabinet, about three feet distant from the medium, came out of its own accord and moved up to within a foot of her. Eusapia waved one of her hands, still controlled by ours, above the stool, and it moved in various directions, corresponding to the movements of her hand. She then approached her hand to the stool and a complete levitation resulted. One of us then passed his hands between the stool and the medium's body, and along the carpet, showing that no thread, hair, string, or other attachment was possible. We picked up the stool and examined it, replacing it on the ground. We did not allow Eusapia to touch the stool with hand or foot, after it had been placed on the floor, but held her hand in ours about three feet above the stool, and held her leg by knee and ankle on the side nearest the stool. There was a brightly illuminated patch of carpet of about eighteen inches between the small stool and her skirt. In spite of these precautions, however, the stool immediately began its movements, and rose into the air several times under the hands of one of the investigators and without being touched in any way by Eusapia. (pp. 259-260)

Carrington then went on to summarize the ideas of those who postulated forces coming out of the medium's body. In fact, and as I have argued elsewhere (Alvarado, 1993), Palladino's mediumship provided a context for, one may say an opportunity for, many of her researchers to develop ideas of this sort using a concept that preceded her mediumship (Alvarado, 2006).

Writing in a previous book (Carrington, 1908), Carrington stated his belief that the human body was ruled by a vital force independent of metabolic processes and that this force was the real principle behind life in the organism. To explain Palladino's phenomena, Carrington postulated that this vital principle, a connecting link between mind and matter, and usually at work only inside the body, could exteriorize on rare conditions and produce physical phenomena. Carrington postulated phenomena that were not particularly intelligent—referred to by him as "class one" phenomena—could be under the control of the subconscious mind of the medium. But there was a second class of phenomena that seemed to express intelligence. Carrington wrote in the book being reviewed here:

> This same vital energy, which is controlled by the medium's own mentality, when producing the phenomena of class *one*, is utilized by the manifesting intelligence in very much the same manner (when the medium is in trance) in producing the manifestations and phenomena of class *two*. We might conceive that this vital energy is utilized by the manifesting intelligence, who imbibes and clothes himself with it, as it were—creating a sort of temporary

> fluidic body through which it can manifest—can come in contact with the material world, move material objects, be seen, felt, and even photographed. . . . The vitality would act as a sort of sheath or cloak, a semi-material substance through and by means of which a spirit can manifest to us here, and initiate the varied phenomena witnessed at Eusapia's séances. (p. 300)

Such a concept, Carrington recognized, without presenting examples, was not completely novel. In fact, Carrington's idea of a vital principle capable of being used by spirits was similar, to give one example among many, to the concept of the perispirit discussed by French spiritists. Allan Kardec discussed the action of the perispirit as an explanation for a variety of phenomena, speculations coming from mediumistic communications (Kardec, 1863). The idea was further developed by Gabriel Delanne, who characterized the role of the perispirit in terms of metabolic and morphological processes that affected the development of the human body (Delanne, 1897).

In another chapter, Carrington focused on psychological and psychophysio-logical aspects of the medium. Among the points he raised was the importance of keeping the medium in a good mood so as to obtain phenomena. Carrington wrote that the medium hiccupped going into trance. Furthermore: "She also sighs, groans, and seems to be extremely uncomfortable, until the phenomena are well under way; and especially during the production of any larger phenomena she cries, 'Oh, dear! Oh, dear!' and groans repeatedly. When she passes into trance, however, this suffering is lost. . . . The lesser phenomena are, apparently, nearly always remembered—the more remarkable ones are forgotten" (pp. 319-320).

The chapter also included speculations about the causes of the medium's fraudulent performances. In Carrington's view, fraud could be conscious, caused by "her love of mischief" (p. 327). But Carrington believed that most of the fraud was unconscious, taking place during trance: "There is a strong impulse to produce phenomena, and, if she is not restrained, she will endeavor to produce them in a perfectly normal manner. But if she *is* restrained, genuine phenomena will result—as we repeatedly ascertained" (p. 328). Carrington's writing, together with those of others such as Ochorowicz (Ochorowicz, 1896), reminds us that Palladino's mediumship was involved in the development of the concept of unconscious fraud in mediums.

Carrington ended his book by restating his belief in the reality of the phenomena and hoping that further investigations would make the world see Palladino "not as a vulgar impostor, but as a rarely gifted individual, possessing powers worthy of the deepest study and respect; as a delicate and sensitive piece of organic machinery, which should be guarded and cared for with the utmost kindness and consideration" (p. 338). Carrington's wish has not been fulfilled, as is clear from many later writings about the medium. Not every-

one sees Palladino today positively, even within parapsychology. But perhaps we may learn from Carrington's experiences. Even if physical mediumship is not a main line of research in current parapsychology, and if concepts of force such as Carrington's are not widely accepted by researchers, some of the points made by him in the book are still valuable today. Among them I will mention the value of having knowledge of trickery, something that is clear in Carrington's discussion of his own seances. Unfortunately, there are examples of researchers coming from old to more recent times who, without any particular expertise in the detection of trickery, have presumed that they are capable of conducting research on macro-PK phenomena solely because they have been trained in an academic discipline. Although this may not be a problem in some cases, Carrington's book reminds us of the importance of researchers having the proper qualifications to conduct credible and well-controlled research with physical phenomena.

Carrington's work is also a reminder of important but often forgotten aspects of past theory, and of the difficulties of achieving personal and collective conviction in the study of phenomena that, even within parapsychology, are very controversial.

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Can the Mind Survive beyond Death? In Pursuit of Scientific Evidence by Satwant K. Pasricha. New Delhi: Harman Publishing House, 2008. 527 pp. $52 (hardcover, 2 vols.). ISBN 9788186622933.

Satwant Pasricha is a psychologist in India who began working with Ian Stevenson in 1974 on cases of children who report memories of previous lives. After training under Stevenson, she became his collaborator and then an independent researcher. She also had successes in clinical psychology. In 2009, she completed a long tenure as Professor of Clinical Psychology at the National Institute of Mental Health and Neurosciences (NIMHANS) in Bangalore, and her book notes that she is the only person in India with training in both clinical psychology and parapsychology.

Parapsychology is the focus here, as the title would suggest. This two-volume set is divided into 22 chapters, each consisting of a previously published article, with Pasricha being sole author or lead author of 17 of them. (Full disclosure: I am one of four authors of one paper.) Though most deal with what are called cases of the reincarnation type, related areas such as near-death experiences (NDEs) are addressed as well.

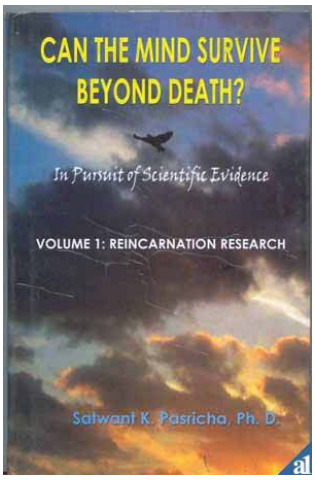
In the three chapters on near-death experiences, Pasricha (along with Stevenson in one) shows the cross-cultural similarities as well as cross-cultural differences in reports of NDEs. One difference between those in India and those in the West is that the Indian ones are all what Stevenson termed "bureaucratic bungling cases," in which the ill person reports being taken by messengers to a man or woman who looks over a book or papers and determines that the wrong person has been sent for. As an example, the man with the book in one case says in a rage to the messengers: "I had asked you to bring Vasudev the gardener. Our garden is drying up. You have brought Vasudev the student" (p. 402). In a large survey, Pasricha found that 62% of the individuals in India who were reported to have died but survived said they had had NDEs, far above the percentage in American surveys. She points out that all but one of the Indian

subjects had their experiences at home, as opposed to the classic American ones that occur in hospitals when patients are revived after their hearts briefly stop. Though this raises the question of whether the Indian subjects were actually at the point of death as opposed to being merely ill, it is not clear how much difference that makes. Stevenson, Cook, and McClean-Rice (1989–1990) examined the medical records of 40 American patients who had reported NDEs and found that 22 seemed to have had no life-threatening condition. Owens, Cook, and Stevenson (1990) compared the NDE reports of those close to death versus those who were not and found few differences, except that those who really were close to death were more likely to report an enhanced perception of light and enhanced cognitive powers.

Though the differences in NDEs across cultures may strengthen the opinions of those who think NDEs are psychological creations, they weaken the case for a biological explanation. After proposing a neurological mechanism for how the dying mind might produce a tunnel-like visual experience, Blackmore (1993) tried to say that Indian reports of NDEs included tunnel experiences, even though they did not. In a paper that Pasricha was a coauthor of but which is not included in the book (Kellehear, Stevenson, Pasricha, and Cook., 1994), the authors correctly took her to task for this. Of course, a tunnel experience is only reported by a minority of American subjects as well, so their importance may be overstated at times. All in all, Pasricha's documentation of Indian NDEs is an important contribution to the field.

While all this book's chapters deal in some way with the question in its title, some of the more interesting ones do so only indirectly. Chapter 11 examines why so few cases of past-life memories are reported in South India even though they seem practically ubiquitous in North India. Pasricha presents seven cases from South India that reveal features similar to those to the north, but these represent a paltry set compared with the nearly 450 cases she notes in North India. Barker and Pasricha (1979) found a prevalence rate of 2.2 cases per thousand inhabitants in Uttar Pradesh in North India. While no systematic survey has been conducted in South India, when Pasricha used the opportunity during a systematic survey of near-death experiences (included in the book) to inquire about past-life memories, she did not hear about a single case. She explores reasons for a disparity in prevalence rates between the two regions. She notes that Hinduism is the majority religion in both, though subtle differences exist in some of the beliefs and practices. She also suggests that differences in education and literacy rates (higher in South India) or childrearing practices may contribute to the disparity, but she is unable to reach any definite conclusion. I wonder if genetics may play a role, both in differences in various regions of a country as well as in differences across cultures.

Another chapter that does not focus precisely on the question of the title



is one on cases found to involve deception or self-deception. Written by Stevenson, Pasricha, and Godwin Samararatne, it tells some interesting stories, including that of a Turkish boy who was named Kenedi when he was born in 1965 to a father who admired John Kennedy immensely. Though his few statements about Kennedy's life only involved information well-known generally—that he was President Kennedy, that he lived in America, was married, had two children, and was rich—the boy became fully convinced that he had been the president and remained convinced at least until he was interviewed at age 20. Another case, which Stevenson helped expose, was a complete fabrication, concocted out of whole cloth by a journalist and published in the magazine *Fate*. The deception cases all serve as cautions against accepting claims too credulously and as evidence that researchers do not approach the cases already convinced of their legitimacy.

Other chapters focus on cases that provide more compelling evidence of survival. One describes children in India born with birthmarks or birth defects that appear to match wounds suffered by the deceased individual whose life the child is thought to remember. Though Pasricha focuses rightly on the marks and defects, I would have liked to have heard more about the statements some of the children made. Deepak Babu Misra and Ramniri Jatav both apparently gave names and locations matching the previous lives of strangers some distance away, and it would be helpful to know how well the history of their statements could be documented.

Pasricha concludes with papers, both having Stevenson as first author, covering two of the most remarkable and perplexing cases ever to appear in the literature. The first is that of Uttara Huddar, a woman who at the age of 32 suddenly displayed a new personality. This personality did not recognize Uttara's family or friends and could not speak Marathi, Uttara's native language. Instead, she spoke what was eventually understood to be Bengali, which Uttara did not know. She called herself Sharanda and seemed to come from another time, as she showed a lack of familiarity with any tools, appliances, or vehicles developed after the industrial revolution. Sharanda stayed "in control" for several weeks. Uttara then returned to her normal personality, but Sharanda continued to emerge intermittently.

In addition to discussing various locations in Bengal, Sharanda gave the names of a number of family members, and these were eventually traced to a

family that lived in West Bengal in the early nineteenth century. The names and relationships that she gave for her father and six other male members of the family all matched a male genealogy of the family that was discovered. The genealogy had been published in a Bengali magazine with a local circulation, but as Uttara had never visited that state, the authors were confident she had never seen it.

Regarding Sharanda's ability to speak Bengali, Uttara and her family said she had never learned it. One of the authors' associates, Professor Pal, had four long talks with Sharanda in Bengali, and he and five other native Bengali speakers all agreed that despite some imperfections in her speech, she had a solid command of the language. Stevenson (1984) later gave new details in a subsequent report. He noted that Uttara had been accused of having learned Bengali in school, though the evidence for that was meager. He had also asked a linguist to listen to two recordings made of Sharanda speaking and singing. The linguist said that her accent was non-native Bengali, and, based on the recordings, he did not hear indications of archaic speech that others had heard in conversation with her. Was this a case of possession by a Bengali spirit using the imperfect instrument of a woman who had never spoken Bengali, or was it a very strange case of dissociation, in which a woman, as in examples of multiple personality disorder, suddenly took on the identification and behaviors of a different person, in this case somehow even displaying knowledge she seemingly could not have acquired in her life?

The last case in the book involves a young woman named Sumitra who experienced possible seizure episodes and then seemed to die during one of them. As her family began grieving and preparing for her funeral, she revived and, after a period of confusion, said that her name was Shiva and that she had been murdered by her in-laws in a place called Dibiyapur, some 55 km away. She rejected her husband and her child and asked to be taken to Shiva's two children. She gave many details that were found to correspond to the life of one Shiva Divedi, who was unknown to Sumitra's family and who had died violently (how and at whose hand was unclear, though her in-laws were under considerable suspicion) in Dibiyapur two months before Sumitra's transformation. Sumitra/Shiva was initially unable to recognize her own family and friends around her but later recognized 23 people from Shiva's life either in person or in photographs. Her transformation also included changes in her behavior, from "that of a simple village girl to that of a moderately well-educated woman of higher caste and more urban manners, who could now read and write Hindi fluently" (p. 474). Except for a period of a few hours that occurred a year after her transformation, Sumitra/Shiva had remained Shiva constantly for two years when the investigation was completed.

Pasricha began that investigation a month after Sumitra/Shiva first met a

member of Shiva's family, her father. She and Stevenson ultimately interviewed 24 members of the two families, along with 29 other individuals for background information. Unless the case is an elaborate fraud perpetrated by a large number of people for no apparent purpose, Pasricha and Stevenson certainly seem to have documented a case of possession. Of this, they write: "Although we do not dogmatically assert that this is the correct interpretation of this case, we believe much of the evidence makes it the most plausible one" (p. 500).

Other chapters cover topics such as the role parental guidance may play in the cases, phobias that some subjects show toward the mode of death of the previous individual, cases in which no deceased person is found who matches the details given by the child, and cases in which the child appears to remember a life of someone who practiced a different religion. All the chapters are interesting, and with Pasricha's clear and concise writing, easily enjoyed by any general reader with an interest in these topics. Though the book does not provide a definitive answer to the question of whether the mind can survive beyond death, it gives much food for thought. And it does provide definitive evidence of Pasricha's contribution to the field, both as Stevenson's colleague and as a very accomplished researcher in her own right.

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Morphic Resonance: The Nature of Formative Causation by Rupert Sheldrake. Park Street Press, 2009. 352 pp. $19.95 (paperback). ISBN 978-1594773174.

This is a revised and expanded edition of *A New Science of Life*—an interesting book that stirred up considerable controversy when it was published in 1981. This edition is expanded and updated, containing new experiments in Appendix A, and a dialogue with David Bohm in Appendix B. Physicist David Bohm should need no introduction, and his other works relevant to the subject of this book include Bohm, 1981, and Bohm and Peat, 2000. The author of *Morphic Resonance* has a background in biochemistry, and has written on such "fringe" topics as paranormal cognition in animals, spirituality, etc. (Abraham et al., 1992; Sheldrake, 1988; Sheldrake, 1990; Sheldrake, 1994; Sheldrake, 2003; Sheldrake et al., 2005).

Stated briefly, Sheldrake is proposing "formative causation": This is the hypothesis that complex dynamical systems which have degrees of freedom (e.g., crystallization, animal behavior) will tend to take a particular path more frequently when similar systems (distant in space) have taken that path in the past. Examples include the spread of new behaviors through animal populations and the generation of specific morphologies during embryonic development. This is a hypothesis about the occurrence of patterns (but not their origin) through repetition, and a proposal to add a new causal factor that must be considered when attempting to explain the function of complex systems. In this view, an animal acts (instinctively) because other animals have acted this way in the past; a plant acquires a given shape because its ancestors did so in the past. This idea is intuitively pleasing, since habituation and entrainment is so common a phenomenon at many levels of organization and in many systems (e.g., neuroscience). The author proposes the existence of "morphogenetic fields" that are shaped by events and serve as "probability structures", guiding the evolution of dynamical systems and expediting their discovery of lowest-energy configurations.

Sheldrake's theory requires the existence of "higher-level" laws that determine how complex systems choose to follow certain paths where they have degrees of freedom. In the Preface, Sheldrake suggests that these are all laws that come and go, in contrast with "immutable laws of physics" (e.g., way to crystallize is a law that appears, animals avoiding barbed wire is a law that appears, etc.). It should be pointed out that another difference from the laws of physics is that the latter apply based on low-level properties of matter/energy (an electric field affects behavior of charges), while Sheldrake's laws apply to complex systems that cannot be defined by simple physical properties. It seems unlikely that there are billions of new laws that are continually created and destroyed (in some Platonic sense) as living systems come and go; if there

were indeed a way in which distinct sets of directed outcomes could be coupled to physical objects based on their higher-order properties (a fundamental law that applied to plant type A but not plant type B), then perhaps a single, immutable law could be formulated that applied to complex systems with significant degrees of freedom and could be coupled to a storage medium, which contained the specifics of each new mode discovered by some system and was strengthened by repeated behavior.

This is intrinsically a controversial proposal: Modern science, especially biology, prefers its causes to be spatially local and formulated at the level of chemistry. However, the author draws additional contrasts (and makes enemies) where there is perhaps no need. Sheldrake spends a lot of time talking about the cost of the genome project, the net losses of the biotech industry, the remarkable conservation of genetic pathways across phyla, and the mysteries of why certain species have more genes or DNA than others. The point he tries to make is that by neglecting morphic fields, the predictive power of today's models is not satisfactory. However, epigenetics, regulation, regeneration of pattern in organisms, and the "molecular genetic data avalanche" which he discusses, are just not as troublesome as he makes them out to be. None of these things are paradoxes of the (useful and interesting) kind that spell the end of an insufficient paradigm (as the black body radiation problem was for classical physics). The reason is that all of these issues are not only predicted by, and consistent with, existing theory, they are perfectly tractable (for continued progress) using current methods and approaches. There is nothing in his list that has truly stymied modern biology. The impasse of the kind he envisions may occur, but there's no sign of it yet.

Many of the mysteries Sheldrake focuses on result from a mistaken (but pervasive) perspective where genes code directly for structures or behaviors. The missing layer—embryonic development—clearly demonstrates why things are much more complex than common arguments make out. The genome encodes protein components that interact to produce the body and its nervous system. This "production" process has enormous complexity, and even tiny changes in the right elements of regulatory gene networks can result in outcomes that can be hugely different. There is not a one-to-one correspondence between gene and physical or behavioral trait, because of embryogenesis—the dynamical system (Gilbert and Epel, 2009; Slack, 2006) that lies between genotype and phenotype; this system can magnify genetic differences (flexibility) as well as mask them (robustness).

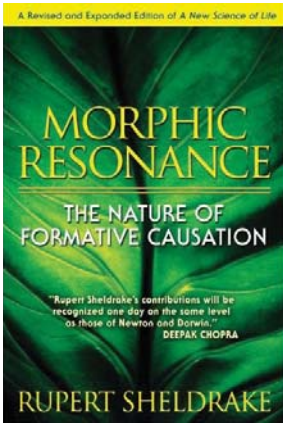
The research community is not at a plateau, prevented from further progress by fundamental problems with the paradigm, but instead is generating fascinating new findings at an exponentially increasing rate. Sheldrake's theory is thus not a solution to a present crisis. It is simply not correct that "[molecular

biology approach]'s limitations are becoming increasingly apparent" (p. xix). The hope that the genome project will automatically make everything clear and obvious may have been in the mind of the lay public, but this is a straw man with respect to the biology community who all knew this was just a necessary first step, not the solution to the question of pattern formation.

However, there is indeed an interesting problem here. While the progress of molecular genetics is going full-steam ahead toward tremendous advances in personalized medicine, regeneration, and diagnosis, the interesting question is: Precisely what do you need to know to predict the shape of a developing (embryo) or behaving (animal) system? Is knowing the genes sufficient? Certainly no one in the biology community thinks so. Because the genes do not code directly for shape, biologists know that you cannot simply read off the pattern of an animal's form from its genetic material. Genes are instructions for making components of cells that interact in extremely complex ways (with some of these components being ones that modify instructions for making other components). This all requires the cellular machinery to interpret DNA, and there are many kinds of biophysical signals overlaid onto the function of the raw genetic code. So the claim that "DNA determines everything" is trivial—no one believes this. But what do we really need to know to predict the outcome of an egg's journey into adulthood? Are all the causes local to the egg (the dominant paradigm), or do we also need to know what happened to similar animals in the past (the hypothesis formative causation) because microscopic local conditions underdetermine the behavior of embryonic systems?

Given the above, what of the claim that if we know everything about how the cell machinery works to interpret the genetic code, we could predict in great detail what sort of organism is going to be built? This is the problem of embryonic development, and many of us are studying it. The hope is that with the right computational tools, and knowing the initial conditions to the necessary level of detail, it should be possible to constructively understand morphogenesis. This is a plausible claim, but it would not be fair to say that it's undeniably true.

Suppose we were handed an egg and the fully sequenced genome of an unknown organism. Could we figure out the shape and function of the organism this egg encodes? There are two main approaches. One would be to simply simulate the system at some level of detail. For example, scan the molecular structure of the egg, and just model every particle's movement using the laws of physics, for some extended time period, and see what happens (ironically, ignoring the genome entirely). This Laplacean strategy trades "understanding" for "predicting", is certainly impossible using today's technology, and may be entirely intractable given Turing, Gödel, and other fundamental limits on computation in the physical universe. But, the impracticality of the above strategy doesn't prove that it can't be done "in principle"—that the egg doesn't actually



contain all it needs to know to make an embryo (not requiring morphic resonance).

The other approach (practiced today) is to scan the genome looking for control circuitry and attempt to figure out, without modeling the lowest level of components, what kind of shape is to be built. This can currently be done for some aspects of embryonic pattern, but it is crucial to note that it can only be done by using historical and comparative data from other species. That is finding a circuit involving BMP (bone morphogenetic protein) does not reveal that a bone will be made (never mind the shape of the bone) because the BMP molecule has nothing bone-like about it. It's an arbitrary code, in the way that the English word *cat* is not cat-like and only has its meaning by convention. How do biologists know that BMP activation may signal the production of bone? Because they have observed BMP initiating bone growth in past experiments in other species, and have inferred an evolutionarily conserved pattern (the definition of BMP pathways). While this information is of the noncontroversial kind (unlike Sheldrake's fields) and does not conflict with a "local" view of the causative forces at work in development, it is ironic that biologists rely on nonlocal information (analyses of many other species and experimental data removed in time from the embryo under study) to understand the genetic networks that control embryogenesis.

Thus, the biology community points to recent successes in controlling growth and development and claims that it can be done in general. However, at this point, generalized rational control over biological shape or behavior is largely a promissory note: The suggestion is that it will be mastered, eventually. The reality is that biologists have good mechanistic models for laying down basic axes during development (head vs. tail) and morphogenesis of some specific structures (e.g., distal limb). But overall, it must be admitted that we are still in the stage of putting together genetic pathways, and most of the models are not constructive or algorithmic—inspection of a high-resolution genetic pathway model from a paper in a top-tier journal usually does not reveal whether it makes the shape of a dandelion, an octopus, or a vertebrate kidney. Some of us are trying though, and the genetic pathways, combined with sophisticated mathematical modeling, are beginning to show how shape emerges from the recursive, complex interactions of multiple low-level components. Still, the origin of precise shapes (e.g., the ear) and the encoding of target shapes and the cybernetics of growth control for regulative events (e.g., salamander limb regeneration) remain open problems. So the truth is somewhere in between.

Sheldrake is wrong in saying that it's now seen to be hopeless. The establishment is wrong in saying that they've already done it. The reality is that it's an interesting and open question as to whether something like Sheldrake's hypothesis will be necessary.

Sheldrake's fields would not be necessary for systems that converge: Any process that is robust and highly determined will have a predictable outcome with no need (or room) for any higher-level laws like morphic resonance. But, processes that pass through "chaotic" points where several different outcomes are separated by a choice point with a high sensitivity to conditions may indeed prove unpredictable in principle. This is a basic result of dynamical systems theory (Prigogine and Stengers, 1997), and it is not yet known whether embryogenesis and behavior are mostly like the chaotic systems whose behavior cannot be predicted from first principles, or highly constrained ones that are easily solved analytically. The robustness and high reproducibility of development (millions of frog eggs all reliably construct a highly complex tadpole and frog) suggest that much of the control networks ought to be quite deterministic. In contrast, many of the actual control networks (both genetic and physical) appear to be best described by chaotic modes when modeled (Barbi, 1998; West, 1990).

Certainly this problem is even sharper in cognitive science, where we have good models for low-level information processing and behavioral programs, but not the faintest idea of what it means for a piece of matter (a brain) to know, as a first-person subject, the Pythagorean theorem (as distinct from "exhibiting Pythagorean theorem–quoting behavior"). Of course, the cognitive science community believes that by learning more about the former, we will eventually understand the latter (Dennett, 1991). Perhaps, but this is a promise not yet reality. Whether or not these efforts will reach a point where, like predicting molecular structures, we can list a number of likely outcomes that could occur in a given situation but cannot say which it will actually be remains to be seen. If so, then higher-order laws like the kind Sheldrake suggests may indeed need to be sought.

The morphic resonance hypothesis is missing a number of details. To be fair, Sheldrake is one person without the benefit of a huge, well-funded community of researchers—he is to be applauded for continuing to develop novel tests and implications of his model. I list the missing elements below as opportunities for logical clarification and fleshing out this (or a similar) theory, not a criticism of the proposed concept.

What is the physical nature of these fields? Do they carry information and are thus limited by the relationships that have now been identified between matter/energy and information processing (Seife, 2006)? What about the causal closure of physics, and at what level do these fields interact with (make a dif-

ference in) the micro events controlling behavior of objects in the physical world? A lot of thought has been put into this by people working on dualist models of mind interaction with the physical brain (Averill and Keating, 1981; Libet, 1994; Mohrhoff, 1999; Popper and Eccles, 1984). Sheldrake makes some analogies with quantum physics fields, which may eventually be the right conceptual apparatus for understanding this, but much more specific models have to be proposed and tested.

A closely related issue is: What is the system by which "ways of doing things", as fundamentally different as crystallization, craniofacial morphogenesis, and potato washing by monkeys, get encoded and decoded into some sort of "field"? How does this system cut up "systems" into natural kinds? How close does a system have to be to make use of some morphic field that exists for a past system? "A plant takes up a shape because its ancestors did so" really contains within it questions such as: If genetics doesn't matter very much, what is an "ancestor" for a given creature? If the field doesn't use genetic descent to identify which organisms' prior efforts to apply to this one, what does it use? What guides the development of a genetic chimera—an animal created in the laboratory with an entirely new and unique shape that has never been seen before (as we do routinely in our work)—and where does its morphic field come from? Sheldrake will need a better definition of "morphic resonance"—is it purely geometric? And also of "morphic units". If organization is what matters, is a computer-simulated flower coupling to the same field as a real one?

What is really gained by calling it a "field"? Besides the intuitive "nonlocal" notion of a field (Haraway, 1976), is anything in this model field-like in the sense that the mathematical properties of fields (continuity, a value at every point in some sort of space, metrics and geometries, etc.) help us to understand how it works? Finally, the issue of backward causation gets short shrift. The four-dimensional Parmenidean block Universe of relativity theory tells us that past and future are not absolute, which becomes relevant if the morphic fields are nonlocal.

Sheldrake's model is in principle testable (a very good quality), but will be distinctly nontrivial to test in practice (beyond establishing the existence of nonlocal influence of past forms). Aside from testing whether patterns spread "paranormally", it is really unclear what the research program would be to see how this works at a molecular level, if scientists suddenly decided this phenomenon really existed and were willing to devote significant man hours/dollars to its investigation. That does seem to require a paradigm shift, but Sheldrake's proposal that science should be taken out of the hands of the "scientific priesthood" is probably more driven by the (often unprofessional and emotional) response his work has received in mainstream circles and is less likely to produce results

in practice. The reality is that an average person, untrained in the most powerful techniques available to modern biophysics, will not be able to move beyond a first step in generating true novel knowledge. It is certainly true that the progressive increase of the "age at first independent funding" in the community, and the conservative, risk-averse nature of reviewers today, are serious issues for groundbreaking proposals. But there are precious few examples of true progress by outsiders (those without training or access to the expensive equipment needed to actually answer "how" questions). The low-hanging fruit has been picked. Real progress (not just "showing that something weird is going on" but explaining phenomena to the amazing degree now routinely expected from scientists) does require much more than unfettered "imagination".

Why was the book called "infuriating" by a review in the journal *Nature* (Maddox, 1981)? It dares to ask the establishment whether the fundamental claim of the sufficiency of local effects to explain complex system behavior is true. Many would like to sell the promise of local, molecular-level prediction and control as established fact, and it is uncomfortable to critically examine foundational assumptions, especially when there is no alternative theory of equally predictive power. The bottom line is that it is entirely not certain that there will not be important dynamical systems (such as embryogenesis and behavior) that will defy prediction due to the well-understood features of deterministic chaos. What is being proposed here is a radical claim—that at those points, a brand new type of effect in nature will apply, coupling past histories of similar systems to outcomes. This is a useful book for focusing attention on the fascinating question of exactly what it will take to explain different kinds of systems—what kind of information and laws at what level of organization are to be sought? Anyone interested in Sheldrake's hypothesis will want this updated edition. The critiques of the molecular/developmental/evolutionary biology and cognitive science programs are not particularly convincing (although keeping our feet to the fire, to make sure assumptions and promises do not become viewed as established fact, is a good thing).

Overall, this is an imaginative, novel, and (at least initially) testable proposal. Any idea that draws so much criticism probably can tell us something of interest, whether it is right or not. I highly recommend the book to anyone interested in the patterns of information flow, emergence, and the laws of nature (Goodwin, 2001). The attack on developmental biology and its progress could have been better-informed and targeted. There are truly holes in this field, but they are not quite where Sheldrake says they are; a lot has happened since 1981, and some really elegant, molecular-level insight into biology and medicine has been made since the "data avalanche" of genomics became available for mathematical analysis, and specific cases of regeneration, regulation, and evolutionary change have been explained at the molecular level.

I would have wanted, in this new edition, for the author to speak to some of the above issues, and in particular to work on outlining which kinds of systems/processes are subject to formative causation effects and which are not. Stated another way, what percent of development is determined by local interactions of matter in the embryo and what percent is nonlocally determined by these fields? Ideally, this book should be read together with a good modern textbook on molecular embryology, biophysics, and epigenetics (Gilbert, 2006; Gilbert and Sarkar, 2000; Jablonka and Lamb, 1995; Loewenstein, 1999; Pollack, 2001) to give the reader a better perspective on the remarkable progress that has been made on the problems Sheldrake identified, and to help discover where the holes, and thus opportunities for something like formative causation to matter, really are. Regardless, Sheldrake writes engagingly about what is surely one of the most interesting and far-reaching, interdisciplinary problems of modern science. With or without morphic fields, extremely exciting developments in this area are forthcoming, and they may transform our basic understanding of neurobiology, evolution, and biomedicine.

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A New Science of Life: The Hypothesis of Formative Causation by Rupert Sheldrake. Icon Press (London), 2009 (revised edition). 304 pp. £9.99 (paperback). ISBN 978-1848310421.

This is the third edition of Sheldrake's 1981 volume. The topic is revealed in the subtitle, "The Hypothesis of Formative Causation." Sheldrake's hypothesis belongs to an earlier trend in biological thinking that views organic life in terms of whole systems. Such views include *holism* and *organicism*,[1] in contrast to *mechanism* (e.g., reduction of biology to physics and chemistry) and *vitalism*.

Vitalism is a somewhat ambiguous term. Generally it is thought of as the view that a nonphysical factor causes the development and behavior of organisms. This may refer to the Cartesian concept of a substantive nonphysical soul inhabiting the physical body;[2] or it may invoke a Bergsonian *elan vital* or "vital essence"; or, in its most generous form, it is simply the view that living things exhibit a distinctive organization that cannot be entirely accounted for by reducing the organism to its parts.

Sheldrake's view would appear to be in sync with (at least) this latter sense of "vitalism." Indeed, the problem may not be merely one of terminology. It turns out on close scrutiny that Sheldrake's hypothetical construction seems to vacillate between certain characteristics of vitalism and others of the mechanical–reductionist viewpoint. To explore this possibility, it will be appropriate first to introduce a general view of his hypothesis, the problems it seeks to address, and its historical background. It is against this background that an appraisal of Sheldrake's theory is best undertaken.

The Theory and Its Background

The issues that concern Sheldrake are (1) How do new forms come into being? (2) How do developing organic systems "regulate" so as to persist in reaching a specific outcome even if the normal course of development is obstructed? (3) How does regeneration, or restoration of damaged structures, work? (4) How is it that reproduction, in which "a detached part of the parent becomes a new organism," can take place? Sheldrake holds that reductionistic explanations fail (pp. 85–93). His hypothesis is intended to provide an organismic explanation.

The Preface states the hypothesis in a simple way. It is the claim that *nature is habitual*. Although the full theory goes beyond this simple statement, Sheldrake clearly means to distill the theory within this provocative concept. If by "habitual" he means merely that nature exhibits regularities, the hypothesis is empty. Sheldrake explains, however, that to call nature "habitual" is to deny that natural processes take place according to fixed immutable laws. The laws of nature arise not from some unchangeable realm of certainties (e.g., ideas in the Mind of God), but from the orderliness of biological phenomena: behavioral regularities subject to evolution. This argues for a *reversal* of the role of biological nature from a peripheral or emergent phenomenon to a fundamental governing principle within the cosmos as a whole. Thus Sheldrake goes on to assert that "crystals and molecules . . . follow the habits of their kind," just as "all animals and plants draw upon and contribute to a collective memory of their species."

Here at the outset a question arises. Are molecules, crystals, plants, and animals on a universal continuum, or not? If habit is a result of something called collective memory, do crystals and molecules thereby "remember?" If so, then the suggestion is that some rudiment of what we might call "consciousness" (remembering) is present at the most fundamental level of physical existence. Indeed this is the view Sheldrake embraces. Not only is organic behavior not reducible to physics and chemistry, but the reverse is true: Physics and chemistry involve some principle or principles that are continuous with those governing organic behavior (p. 26, p.78). Minimally, this is "habit" or "collective memory."

Sheldrake's proposal may be compared with the views of the paleontologist–philosopher Pierre Teilhard, who as early as 1928 held that the evolutionary context of change and development must be extended to all of science, including physics. In addition to *tangential energy*, the subject of traditional physics, Teilhard held that there is also *radial energy*. This is an energy continuous with all of physical nature, drawing matter toward complexity of functions and therefore toward "interiority." "Interiority" embraces not just human self-awareness but also the generalized teleological nature of organisms, or "psychism."[3]

In 1955 botanist Edmund W. Sinnott described this defining characteristic of organic life and behavior as "the insistent tendency of living things for bodily development to reach and maintain, as a norm or goal, an organized living system of a definite kind."[4] This teleological character, which Sinnott believed is continuous throughout the spectrum from organic development to behavior, is what Teilhard wishes to extend all the way to the matter of physics; and Sheldrake appears to adopt the same position when he says that "habit" or "collective memory" is the dynamic behind not only organic development but also the formation of crystals and molecules.

We must, of course, elaborate upon what is meant by "collective memory", but before doing so it is essential to understand how "interiority" is manifest in a living body. Here we may cite Aristotle: "The parts of plants are in spite of their extreme simplicity 'organs': e.g., the leaf serves to shelter the pericarp, the pericarp to shelter the fruit, while the roots of plants are analogous to the mouths of animals, both serving for the absorption of food."[5] What Aristotle here describes is a system of *cooperating functions*. The expression *serves* indicates a functional relationship among the parts of the system. In such a relationship, the function of an organ supports the whole, which at the same time supports the functioning organ. Because this constitutes a system of mutual "purpose," the system *as a whole* necessarily exhibits a teleological character.[6]

In Sheldrake's theory, what roughly corresponds to Teilhard's *radial energy*, the energy of self-centered organization, is Sheldrake's idea of whatever it is that drives habit, or "collective memory." So we come to the crux of the matter. What establishes or creates "collective memory" are *fields* called "morphic fields" whose influence on matter causes material substances to take on specific forms. The term *morphic fields* refers to an overarching category that includes all forms of organized interrelationships, starting with *morphogenetic fields*, which "influence" development of forms such as the forms of crystals, molecules, and biological structures, to *behavioral fields* and *social fields* (pp. 12–13).

Morphic fields are "physical entities that can have physical effects" (p. 78). It is through their physical effects that the fields "influence" both the development and continuance of organized interrelationships. Morphic fields at all levels, therefore, are the physical causes of the existence of form in the universe. "Each kind of system . . . must have a specific kind of morphogenetic field: Thus there must be one kind of morphogenetic field for protons; another for nitrogen atoms; . . . another for the kidneys of sheep; another for elephants . . . and so on" (p. 95).

The role played by morphic fields in creating "habit" or "collective memory" is that forms existing in the past exert a causal influence on the development and maintenance of subsequently existing forms. The means by which

this influence from past to future is enabled is through similarity. A form will be repeated "because the form of the first system would...determine the form taken up by subsequent similar systems." This happens "because of a trans-spatial and trans-temporal influence from the first such system." The attraction of form-to-similar-form across time and space is called "morphic resonance."

Finally, the issues of morphology such as regulation, regeneration, and reproduction are resolved by reference to the morphogenetic fields that impinge upon each living or developing system. If accident interferes with the development of an organism, its associated morphogenetic field makes the necessary corrections. This takes place because of two factors: First, the morphogenetic field has a causal relationship to the developing form; second, the field exercises a teleological effect: It "contains" the "virtual form of the final system" (p. 97). Thus the morphogenetic field (and presumably all morphic fields at whatever level) acts much as would an Aristotelian "final cause."

Sheldrake explains the causal relationship between morphic fields and the organic forms they bring into being by postulating a previously unrecognized type of causation, which he calls *formative causation*. This mode of causation is not the same as energetic causation, which is that studied by traditional physical science. There is then a parallel of intent if not of detail between Teilhard's two energies, tangential and radial, and Sheldrake's two forms of causation, energetic and formative. Teilhard, however, insisted that in the final analysis there exists only a single energy in the universe, which has two aspects, radial and tangential, while Sheldrake does not appear to take this route. Formative and energetic causa-tion are two separate kinds of causality, not expressions of a single universal energy.

Entities Beyond Necessity

When I first encountered Sheldrake's ideas back in the 1980s, I was quite interested in them. There is a seductive character to the concept of morphic fields existing in a kind of subspace or invisible modification of space–time, able to leap across from past to future, and exerting the necessary teleological influence which explains the inherent directiveness of organic life. This theory is especially attractive to those who find a mechanistic universe repugnant and a dualistic universe that severs consciousness from matter equally repugnant. Sheldrake's theory seems on the surface to satisfy the need for a nondualistic, nonmechanistic reality. Unfortunately, on this 2009 re-reading of the text, I must conclude that Sheldrake himself has been mesmerized by the seductive character of his theory to the point where he has lost track of, or does not wish to carry out, the degree of analysis necessary to test the coherence of his own argument.

What Sheldrake actually has done is to create a *secondary pseudo-reality*

dwelling in a debatable realm of its own, to account for what happens in primary reality. For all of his efforts to insist that morphic fields are "physical entities" that exist as "spatial structures" having "physical effects," he is simply unable to make this stick because (a) eventually the concept of a morphic field turns out to be hopelessly confused, and (b) he defines morphic fields into a physical limbo from which there is no return.

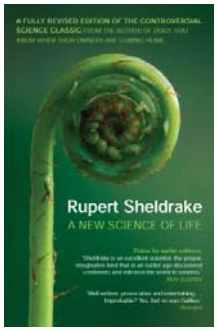
A critical point in Sheldrake's theory is his separation of morphic fields from known fields of science such as gravitic and electromagnetic fields, by asserting that morphic fields achieve their effects by means of a different order of causality, which he calls "formative causation" in contrast to "energetic causation." It is not clear just why Sheldrake chooses to separate morphic fields from known fields of science; but it may be because of significant differences in the way the fields achieve their claimed effects. Whatever the reason, he does separate the action of morphic fields from the action of gravitic and electromagnetic fields by means of his distinction between formative and energetic causation.[7]

He then has two problems. The first is to explain what "formative causation" is, and the second is to explain how this mode of causation "enlists" energetic causation in order to create and maintain physical systems. He attempts first to justify the concept of formative causation by arguing that there are types of causation other than energetic causation. To support this, he uses an example taken from architecture (pp. 93–94).

> In order to construct a house, bricks and other building materials are necessary. So are the builders . . . and so is the architectural plan that determines the form of the house. . . . Thus the plan can be regarded as a cause of the specific form of the house . . . similarly, a specific morphogenetic field is a cause of the specific form taken up by a system, although it cannot act without . . . the energy necessary to move [materials] into place.

The problem with this is that the plan of a house is not a cause at all. Sheldrake seems to have been thinking of the idea of "formal cause" attributed to Aristotle. But this use of "cause" was due to a mistaken translation. The plan of a house is rather an example of what Aristotle called one of the *aitia*, or "explanatory factors" involved in defining the nature of something. Unfortunately, the Greek term *aiton* was translated as "cause" and so the plan of a building, or a statue, or anything else, was called a "formal cause." Calling the plan of a house a "cause" in the sense of its being an *aiton* does not establish that there are more kinds of *causes* than the causality investigated by scientists by means of statistical methods and correlations.

Sheldrake stresses the analogy between the plan of a house and the causal efficacy of the morphic field by claiming that the field contains *information*, the way the plan of a house provides information necessary for the building



of a particular house. In so doing he reveals that he is not citing the alleged causality of the house plan merely to illustrate that there can be different kinds of causes, but rather that his comparison is precise: The information-content of the morphic field guides the form of an organism in essentially the same way that the house plan guides the construction of a house.

But if the morphic field is to affect the development or continuance of a system, there must be some sort of intermediary apparatus that can access the information presumed to be carried somehow within the field and put into action the required "energetic" causes. As far as I can tell Sheldrake is unable to explain how the connection between the information supplied by the morphic field and the necessary material energies can be accomplished. He has separated morphic fields from known fields by defining them as "nonenergetic" (p. 94). Sheldrake submits that the only way to detect these nonenergetic fields lies in the phenomena they are claimed to cause (p. 99). This makes the idea of morphic fields as causes teeter very close to being an ad hoc explanation.

It is true, as Sheldrake points out, that electromagnetic and gravitic fields are, in a sense, only detectable by their effects. However, in the case of these known fields there are two significant differences. The first is that they can be described with mathematical precision from which predictions may follow. It could be argued that there is no precise predictive mathematical formulation for morphic fields because organic phenomena are not susceptible to such precision, but this is what we know already without reference to morphic fields.

The second difference is that known physical fields are brought into existence by the presence of some generating physical structure: in the case of gravity, the presence of mass; in the case of magnetism, a current flowing through a wire, or an existing magnetized metallic object. Sheldrake argues that similarly a morphic field is generated by the presence of an organically structured physical form. To make this argument, he introduces the idea of a "morphogenetic germ." A morphogenetic "germ" is an "already organized system" which then "becomes surrounded by a particular morphogenetic field because of its characteristic form" (p. 97).

The natural objection that arises is that since organized living systems are said, in effect, to be caused by morphic fields, and morphic fields are now said to originate as a result of the existence of "already organized" living systems (serving as "germs"), we have been led into a circular causality. Sheldrake cannot avoid this issue by proposing that morphic fields for every possible form in the universe exist prior to their physical embodiments, because this would be to adopt an essentially Platonic view. If Sheldrake were to admit to a

Teilhardian radial energy, then the emergence of the first organized form would be accounted for; but then there would be no need for adding his secondary level, the realm of morphic fields.

Sheldrake dismisses this issue by saying that his theory does not address the question of origins. That, he says, is a metaphysical question that goes beyond science (p. 237). This is a faulty argument, because the question is not about ultimate origins, but rather about causality. In his effort to make morphic fields analogous to gravitic and electromagnetic fields, he needs some originative agent. The only thing that might be appealed to for giving rise to a morphogenetic field is a developing organism itself. But it cannot be a developing organism without a morphogenetic field. The circularity here is a logical flaw, not something to be cast off as a metaphysical question.

This difficulty is brought into sharp focus by the factor of teleology. A morphogenetic field must "contain" the "virtual form of the final system": It must bear within it the teleological directionality that is the mark of organic being. Whence, we must ask, is the newly generated morphogenetic field to receive this telic impulse? It can only be derived from the originating agent, i.e. a pre-existing organized system that may serve as the "germ." But if the pre-existing system already is possessed of the telic impulse, there is no need for a morphogenetic field to explain its developmental characteristics. If it is not, then the morphogenetic field to which it gives rise cannot possess the "virtual form" and so is a useless superfluity.

What we are encountering here is a simply unacceptable degree of conceptual confusion. It compounds itself as Sheldrake proceeds to modify the character of morphic fields to match whatever is needed. Among the many cases where he makes such adjustments is this: "If a system were associated with a different morphogenetic field, it would develop differently" (p. 94). This is an empty tautology, whose implied reverse highlights the emptiness, e.g., *if a system develops differently, it is associated with a different morphogenetic field.* On the surface this may appear informative, but upon reflection one realizes that no matter what variations in organic development may occur, the morphic fields in their parallelism will be modified accordingly; and this without end, because at the level of empirical investigation, organic existence is *not* a matter of mathematical precision, and the concept of *form* is itself not absolute but dependent on context.[8]

In pursuing this course, Sheldrake has to give morphic fields puzzling and contradictory properties. On one hand he continually uses spatial terminology to describe them: They "contain" the virtual form; they "surround" and "embed" the physical form; they have *sizes* and are capable of changing their sizes to match the sizes of one or another physical system. On the other hand, with respect to their causal efficacy (by formative causation), they are essen-

tially "information," in which case it would seem that they might have no size, or at least would not have to match the sizes of their physical counterparts.

On yet another account, they are "probability structures" (p. 105). Furthermore, they must *vibrate*, because the way in which past morphic fields attach themselves to present or future physical systems (in order to engineer "collective memory") is through their resonance with the vibratory characteristics of the systems they control. Aside from the peculiar question as to how a "probability structure" might come to vibrate, there is also the question of how a present system can develop a form sufficiently similar to the form of a past system without having its own *present* morphic field, obviating the necessity for attracting a past morphic field by means of resonance. Here the chicken-and-egg problem of circular causality reasserts itself.

Thus the picture is that "probability structures," carrying information and containing "virtual forms," have sizes, change sizes as required, occupy space, cause causes, travel through time, and vibrate in resonance with vibrating physical systems. Moreover, their origin is a logical impossibility because they are engendered by the things they engender.

Now this conceptual morass testifies, in my opinion, to the likelihood that because the general idea of controlling fields in mysterious regions of space has such a mesmerizing effect, these issues are simply set aside. Instead, Sheldrake takes up the major part of his text by redescribing known systems with an overlay of his hypothetical construction. This move becomes extremely elaborate and does not constitute any sort of proof of the existence of morphic fields. Nevertheless, the phenomena of morphogenesis do lend themselves to his descriptions in terms of fields, which gives these redescriptions an aura of significance.

One reason for this is that the concept of *field* is at once unclear and ambiguous. One application of the term which does not postulate the existence of a spatiotemporal modification such as that of a gravitational field, is in a phrase such as "field phenomenon" as applied to any system which is not susceptible to description in terms solely of the operation of its individual parts. An ecosystem, for example, is appropriately described as a field phenomenon.

The basic meaning of the term *field* is that it refers to a region whose boundaries are characterized by some common structures or activities, e.g., a playing-field or a field of wheat. In the case of a "field phenomenon," the reference is to a region of forms and activities that demands a transactional rather than an interactional description. By a transaction is meant the sort of relation a buyer has to a seller, or a yucca-moth to a yucca flower: Neither can be fully described without describing the other.[9]

Such a transactional system of functional relationships, or a *field*, exists in its own right and calls for a field-specific description. There is no warrant for

proposing that this kind of activity requires an additional factor, a "field" like a gravitational field, to account for its existence. Sheldrake notes in his text that biologist Waddington understood the concept of a morphogenetic field as "essentially a descriptive convenience" (p. 69). But Sheldrake evidently feels that he must establish an external cause for the relational characteristics of a system on the grounds that such a system cannot exist on its own. Sheldrake reveals this tendency when he complains that an approach like Waddington's does not "explain" morphogenesis. Sheldrake appears to identify explanation with some sort of mechanistic causal account, so he supplies morphic fields as causes.

The postulation of a morphic field which is a separate physical entity from that of the transactional system proper has another role to play in Sheldrake's theory. The morphic field is the means by which Sheldrake believes he can account for habit, or the procreation and behavior of similar forms throughout time. He needs something that "contains" the form of a given system but can separate itself from the original system in order to transit time and space and associate itself with a future system. For example, he proposes as evidence for the existence of morphic fields a number of cases where some new form proliferates over time in ways that would be explained, perhaps, if there were morphic fields. However, since the very concept of morphic fields is ad hoc and conceptually faulty, it must be discarded as an explanation. That may leave the question of proliferation of similar forms simply unexplained, as part of a larger problem, which I shall discuss briefly below.

The Deep Problem

What Sheldrake is really wrestling with, unsuccessfully in my opinion, is the deep problem of *the nature of time*, particularly as time is experienced through the existence of memory. Another formulation of this problem is that it is the problem of what accounts for continuity of consciousness, or by extension the continuity of organic life over time. It is a problem that was important for Kant in his *Critique of Pure Reason* and which, with respect to human consciousness, prompted Kant's theory of the "synthesis of reproduction in imagination."[10] However, the problem extends beyond the sphere addressed by Kant to include biological continuity as well. Sheldrake's theory is, at its center, a response to this issue, although in my view it fails for reasons I have outlined above and for other significant problems I have not taken up in detail.[11]

It is with respect to this deep problem that Sheldrake's account stands out as having some features of a mechanistic explanation, and some features of a vitalistic one. His account is a mechanistic one because what he is looking for is some mechanism to *cause* organic behavior, and has proposed morphic fields acting through "formative causation" as this mechanism. Regarding this

particular aspect, Sheldrake's hypothesis is strikingly analogous to Aristotle's view regarding the existence of motion in the universe.[12]

Everything that moves, Aristotle reasons, must be moved by something else. But there cannot be an infinite regress of movers. Therefore, there is a first, unmoved mover that is the cause of all motion in the universe. Similarly, Sheldrake requires an exterior cause for the continuity of development in organic life. Such life cannot, apparently, manage to develop, adapt, and procreate over time on its own, so there must be a kind of "unmoved mover" in the form of the morphic field that causes this behavior. The analogy with Aristotle's view is very close. Because the unmoved mover does not move, its only possible action is thought, or "perfect contemplation." This would be analogous to the "information" present within a morphic field, which affects movement in a developing system without actually engaging in energetic causality. "Formative causation" is a kind of conceptual causality like the thinking of the unmoved mover. Echoing the question of how an unmoved mover can move anything, Sheldrake has the problem of how formative causation can translate into energetic causation, or how the plan of a house can "cause" a house.

What we have entered here is the realm of metaphysics. As such, Sheldrake's hypothesis also has some characteristics of vitalism, because an unmoved mover (a nonenergetic cause) cannot be detected in the physical universe and it affects matter in a mysterious way from a realm of pure contemplation, i.e. it exists in a secondary reality whose connection with the empirical world is inexplicable, just as the connection between some *elan vital* or "ghost in the machine" and living beings is forever a mystery. To some, in fact, Sheldrake's view "affirms the profoundly vitalistic idea that nature develops in harmony with invisible, immaterial, but powerful forces."[13]

There is also a similarity, or resonance (if I may use the term), between Sheldrake's ideas and the notion of sympathetic magic. One might consider "conceptual causality" as a power of thought to move objects or achieve results in the physical realm without resorting to energetic causality. Thus, Uri Geller bends spoons apparently by thinking about bending them. Or voodoo, where whatever is done to a doll made to be similar to a person will affect the person in reality because of the analogous relationship between the doll and the person.

The closeness of Sheldrake's edifice to metaphysical theories may account for its high degree of fascination that seems to overwhelm recognition of the underlying conceptual problems. It is worth pointing out in this connection that Sheldrake appeals to an elaborate architectonic, which he attributes to organismic theory with connections to A. N. Whitehead and Arthur Koestler, that describes a hierarchical developmental process that is actually a form of certain widespread metaphysical architectures found in Eastern and esoteric thought.

For example, the system of chakras and the development of enlightened consciousness through the progression of Kundalini (a type of energy) in sequence from the root chakra to the crown chakra is based on essentially the same architectural scheme. Development occurs through a series of stages. Each successive stage is integrated with the previous ones by means of analogy of form (the chakras are represented as unfolding flowers having an increasing number of petals), and yet each chakra represents a functional component of a whole system of consciousness. The chakras themselves, like morphic fields, are invisible to ordinary (nonspiritual) vision. And like morphic fields, they are sometimes given a physicalistic description by claiming they are made up of "very fine atoms" too fine to be seen, but by means of which one chakra can "interpenetrate" another.[14]

Thus the borderline between Sheldrake's effort and metaphysical theories appears very thin. Sheldrake has in fact mounted a heroic effort to bring these essentially metaphysical and vitalistic ideas into the realm of physics. Some may think it unfortunate that he appears to have failed. Others may, on seeing this failure, realize that perhaps the phenomena of life and consciousness do not need exterior support for their existence, but are rather features of a living universe that simply have to stand on their own and be dealt with at their own unique level of description.

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Notes

[1] The term *organicism* in biological theory is generally attributed to biologist William E. Ritter in 1919.

[2] "The Ghost in the Machine" as Gilbert Ryle called it in *The Concept of Mind* (Barnes & Noble, 1949).

[3] Teilhard, Pierre de Chardin (1969), *The Phenomenon of Man*, Harper Torchbooks, pp. 35–36, 57n., 60.

[4] Sinnott, Edmund W. (1955), *Biology of the Spirit*, Compass Books, p. 84.

[5] Aristotle, *De Anima*, Book II, Chapter I.

[6] The concepts of functional complementarity, complexity, teleology, and interiority, in this context, are all aspects of the idea of organic being.

[7] Teilhard, in contrast, places gravitation on a continuum of development with biological and psychological emergence. Cf. Teilhard, Pierre, *Activation of Energy*, Harcourt Brace Jovanovich, 1971, p. 168. Originally published in 1963.

[8] Cf. Stephen Braude, "Radical Provincialism in the Life Sciences: A Review of Sheldrake's *A New Science of Life*," *The Journal of the American Society for Psychical Research 77*, January 1983.

[9] Cf. J. Dewey & A. Bentley (1960), *Knowing and the Known*, Beacon Press, pp. 69, 73, 89, etc.
[10] Cf. R. P. Wolff (1973), *Kant's Theory of Mental Activity*, Peter Smith Publisher, p. 119. Original copyright 1963.
[11] See Braude, op. cit., for a detailed analysis of other problems with Sheldrake's theory.
[12] Aristotle, *Metaphysics*, 12.7, 12.8.
[13] Cf. http://www.bookrags.com/vitalism
[14] Cf. my paper on this topic, "Models of Development in Esoteric and Western Thought: A Summary," at http://www.stanmcdaniel.com/pubs/development/development.html

Article of Interest

"Why AI Is a Dangerous Dream," Opinion, Interview with Noel Sharkey by Nic Fleming. *New Scientist* 2723, 01 September 2009. http://www.newscientist.com/article/mg20327231.100-why-ai-is-a-dangerous-dream.html

Back in 1972, philosopher Hubert Dreyfus made a detailed and, to some, devastating critique of the possibility of duplicating human consciousness by means of computer hardware and software. Among artificial intelligence (AI) enthusiasts, however, Dreyfus's arguments fell on deaf ears. It is a matter of considerable interest, then, that the cause against treating human beings as machines has been taken up after 37 years by no less a personage than a professor of artificial intelligence and robotics at the University of Sheffield in the United Kingdom.

Dr. Noel Sharkey, a Doctor of Science who also has a Ph.D. in psychology and has held positions at Yale, Stanford, and Berkeley, has changed his position from being a "believer" in AI to that of holding that the developments in the field to date indicate that "intelligence in the animal sense" is not even theoretically possible for machines.

In this provocative interview, Dr. Sharkey answers a number of questions put to him by the interviewer, Nic Fleming, regarding his change of position. Of particular interest is his modification of Marvin Minsky's definition of AI ("the science of making machines do things that would require intelligence if done by humans") to a weaker form. According to Sharkey, AI should now be thought of as "the science of making machines do things that lead us to believe they are intelligent." But such a machine, Sharkey believes, would never be a conscious intelligent being, or one that possesses sentience and self-awareness.

Of course, in a brief interview Sharkey's negative appraisal of the possibility of a truly sentient artificial entity does not receive an in-depth representation. However, two arguments emerge that are deserving of attention considering his

intimate knowledge of the field and his academic and professional qualifications. His first point is that despite continuing research "there is just no evidence of an artificial toehold in sentience." He points out that "the idea of mind or brain as computational is merely an assumption, not a truth."

Rather than an assumption, perhaps one might call it a hypothesis. Sharkey's position is then that the hypothesis has not shown itself to be viable. One might point out, although Sharkey does not, that even should the brain be shown to be entirely reducible to a form of computer hardware, this would not necessarily impact the nature of mind, since the relation between mind and brain still remains an open question. Very strong arguments have recently put forth challenging the assumption of mind–brain identity (e.g., W. T. Rockwell, *Neither Brain nor Ghost*, MIT Press, 2007, and A. Noe, *Out of Our Heads*, Hill and Wang, 2009).

Almost as interesting as Sharkey's views in this interview are the comments by readers. Sharkey makes the point that when he challenges the assumptions behind AI, he finds that the arguments of "believers" approach the level of a kind of religious fanaticism. His point is borne out by the arguments of many of the commenters, who simply want to trash Sharkey's views as absurd, insane, or at best sadly misguided.

The major thrust of this interview, however, is Sharkey's concerns regarding possible serious repercussions should there develop a proliferation of robotic imitations of sentient servants, whether in civilian life ("helper" robots for the elderly, etc.) or military (robotic soldiers and weapons). Sharkey believes there are indeed dangers facing humanity if we move toward "a world in which wars, policing, and care of the vulnerable are carried out by technological artifacts that have no possibility of empathy, compassion or understanding."

For this reason, Sharkey is calling for ethical guidelines and laws to govern the use of robots. His is certainly not a voice in the wilderness. There have been other calls for exploration of ethical problems that are reasonably anticipated as computer-controlled servomechanisms become more and more present in the human environment. Among the responses to this issue have developed speculations by AI enthusiasts that "ethical robots" would solve the problem. One writer, James Gips of the computer science department at Boston College, has enthusiastically said: "It is exciting to contemplate ethical robots and automated ethical reasoning systems" (http://www.cs.bc.edu/~gips/EthicalRobot.pdf). To this writer, nothing could be more chilling and nothing could better justify Sharkey's deep concerns.

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