

Consciousness -- What Is It?

L. Dossey¹, B. Greyson², P.A. Sturrock³, and J. B. Tucker⁴

¹Explore, Santa Fe, NM 87501

²University of Virginia Health System, Division of Perceptual Studies, Charlottesville,
VA 22902

³Center for Space Science and Astrophysics, Stanford University, Stanford, CA 94305

⁴University of Virginia Health System, Division of Perceptual Studies, Charlottesville,
VA 22902

Abstract

Conventionally, there is a tendency to view consciousness as simply a property or activity of the brain. One can explain a lot about consciousness in this way – but not everything. In this article, we draw attention to certain aspects of consciousness that resist the conventional interpretation including, in particular, out-of-body experiences, past-life memories, the apparent linked consciousnesses of twins, and healing at a distance.

KEY WORDS: consciousness, shared consciousness, twins, dissociation, near death experiences

1. INTRODUCTION

Oscar Wilde began a mini-essay with the words “Ah! Meredith! Who can define him?” (Wilde, 1889) Perhaps we should begin this essay with “Ah! Consciousness! Who can define it?” However, before discussing consciousness, it may be helpful to distinguish two different types of science.

What we might call “Type I” science is a “forward” or “deductive” process, in which we begin with agreed concepts and an established base of knowledge such as physical laws, and explore the consequences. The bulk of “everyday science” seems to fall into this category.

What we might call “Type II” science is a “reverse” or “inductive” process in which, beginning with a phenomenon that is not understood and handicapped by the absence of useful concepts, we attempt to establish appropriate concepts and then derive the principles governing the phenomenon. Major paradigm shifts such as quantum mechanics belong in this category.

In discussing a complex problem such as consciousness, it makes a huge difference which scientific approach one adopts. Following the pattern of Type I science, it is natural to begin with the brain and to examine the possibility that consciousness can be fully understood as a brain activity. This approach is by no means straightforward, and raises challenging problems. If you had terminal health problems, a future surgeon might be able to remove your brain and implant it in the healthy body of some young person who had just been killed. Then we would suppose that, when you wake up from the operation, you recognize your own mind with its memories and peculiarities, and are happy to see that you now have a handsome, strong, and healthy young body.

But now let us fast-forward one hundred thousand years, when computers can read everything in your brain, and use that information to program another brain to have precisely the same informational structure and content as your original brain. Now, when you wake up from that operation, where are you? If you are in one body, which is it? Or can you be in both bodies at the same time? We see that there may be conceptual problems with the consciousness-is-brain-activity hypothesis.

However, to return to our main theme—the nature of consciousness, it is important to note that we do not test a hypothesis by looking for more and more facts that are in agreement with that hypothesis. On the contrary, we test a hypothesis by carefully searching for facts that are incompatible with that hypothesis. If no such facts come to light, the case for the hypothesis is greatly strengthened. If such facts do come to light, the hypothesis must be abandoned or at least modified.

The purpose of this article is to highlight four phenomena that appear to be incompatible with the consciousness-is-brain-activity hypothesis. One of these

comprises “out-of-body” experiences (OBEs), in which a person reports being separated from his or her body and acquiring information that it would have been impossible for the person to obtain by normal means. This topic is discussed in Section 2. A second topic is reincarnation, indicated by evidence that a child remembers a previous life, when careful investigation finds correspondences between the child’s memories and facts concerning the “previous personality.” This topic is discussed in Section 3. We discuss evidence for interactions between consciousnesses in Section 4, healing at a distance in Section 5, and offer some concluding thoughts in Section 6.

2. OUT-OF-BODY EXPERIENCES

In out-of-body experiences (OBEs), a person’s consciousness is experienced as having separated from the body. A tentative estimate is that at least 10% of the 5/26 general population have experienced one or more OBEs (Alvarado, 2000, pp. 184– 186). Models of consciousness that link it inextricably with the brain have included neural mechanisms to account for the experience of being out of the body and perceiving events as if from a different location. Sometimes these proposed mechanisms have been taken to imply that out-of-body experiences are nothing more than hallucinations or illusions produced by altered brain physiology (Churchland, 1986; Crick, 1994; Pinker, 1997).

For example, Joseph (1999, 2001, 2009) has written extensively about the role of hyperactivation of the amygdala, hippocampus, and inferior temporal lobe in splitting consciousness from the body under traumatic circumstances. However, Joseph prudently acknowledged that these neuroanatomical data are ambiguous with regard to whether altered brain physiology causes out-of-body sensations that are merely hallucinatory or, alternatively, whether it enables the mind truly to separate from the body, permitting accurate out-of-body perceptions that accord with external reality (Joseph, 2001, p. 132). If out-of-body perceptions are merely hallucinatory, then the neurophysiological findings elaborated by Joseph and others may provide sufficient explanation. Even if out-of-body perceptions are not hallucinatory, but are in fact veridical representations of external reality beyond the reach of the senses, these neurophysiological models may still contribute significantly to our understand of the phenomenon. But in the latter case, they do not provide sufficient explanation without some further explication of the mind- body relationship (Kelly et al., 2007).

Many out-of-body perceptions are entirely subjective, providing no evidence that the person actually separated from the body, rather than simply imagined separating. However, in other cases experiencers report that, while out of the body, they became aware of events either occurring at a distance or that in some other way would have been beyond the reach of their ordinary senses. Some of these accurate perceptions included unexpected or unlikely details, such as a woman in childbirth who reported being out of her body and seeing her mother, a non-smoker, smoking a cigarette in the waiting room (Cook, Greyson, & Stevenson, 1998, p. 391). Notably, Ring and Cooper (1999) reported 31 cases of blind individuals (nearly half of them blind from birth) who experienced during their OBEs quasi-visual and sometimes veridical perceptions of objects and events.

A frequent criticism of these reports of perceptions of events at a distance from the body is that they often depend on the experiencer's testimony alone. The paucity of corroborating testimony in many cases has encouraged commentators to dismiss such reports as anecdotal. However, some cases have been corroborated by others (e.g., Clark, 1984; Hart, 1954; Ring & Lawrence, 1993). Van Lommel et al. (2001, p. 2041), for example, reported a case in which a cardiac arrest victim was brought into the hospital comatose and cyanotic, and even after restoration of his circulation he remained in a coma and on artificial respiration in the intensive care unit for more than a week. When he regained consciousness and was transferred back to the cardiac care unit, he immediately recognized one of the nurses, saying that this was the person who had removed his dentures during the resuscitation procedures. He said further that he had watched from above the attempts of hospital staff to resuscitate him in the emergency room, and he described "correctly and in detail" the room and the people working on him, including the cart in which the nurse had put his dentures. The nurse corroborated and verified his account. Cook, Greyson, & Stevenson (1998, pp. 399–400) reported a case of this type in which a patient undergoing open-heart surgery described leaving his body and watching the cardiac surgeon "flapping his arms as if trying to fly." The surgeon verified this detail by explaining that after "scrubbing in", and to keep his hands from possibly becoming contaminated, he had flattened his hands against his chest, while rapidly giving instructions to the surgical interns by pointing with his elbows.

A dramatic OBE from the 19th century involved Mr. Wilmot and his sister Eliza who were traveling by ship from Liverpool, England, to New York in a severe storm (Sidgwick, 1891, pp. 41-46). More than a week after the storm began, Mr. Wilmot's

wife in Connecticut, worried about the safety of her husband, had an experience while she was awake during the middle of the night, in which she seemed to go to her husband's stateroom on the ship, where she saw him asleep in the lower berth and noticed another man in the upper berth looking at her. She hesitated, kissed her husband, and left. The next morning, Mr. Wilmot's roommate asked him somewhat indignantly about the woman who had come into their room during the night. Eliza Wilmot corroborated this story, saying that the next morning, before she had seen her brother, his roommate asked her if she had been in to see Mr. Wilmot during the night, and when she replied no, he said that he had seen a woman come into their room in the middle of the night and kiss Mr. Wilmot.

Of course, not all OBEs are veridical in nature, and most provide no evidence of anything more than a subjective experience. Nonetheless, some OBE reports are corroborated by independent observers; the Wilmot case is not unique (see, e.g., Cook, Greyson, & Stevenson, 1998; Kelly, Greyson, & Stevenson, 1999–2000). Hart (1954) analyzed 288 published OBE cases in which persons reported perceiving events that they could not have perceived in the ordinary way. In 99 of these cases the events perceived were verified as having occurred, and the experience had been reported to someone else before that verification occurred. A type of OBE that particularly strains models that link consciousness inextricably to the brain involves “reciprocal apparitions,” again exemplified by the Wilmot case. In such cases, while one person is having an OBE, or having a dream in which he or she seems to go to a distant location, a person at that location, unaware of the first person's experience, sees an apparition of that person. Hart (1954) summarized 30 such cases that had been published up to that time (see also Hart & Hart, 1933). In one unpublished case from the University of Virginia collection, a nurse became friends with a quadriplegic man who required several hospitalizations for pneumonia and other complications. During one of these hospitalizations, the nurse, feeling guilty that she had not recently visited this patient, had a dream in which she seemed to go to him in the hospital, stood at the end of his bed, and told him to keep fighting.

Shortly afterward, the patient's sister told this nurse that he had reported seeing her standing at the foot of his bed, telling him to keep fighting.

A few individuals may have OBEs repeatedly or voluntarily, making them potentially amenable to observation under controlled conditions. Tart (1968) studied a woman who was able, while monitored by EEG in the laboratory, to have an OBE in which

she read a five-digit number that was randomly selected and placed as a target on a shelf out of range of her normal sight. In another experiment, a person who could induce OBEs at will attempted during randomly selected periods to go to a specified location during an OBE and influence a variety of detectors located there, including his pet kitten, which showed significantly less movement and less vocalizing during the OBE periods than during the control periods (Morris, et al., 1978). Osis and McCormick (1980) tasked another person who claimed to induce OBEs at will to view a randomly-generated target that appeared as an illusion visible only from one particular point in space. Unbeknownst to the subject, a strain gauge sensor was situated at that location. The strain gauge activation was significantly higher during hits than during misses. These experiments, as well as the spontaneous reciprocal apparitions described above, suggest that veridical OBE perception may be objectively real, implying that some aspect of consciousness can under certain circumstances separate from the physical body.

3. REINCARNATION - CHILDREN'S REPORTS OF PAST-LIFE MEMORIES

Children's reports of memories of previous lives have been the subject of systematic study for the last fifty years (Stevenson, 2001). Beginning with Stevenson, a number of researchers have now collected over 2,500 cases. Though easiest to find in cultures with a general belief in reincarnation, cases have been identified all over the world, including in the U.S. (Tucker, 2005) and in Western Europe (Stevenson, 2003). The strongest cases have included statements that have been verified to 9/26 accurately describe the life of one particular deceased individual. The following is one example.

The Case of Kumkum Verma. Stevenson (1975) reported the case of Kumkum Verma, a girl in India who began talking about a previous life when she was three years old. She said she had lived in a place called Darbhanga, a city of 200,000 people 25 miles from her village. She described a life as a woman there and named the section of the city where she said she had lived, a commercial district of artisans and craftsmen. She gave numerous details, and her aunt made notes of some of Kumkum's statements six months before any attempt was made to verify them. Though some of the notes were lost, Stevenson obtained a partial list and had it translated into English. It revealed 18 statements from Kumkum, all of which matched the life of a blacksmith's wife who died in Darbhanga five years before Kumkum was born. These included the name of the city section, her son's name and the fact that he worked with a hammer, her grandson's name, the name of the town where her father lived, the location of his home

near mango orchards, and the presence of a pond at her house. Also included were personal details that were accurate for the deceased woman, with Kumkum saying she had an iron safe at her house, a sword hanging near her cot, and a snake near the safe to which she fed milk.

Kumkum's family noted that she used some unusual expressions and spoke with an accent, both of which they associated with the lower classes of Darbhanga. Kumkum appeared to have had no access to the information about the woman through normal means. By all accounts, the two families involved had been completely unknown to each other and were separated not only by distance but also by social class, as Kumkum's father was an educated landowner.

The children in these cases generally begin talking about a previous life at an early age, with the average being 35 months. They usually stop by the age of six or seven. They typically start their past-life talk spontaneously with no urging from their parents. Indeed, parents often try to get the children to stop talking about a past life, even in places with a general belief in reincarnation. The children usually describe recent, ordinary lives, with the one exceptional aspect of the life frequently being the death, as many of the previous individuals died at an early age and 70% died by unnatural means. Some children say they were deceased family members, but others report being strangers at other locations as Kumkum did. Almost all describe a previous life in the country in which they live, though some report being soldiers of another nationality who were killed in the child's home country during a war. This includes 24 Burmese children who said they had been Japanese soldiers killed in Burma during World War II, a claim parents would have been most unlikely to encourage given how despised the Japanese Army was there (Stevenson & Keil, 2005).

Along with their statements, many of the children show behaviors that appear associated with their apparent memories. They often show strong emotions about the previous life and also emotions appropriate for the relationship the previous person had with different individuals, being deferential toward the previous husband, for instance, but bossy toward the previous person's younger siblings. Other behaviors include phobias, with the children showing intense fears related to the mode of death in 35% of the unnatural death cases (Tucker, 2005). Many of the children also show themes in their play that appear connected to their apparent memories. This most often involves acting out the occupation of the previous person, with some children engaging compulsively in such play for hours on end.

It is significant to note that a number of the children had birthmarks or birth defects that matched wounds—usually the fatal wounds—on the bodies of the previous individuals. Stevenson (1997) published a collection of 225 such cases that included a variety of dramatic or unusual defects. These included stubs for the fingers of only one hand—when the previous person had lost the fingers of one hand in a fodder chopping machine—and an underdeveloped side of the face of one child with only an accompanying stump for an ear—when the previous person had been shot in the side of the head at close range. Stevenson listed 18 cases in which children had double birthmarks, corresponding to both the entrance and exit wounds suffered by gunshot victims.

Such marks are reminiscent of work in other areas demonstrating that mental images can produce specific somatic effects in at least some individuals, such as hypnotized subjects who develop blisters after being told they are being burned by a hot object (Gauld, 1992). The birthmarks and birth defects are consistent with a process in which the consciousness of the previous individual, containing the final mental images from the previous life, affects the development of the fetus and produces defects similar to the wounds that individual had suffered. In sum, the children appear to possess memories, emotions, and mental images that previously belonged to a deceased individual. Though the mechanism that might enable their transfer to a new body remains to be understood, the cases provide evidence for the persistence of consciousness after death.

4. LINKED CONSCIOUSNESS IN TWINS

Another area that provides evidence that consciousness is not confined to the brain involves cases of twins who appear to share a non-physical connection. This phenomenon is most thoroughly described in Playfair (2008). Some examples follow.

A student at Stony Brook University awoke out of a deep sleep at 6 a.m. and cried out that her twin sister was in trouble. She told her roommate and soon called her mother. She learned that at the time she woke up, a bomb had exploded outside her sister's apartment in Arizona, shattering her window and leading her and her husband to rush out of the building (Playfair, 2008, p. 60).

A young girl was with her mother in the kitchen of their house when she suddenly said, "Hurry, Elizabeth has fallen off Jack's bicycle and hurt her knee!" Her mother

followed her as she ran out of the house and down the road, where they found her twin sister still lying on the ground where she had fallen (Gaddis & Gaddis, 1972, pp. 99-100).

A set of twins, a physician and a London banker, reported that as teenagers, one of them was walking down a road when she felt threatened by a car that kept turning around and approaching her. The girl became panicked and started to run. She imagined her sister and thought, "Alison, if there's anything you can do, tell Dad to come quick!" Alison, at home studying in the room the two girls shared, suddenly felt as if her sister was there. She reported experiencing "a feeling of real panic— like 'Get Dad! Get Dad!' I suddenly knew there was something wrong with Aily" (Playfair, 2008, p. 53).

The connections at times appear to manifest somatically rather than mentally. The girls in the last example seemed to share pain at times. One tripped in a pothole during a run and sprained her ankle. At that moment, her sister experienced a sudden burning sensation that started in her feet and then spread over her body. Another time, one of them was in bed when she experienced pain in her nose so severe she got up and took a painkiller. At the same time sixty miles away, her sister was in a pool when another swimmer shot up from the bottom and hit her in the face, breaking her nose (Playfair, 2008, pp. 53-54).

In another case, a woman who had moved to Japan phoned her twin and asked her to send some bras because her breasts had become tender and swollen. Later that day, her symptoms led her to wonder if her sister was pregnant, and by the time they spoke again later that week, her sister could confirm that indeed she was (Playfair, 2008, pp. 51-52).

Such reports are not rare. In a survey in which 600 twins or parents of twins completed questionnaires, 183 reported either experiences that might be explained 13/26 by reading each other's minds or instances of being surprised by having the same illness or pain simultaneously (Rosambeau, 1987). Such connections can appear evident at a very early age. One example involved 3 day-old twins, where one began shrieking and shaking as his brother was face down in pillows and turning blue, the child's screams saving his brother's life (Playfair, 2008, pp. 44-45).

It may not be surprising then that apparent connections can occur in twins separated in infancy. The Minnesota Study of Twins Reared Apart involved 135 pairs, including the “Jim twins” (Segal, 1999, pp. 116-118). Reared by different adoptive families in Ohio and reunited at age 39, they were both named Jim and had been married twice, first to a woman named Linda and then to a woman named Betty. They had sons with the same name (though different spellings): James Alan and James Allan. As children, they each had a dog named Toy. They had taken family vacations to the same three-block strip of Florida beach (without ever meeting), both arriving in light blue Chevrolets. Both worked part-time as sheriffs, and they consumed the same brand of cigarettes and the same brand of beer.

Since such similarities can hardly be ascribed to genetics, one might be inclined to blame simple coincidence. That explanation becomes more strained when considering the American twins who, reunited at age 25 after being raised in dissimilar environments, discovered they both used the same rare Swedish toothpaste (Segal, 1999, p. 119). Such cases suggest a persistent non-physical linkage in some twins, even those who are reared apart from each other.

5. CONNECTIONS BETWEEN CONSCIOUSNESSES, AND HEALING AT A DISTANCE

In Section 2 and 3, we have presented evidence suggesting that consciousness has an existence independent of the body—and therefore independent of the brain. But what properties could one or should one assign to that consciousness other than the fact that it is in some way related to, or perhaps comprises, someone’s “personality” or “essential identity”? In particular, can there be a linkage between the consciousnesses of two different individuals?

This leads one to the consideration of evidence concerning “ESP” or “extra-sensory perception,” for which there is voluminous experimental evidence. [See, for instance, Bem (2011), Jahn and Dunne (1987), Radin (1997).] It also leads to another important and relevant area of current research—that of anomalous healing, such as healing brought about by the unknown influence of a healer on a healee who may be in a remote location. According to the conventional view that human consciousness is simply an activity or property of the brain, such healing is impossible. Yet there is abundant evidence that it does in fact occur. In recent years, many researchers have undertaken clinical and laboratory studies designed to answer two fundamental

questions: (1) Do the compassionate healing intentions of humans affect biological functions in remote individuals who may be unaware of these efforts? And (2) can these effects be demonstrated in nonhuman processes, such as microbial growth, specific biochemical reactions, or the function of inanimate objects?

The first question is extraordinarily difficult to study (Schwartz and Dossey, 2010). There are studies which demonstrate significant effects of distant healing in cardiopulmonary (Byrd, 1988) and AIDS (Sicher, et.al., 1998) patients, for example. But the methodological and ethical challenges involved in studying healing effects on humans at a distance are formidable. For instance, in distant healing prayer studies, can it be assumed that the “not prayed for group” really did not receive any prayer or healing thoughts from either themselves or their loved ones?

The second question, whether healing can affect non-human processes, is far easier to address. The pioneering work of Bernard Grad at McGill University set the standards for systematic laboratory work on healing. Most notably, Grad studied the effects of healers on wound healing in mice and the growth rates of “shocked” plants (Grad, 1965). In both areas Grad found that wounded mice healed 15/26 significantly faster after having been treated by a healer, and shocked plants similarly had higher germination and faster growth rates. In more recent times, Bengston and Krinsley (2000) have found that inexperienced skeptical volunteers acting as healers can produce full cures in mice infected with a normally fatal dosage of mammary adenocarcinoma. Subsequent mouse studies using the same mammary adenocarcinoma model also indicated a curious “resonant bonding” between experimental and control mice, so that healing intention directed towards the treated experimental animals somehow also affects the untreated control animals (Bengston and Moga, 2007). It is interesting that these experiments on laboratory mice seem to produce patterns that mimic placebo responses in human studies.

What has been accomplished? In 2003, Jonas and Crawford (2003) found "over 2,200 published reports...and other writings on spiritual healing, energy medicine, and mental intention effects. This included 122 laboratory studies, 80 randomized controlled trials, 128 summaries or reviews, 95 reports of observational studies and nonrandomized trials, [and] 271 descriptive studies, case reports, and surveys...."

How significant are these clinical and laboratory studies? Using the strict CONSORT (Consolidated Standards of Reporting Trials; CONSORT 2010) criteria, Jonas and

Crawford gave an A grade to studies involving the effects of intentions on inanimate objects such as sophisticated random number generators. They also gave a high grade (B) to intercessory prayer studies involving humans, and to similar laboratory experiments involving nonhumans such as plants, cells, and animals. In order to relate this phenomenon to brain activity, one would perhaps need to hypothesize some form of radiation that emanates from the brain and somehow influences the healee. However, if this approach proves not to be fruitful, one could regard this as another phenomenon that, along with OBE's and reincarnation, needs a fundamentally different type of explanation. Recently, for example, Hendricks, Bengston, and Gunkelman (2010) demonstrated interpersonal EEG coupling 16/26 between healer and subject pairs. The healer's EEG data showed harmonic frequency coupling across the spectrum, followed first by between-individual EEG frequency entrainment effects, and then by instantaneous EEG phase locking. The healer produced a pattern of harmonics consistent with Schumann's resonances, with an entrainment of the subject's EEG by the healer's resonance standing waves, and with eventual phase coupling between the healer and healee. The authors speculate that healing may involve a Schumann-resonance-type standing electric field as a connectivity mechanism (Hendricks, Bengston, & Gunkelman, 2010).

6. DISCUSSION

If consciousness is not simply a brain activity, what might it be? One approach is to modify the "brain" concept, and to hypothesize that consciousness is the activity of some other entity. For this purpose, we could reactivate (one might say "resuscitate") the dated and little-used term "soul." We might then suppose that it is the soul that leaves the body and rises in the operating room to view the body from above. We might also suppose that the soul leaves the body of someone who dies, to later reenter a new person who is about to be born. But these may prove to be overly simplistic concepts: just as computing may be carried out either in a desktop computer or in the "cloud", so it may prove that the consciousness associated with one person is intrinsically inseparable from consciousnesses related to additional—perhaps many other—persons.

It is important to keep in mind the extraordinary tentativeness of almost anything that can be said about the nature of consciousness. According to John Maddox (then editor of *Nature*), "What consciousness consists of...is...a puzzle. Despite the marvelous successes of neuroscience in the past century..., we seem as far from understanding

cognitive process as we were a century ago.” (Maddox, 1999.) The philosopher Jerry A. Fodor expressed a similar opinion, saying, “Nobody has the slightest idea how anything material could be conscious. Nobody even knows what it would be like to have the slightest idea about how anything material 17/26 could be conscious. So much for the philosophy of consciousness.”(Fodor, 1992) In a similar vein, Stuart Kauffman, the theoretical biologist and complex systems theorist, wrote “Nobody has the faintest idea what consciousness is.... I don’t have any idea. Nor does anybody else, including the philosophers of mind.” (Kauffman, 2011.)

The need for humility in approaching the subject of consciousness has long been emphasized by theoretical physicists: physics, as currently understood, may not be up to the task of deciphering the nature of the mind. Wigner (1983) expressed the view that “It [physics] will have to be replaced by new laws, based on new concepts, if organisms with consciousness are to be described.... [I]n order to deal with the phenomenon of life, the laws of physics will have to be changed, not only reinterpreted.” Penrose (2003) has stated “My position [on consciousness] demands a major revolution in physics.... [T]here is something very fundamental missing from current science. Our understanding at this time is not adequate and we’re going to have to move to new regions of science....” Nick Herbert, a physicist, has expressed his thoughts more colorfully: “Science’s biggest mystery is the nature of consciousness. It is not that we possess bad or imperfect theories of human awareness; we simply have no such theories at all. About all we know about consciousness is that it has something to do with the head, rather than the foot.” (Herbert, 1987.)

Experimental results such as those discussed in preceding sections may point to an unknown mechanism of linkage between consciousnesses. Schrödinger, one of the fathers of quantum mechanics, coined the term “entanglement” (Schrödinger, 1935) and later proposed that the consciousnesses of all individuals are united (Schrödinger, 1969, 1983). “Entanglement” is a property of a quantum-mechanical system containing two or more components that have once been in contact. Even though they may later be separated, they remain linked in such a way that the quantum state of any one of them cannot be adequately described without full consideration of the others (Schrödinger, 1935). Though resisted by Einstein as 18/26 “spooky action at a distance,” quantum entanglement has been demonstrated experimentally, including over kilometer distances (Tittel et al. 1998; Nadeau & Kafatos, 1999, pp. 65-82).

Although physicists originally believed entangled states between distant particles were of no practical consequence, evidence now suggests that the effects of quantum entanglement may “scale up” into our macroscopic world, such as linking separated human neurons in vitro. (See, for instance, Pizzi, et al., 2004.) If separated neurons can be entangled in vitro, might whole brains be entangled at a distance? Several experiments using fMRI and EEG-based protocols suggest that this is the case. In these experiments, the stimulation of one individual’s brain appears to be registered simultaneously in a distant individual’s brain by fMRI or EEG (Standish et al., 2003, 2004; Wackerman et al., 2003). These experiments suggest that the idea of united, linked minds may be more than philosophical speculation.

For Schrödinger (1935), entanglement was the key insight dividing classical from modern physics. He said, “I would not call ... [entanglement] one but rather the characteristic trait of quantum mechanics, the one that enforces its entire departure from classical lines of thought.” He further wrote (Schrödinger, 1983): “To divide or multiply consciousness is something meaningless. In all the world, there is no kind of framework within which we can find consciousness in the plural; this is simply something we construct because of the spatio-temporal plurality of individuals, but it is a false construction.... The category of number, of whole and of parts are then simply not applicable to it; the most adequate...expression of the situation is this: the self-consciousness of the individual members are numerically identical with [one an]other and with that Self which they may be said to form at a higher level.” He also remarked (Schrödinger 1969): “Mind is by its very nature a *singulare tantum*. I should say: the overall number of minds is just one.”

To paraphrase Schrödinger’s statement, one might say that consciousnesses are inextricably entangled. This concept plays an important role in modern psi 19/26 research. According to Radin, “There are theoretical descriptions showing how tasks can be accomplished by entangled groups without the members of the group communicating with each other in any conventional way. Some scientists suggest that the remarkable degree of coherence displayed in living systems might depend in some fundamental way on quantum effects like entanglement. Others suggest that conscious awareness is caused or related in some important way to entangled particles in the brain. Some even propose that the entire universe is a single, self- entangled object.” (Radin, 2006, p.1.)

But we must be cautious: Invoking “entanglement” may simply substitute one mystery for another. While it is true that distant individuals appear to be linked in some sense (for instance in the correlated behaviors of identical twins raised apart, or in apparent healing at a distance), there is as yet no definitive evidence that “human entanglement” is a manifestation of “quantum entanglement.” We may be dealing with correspondences in terminology and nothing more. It is important to bear in mind that in studies of apparent remote healing, for instance, factors such as compassion, love, and empathy seem to play a key role (Achterberg et al., 2005), but these factors are not to be found in the equations of quantum physics. Moreover, physicists agree that the nonlocal connections between entangled particles cannot be used to transfer information. (Nadeau & Kafatos, 1999, pp. 80-81.) In contrast, it appears that information can be transferred between distant, entangled humans (as in remote healing; in identical twins raised apart); in correlated fMRI or EEG patterns between distant human beings; or in ostensible telepathic exchanges. (See, for instance, Radin 1997, 2006.) It therefore seems unlikely that “entangled particles” can fully account for the entangled actions and emotions of human beings. For all that, “entanglement” is a useful metaphor for distant correlated human experiences. The fact that entanglement is now recognized to exist at the subatomic quantum level should at the very least encourage us to explore similar (but probably different) phenomena at the human level.

The idea that humans may be linked collectively through space and time is ancient, and is one of the underlying philosophies of several Eastern wisdom traditions. In the West it emerged in the philosophy of Plato, Plotinus, and Swedenborg. It formed the basis of Emerson’s view of the Over-Soul. Swiss psychologist Carl G. Jung invoked this view in his concept of the collective unconscious that unites all minds — past, present, and future. However, research concerning consciousness is clearly research of the “Type II” variety. Rather than attempt to develop a theory based on information now in hand, we may be better advised to regard current research on OBEs, reincarnation, and anomalous healing as the beginning of a major long-term program of developing more powerful and more fruitful concepts that can elucidate the nature of consciousness. We have recently pointed out that phenomena such as those discussed in this article, together with other anomalous phenomena, may require a revision of our current “Model of Reality,” and that our revised model may involve the concept of hyperspace (Sturrock, 2009).

ACKNOWLEDGEMENT We wish to acknowledge a valuable contribution from

Professor William Bengston, of the Department of Sociology at St. Joseph's College, and helpful suggestions from two referees.

References

Achterberg J, Cooke K, Richards T, Standish L, Kozak L, Lake J., 2005, Evidence for correlations between distant intentionality and brain function in recipients: a functional magnetic resonance imaging analysis. *J Alternative and Complementary Medicine*, 11(6), 965-971.

Alvarado, C. S., 2000. Out-of-body experiences. In E. Cardeña, S. J. Lynn, & S. Krippner, Eds., *Varieties of anomalous experience: Examining the scientific evidence*, pp. 183-218, American Psychological Association, Washington, DC.

Bengston, W., & Krinsley, D., 2000. The Effect of the Laying On of Hands on Transplanted Breast Cancer in Mice. *Journal of Scientific Exploration*, 14, 353-364.

Bengston, William, & Moga, Margaret. 2007. Resonance, Placebo Effects, and Type II Errors: Some Implications from Healing Research for Patients. *Experimental Methods. Journal of Alternative and Complementary Medicine*, 13, 317-327.

Bem, D. J., 2011. Feeling the Future: Experimental Evidence for Anomalous Retroactive Influences on Cognition and Affect, *Journal of Personality and Social Psychology*, 100, 407-425.

Byrd, Randolph. 1988. Positive Therapeutic Effects of Intercessory Prayer in a Coronary Care Population. *Southern Medical Journal*, 81, 826-829.

Churchland, P. S., 1986. *Neurophilosophy: Toward A Unified Science Of The Mind/Brain*. MIT Press, Cambridge, MA. Clark, K., 1984. Clinical interventions with near-death experiencers. In B. Greyson & C. P. Flynn, Eds., *The Near-Death Experience: Problems, Prospects, Perspectives*, pp. 242-255. Charles C. Thomas, Springfield, IL.

CONSORT, 2010. Transparent Reporting of Trials. 2010, <http://www.consort-statement.org/>. Accessed December 9, 2010.

Cook, E. W., Greyson, B., & Stevenson, I., 1998. Do any near-death experiences provide evidence for the survival of human personality after death? Relevant features and illustrative case reports. *Journal of Scientific Exploration*, 12, 377-406.

Crick, F. (1994). *The Astonishing Hypothesis: The Scientific Search For The Soul*. Simon & Schuster, London.

Fodor J., 1992, The big idea: Can there be a science of mind? *Times Literary Supplement*. July 3, 1992, 5-7.]

Gaddis, V., & Gaddis, M., 1972. *The Curious World of Twins*. Hawthorn, New York, NY.

Gauld, A., 1992. *A History of Hypnotism*. Cambridge University Press, Cambridge.

Grad, B. 1965. Some biological effects of the “Laying-On of Hands”: A review of experiments with animals and plants. *Journal of the American Society for Psychical Research*, 59: pp. 95-127.

Hart, H., 1954. ESP projection: Spontaneous cases and the experimental method. *Journal of the American Society for Psychical Research*, 48, 121-146.

Hart, H., & Hart. E. B., 1933. Visions and apparitions collectively and reciprocally perceived. *Proceedings of the Society for Psychical Research*, 41, 205-249.

Hendricks, L., Bengston, W., & Gunkelman, J., 2010. The healing connection: EEG harmonics, entrainment, and Schumann’s resonances. *Journal of Scientific Exploration*, 24, 655-666.

Herbert, N., 1987, *Quantum Reality*, Anchor/Doubleday, Garden City, NY, 249.

Jahn, R. F., & Dunne, B.J., 1987. *Margins of Reality: The Role of Consciousness in the Physical World*. Houghton Mifflin Harcourt, New York, NY.

Jonas, W.B., & Crawford, C.C. (eds.), 2003, *Healing, Intention and Energy Medicine*. Churchill Livingstone, New York, NY, pp. xv-xix.

Joseph, R. 1999. The neurology of traumatic “dissociative” amnesia: Commentary and literature review. *Child Abuse & Neglect*, 23, 715-727.

Joseph, R., 2001. The limbic system and the soul: Evolution and the neuroanatomy of 23/26 religious experience. *Zygon*, 36, 105-136.

Joseph, R., 2009. Quantum physics and the multiplicity of mind: Split-brains, fragmented minds, dissociation, quantum consciousness. *J. Cosmology*, 3, 600-640.

Kauffman, S., 2011, Quoted in: *God enough*. Interview of Stuart Kauffman by Steve Paulson. www.salon.com/env/atoms_edem/w008/11/19/stuart_kauffman/index1.html. Accessed February 15, 2011.

Kelly, E. W., Greyson, B., & Stevenson, I., 1999–2000. Can experiences near death furnish evidence of life after death? *Omega*, 40, 513-519.

Kelly, E. F., Kelly, E. W., Crabtree, A., Gauld, A., Grosso, M., Greyson, B., 2007. *Irreducible Mind: Toward a Psychology for the 21st Century*. Rowman and Littlefield, Lanham, MD.

Maddox, J., 1999, The unexpected science to come. *Scientific American*. Dec. 1999; 281(6):62-7.

McFarland, Jefferson, NC. Stevenson, I., & Keil, J., 2005. Children of Myanmar who behave like Japanese soldiers: a possible third element in personality. *Journal of Scientific Exploration*, 19, 171-183.

Morris, R. L., Harary, S. B., Janis, J., Hartwell, J., & Roll, W. G., 1978. Studies of communication during out-of-body experiences. *Journal of the American Society for Psychical Research*, 71, 1-21.

Nadeau, R., Kafatos, M., 1999. Over a distance and in “no time”: Bell’s Theorem and the Aspect and Gisin experiments, in *The Non-Local Universe*, Oxford University Press, New York, NY.

Newman, H. H., 1940. *Multiple Human Births*. Doubleday, Duran, New York.

Osis, K., & McCormick, D., 1980. Kinetic effects at the ostensible location of an out-of-body projection during perceptual testing. *Journal of the American Society for Psychical Research*, 74, 319-329.

Penrose, R., 2003. Quoted in: Karl Giberson. *The man who fell to Earth*. Interview with Sir Roger Penrose. *Science & Spirit*. March/April; 2003: 34-41.]

Pinker, S. (1997). *How The Mind Works*. New York: Norton. Pizzi, R, Fantasia, A, Gelain, F, Rossetti, D, & Vescovi, A. , 2004. Non-local correlation between separated human neural networks. In: Donkor, E., Pirick, A.R. & Brandt, H.E. (eds.) *Quantum Information and Computation II*. Proceedings of SPIE. 107-117. 24/26

Playfair, G. L., 2008. *Twin Telepathy*. (2nd ed.). History Press, Stroud, Gloucestershire, UK. Radin, D. 1997. *The Conscious Universe: The Scientific Truth of Psychic Phenomena*. HarperEdge, San Francisco, CA.

Radin, D., 2006. *Entangled Minds: Extrasensory Experiences in a Quantum Reality*, Paraview Pocket Books, New York, NY.

Ring, K., & Cooper, S., 1999. *Mindsight: Near-Death And Out-Of-Body Experiences In The Blind*. William James Center, Institute of Transpersonal Psychology, Palo Alto, CA

Ring, K., & Lawrence, M., 1993. Further evidence for veridical perception during near-death experiences. *Journal of Near-Death Studies*, 11, 223-229.

Rosambeau, M., 1987. *How Twins Grow Up*. The Bodley Head, London.

Schrödinger E., 1935, Discussion of probability relations between separated systems. *Mathematical Proceedings of the Cambridge Philosophical Society*, 31, 555-563.

Schrödinger E., 1969. *What is Life? and Mind and Matter*. Cambridge University Press, Cambridge, 145.

Schrödinger E., 1983. *My View of the World*. Ox Bow Press, Woodbridge, CT, 31-34.

Schwartz, S.A., & Dossey, L., 2010. Nonlocality, intention, and observer effects in healing studies: laying a foundation for the future, *Explore (NY)*, 6, 295-307.

Segal, N. L., 1999. *Entwined Lives: Twins and What They Tell Us About Human Behavior*. Dutton, New York.

Sicher, F., Targ, E., Moore, D., & Smith, H. 1998. A Randomized, Double Blind Study of Distant Healing in a Population with Advanced AIDS. *Western Journal of Medicine*, 169(6), 356-363.

Sidgwick, E. M., 1891. On the evidence for clairvoyance. *Proceedings of the Society for Psychical Research*, 7, 30-99.

Standish, L., Johnson, L.C., Richards, T., & Kozak, L., 2003. Evidence of correlated functional MRI signals between distant human brains. *Alternative Therapies in Health and Medicine*, 9, 122-128.

Standish, L., Kozak, L., Johnson, C., Richards, T. 2004. Electroencephalographic 25/26 evidence of correlated event-related signals between the brains of spatially and sensory isolated human subjects. *J. Alternative and Complementary Medicine* 10, 307-314.

Stevenson, I., 1975. *Cases of the Reincarnation Type. Volume 1, Ten Cases in India*. Charlottesville, VA: University Press of Virginia.

Stevenson, I., 1997. *Reincarnation and Biology: A Contribution to the Etiology of Birthmarks and Birth Defects*. Praeger, Westport, CT.

Stevenson, I., 2001. *Children Who Remember Previous Lives: A Question of Reincarnation*, rev. ed. McFarland, Jefferson, NC. Stevenson, I., 2003. *European Cases Of The Reincarnation Type*.

Sturrock, P.A., 2009. *A Tale of Two Sciences, Exoscience*, Palo Alto, CA.

Tart, C. T., 1968. A psychophysiological study of out-of-body experiences in a selected subject. *Journal of the American Society for Psychical Research*, 62, 3-27.

Tittel, W., Brendel, J., Zbinden, H., & Gisin, N., 1998. Violation of the Bell inequalities by photons more than 10km apart. *Physical Review Letters*, 81, 3563-3566.

Tucker, J. B., 2005. *Life Before Life: A Scientific Investigation of Children's Memories of Previous Lives*. St. Martin's Press, New York, NY.

Van Lommel, P., van Wees, R., Meyers, V., & Elfferich, I., 2001. Near-death experiences in survivors of cardiac arrest: A prospective study in the Netherlands. *Lancet*, 358, 2039-2045.

Wackerman, J, Seiter, C, Keibel, Walach, H., 2003. Correlations between brain electrical activities of two spatially separated human subjects. *Neuroscience Letters*, 336, 60-64.

Wigner, E. P., 1983. Remarks on the mind-body problem. In: *Quantum Theory And Measurement* (John Wheeler and Zurek Wojciech, eds.) Princeton University Press, Princeton, NJ, p. 99.

Wilde, O., 1889. *The Decay of Lying*.