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BOOK REVIEWS

The Metamorphosis of Plants by Johann Wolfgang von Goethe (introduction and photography by Gordon L. Miller). Cambridge, MA: MIT Press, 2009. 155 pp. $21.95 (hardcover). ISBN 978-0-262-01309-3.

Johann Wolfgang von Goethe (1749–1832) was one of Germany's best known writers and poets, and he is most famous for his version of Faust. Less well known are his scientific works on the forms of plants and on the nature of colours. This book, a translation of his 1790 *Metamorphosis of Plants* is here published with a helpful introduction by Gordon L. Miller and lavishly illustrated with Miller's excellent colour photographs of plants, along with earlier black-and-white illustrations by German followers of Goethe.

Goethe was a pioneer of a holistic approach to science and was critical of the mechanistic attitudes already well established in the scientific world in the late 18th century. In this book, his approach to plants is based on close observation of their forms, including abnormal forms. Inspired by the luxuriant vegetation he saw in Sicily on a journey there in 1787, he sought to find a key to all plant form through which the great variety of plants could be understood more deeply. But this was not an evolutionary approach, it was more Platonic in that he looked for an ideal underlying form of the *Urpflanze,* or original plant, from which others can be derived in thought.

He concentrated his attention on leaves, and saw the parts of flowers as transformations of fundamental leaf structure, most obvious in the sepals and petals. He found abnormal plants in which leaves were partially transformed into sepals, sepals into petals, and petals into stamens, and helped lay the foundations of the science of plant morphology, the study of form.

One of his most important contributions was in combining direct seeing with understanding, so that in looking at a plant one could understand it more deeply by observing the transformations and nature of leaves and flowers and their inter-relations. This is very different from the approach in modern reductionistic plant science where the form disappears behind a mass of molecular data on genomes, proteins, and enzymes.

Goethe's approach is more or less forgotten by modern-day practitioners of the plant sciences, but has been kept alive by followers of Rudolf Steiner, the Austrian philosopher and educator. Steiner developed and modified Goethe's own approach, and in Steiner schools and colleges a succession of authors have continued the Goethean approach to morphology. Although this kind of science has so far had little impact on mainstream research or education, it surely has an important part to play in the future. If we are to have a more holistic science education system, it must be based on the direct experience and observation of nature, and Steiner schools and colleges are almost the only places where there is

a living tradition of teaching science in this way. For these reasons, Goethe's *Metamorphosis of Plants* takes on a larger and more contemporary significance.

Not everything in Goethe's writings remains relevant today, and some of it is clearly dated and superseded, as when he says "The fine matter developed in the anthers looks like a powder, but these tiny grains of pollen are just vessels containing a highly refined juice. We therefore subscribe to the view that this juice is absorbed by the pistils to which the pollen grains cling, thereby causing fructification." These passages are an interesting window on a different era of science, but are far less relevant than Goethe's general approach.

Goethe originally planned to produce a fully illustrated edition of this book, but never achieved this. Miller's photographs are helpful in making the principles Goethe describes more easily visible, which is after all what Goethe's approach was all about. For those who do not already possess a copy of the *Metamorphosis of Plants* and who are interested in the foundations of holistic science, this book will be a useful addition to their library.

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The Science of Leonardo: Inside the Mind of the Great Genius of the Renaissance by Fritjof Capra. New York: Anchor Books, 2007. 352 pp. $16.95 (paper). ISBN 978-1-4000-7883-7.

Leonardo Da Vinci was the archetypal Renaissance man. Many books have been written about him, but until now there has been no study devoted specifically to his science. Everyone knows that Leonardo was an artist, inventor, anatomist, and musician and that he left behind him many notebooks filled with observations, drawings, and notes in cryptic mirror writing. But his notebooks were not published in his lifetime and were not examined by scholars until quite recently. Capra's research has involved talking to experts on Leonardo, visiting collections of his works, and drawing on thousands of pages of his surviving notebooks.

The first part of Capra's book is a conventional biography of Leonardo, placing him in his social, cultural, and historical context. The second part concentrates on his science. The book is well researched and written in a straightforward, unpretentious style. Capra does a good job in bringing to light Leonardo's extraordinary range of interests and finding coherent patterns within the scattered references in his notebooks, which covered all his working life.

Leonardo was illegitimate and received no formal classical education. He started as an apprentice in the workshop of Andrea Verrocchio, who had one of the most exciting studios and workshops in Florence carrying out many kinds of commissions, not simply painting. While Leonardo was working with him, one of the commissions was to create a gilded copper ball, 2.5 metres in diameter, to be placed on top of the marble lantern of the new cathedral of Florence. Nothing like this had been done before. The ball's many sections had to be made separately and then welded together. But there were no welding torches, and only small welds could be carried out at a forge. The only way to do it was to use concave mirrors to focus the sun's rays to burn the weld. These mirrors had to be made in the workshop itself, and may have been one of the stimuli for Leonardo's studies of the geometry of 'fire mirrors' and geometry and optics.

Leonardo's studies of flowing water, tresses of hair, and human and animal anatomy, as well as his technical drawings of machines and mechanisms, show an extraordinary visual insight and imagination. He drew some of the first contour maps, representing the landscape as if seen from the air. We are all used to looking out of aeroplanes and there is nothing new in aerial views for us. But in Leonardo's time, the closest approach to the aerial view was gazing from the top of mountains. Leonardo was one of the early mountaineers of the Renaissance, and his climbing of Monte Rosa in the alps may well have influenced this ability to visualise from above.

The principle of aerial views was taken further by Leonardo in imagining the earth seen from the moon. He argued that the moon's light is a reflection of the sun and its patchy radiance as a result of multiple reflections from waves on its waters. He was of course wrong about water on the moon but he argued that the same would happen if the earth were viewed from the moon: "To anyone standing on the moon . . . this our earth with its element of water would appear and function just as the moon does to us." This ability to visualize the earth from outside was taken further by Johannes Kepler in his famous science fiction–like story of a journey to the moon in his *Somnium* or dream, when he envisaged the earth as a rotating sphere floating in a space. This kind of scientific imagination underlay the making of globes, which everyone takes for granted in school classrooms. In a way, the first time astronauts looked back and saw the earth from outside simply confirmed what had been grasped centuries earlier by the imagination of people who were capable of visualising things from a literally higher point of view. Leonardo was among the first.

Perhaps Leonardo's ability to imagine a bird's-eye view in the drawing of his contour maps was also related to his fascination with flight. He designed flying machines based on a close study of birds' wings, although he came to realise that these would not work because the relevant human muscles were simply not strong enough.

Capra makes it clear that Leonardo's mind was exceptionally good at recognising similarities in different kinds of phenomena. For example, through his study of waves in water, and of the way that ripples could interpenetrate other ripples

on the surface of water, he came to the conclusion that light was itself a wave phenomenon, with waves spreading out from illuminated objects. This wave-like nature helps explain why light from different objects could interpenetrate and not interfere. He also thought of sound as waves in air and earthquakes as waves in earth, seeing wave patterns in all four elements, a wonderfully unifying vision.

But this, like most of Leonardo's other insights, had no influence on subsequent science because he kept these observations secret and never systematically collected and published the contents of his notebooks. Hence it is only recently that historians have come to realise how he foreshadowed many subsequent scientific discoveries.

One of the general principles that Leonardo developed was the conservation of volume. He saw this as general principle governing all changes and transformations of natural forms, and he applied it to the analysis of various movements of the human body, including the contraction of muscles, as well as to the flow of water and other liquids. Here is what he wrote about the flow of a river: "If the water does not increase, nor diminish, in a river, which may be of varying tortuosities, breadths and depths, the water will pass in equal quantities in equal times through every degree of the length of that river."

Capra suggests that the realisation that the same volume of water can take an infinite number of shapes may well have inspired him to search for a new, dynamic geometry of transformations. In later life, Leonardo made a close study of Euclidian geometry, and he was fascinated with geometrical transformations, where areas could be conserved while shapes were changed, another way in which the unifying insight of conservation of volume or area was working itself out in his mind.

To write on Leonardo as Capra has done requires a wide range of reading and scholarship, and Capra's research is impressive. He tells us he has been interested in Leonardo throughout his adult life, and this book benefits from his years of interest in the subject of Leonardo's science. Inevitably, there are some patchy and inadequate summaries of the historical background. For example in discussing Leonardo's theory of vision, Capra's summary of previous theories is simplistic and he makes no reference to the definitive historical study that would have illuminated his interpretation of Leonardo's place in this history, namely David Lindberg's *Theories Of Vision From Al-Kindi To Kepler*. When Capra discusses Leonardo's holistic vision in relation to modern science, he refers vaguely to unnamed "cognitive scientists" who share a similar vision today, as if this is a large-scale movement within contemporary science. But he seems to be referring mainly to the views of Francisco Varela, whose ideas were very highly rated by Capra in some of his previous books.

One small point about the layout of the book: unfortunately, Capra and his publishers follow an annoying habit of making it difficult to locate endnotes. The endnotes are listed chapterwise under headings like Chapter 1, Chapter 2, etc. But when reading a particular chapter, all one knows is the title of the chapter,

which is printed across the top of the page, not its number. To locate a note it is necessary to flick back through the book to find out the number of the chapter then go to the endnotes and locate the note. At the very least, the headings for each section of endnotes should give both the chapter number and its title, for example "Chapter 8, Pyramids of Light," but even better, the headings of the notes pages could be made more informative by giving the page numbers to which they refer, for example, "Notes to pages 64–85."

I read this book with great interest and pleasure. I recommend it to anyone who is interested in the history of the Renaissance and the fascinating period when science and the method of empirical inquiry were coming into being but still conceived of in a holistic and organic spirit, before science took a mechanistic path in the 17th century, which has continued ever since. Capra raises the question of what would have happened if Leonardo's insights had been published and had formed part of the growth of science. Would they have helped science develop in a more holistic manner from the outset? We cannot know. But this book makes it very clear that science is not just a private but a collective enterprise. As the historian of science Patricia Fara has observed, "Being right is not always enough: If an idea is to prevail, people must see that it is right." Leonardo's secrecy was not in the spirit of subsequent science, and that is why most of his insights lay dormant until very recently when they were discovered by scholars. Capra does an excellent job in making them more widely available.

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Quantum Aspects of Life edited by Derek Abbott, Paul C. W. Davies, and Arun K. Pati. Imperial College Press, 2008. 468 pp. $104.00 (hardcover) and $58.00 (paper). ISBN 978-1-84816-253-2 (hardcover) and 978-1-84816-267-9 (paper).

This book is a collection of contributed chapters by different authors, plus several transcripts of debates (as Appendices), arising from a 2003 NASA-sponsored conference on the role Quantum Mechanics (QM) plays in Biology. Because QM describes the behavior of the fundamental building-blocks of the Universe, it is necessarily a cornerstone of all processes, living and non-living. This is the "trivial" sense in which biology and quantum physics intersect. The book is dedicated to examination of the "non-trivial" claim, which is that biological systems make use of specific aspects of QM that are not accessible to purely classical processes: tunnelling, coherent wavelike nature of matter,

entanglement, and intrinsic spin. Another way of formalizing this thesis is that biologists will need to understand QM, in the way that they currently study statistics, electrochemistry, and game theory, to truly understand important chunks of their subject matter. This claim is controversial, and having settled on this definition as the basis of argument, the contributions in the book fall fairly cleanly on the side of pro or con.

Each of the chapters presents the case for or against this claim, with more direct interactions among the participants transcribed at the end as debates. The book is a very interesting read, containing pieces from some of the key players in this area. One point to note is that, as the contributors are expert physicists and theoreticians working on quantum computation or chemistry, they never bother to give a layman's definition of what all the fuss is about: what is so special about QM? A chapter introducing readers to the basic experiments in QM, to get their heads properly spinning and out of the classical realm, would have been welcome. On the other hand, so many excellent introductions to this field have been published recently (Bruce, 2004; Davies & Brown, 1986; Herbert, 1987; Lloyd, 2006; Lockwood, 1989) that this omission is not much of a problem. Do not pick up this book if you are interested in "quantum spiritual healing" or the role of nonlocal synchronicity in interpersonal psychology. Some of the chapters are quite accessible to the well-read amateur, while others (e.g., the discussion of quantum dynamics in photosynthesis) are extremely specialized. Overall, this is a very crisp, no-nonsense, high-level discussion of the possible role of QM phenomena in biology. Readers with a good understanding of the basics of QM and of the big questions in biology will get the most out of it. There are many details, formulas, and concepts from quantum computing throughout the text. Readers hoping for a conclusive feel-good message of general applicability to their everyday lives will be disappointed. Those interested in a state-of-the-art discussion of where QM stands in biology will not be.

Some of the persistent themes throughout the discussion include the following: 1) Is it only emergent complexity that gives life its special character, or are true QM effects manifest at the macroscopic level? 2) Can such effects survive the "hot, wet" environment of the living cell and avoid decoherence, which reduces underlying quantum properties to the familiar, macroscopic and classical behaviors? 3) Can living structures take advantage of massive superposition to carry out true quantum computations? And 4) what are the right scales, structures, and phenomena in which to look for evidence of QM involvement?

The con side relied on basic calculations showing that the answer to theme 2 is no, that the elusive entanglement and superposition that give QM its magic cannot possibly survive the frequent interactions and warm temperatures of the living state. Contributors on the con side remind the reader that successful QM and quantum computation experiments are done in a vacuum, at very low temperatures, and with a very small number of particles involved. Moreover, they challenge the pro side to come up with any examples in biology where true QM is necessary to understand a biological problem. It should also be noted that

in a few places, the attention of the reader is drawn to the fact that QM not only provides new capabilities for enhancing life, it also imposes new limits (Wigner inequalities, Heisenberg's uncertainty principle).

The pro side supplied arguments to show that such effects can indeed be preserved in specialized biological structures (e.g., DNA and tubulin). Since QM provides such useful possibilities for living systems, it was argued that surely biosystems have learned to capitalize on them, as they have learned (through evolution) to exploit other aspects of physics (thermodynamics, mechanics, materials properties, etc.). It was also suggested that QM would be a crucial component at the origin of self-reproducing systems—a key component of life, since the optimization process of evolution cannot get off the ground until self-reproducing systems with a mode of heredity are formed.

What exactly could QM be used for in living systems (Jibu & Yasue, 1995; Josephson & Pallikari-Viras, 1991; Stapp, 1993)? The information-processing capabilities of quantum computers and the backwards-causation that has been explored in QM suggest that QM may provide a way to search through truly vast solution spaces in tractable time-scales, or to provide a bit of teleology in selecting favorable outcomes to some processes (inverse Zeno effect). It is argued, for example, that Grover's algorithm (a search that occurs faster than possible with classical systems) could be carried out by biological systems and does not require fragile entanglement. The identification of improbable but useful solutions crops up at every level of biology (from protein folding to evolution of complex structures), and while more conventional explanations exist for most of these solutions, QM may indeed turn out to be involved. This is especially relevant to the origin of life itself, as argued by Paul Davies, who suggests the origin of life not in complexity but in the unique properties of quantum events that can replicate and process information. Whether this event is extremely improbable, requiring the special features of QM (Davies, 1999), or an inescapable feature of some sort of chemistry that we do not yet understand (Eigen & Schuster, 1979) is under significant debate. Similarly, Seth Lloyd argues that the essential discrete, digital, probabilistic nature of QM events guarantees emergence of the auto-catalyzing, information-processing phenomenon we call life.

Another place where a role for QM is proposed is in explaining the coherent nature of conscious experience (the "binding problem"). Hameroff argues that the tubulin proteins in the cellular cytoskeleton perform quantum computation and thus serve as the substratum of information processing in living systems. This view has been expounded in greater detail in the work of Penrose (1991, 1996), although much work in basic philosophy of mind/cognitive science would have to be done to make it clear how QM can solve the "hard problem of consciousness" (Chalmers, 1996): why would a Bose-Einstein condensate automatically enjoy first-person experience or intentionality? There is a brief mention of free will as another place where QM may be involved, although it should be kept in mind that it is not at all clear how *in principle* random outcomes would give us what we understand as free will (Dennett, 1984).

This book is a very mainstream discussion between the dominant paradigms in quantum computation, chemistry, and evolutionary biology. There are no anomalous or fringe areas discussed; in particular, the PEAR-type of experiments suggesting effects of living systems on quantum processes *outside* of their bodies (Jahn & Dunne, 1987; Schmidt, 1973) are not mentioned at all. The authors stick closely to quantitative arguments, discussing only things that have a precise definition. While this necessarily reins the discussion closer to what we know, it provides a welcome degree of grounding, and most of the contributors write in the context of needing to falsify large areas of the possibility space in this field, so that tractable, informative experiments can be performed.

In the end, the argument is left wide open, and the details are technical enough so that it is not really feasible for non-experts to have opinions one way or the other. The discussion is spirited and energetic; I highly recommend the book to anyone interested in these questions and willing to do the necessary background homework to really understand the issues involved. It is clear that much work remains to be done in the fields of quantum computation and chemistry to understand what is possible and what might be occurring in living systems. At the same time, biologists have to keep an eye open for effects that might require true QM to be properly explained. Significant experiments have been proposed and the burden is now on the pro side to illustrate conclusively that QM is relevant for the macroscopic domain of life. It is not yet crucial for biologists to understand QM, but it may well be so in the future; if so, some extremely fascinating biology will result, with implications for evolution, cell biology, and cognitive science.

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Medicine, Miracles, & Manifestations: A Doctor's Journey through the Worlds of Divine Intervention, Near-Death Experience, and Universal Energy by John L. Turner, foreword by Robert F. Spetzler. Franklin Lakes, NJ: Career Press, 2009. 256 pp. $15.99 (paper). ISBN 978-1-60163-060-5.

This book is written by a neurosurgeon who has a degree in engineering and who did his surgical residency at the Cleveland Clinic and went on to practice in Hilo, Hawaii. The format of the book is a series of case presentations along with intermittent discussions on metaphysical principles and his subjective musings about each case. Some of these cases are simplistic in the sense that they represent a neurological procedure where Dr. Turner either prays or has a dream about the patient during his or her recovery period.

His discussions on the actual surgical procedures are accurate, and often the details of the surgical procedures themselves are quite engrossing. The loss of some of his patients caused him to evaluate in more detail near-death experiences, and particularly the work done by Dr. Raymond Moody. In one case, Dr. Turner was involved in the issues of karma and its effect on the surgical course of one of his patients, and in particular, the apparent spontaneous remission and cure of a brain tumor. In his subsequent chapter on "soul travel," Dr. Turner turns to an academic discussion on Dr. Moody's work as a medical student, on subsequent medical research which has emerged including studies reviewing activity in the angular gyrus of the brain, and on the work of Dr. Rick Strassman on the possible role of dimethyl tryptamine as a possible neurotransmitter during near-death experiences.

Dr. Turner reports on many of his own personal experiences trying to induce out-of-body experiences including experimentation with electronic devices delivering audio tones to the brain in order to synchronize various brainwave activities.

Dr. Turner later began experimenting with astral projection under the instruction of a Master and then proceeded to attend Buddhist meditation; he writes of his personal experiences of dissociated awareness during chanting meditation. Further into the book he writes about his experiences when he was approached by a Japanese group that looked at healing from a distance, the Mokichi Okada

Association. This would begin a long period for him of evaluating healing at a distance and of channeling energy for patients. In addition, Dr. Turner was interested in the practices of Johrei, a non-denominational association given to the application of healing energy. He applied it to many of his patients and was surprised at some of the positive outcomes that emerged from his surgical undertakings. He began the practice of administering Johrei to his patients prior to undertaking surgery and again attributes much of the miraculous recoveries of some of his patients to these practices that originated in Japan. Dr. Turner later turned his attention to remote viewing and tried to use remote viewing for evaluating near-death experiences. He then applied remote viewing also to the practice of making diagnoses and felt that in a number of situations this was useful, including a diagnosis of a herniated lumbar disc and spinal abscess.

This book ends with a useful summary on neuroanatomy and on some of the ties of this neuroanatomy not only to out-of-body experiences but also to higher spiritual functions. Overall, this is a book intended primarily for the lay-person. It does a very good job of explaining some of the practices and hypotheses which Dr. Turner applied in many of these cases. It is also beneficial to have his personal reactions to these various spiritual modalities as he is not only looking at them from the point of view of a clinician but also evaluating them from the point of view of an engineer. The book does suffer in some regards because there is so much jumping from one particular theory or school of thought to another. This is a reflection, no doubt, of Dr. Turner's avid interests and desire to develop a more encyclopedic knowledge of the modalities, but it does leave the reader, at times, feeling as if they have just had a very superficial introduction to a number of very interesting potential scientific topics.

In closing, the book is well written and is engaging. It suffers from a lack of scientific depth but makes up for this in terms of being a series of moving personal stories. And Dr. Turner's insights are certainly valuable to any reader.

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Parsing the Turing Test: Philosophical and Methodological Issues in the Quest for the Thinking Computer edited by Robert Epstein, Gary Roberts, and Grace Beber. Springer, 2009. xxiii + 517 pp. $199.00 (hardcover). ISBN 9781402067082.

This big, expensive book offers much food for thought. This review will be a reaction to the first editor's introduction, plus the clever reverse Turing test in

Chapter 28 by Charles Platt, with machines attempting to determine if humans have any intelligence. Basically, based on my sample of these two chapters, this book is a celebration of the coming extinction of the human race. I shall play the devil's advocate, and also take a meta perspective on the book, analyzing its significance as a social phenomenon instead of considering its contents.

Turing's famous paper on the imitation game (reprinted and annotated in this book), a remote conversation with a computer attempting to prove it is human, in addition to its intellectual fireworks reflects the fact that Turing, as the French say, "felt uncomfortable in his skin," both as a male and as a human being. As this book indicates, this has now become part of the zeitgeist and a general social problem.

The general attitude I see here reminds me of remarks by Marvin Minsky I heard many years ago, when he called human beings "meat machines" and described the human race as a carbon-based life-form that was creating a silicon-based life-form that would replace it. At the time, his remarks seemed a bit mad, but now many people seem to feel that way.

Why is this? Well, our current society attempts to make people into machines; it behaves as if human beings were ants or bees. We are being forced to live in an anthill, beehive society. Obviously machines are better at being machines than we are, and humans feel ill-suited for anthill or beehive life. Human beings are made to feel obsolete, has-beens.

Robert Epstein's introduction argues that a super-human intelligence is inevitable and not far off in time, and that at best we shall be slaves or pets for the machine, at worse exterminated as annoying insects. The authors are well aware of the amazing advances in computer technology that they believe make this possible, but perhaps they are less aware of the fact that the more we understand about organisms, the more molecular biology progresses, the more amazing living beings seem. The cells in the human body were originally autonomous living beings that have now banded together, much like the citizens in a nation or the employees in a corporation. An individual cell is amazingly sophisticated and, it seems to me, is best compared with a computer or even with an entire city.

So our artificial machines may not catch up with Nature's machines for a while. Can a century of human engineering compare with billions of years of evolution, essentially an immense parallel-processing molecular-level computation going on throughout the entire biosphere?

In a more optimistic scenario we are not exterminated, the machines will be our servants. Isaac Asimov thought that in the future human beings might live like ancient Greek aristocrats with robotic slaves.

Yes, machines can calculate better than we can and remember things better than we can. Should we be very upset? Railroad trains go faster than a person can run, a steam-shovel can move earth more quickly than a person, and an airplane can fly. But human beings made those machines and should be proud of it. Are we upset about the fact that we need to wear clothing in the winter? Not at all. People are not very fast, not very strong, they do not have fur or a tough hide, but they

are extremely curious, clever, and imaginative, flexible and adaptable. Like the universal Turing machine, we are generalists, not specialists. We are not optimized for any particular little ecological niche.

It is also possible that eventually enhanced humans and humanized machines will become nearly indistinguishable, which doesn't sound too bad to me. It's much like wearing clothing or using a can-opener.

But maybe none of this will happen. Another possibility is that machine intelligences will remain unconscious zombies, monstrous golems lacking a divine spark, a human soul. For we are products of George Bernard Shaw's life-force, of Henri Bergson's "élan vital," and machines are not. This is of course not a fashionable view in our secular times, but let me try to give a contemporary version of this argument, one designed for modern sensibilities.

First of all, quantum mechanics, a branch of fundamental physics, has been telling us that the Schrödinger Psi function is real, more real than the particles it describes. Electrons in atoms are expressed as probability waves that interfere constructively and destructively. Atoms are like musical instruments.

Whatever the Psi function is, it is not material. It is more like an idea, and therefore gives support to those Platonic idealist philosophies that view spirit as more fundamental, more real, than matter. Of course, this is not a fashionable interpretation. Nonetheless, Nature is giving us this hint loud and clear, even if we refuse to listen.

The latest version of quantum mechanics, now called quantum information theory, reformulates "classical" 1920's quantum mechanics in terms of qubits of information; information is certainly not matter. In my opinion quantum information theory is even less materialist than classical quantum mechanics.

Consciousness, quite mysterious at this time, is also more about information than about matter, I think. Could consciousness reflect some currently unknown level of physical reality? Could our current science be radically incomplete? Indeed, it may well be so. There may be many scientific mysteries yet to solve.

It is true that during the three-century–plus history of modern science, each period thinks it has a nearly final answer, only to discover 25 or 50 years later some totally unexpected phenomenon that provokes a complete paradigm shift. Let me invoke a temporal rather than a spatial "Copernican principle." Why should our epoch be especially favored? Why should we have the final answers?

A simple linear extrapolation of the history of science suggests that a century from now things will look remarkably different. What did we know of quantum mechanics a century ago? Is it possible that, to use Wolfgang Pauli's trenchant phrase, our current scientific world-view "is not even wrong"? For our grandchildren and great-grandchildren's sake I hope so. How boring if it should happen that there will be no fundamental changes in our scientific world view in the future. Why should Nature's imagination be as limited as ours?

So if our current scientific world view is not at all final, perhaps living beings do have something special that machines cannot attain, something that science

will some day understand as well as we currently understand quantum mechanics, a scientific version, perhaps, of the soul or what the spiritual would refer to as a divine spark. How otherwise to understand cases of amazing human creativity? Pick your own favorite examples. I pick the composer Johann Sebastian Bach and the mathematicians Leonhard Euler, Srinivasa Ramanujan and Georg Cantor. Can machines have that kind of creativity, that kind of inspiration? These men seem to have had a direct link to the source of new ideas.

Believers in Darwinian evolution by natural selection will argue that no vital spark, no élan vital, nothing at all divine is needed, just random mutations. I myself am a believer in Darwinian evolution. I am currently trying to develop a theory I optimistically have dubbed "metabiology." The purpose of metabiology is to prove mathematically that Darwinian evolution works. But I am open to the possibility that this may not be achievable. It would also be delightful to be able to prove that evolution by natural selection doesn't, cannot work. I would be happy either way, as long as I can prove it. Most likely my metabiological ideas will lead nowhere, but I feel my honor as a mathematician demands that I should give it a try.

And why have human beings become so defeatist? Is it more fun to work in a factory that produces robots than to conceive and raise one's own children? Or look at cars. I have been in remote corners of Argentina, where people seem almost completely divorced from the modern world economy and do everything themselves. They manage splendidly without cars, with horses and donkeys. These are self-reproducing cars, vegetarian cars, not ones that need petroleum.

No wonder that the contributors to this book have given up on human beings. People are ill-used in our modern society, and sensitive scientific intellectuals feel it. Scientists are now micro-managed. The refereeing and grant systems, with everything decided by committees, favor safe, conservative, incremental science. Can radical new ideas have a chance with our current "factory" science? I doubt it. Would Galileo, Newton, Maxwell, Darwin and Einstein be able to work in the current system? Would Euler, Ramanujan and Cantor? I think not.

As I said, human beings are not ants, they are not bees, they were not designed to be slaves. Let's look at particularly creative periods in human history, for example, ancient Greece and the Italian Renaissance.

How come the ancient Greeks were so creative? I asked a Greek intellectual that once, in Mykonos, and he told me that the ancient Greeks discussed this and noted that ancient Egypt was largely stable and un-innovative for millennia, the contrary of the ancient Greeks, because Greek city-states were small and separated by mountains or isolated on islands, and so imaginative individuals could be creative and affect things, while Egyptian geography permitted strong central, unified control of an empire, creativity was suppressed, and talented individuals could have little or no effect.

Similarly, the creativity of the Italian Renaissance probably had something to do with the fact that even now there is no Italian nation-state. Italians are first of all Tuscans or Sicilians; they are individualists, not Italians!

In both cases, ancient Greece and renaissance Italy, chaos and anarchy encouraged creativity and kept it from being suppressed by the authorities.

What can we learn from this? That strong central control is bad for us. Immediate corollaries: The European Community was not a good idea. And the United States would be better off as 50 separate states. At least that's the case if you want to maximize creativity. I've already said what I think of the current refereeing and grant systems.

Let me wrap up my argument. People are not machines. It is time for people to stop trying to be like machines, because we have machines for that now. We should stop worshipping the machine and instead unleash our creative, curious, passionate, inspired, intuitive, irrational individualistic humanity.

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Blink: The Power of Thinking Without Thinking by Malcolm Gladwell. New York: Back Bay Books/Little, Brown and Company, 2005. 296 pp., including index + 15 pp. of Reading Group Guide. $25.95 (hardcover). ISBN 978-0-316-17232-5 (hardcover) and 78-0-316-01066-5 (paper).

Most people stumble over the truth, now and then, but they usually manage to pick themselves up and go on, anyway.

—Winston Churchill, n.d.

Malcolm Gladwell is a journalist, author, and popular psychologist. He began his career at *The American Spectator,* a conservative monthly magazine, followed by a position as a science writer for *The Washington Post*. Since 1996 he has been a staff writer for *The New Yorker.* His frequent focus as an author is the world of sociology, psychology, and social psychology. Gladwell achieved national notice for his 2000 bestseller *The Tipping Point,* which discussed the potentially massive implications of small-scale social events (Gladwell, n.d.).

Blink is Gladwell's second book. According to his publisher, *Blink* draws on "cutting-edge neuroscience and psychology to reveal that the difference between good decision making and bad has less to do with how much information we process than with our ability to focus on a few, particular details. Gladwell shows how we all can become better decision makers—in our homes, in our offices, and in everyday life" (back cover of paper edition). The subtitle of the book, *The Power of Thinking Without Thinking,* expresses the book's main premise.

In the Introduction, Gladwell discusses how the J. Paul Getty Museum in California was almost taken in by an art dealer who attempted to sell to the institution a reputedly ancient Greek marble statue dating from the 6th century B.C. The Getty was appropriately cautious and subjected the statue to 14 months of

grueling tests to determine its authenticity, employing an electron microscope, electron microphobe, mass spectrometry, X-ray diffraction, and X-ray fluorescence. Finally satisfied, the Getty bought the statue for the asking price of $10 million. In the fall of 1986, the statue went on display for the first time. Controversy erupted immediately. Four experts on ancient Greek sculpture had immediate, strong feelings that the statue was not genuine the instant they laid eyes on it. One authority, on merely glancing at the statue for the first time, found that the word that immediately popped into his mind was "fresh," which was not exactly what the Getty directors wanted to hear. Further research determined that the statue had been aged artificially, which fooled the sophisticated scientific tests done to determine the antiquity of the marble from which it was made. The statue was eventually found to be a fake.

Gladwell emphasizes the "intuitive repulsion" felt immediately by the naysaying experts. He states, "In the first two seconds of looking—in a single glance—they were able to understand more about the essence of the statue than the team at the Getty was able to understand in fourteen months. *Blink* is a book about those first two seconds."

Blink contends we cannot only know things instantly with almost zero information, as in the case of the fake Greek statue, but also that we can know things before they happen. If this sounds familiar to readers of *JSE,* it should, for it involves the nonlocal acquisition of information that constitutes much of the remit of parapsychology.

An example from Chapter Four deals with a group of Cleveland firefighters attempting to put out a kitchen fire in a private residence. The lieutenant in command sensed that the fire was not responding properly. He suddenly turned to his men and said, "Let's get out *now*!" Moments after they retreated from the kitchen, the floor on which they had been standing collapsed. The fire, it turned out, had originated in the basement, not the kitchen.

It's at this point that "ESP" makes its only appearance in the book, and it is handled in a derogatory way. Gary Klein, an expert in decision making, is quoted by Gladwell as saying that the fireman in command "didn't know why he had ordered everyone out. . . . He believed it was ESP. He was serious. He thought he had ESP, and he felt that because of that ESP, he'd been protected throughout his career." Gladwell states, "Klein is a decision researcher with a Ph.D., a deeply intelligent and thoughtful man, and he wasn't about to accept that [ESP] as an answer." Gladwell implies that anyone who is intelligent and thoughtful will reject ESP outright. He describes how Klein interviewed the firefighter and helped him to realize how he'd used subtle clues to make his decision to evacuate, such as the fact that the fire wasn't responding to water the way it should, it was hotter than an ordinary kitchen fire, the fire wasn't as noisy as expected, and so on. "All this thinking was going on behind the locked door of his consciousness," Gladwell says, ruling out the necessity of invoking ESP. So psi gets eliminated, and the citadel of reason is safely protected from the barbarians.

Other examples follow, such as when George Soros, the investment tycoon, successfully predicts world financial markets without rationally knowing why; or when Vic Braden, the famous tennis coach, unfailingly predicts double faults with extreme accuracy without a clue about how he does it. A psi-savvy reader would wonder whether these might be instances of precognition, but such wonder, having already suffered a slap-down in the case of the fireman, is not allowed to surface further in *Blink.*

No one doubts that humans can make snap decisions by unconsciously constructing inferences based on mere scraps of information, memory, and prior experience. The problems arise when all other possible explanations are disregarded.

Nowhere does Gladwell demonstrate a glimmer of awareness that a human precognitive faculty even exists. He fails to mention, for example, the various presentiment experiments that have been done by psi researcher Dean Radin and other investigators around the world that show, beyond reasonable doubt, that future knowing is an innate ability that possibly exists to some degree in most humans (Radin, 2006: 161–180). To date, more than 20 of these experiments have been done by different investigators, and nearly all point in the same direction—that the body can react to a future event before that event has been randomly decided by, say, a computer.

An increasing number of prominent scientists have implied that modern physical theory does not prohibit the acquisition of future information. For example, Brian Greene, the Columbia University physicist, says, "[The] laws of physics that have been articulated from Newton through Maxwell and Einstein and up until today, show a complete symmetry between past and future. Nowhere in any of these laws do we find a stipulation that they apply one way in time but not the other . . . in theory events can unfold in reverse order" (as quoted in Scoular, 2007: 152). Physicist Gerald Feinberg observed, "If such [paranormal] phenomena indeed occur, no change in the fundamental equations of physics would be needed to describe them" (Feinberg, 1975). Physicist O. Costa de Beauregard stated, "Far from being 'irrational,' *the paranormal is postulated by today's physics*" [emphasis in original] (de Beauregard, 2002). And, "Today's physics allows for the existence of 'paranormal' phenomena of telepathy, precognition, and psychokinesis. . . . The whole concept of 'nonlocality' in contemporary physics requires this possibility" (de Beauregard, 1998).

Nice theory, but does it work in practice? Kary Mullis, the Nobel chemist, became fascinated with Radin's presentiment experiments, visited Radin's laboratory, and volunteered as a subject. The results shook him up. When he appeared as a guest on National Public Radio's *Science Friday* program in May 1999, he said, "I could see about three seconds into the future ("Is This Really Proof," 2007). . . . It's spooky. . . . [Radin has] done that over and over again with people. That, with me, is on the edge of physics itself, with time. There's something funny about time that we don't understand because you shouldn't be able to do that . . ." (as quoted

in Radin, 2006: 170). If the skeptical Mullis could see into the future, why not Gladwell's subjects? Why not Gladwell?

Brian Josephson, a Nobel physicist at Cambridge University, says of the presentiment findings, "So far, the evidence seems compelling. What seems to be happening is that information is coming from the future. In fact, it's not clear in physics why you can't see the future. In physics, you certainly cannot completely rule out this effect" (as quoted in "Is This Really Proof," 2007).

In addition to presentiment experiments, the hundreds of precognitive remote viewing studies done at the Princeton Engineering Anomalies Research (PEAR) laboratory and elsewhere could explain many of Gladwell's examples in which time-displaced acquisition of information appears to occur. The precognitive remote viewing experiments show that a so-called receiver can receive distant information from a sender up to a week before the information is even sent, and even before the information that is to be sent has been randomly selected by a computer (Jahn & Dunne, 2009).

In addition, thousands of trials of online tests of precognitive ability, such as those that have been logged at the Boundary Institute's www.gotpsi.org, strongly suggest that precognition is real, with staggering odds against chance (Boundary Institute online, n.d.).

In my recent book, *The Power of Premonitions* (Dossey, 2009), I reviewed empirical findings in replicated experiments from a host of sources—researchers Radin, Bierman, McCraty, Vassy, May, Schwartz, Spottiswoode, Klintman, and Wildey, and from institutions such as the PEAR laboratory, Stanford Research Institute (SRI), and Science Applications International Corporation (SAIC). All told, this evidence suggests that we possess an innate, inborn capacity for future knowing. This collective evidence raises precognition from fantasy to fact. Henceforth the dialogue need not center over whether precognition exists, but on who's skilled at it, how it functions, how we can increase its reliability, and what it says about human nature.

In spite of Gladwell's exclusion of this evidence, he describes what may actually be a presentiment-type experiment without realizing it. He discusses in the Introduction a University of Iowa experiment showing that the palms of gamblers begin to sweat, indicating a stress response, long before they have a conscious clue that something is wrong with a deck of cards they are using. "In other words," Gladwell says, "the gamblers figured the game out before they realized they had figured the game out. . . ." Advice to Gladwell: Wake up and smell the presentiment.

In the end, Gladwell's preferred explanation for blink-type knowing is, literally, ignorance. He states that we should simply "accept the mysterious nature of our snap judgments. . . . [W]e're better off that way."

I don't think we are better off that way. In any case, the ignorance surrounding nonlocal knowing is not as profound as Gladwell imagines.

Unfortunately, none of the above evidence receives a whiff of recognition in *Blink,* even though it is central to Gladwell's subject. One wonders if the

exclusion is deliberate. For instance, the terms *premonition* and *precognition* do not even appear in the index. There is nothing new about this sort of rejection, of course. Many science writers consider the evidence favoring psi to be a "third rail," which if touched, can be fatal to their careers. So they simply ignore the evidence that consciousness can operate nonlocally outside the present and beyond the body.

Some outstanding scientists are not as squeamish as Gladwell in considering nonlocal knowing as an explanation for many of the examples he uses. Among them is Lord Paul Drayson, Britain's science minister. In discussing *Blink,* Drayson says he has personally known in advance that something is going to happen. He says, "In my life there have been some things that I've known, and I don't know why . . . like a 'sixth sense' " (as quoted in Leach, 2008).

Psychologist and consciousness researcher James Carpenter thinks "sixth sense" is misleading. Carpenter believes precognition is so fundamental and innate that he calls it "first sense." In two landmark papers, he summarizes evidence suggesting that we always exist "a little beyond ourselves in space" and "a little ahead of ourselves in time" (Carpenter, 2004a,b). And if the need arises, says Carpenter, we can exist beyond and ahead of ourselves not just a little, but a lot. According to Carpenter, "first sense" is rather like psychic radar that sweeps ahead of ourselves in space and time, informing us of events we need to know about. It operates unconsciously most of the time, for reasons that mainly have to do with efficiency.

Thousands of lay readers have found *Blink* to be an enchanting read, and Gladwell deserves credit for inspiring their curiosity. But for those who realize that psi research has moved far beyond Gladwell's limited analysis, the book will probably seem fragmentary, incomplete, and a disappointing failure of nerve.

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The Seer in Ancient Greece by Michael Attyah Flower. Los Angeles: University of California Press, 2008. 305 pp. $50.00 (hardcover). ISBN 978-0-520-25229-5.

This is an important book with a bold thesis. According to classicist Michael Flower, "divination was a major system of knowledge and belief for the Greeks and was practiced in regard to every sort of important question" (p. 2). The seer (*mantis*) was the major source of divination, and seership pervaded all levels of Greek society, although oracles, fewer in number and restricted to special places and times, were also consulted for divinatory purposes. Today we call oracles mediums or prophets and think of them as possessed by the god who presumably speaks through them. The handier and more pervasive presence of seercraft involved a technique or system of interpretation of signs, produced artificially or given in nature, in response to questions asked or problems posed. Unlike fortune-tellers and popular psychics of modern society, Flower notes, the clientele of the ancient Greek seer consisted of statesmen, generals, and other citizens in the mainstream of established life.

Although the seer generally was obliged to master the technical aspect of his or her craft, Flower emphasizes the importance of intuition, inspiration, possession, and ecstatic utterance. In short, every act of divination was a complex performance and depended on a mixture of technique and intuition. The fact that seers and oracles sometimes faked the appearance of possession or inspiration, which enhanced the dramatic effect, and despite failures and the mockery of satirists like Lucian, Flower states emphatically that the overall judgment of Greek society concerning the utility of divination was positive. "In the Greek world a seer, who operated by a combination of skill and charismatic inspiration, was the most authoritative expert on religious matters" (p. 24). The paid, free-lancing seer then was the key figure in Greek religion. Again, Flower strongly states his thesis: "The rites of divination were not only ubiquitous in Greek society; they were also uniquely authoritative. This was true not only for the uneducated masses, but also for the elite, and not just in the archaic period, but even during the classical and Hellenistic periods" (pp. 104–105). The question is how to explain this pervasive, authoritative power.

Greek seercraft encompassed such divinatory arts as augury, the interpretation of dreams, of portents like lightning, thunder, earthquakes, eclipses, the chance utterance of words, and other exceptional occurrences. It also involved extispicy, divination by the abnormalities of the innards of sacrificial animals. Sphagia, used on battle-lines, involved slitting an animal's throat and observing the manner in which the blood spurted out. An important technique was hepatoscopy or divination by scrutiny of the liver. In addition, there were the great oracles at Delphi, Dodona, Olympia, and other sacred locales. Many techniques of divination seemed to involve perceptually unusual and ambiguous situations that worked like Rorschach imagery, which we may presume stimulated intuitive leaps and insights.

The seer functioned as an aid in situations of existential crisis where habit, common sense, and the rules of everyday life faltered before paralyzing obstacles. So that "divination not only provides answers to perplexing and difficult questions; it also facilitates decisive action in cases where individuals might otherwise be at a loss to act" (p.74). The social function of divination was not to predict the future for reasons of mere curiosity but to facilitate action at junctions of life when action was unavoidable. In terms of this analysis, one senses the inevitability of some form of religion, for there will always be limits to what rule-based rationality can accomplish and there will always be situations where human beings confront existential shock, impasse, and novelty.

Flower's book shows how these immensely creative people of antiquity, these founders of democracy, philosophy, logic, tragedy, comedy, satire, history, epic poetry, rhetoric, comparative mythology, political science, theory of education, etc., made use of divination in virtually every department of human life. From the practice of democracy to the ventures of war, in every risky human enterprise and critical life transition, seers, sibyls, and oracles were called upon to point the way and empower action. Was there a connection between the creativity of the classical Greeks and their immersion in the *interpretative* arts of divination? A religion centered on a constant *ad hoc*, freely interpretative activity of the mind might well shunt itself to high creativity in the arts and sciences.

Flower holds firm to his thesis that divination was central to ancient Greek religion and civilization. He also admits that fellow scholars are apt to disagree with him because divination, and what it implies, is "profoundly alien" (p. 241) to their rationalistic and positivistic biases. What, specifically, was so alien? He writes that it "was the seer who acted as the critical bridge between the limited and partial knowledge of mortals and the superior knowledge of the gods" (p. 240). Alien is the idea that a seer could access "superior knowledge" in any way beyond "the limited and partial." The ancient Greeks believed this knowledge was possible. Not all the time, to be sure, but often enough and consistently enough for seercraft to survive from archaic to Hellenistic times, and among the most educated and mainstream sectors of Greek society.

But if the "rationalists" and "positivists" are correct, Flower has a problem with his thesis: how indeed does one explain the Greeks' "genuine belief in the

objective validity of divination" (p. 241)? How does one explain that, although the Greeks constantly demanded public demonstration of all types of competence (not being disposed to take things on faith), the seers were high status professionals who were in constant demand, competed for the best clients, made lots of money, and often achieved fame in real life and mythic eminence in great literature? It seems reasonable to suppose that divination had to work well enough for it to have attained its major status in Greek society.

One is driven to say: *either* the professional seers, by sheer chutzpah and charisma, conned the most intellectually lively and contentious civilization of the ancient world for its entire history *or* we must admit that at least a significant part of the time the seers did indeed succeed in demonstrating useful advice and insight *by paranormal means*. Flower skirts around the problem, as I have just stated it. All he says by way of differentiating himself from the unsympathetic rationalists and positivists is that you have to enter into the mentality and presuppositions of an alien culture to understand that culture; you must, he suggests, put on the appropriate "perceptual filters." He is right about this. But the cultural empathy he insists upon fails to address the dilemma I have posed.

Of course, we cannot prove the occurrence of paranormal cognition needed to account for the pervasive belief in divination. We simply don't have the kind of refined testimony needed to do so. On the other hand, we could say that in light of modern evidence for paranormal cognition, it is reasonable to suppose that the ancient seers and oracles did produce *enough* paranormal cognition to account for the ongoing belief in divination. It would not prove the case but it would render the belief more plausible.

The author, however, writes that " . . . clairvoyance as a psychological attribute may or may not be a characteristic of some individuals. Unfortunately, the truth or falsity of such phenomena cannot be proven" (p. 6). The last statement is false. For well over a hundred years now psychical researchers and parapsychologists have been collecting case histories and performing all manner of carefully controlled types of experiments that have attempted to do just what Flower says cannot be done. If he had said, "The efforts hitherto to prove paranormal cognition have failed to convince me," he would have been on safer ground, as long as no one challenged him. Can it be that the author never heard of psychical research or parapsychology? Although the terms do not show up in his index, he does cite Frederic Myers in a footnote and also refers to E. R. Dodds, classical scholars and students of psychical research. Indeed, Myers was one of the founders of psychical research, and other classical scholars such as Gilbert Murray, Andrew Lang, and Mrs. A. W. Verrall made important contributions to the field.

In 1946, Dodds wrote a paper called "Telepathy and Clairvoyance in Classical Antiquity." In it he argues that, apart from relatively few exceptions, the ancients left us with little of the kind of evidence for telepathy and clairvoyance that we can rely on, just as they lacked the kind of criteria for historical or biographical evidence that modern scholarship demands. What we can infer, however, is

that the types of experience they reported through the lens of their very different cultural mind-set were experiences for which we do have abundant modern evidence, thanks to psychical research; Flower did not cite or discuss this paper of Dodds.

Unfortunately, Flower cites Dodds and Myers in a perfunctory way that shows he would rather distance himself from them. Perhaps the author is intimidated by the "rationalists" and "positivists" he alludes to and prefers not to risk exposing himself to their wrath and petulance. If, however, he took the trouble to make use of psychical research, he would have been able to bolster his main thesis. Flower ought to be proud that classical scholars played a major role in the creation of the (admittedly) embattled science of psychical research. Instead, by retreating from the modern research, he weakens his own position; for without the modern evidence, one could argue that the ancient Greeks, though brilliant and creative in so many domains of culture, were incredibly credulous about the utility of divination.

In spite of this unfortunate omission of a crucial part of the story, this is a valuable book that sheds new light on our understanding of the classical Greeks. It argues against those who claim that the exercise of intuition is inconsistent with high order creativity in civilized life.

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Astrology off the Beaten Track: A Scientific Study of Planets and Personality by Suzel Fuzeau-Braesch. San Antonio, TX: Anomalist Books, 2009. 172 pp. $12.95 (paper). ISBN 1-933665-36-X.

At last, someone doing scientific studies on astrology and *publishing* their results. Unfortunately, the author, Dr. Suzel Fuzeau-Braesch, died January 24, 2008, at the age of 80. This book was published posthumously by her son, Alexandre. Dr. Fuzeau-Braesch was a biologist who received her doctorate in biology from the University of Paris.

How does a biologist get interested in astrology? From the book's Prologue:

During a conference in London in 1970, she came across the first astrological computers in a shop on Oxford Street. Determined to show that astrology was bogus, and driven by

curiosity, she entered the dates of birth of her three children, as well as some other relatives, and was amazed to find the results couldn't be interchanged. Each profile corresponded to that particular child and their distinct personalities. Troubled by the results, she decided to learn more about astrology. After she retired, she dedicated her time to research in astrology. (p. 7)

Her research projects were ingenious. She did studies on twins and world events. She even studied dogs and cows!

A scientist must be objective and open-minded, especially when applying scientific methods to astrology, which has been constructed over the course of two millennia with the imprint of a variety of cultures, imagination, and mythological beliefs.

How can this be done?

The answer is so simple that no one has, until now, provided it. Apply astrology to the behavior of animals, not humans, because animals will act naturally and not be influenced by culture or preconceived ideas. (p. 58)

A little background is in order here. For centuries, astrologers have asserted that two points on the horoscope wheel were of great importance: the Ascendant and the Midheaven. The Ascendant is the point where the ecliptic (the Sun's apparent path across the sky) intersects the eastern horizon. The Midheaven is the high point of the Sun's apparent path (technically, it's where the ecliptic intersects the prime meridian). Astrologers allege that a planet within a few degrees of either point will influence the personality and career of anyone who happens to born at that time. In the 1950s, Michel Gauquelin did his famous study and found effects for Venus, the Moon, Mars, Jupiter, and Saturn. The effects he found were exactly those claimed by astrologers.

There have been many studies done where no evidence was found to support astrological claims. However, you cannot prove a negative. No matter how many studies fail to find a white crow, it only takes one successful search finding one white crow to falsify all the previous research and prove conclusively that all crows are not black. Gauquelin found five white crows. Fuzeau-Braesch claims to have found some more.

The twelve breeders who took part in the experiment recorded the lives of their puppies in great detail. Fifteen different breeds of dog were involved to insure that the results were not specific to a particular breed…. The kennels were all in the Paris area to insure easy contact with the breeders. The breeders who agreed to participate had no special knowledge of, or interest in, astrology. Over a period of five years, a total of 100 litters were investigated, from two to eight pups in each, for a total of 500 pups. (p. 59)

The results showed a strong correlation between the traits of extraversion and dominance and the angular placements of the planet Jupiter and the Sun. "The results exceeded the threshold of significance we set for the test" (p. 63).

An objection could be made that the results are due to DNA. Dr. Fuzeau-Braesch dealt with that by next doing a study of cloned cows. In this case, the DNA would be identical and therefore not a factor. Unfortunately, there were only 30 cases available, not enough for statistical significance. However, the results were in line with Gauquelin's study. The cows with Mars and Jupiter at the angles

were more aggressive and extroverted. The cow with an angular Moon was "calm and friendly."

Another study was done with human twins. Shouldn't all twins have the same horoscope? The answer is no, for the simple reason that they are not born at the exact same time. The Midheaven shifts one degree every 4 minutes, and twins can be born much further apart than that. This can change the connection of planets to the chart angles and affect the final result.

The information was obtained by mail in two stages. First the parents were asked the date, place, and time of birth. They were told that this was necessary for a scientific investigation. No mention was made of astrology. Unfortunately, the author did not say what other information (if any) was requested in this first letter. Some of the parents could easily have figured out that date, time, and place of birth meant that astrology was the subject under study.

A better procedure would have been to request other information as well in order to mask the subject of the study. Isn't this dishonest? Not at all. Test subjects have a tendency to slant their responses if they know what the research is about. For example, a study was once done on the effect of clothing on observers. The researcher told the test subjects that he was going to test their "psychic ability" by having them look at photos of "twins." The pictures were of the same model dressed in different clothing. A statistically significant number of subjects said that the "twin" dressed in a beige raincoat was more prestigious than the "twin" in the black raincoat (Molloy, 1988: 25).

When the subject is astrology, there is always the danger that a test subject will have some knowledge of it and the test results will be affected. Fortunately, the idea most people have about astrology is that it is based entirely on 12 "signs." Most people know nothing about Ascendants and Midheavens, and even some astrologers have never heard of Gauquelin sectors. The chances of the results being skewed are therefore lessened. However, it would still be best if extra steps were taken to minimize this.

The second letter sent to the parents asked a series of questions. The first question was: Were the twins identical or fraternal? The other questions concerned personality traits of the twins. The respondents had to use terms such as "more" or "less" emotional or energetic. Some keywords were also used, such as "reserved" and "expansive" that had astrological significance. "Reserved," for example, is identified with the planet Saturn.

> When the forms were returned, it was determined which answers were "right," meaning the answer matched astrological indications, which answers were "wrong" because they did not support astrological indications, and which were "null," signifying those where nothing had been answered. Of the 238 answers received, a majority of the answers (153) were "right." A minority of the answers (65) were wrong. Only 20 were "null." (pp. 84–85)

The author claims that the odds of getting this result by chance are 0.001% and it is statistically significant. Thirteen of the 251 families contacted did not respond. Assuming that each of these did respond and gave negative results, the proportion would then be 153/98.

This, treated in the same way, gives a statistical probability of 0.04%. Thus even in the worst possible case, the results cannot be due to chance and would be significant in any scientific research. (p. 85)

The only chapter I did have an objection to was the one on "mundane" astrology, the astrology of world events. For some unexplained reason, the author decided to use cycles of Jupiter and Neptune and Jupiter and Uranus. She did not get conclusive results. Any astrologer could have told her that the cycles to examine would have been Saturn with Uranus or Pluto. For example, Saturn and Pluto were making a conjunction (zero degrees) in 1914 at the start of World War I. They made a square aspect (90 degrees) in 1939 at the start of World War II. They made an opposition aspect (180 degrees) in 2001 at the time of 9/11. They are going to be making another series of squares starting October 29, 2009, so let's see what happens then (this is being written June 22, 2009).

The bottom line is that the research in this book is a good start. The book itself is well written with simple, easy to read language (how often do we see that!). Of course, the work has to be thoroughly examined and we have to see if it can be replicated. If so, then it provides support for the earlier Gauquelin work, and that would indicate that there might just be something to astrology after all.

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Haunted Greece and Rome: Ghost Stories from Classical Antiquity by D. Felton. Austin: University of Texas Press. 1999. 168 pp. £12.99 (paper). ISBN 978-0292725089.

In the decade since its publication, D. Felton's brief book has deservedly acquired the status of a minor classic. It is an accessible, well-written and engaging exposition and analysis of a trio of versions of a deeply traditional ghost-story from the Graeco-Roman world. This is the tale in which a murder-victim has been buried without rites inside a house, and his ghost terrorises visitors until a wise man confronts it, unravels the story and has the corpse removed for due burial (Plautus *Mostellaria* 476-505, Pliny *Letters* 7.27, Lucian *Philopseudes* 30-1). The wide-ranging discussion incorporates most of the other significant ghost stories from classical antiquity. The author brings an open-minded and refreshing range of perspectives to bear upon her material, drawing upon the

Nachleben of the western tradition and even urban myth, but the approach that rightly predominates is a folkloric one, and it is unsurprising to find that the preface cites as mentor William F. Hansen, the doyen of the study of folklore in a Classical context. If I were to make any criticism of the book, it would be that, for all her broad perspectives, Felton did not carry her focal analysis forward into Patristic literature. The Church Fathers offer two further, and striking, versions of her chosen story-type: Constantius of Lyon *Life of St Germanus of Auxerre* 2.10 (480 AD) and Gregory the Great *Dialogues* 3.4 (sixth-century AD). The importance of these is that they arguably shed light on the earlier development of the story-type by preserving some of its motifs in purer form than the extant pagan versions do. The Constantius and Gregory versions were noted in another treatment of the ancient story-type coincidentally published in the same year as Felton's, and this will also interest readers engaged by her work: A. Stramaglia, *Res inauditae, incredulae: Storie di fantasmi nel mondo greco-latino*. Bari: Levante Editori, pp. 133–169. I have supplied English translations of them in connection with my own discussion of the *Philopseudes* version in D. Ogden, *In Search of the Sorcerer's Apprentice: The Traditional Tales of Lucian's Lover of Lies*. Swansea: Classical Press of Wales, 2007, 205–224, a discussion considerably foreshortened in deference to Felton's work.

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Life and Mind: In Search of the Physical Basis edited by Savely Savva. Victoria, BC, Canada: Trafford Publ., 2006. 262 pp. $40.00 (paper). ISBN 978-1425110901.

This book is an anthology of a dozen multi-authored papers that taken collectively constitute an important step forward toward elucidating a *real* science of life—one that deals with its extraordinary aspects, including mind and phenomena involved in energy or distant healing and anomalous bio-communication, topics that have been largely ignored by the mainstream to date. As such the book necessarily challenges the dominant biomedical paradigm, which is molecular reductionism—the attempt to reduce all life functions to the sum of its parts, namely, to biomolecules and their interactions. The topic of this book, which is fundamental to our understanding of life and the foundations of integrative medicine, has been of interest over centuries and has been the subject of major works by formative thinkers including Schroedinger and Gurwitsch.

The book is most remarkable in that it is contains a number of noteworthy contributions from Russian scientists who are members of the Russian Academy of Science. Key works by Russians have been included and translated to English, thanks to the scholarly connections and diligence of the Russian-speaking editor, an engineer and scholar who has worked on healing research and related topics for many years.

Among the anomalous observations discussed, there is the transmutation of the elements by bacteria, the effects of ultralow doses of substances, and bio-communication between living systems that goes beyond conventional sensory means. One of the stated goals of the book is to stimulate scientific interest and gather momentum toward a landmark international scientific symposium to form a consortium on advanced biophysics in order to move science forward in this frontier area. Hopefully, the book will do this and help frontier scientists' work gain momentum and recognition from their peers.

This work covers some of the key anomalies in biology, while it enumerates the failures of the dominant reductionistic biomedical paradigm to accommodate them. Indeed, fundamentally, the life sciences are at an impasse under the molecular paradigm, and this book expands the horizons for those interested in looking beyond it. The book offers novel explanatory hypotheses including several papers on the biofield concept, one on the quantum vacuum, and a systems approach, which attempt to accommodate the various anomalies and stimulate new thinking about the nature of life. Work by key scientists including William Tiller, Hal Puthoff, John Bockris, and James Beichler, among others, are included.

There are only a few shortcomings of this work. Missing from the book is an index, which would have been helpful. More illustrations would have been helpful as well, especially in the papers by the Russian authors whose work is not easily accessible to the English-speaking world.

As a biophysicist who has been conducting research at the frontiers of biofield science, I find this book both exciting and a great resource. I was unfamiliar with some of these Russian authors and their work until now. This book would also be a great asset for students or others interested in exploring the frontiers of the life sciences, or those working toward a more appropriate foundation for alternative and complementary medicine, especially mind-body and energy medicine that also challenge the dominant paradigm. Moreover, for anyone who is grappling with the big questions about the physical and/or metaphysical nature of life, I would certainly recommend it.

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Parapsychology and the Skeptics: A Scientific Argument for the Existence of ESP by Chris Carter. SterlingHouse Publisher, 2007. 218 pp. $18.95 (paper). ISBN 1-58501-108-8.

Chris Carter's slim volume is a slam-dunk future classic in the field of parapsychology.

In it he asks, then answers, three simple, straightforward, questions:

Q. Is there conclusive experimental evidence for psi? Absolutely.
Q. Would the existence of psi contradict established science? Classical science—yes; modern science—no.
Q. Is parapsychology a science? Definitely.

I got a personal kick out of the quote Carter chose to introduce his discussion of the evidence for psi, offered up in 1995 by psi-cop physicist Victor Stenger: "Psychic phenomena have failed to be verified after 150 years of attempts involving thousands of independent experiments. After all this time, we can safely assume they do not exist."

Ironically, Stenger's head-scratching pronouncement was delivered the same year the U.S. government finally disclosed its secret 20-year, $20 million psychic spying program; the American Institutes for Research final report on the Department of Defense's Stargate program concluded that its ESP laboratory experiments were statistically significant; and CSICOP hero Ray Hyman publicly stated "the case for psychic functioning seems better than it ever has been," admitting that "I do not have a ready explanation for these observed effects." By 1995, we already had replications by four independent laboratories in both Europe and the United States of Honorton's game-changing autoganzfeld experiments. Six years earlier, the respected academic journal *Foundation of Physics* had published an analysis by Dean Radin and Roger Nelson of over 800 PK studies conducted between 1959 and 1987, which concluded the odds against its positive results being due to chance were more than *one trillion to one* (Radin & Nelson, 1989). You can only shake your head in wonder. "There is little point in continuing with more replication studies," Carter concludes. His advice to parapsychologists? Move on. Stop wasting time rebutting die-hard debunkers.

I actually met the good professor once. Stenger taught at the University of Hawaii, my alma mater. I had just joined the SSE and Dr. Peter Sturrock was visiting UH, giving an invited talk on campus to a small group of us rookie scientific explorers. I only recall two things from that evening: the erudition and graciousness of Dr. Sturrock and the sour querulousness of Dr. Stenger, who also attended. He appeared affronted that the university had lent its facilities for a meeting of kooks, and argued incessantly and unpleasantly.

Classical science may have no room for psi, but we no longer live in the 17th century. The rules have changed in psi's favor. Carter's concise discussion of Newtonian vs. Quantum Physics, and the ontological implications of each for psi claims, is the finest brief I've ever read on this hard-to-explain topic. Psi is

preposterous under the "laws" of the former; it's possible, even probable (cf. Costa de Beauregard[1]) under the latter, Stenger notwithstanding.

Carter lays out six assumptions of classical science that conflict with the existence of psi—determinism, observer independence, localism, reductionism, upward causation exclusively, and the philosophy of materialism. Then in 20 incisive pages, he describes the topsy-turvy effect new discoveries in quantum physics—"the most battle tested theory in science" (Rosenblum & Kuttner, 1999), but largely undigested by most scientists—have on each of those previously reasonable assumptions. Among the most damaging: quantum mechanics replaces the deterministic universe with a probabilistic universe and gives a prime role to the observer; further, it forces classical physics to deal with the experimentally demonstrated *fact* of quantum non-locality—action at a distance, with no signal required to transmit information. Consciousness studies, meanwhile, are also undermining the philosophical foundation of dogmatic skepticism. Carter notes the "dwindling number of pure materialists that still deny the existence of consciousness," and explores the merits of the two hypotheses currently contending to replace materialism. Both mentalism and dualism acknowledge that mind can exert a causal influence on matter, which "removes the last barrier skeptics can raise about the scientific legitimacy of psi."

Carter doesn't suffer fools gladly. Throughout the book, he highlights some egregious examples of intellectual dishonesty, willful ignorance, double standards, fuzzy thinking, and goal post-moving by well-known skeptics and debunkers unwilling or unable to play fair (visit www.skepticalinvestigations.org for more horror stories). James Randi, Susan Blackmore, Richard Wiseman, Martin Gardner, and Ray Hyman all take it on the chin; Michael Shermer earns a passing cuff. In his chapter on the current, impoverished state of skepticism, Carter quotes Hyman's baffling assertion, "Only parapsychology, among the fields of inquiry claiming scientific status, lacks a cumulative database." This despite J. B. Rhine's landmark 1940 publication summarizing *60 years* of quantitative ESP studies dating back to 1882; Honorton's meta-analysis of 42 ganzfeld studies conducted over *8 years* between 1974 and 1981; and Radin and Nelson's meta-analysis of *28 years* of PK studies, mentioned above. (Scolds Carter: "Meta-analysis is *by definition* the analysis of cumulative experiments.") To put it kindly, Hyman looks ridiculous. As John Beloff says, "Skepticism is not necessarily a badge of tough-mindedness; it may equally be a sign of intellectual cowardice."

Is parapsychology a science? Let's retire this question. Besides having a cumulative database, parapsychology has generated theories that entail falsifiable predictions—Karl Popper's criterion for scientific status. They include both physical theories based on quantum mechanics (physicist Evan Harris Walker's theory stars in Carter's book) and psychological theories dealing with states of mind associated with psi experiences (as examples, Carter cites Rex Stanford's psi-mediated instrumental response and Charles Honorton's "noise-reduction" model).

Carter ends his tour-de-force by revisiting David Hume's argument: "A miracle is a violation of the laws of nature." Skeptics wave this as a talisman to ward off scientific anomalies that threaten their scientific fundamentalism. Carter points out that it rests on two assumptions: first, that the "laws of nature" are known to be correct and complete; and second, that the existence of psi would necessarily conflict with them. The first is obviously wrong, given three centuries of paradigm-busting, scientific revolution since then, most recently by Einstein and Bohr. The second is correct, in the sense that psi *does* conflict with Hume's 18th century science. But as Carter drives home in his book, "the laws of nature as Hume understood them are now long obsolete, and so is his skeptical argument."

My money is on the psi cops ending up in the dustbin of history.

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Note

[1] See Costa de Beauregard, 1975. Also see Puharich, 1979: 13, where Costa de Beauregard "argues that the data and the theory of the physical sciences alone *demands* that ESP and PK exist."

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Soul Survivor. The Reincarnation of a World War II Fighter Pilot by Bruce Leininger, Andrea Leininger, and Ken Gross. Grand Central Publishing, 2009. 272 pp. $24.99 (hardcover). ISBN 978-0-446-50933-6.

If—and that will be a big IF for many people—this book is factually correct in its essential details, it will (a) probably be on the best-seller lists by the time this review is published (it's already, shortly after release, at the 1000 rank level for books in general and number five for Religion and Spirituality books in Amazon sales rank at the time I'm writing this, July 20, 2009); (b) make a lot of people feel threatened and angry; and (c) be one of the most important case studies supporting the idea of reincarnation.

I'll write first about my second point, the potential to upset people, as the context for this review. I think many readers, both older ones who will remember some of this and younger ones, will find this historical background of some interest.

When I was an impoverished electrical engineering student at MIT in 1956, I had already read extensively in the scientific and medical literature on hypnosis, as well as psychical research and parapsychology. Browsing at the remaindered books table in the MIT bookstore one afternoon, I saw, among many others being sold for a dollar, a hardback called *The Search for Bridey Murphy*, by one Morey Bernstein. I skipped by it at first, it sounded like a novel and I was a terribly serious reader in my younger days, but I noticed the word "hypnosis" on the cover and picked it up. It was a book about using hypnotic regression to uncover memories of a past life, and that certainly looked interesting enough to spend one of my few dollars on.

Given my already extensive knowledge—I later went on in my career to become one of the authorities on scientific hypnosis research—I could tell that the author, Morey Bernstein, a Colorado businessman, was well versed in the scientific and medical literature on hypnosis. He had used it both out of curiosity and to help friends with problems. He had heard that there were claims that a person could sometimes be regressed to a previous incarnation, and while he was rather skeptical of that, he decided to try it with an acquaintance. He tape recorded the sessions, which became the basis of his book. His subject, housewife Virginia Tighe, suddenly began speaking in an Irish accent and, on questioning over several sessions, gave many specific details of a life in Ireland as Bridey Murphy. Some of these details could never be checked for accuracy, some were things many people might be expected to know about 19th century Ireland, some were rather esoteric items (e.g., using "ditched" for buried) that we wouldn't expect to be common knowledge. Some were just plain wrong. As I recall it, Bernstein, with admirable scientific caution, concluded that this case was evidence for reincarnation, but certainly not absolute proof in any way, and, as we academics always say, more research was needed.

My finding the book on the dollar remainder table was unusual. Initial sales must have been quite slow, so it was remaindered, but it quickly hit the non-fiction best-seller lists and aroused enormous excitement and controversy all over the country, with reactions ranging from welcoming this proof of reincarnation, to denunciation of the book as the work of the Devil, to declarations that it was scientifically nonsensical, to accusations that the whole thing was fraudulent.

Shortly an anthology came out that was billed as the scientific report on *The Search for Bridey Murphy*. I read it with great anticipation, as I could see from the table of contents that the chapters were by many of the people I knew were *the* medical and scientific authorities on hypnosis. Surely this book would cast a lot of light on the subject?

To my amazement—and I'm sure this was a good lesson for a young undergraduate like me who tended to put too much trust in "authorities"—the chapters had an intensely emotional, denunciatory flavor and a factual sloppiness and inaccuracy that amazed me. There were constant accusations of this sort: "Bernstein claimed these ridiculous things X and Y!" I didn't remember Bernstein writing those Xs and Ys. So I went back and reread the Bridey book and found that the pseudo-skeptics (as I later learned to call them) were indeed so angry at Bernstein for daring to suggest that reincarnation might be real that he had to be debunked, and accuracy could be sacrificed for "The Cause" of defending strict materialism. This was supposed to be science: facts had to come first! You weren't allowed to lie about what someone reported and wrote! It was hard for my idealistic young self to believe that my esteemed Authorities could lose it so badly—but they had.

In the summer of 1957 I got a summer job as a research assistant for physician/parapsychologist Andrija Puharich at his Round Table Foundation in Maine, and Morey Bernstein visited several times during the summer. From talking with him, I learned that I was aware of only a small part of the intense negative attacks on his book. The "big criticism" that people claimed had put the nail in the coffin of any possible veracity to Virginia Tighe's memories had appeared in print by then, namely that a woman, supposedly an Irish immigrant named Bridie Murphy Corkell, claimed that she had lived across the street from Virginia when she was a little girl and had often told the young Virginia tales of old Ireland. So obviously Virginia's memories of being Bridey Murphy were just a subconscious confabulation, spiced with bits of information about old Ireland that she didn't consciously remember having been told.

OK, that seemed a plausible hypothesis, given what we knew at that time of hypnosis and the subconscious. Most people have dismissed the Bridey Murphy case after hearing about this. But Bernstein was furious about it! He told me that a certain big city newspaper publisher had wanted to serialize the Bridey Murphy book in his newspaper chain, but would not do it on terms acceptable to Bernstein. He told Bernstein he would get revenge on him for not letting him have the material. What people weren't finding out, Bernstein told me, was that this ostensible Irishwoman who told Virginia all about Ireland was the mother of this newspaper publisher, and no outside reporters or investigators were allowed to talk with her.

All this was very disillusioning to my young self. People would lie about the facts relating to such an important issue as reincarnation? What kind of world was this? I can, with the wisdom of hindsight, say learning things like this was a necessary part of growing up and becoming "realistic," but I've never liked it!

Incidentally, lest someone suspect that I am biased because Morey Bernstein contributed small amounts (less than a hundred dollars a year for several years) to support my parapsychological research, that was decades after the above events and the formation of my prime opinion on the case: Bernstein had presented some interesting evidence for reincarnation, he was reasonably modest about drawing conclusions from it, but the idea of reincarnation was so threatening to 1950s

culture that leading scientists acted quite irrationally in their attempts to make the case go away. A good overview of the Bridey Murphy case is that of philosopher C. J. Ducasse (Ducasse, 1960).

That's a part of the historical-cultural perspective we come to the Leininger case with. Attitudes toward reincarnation have become considerably more relaxed and in some cases accepting in contemporary culture, but is the change great enough that we have much chance of evaluating reincarnation cases rationally?

Soul Survivor is a well-written book: you can read it like a novel, and it is so engrossing that I'm not going to say much about the content, lest I spoil the plot for you. The characters are so appealing you will easily empathize with them: James Leininger, 2 years old, having terrible nightmares several times a week, his mother Andrea desperately trying to find some way to help her son as this goes on and on, eventually hearing him say some words amid his screaming:

> He was lying there on his back kicking and clawing at the covers . . . like he was trying to kick his way out of a coffin. I thought this looks like *The Exorcist*—I half expected his head to spin around like that little girl in the movie. I even thought I might have to go and get a priest. But then I heard what James was saying . . . "Airplane crash! Plane on fire! Little man can't get out!"

There are accounts of such things as James' love of airplane toys from his earliest days, his mother showing him a toy fighter plane model in a store—she points out to him that it's carrying a bomb underneath it, but 2-year-old James corrects her: "That's not a bomb, Mommy, that's a dwop tank." A tiny kid who can hardly talk knowing about drop tanks, used to allow fighters to fly longer missions? Another account: James' father Bruce also tries to find some way to stop his child from having these horrible nightmares, but stubbornly resists a reincarnation interpretation, even as evidence for it piles up, because he is a Christian and doesn't believe in reincarnation. There are solid facts, like James eventually being asked the name of the aircraft carrier he flew from and saying it was the Natoma Bay. No way, says his father, that's not an American name or proper name for an aircraft carrier—but he then discovers there was a Natoma Bay carrier. And what do you think happens years later when little James is taken to the annual reunion of the crewmen of the Natoma Bay? This is quite a story. . . .

As I read, the careful scientist side of me kept wishing there were some objective witnesses, scientific investigators on the scene to record and document each developing item. A totally impractical wish, of course; there's no mainstream money to support reincarnation research and only a very few trained scientists investigating it. Eventually the family contacted counselor Carol Bowman, who began investigating reincarnation after her own child showed apparent memories of a past life. She's written several books on reincarnation. Some might worry that Bowman is a "believer," she is no longer interested in testing the reality of reincarnation, she's interested in helping the parents of children whose kids are

suffering as they try to deal with the memories they have. Is she "objective"? Does not accepting the possibility or reality of reincarnation automatically make one more objective?

As a parent, if one of my children were troubled by apparent reincarnation memories, my heart as well as my head says I'd much rather contact someone like Bowman, who has ideas on how to help children and parents, than someone who hasn't made up her mind about whether there's any reality to reincarnation and just wants to document what's happening . . . .

Soul Survivor is a fascinating read, I can't recommend it highly enough. If the Bridey Murphy history is indicative, though, by the time this review appears there will have been major attempts to debunk the Leininger case by religious fanatics who oppose the idea of reincarnation and pseudo-skeptics who are determined to uphold what I can only characterize as "The Doctrines of the Church of Materialism." The truth will probably be often victimized in these attempts.

What do I think of the idea of reincarnation, my considered opinion as a scientist with fair knowledge of this area, as modified by who knows what personal factors? Given the outstanding pioneering work of the late psychiatrist and SSE member Ian Stevenson in collecting and investigating thousands of cases of children who seem to remember past lives, I long ago decided that while I can quibble about details and call for more research, I think reincarnation of "something," some aspect of personality, is likely to be real in at least some cases. Since it would make a huge difference in how we lived our lives if we had a lot of evidence favoring reincarnation, I think in a rational world we would be devoting a lot of effort and resources to scientific investigation of the possibility. Stevenson's successors at the Division of Personality Studies at the University of Virginia Medical School are doing a good job, but they are a mere handful of people dealing with a hugely important and complex problem, and working with very limited resources.

Would I bet on our world becoming more rational in this way, realizing that investigating what's real and not real about our possible spiritual nature is a lot more important than curing the common cold, so we should finance the former more than the latter? Good question. . . .

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FURTHER BOOKS OF NOTE

Standing with Stones: A Photographic Journey through Megalithic Britain and Ireland by Rupert Soskin. Thames & Hudson, 2009. 192 pp. $40 (hardcover). ISBN 978-0-500-05158-0.

Wonderful photographs, 248 of them, make this book a magnificent feast for anyone with the slightest interest in the prehistoric monuments whose icon is Stonehenge. And who could fail to be interested by these enigmatic sites? The evidence is clear that 5000 years and more ago, there was large-scale organization and long-distance trade in societies whose tools were Stone Age and yet who built an artificial hill that needed labor equivalent to 500 men working for 10 years, as well as stone circles galore, henges (rings of ditches and banks), and burial chambers as elaborate as Maes Howe in Orkney and Newgrange in Ireland where the very end of a long passage is illuminated by the sun just and only at the winter solstice.

I've been fascinated for decades by the mysteries of these megalithic sites, read whatever I could, and still there are items in this collection that I had not previously come across, for example, those on the Isle of Man, or the occasional careful burial of ear bones, or that a site in Ireland dates to the Mesolithic at around 9500 years ago.

The text accompanying the photos is very brief, but the book gives a rather comprehensive list of volumes for further reading. For help in locating the photographed sites, grid references are given to the British Ordnance Maps system. Icing on the cake is that this volume has the built-in cloth-tape bookmark that used to be standard in high-class books. *Standing with Stones* is a credit in every way to its author and publisher.

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The Journey of Robert Monroe: From Out-of-Body Explorer to Consciousness Pioneer by Ronald Russell. Charlottesville, VA: Hampton Roads, 2007. xxviii + 376 pp. $24.95 (hardcover). ISBN 978-1-57174-533-0.

The Journey of Robert Monroe (*JRM*) is a well-written, highly-readable biography.

It is hard to imagine any regular reader of *JSE* who is does not know the name Robert Monroe. For those few readers (and others) unfamiliar with him and his contributions to the study of OBEs (Out of Body Experiences), and his development of the technology and instrumentation to stimulate/assist OBEs ("The Hemi-Sync Process"), I can also heartily recommend his own three books: *Journeys Out of the Body, Far Journeys,* and *Ultimate Journey.*

JRM is a highly complete and even-handed story of a unique human being. (In using the word "unique", a superlative meaning one-of-a-kind, I find myself bristling at how often that word is reduced to a mere comparative by useless and meaningless adjectives, such as "very", "highly", "totally", etc., by various celebrities [whom should know better], sales people, and noisy pitch-men. Grrrr!)

Robert Monroe was unique!

I had read Monroe's *Journeys Out of the Body* and *Far Journeys* years before I began reading *JRM*. It quickly became apparent that I should also read *Ultimate Journey* before continuing with this review. That was a pleasant if necessary detour.

The British author of *JRM,* Ronald Russell, although previously unknown to me, is a polished professional and the book reflects that polish. He is not only a prolific author with 16 books to his credit (several on topics related to *JRM* and to Monroe's own books above), but has also been a teacher, a lecturer at prestigious British universities, and a frequent editor for other authors, including Monroe (with other personal and professional activities and accomplishments too numerous to cite here). He and his wife, Jill, are members of The Monroe Institute's board of advisors and are both heavily involved in the Institute's work, thus providing obvious and special access to the interesting material presented in the book.

The book is tastefully sprinkled with black-and-white photos and is filled with anecdotal references to many well-known SSE members (and others well known to most SSE members). There is an extremely well-written foreword by one of that latter group, Charles T. Tart, Ph.D., a close friend of Monroe's for more than 30 years. The book's appendix by "Skip" Atwater, an SSE member who spoke at the 22nd SSE Annual Meeting at Kalispell, MT, about The Monroe Institute, is a very useful, 10-page description of "The Hemi-Sync Process". An adequate, but not overly long index for the book is provided, as well as notes at the end of each chapter.

It is difficult to resist over-recommending this book to *JSE* readers interested in the man, Monroe, and the subject area.

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JOURNAL REVIEW

Time & Mind: The Journal of Archaeology, Consciousness and Culture edited by Paul Devereux, Neil Mortimer, George Nash, John Baker, and Michael Winkelman. Oxford, UK: Berg Publishers. ISSN: 1751-696X. Published 3 times a year (March, July, and November); £25 ($48) for 1-year print subscription as of 2008; on-line subscription also available at http://www.bergpublishers.com.

Time & Mind is a new peer-reviewed, interdisciplinary journal that seeks to venture beyond the limits of traditional Western archaeology by providing a forum for articles that explore cognitive approaches to various aspects of ancient civilization, such as the religious and mythical symbolism behind human-altered landscapes; the ritual significance

underlying the placement, function, and structural design of monuments; and the conceptual and expressive meaning behind ancient ceremonial art, objects, and practices. In addition to perspectives on the past, the journal invites articles relating to secular viewpoints on time and mind, and to the way in which the modern mind shapes its own views regarding history and pre-history.

In addition to several book reviews, the inaugural issue of *Time & Mind* includes six articles to reflect its broad scope. In the first article, California archaeologist David Whitley presents ethnographic evidence from petroglyphs created by ancient Native American shamans to make the argument that conceptual metaphors derivable from mythical symbolic interpretation of the petroglyphs may represent long-term knowledge structures that were continually used by Shoshone and Paiute shamans over a period of about 11,000 years to express two meaningful metaphors relating to shamanistic experience during vision quests. Whitley argues that such evidence can be useful in addressing the larger issue within cognitive linguistics of whether conceptual metaphors may "comprise basic building blocks of human thought" (p. 7).

The emerging paradigm of archaeoacoustics is the focus of the second article as New Mexico archaeologist Richard Loose explores the acoustical properties of a natural amphitheater apparently carved out of the face of a sandstone cliff in Chaco Canyon by ancient Anasazi people. A series of acoustics tests revealed that the amphitheater exhibits a 1.8- to 2-second reverberation decay effect at 60 dB that is fitting for broadcasting musical performances. Based on these findings, as well as its proximity to the geometric center of the broad Chacoan community of dwellings and its vast network of roads (Lekson et al., 1988), Loose suggests that the amphitheater may have had important ceremonial significance for the Chacoan people, and that it was perhaps used in large-scale public ceremonies that included music.

Israeli cognitive psychologist Benny Shanon offers a series of speculative hypotheses in the third article to make a case for consideration that several of the profound religious events in the life of Moses and the Hebrew people, as recorded in the Old Testament of the Bible, may have been tied to the use of entheogens, hallucinogenic substances found in various flowering plants and trees that have been used in a religious or spiritual context by various cultures to induce altered states of consciousness. Of particular note, Shanon points out that two plants native to Israel and the Sinai Peninsula region, the *harmala* shrub (aka Syrian rue) and the *acacia* tree, contain the same psychoactive ingredients present in *ayahuasca,* the vine-based hallucinogenic drink used by the Amazon people of South America to induce vivid divinatory visions (Roney-Dougal, 1993: 91–94).

In the fourth article, journal co-editor Neil Mortimer presents an interview with the prominent British archaeologist Peter Fowler, whose wider appreciation of the depth of the landscape surrounding archaeological sites has been extended to expression in his personal works of abstract and rudimentary landscape paintings. Fowler offers thoughts on how the aesthetic dimension of an archaeological landscape might provide a complementary approach to traditional archaeological approaches in the way of better understanding of the possible significance of a site to ancient people.

Jeremy Harte, curator of the Bourne Hall Museum at Ewell in Surrey, England, illustrates in the fifth article the possible way in which local folklore surrounding a given geographical locale can serve as the source for popular legends that can remain into the present by persistent retelling by others. His illustrative focus is the traditional local folklore associated with the withered and often ominous looking forest landscape of Dartmoor, England. According to the folklore, the Dartmoor forest is the site inhabited by a spectral

hunter and his tracking dogs, who are regarded as having an evil nature. Through repeated retelling by 19th century folklorists, the stories of encounters with the hunter and his dogs have given rise to a local legend that continues to be associated with Dartmoor as a way to promote popular tourism.

Archaeoacoustics is addressed once more in the final article, as neuropsychiatrist Ian Cook and his associates at the UCLA Laboratory of Brain, Behavior, and Pharmacology examine the possible correlation between neurophysiological activity and the physical phenomenon of acoustical resonance. Previous field research has found that certain prehistoric structures located in Ireland and the United Kingdom exhibit acoustic resonance effects that lie within the range of 95 and 120 Hz, frequencies that also lie within the range of the human voice (Devereux & Jahn, 1996; Jahn et al., 1996). Using quantitative electroencephalographic (QEEG) monitoring, Cook and his associates explored whether these frequencies may influence brain activity in healthy subjects. At the specific frequency of 110 Hz, they found that the subjects displayed lower QEEG power in their left temporal lobe as compared with the right, and that the pattern of QEEG activity within their prefrontal cortices shifted from left hemispheric dominance to right. This suggests a deactivation of left cortical regions typically associated with language processing, and activation of a right frontal region that may be associated with emotion regulation (Jackson et al., 2003). Although they did not gather information relating to the subjects' subjective states during exposure to the frequency patterns, Cook et al. suspect that activation of the right frontal region might be somehow correlated with the emotional processing of auditory information, and they encourage further research along these lines.

In general, *Time & Mind* is a journal that offers promise for those willing to consider the cognitive aspects of archaeology, promise that may open the way to a wider perspective on civilizations that have existed throughout history and pre-history. In relation to the latter, the prominent Canadian anthropologist J. Norman Emerson once pointed out:

> Research into pre-history . . . is pretty solid. We are able to trace, with a great deal of confidence, the story of what happened and at what time in the history of man such events took place, as well as how extensive such happenings and developments were over a geographic range and territory. But traditional research into human prehistory still has a major weakness. There is a real lack of humanity. . . .
>
> We move from questions of when, how widely, and what happened in the past—where we have some confidence in our findings—to questions of what did it all mean and of what value was it, with less and less assurance and greater speculation. As the realms of art, symbolism, social meanings, and individual and societal values are encountered, our ability and confidence vanishes. Yet these are all the questions which make such a difference when one tries to understand a living person and his culture. (Schwartz, 1978/2001: 138)

In a similar vein, researcher and philosopher Stephan Schwartz (1978/2001) recognized the current limitations faced by traditional archaeology in providing a fuller perspective on past civilizations:

> No matter how carefully chronicled, the detritus of a culture can never bring it back to life. Climatology may reveal that the rains stopped coming and so a tribe was forced to find new territory, which, in turn, accounted for an Indian war. But it cannot reveal how the people felt about all this, or how they explained the failure of the rains. The relevant information about the past, the data needed to answer these questions, is simply not available through traditional archaeological methods. (p. 283)

Arguably, one could begin to attain a basic perspective of the viewpoint of a past culture by considering the cognitive approach to archaeology. *Time & Mind* co-editor Paul Devereux (1997) noted that the ancient Greeks had two views of place. One of them, *topos* (from which the word *topography* is rooted), was the basis for the familiar view of place as we

know it today, in terms of location and physical features. In contrast, the other, *chora,* was ". . . a holistic reference to place: place as expressively potent, place as experience, place as a trigger to memory, imagination and mythic presence" (p. 528). Devereux (1997) offers some suggestions as to how one might cognitively experience the *chora* aspect during a visit to an ancient site, which might offer a sense of the site's meaning and purpose to the ancient people who built it.

While the past can never be fully be re-created or re-lived, considering the points of intersection between archaeology, consciousness research, and cultural studies may open the path to a rudimentary understanding of the experiential meaning of humanity's past. It is hoped that in providing a publication addressing the various issues relating to mind throughout history, *Time & Mind* will be able to achieve this new level of understanding.

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Readers are encouraged to submit for possible inclusion here titles of articles in preferably peer reviewed journals (typically, which do not focus on topics about anomalies) that are relevant to issues addressed in JSE. A short commentary should accompany. The articles may be in any language, but the title should be translated into English and the commentary should be in English.