

The next major section discusses parapsychology and how it might relate to the author's theory of virtual reality. Some of the concepts he covers are PEAR's micro-PK experiments, remote viewing, Pribram's hologram theory, hallucination, reincarnation, poltergeists, healing, and auras. This section was quite good in explaining the relevant research in these areas and providing a lot of jump off points for further study. But the author spends more time explaining these phenomena than tying it to the premise of the book. He tended to bring up every unexplained phenomena under the sun and rather than showing how his VR theory explains the underpinnings, merely shows how they don't contradict his theory. Perhaps the best part is where Thompson proposes the concept of "a universe built for us" based on universal constants and the necessity that they be what they are for the existence of the universe as we know it.

Towards the end he touches on Eastern philosophies and how some of these concepts may apply to his notion of virtual reality, specifically the notion of a universal consciousness as the source of the virtual reality system. This section had the most potential to be of interest, especially considering that the concept of Maya is so pivotal in Hinduism and Buddhism. But rather than give a general description of these concepts as he did in previous sections he dives right in, presenting rather deep descriptions of the Vaishnava school of Hinduism and Tibetan school of Buddhism, to the point where the average reader may have a difficult time keeping up.

In conclusion, this book takes the concept of Maya and virtual reality and discusses how it may apply to a wide range of ideas, both physically, parapsychically, and philosophically. It is also well footnoted with a lot of opportunity to explore these concepts further. And although it is informative this reviewer believes it's important to not take it too seriously from an academic viewpoint. If you liked the *Matrix* movies and are interested in exploring those ideas of virtual reality as reality in the context of the present day, then this would be a good book for you.

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Faith, Science, and Understanding by John Polkinghorne. New Haven, CT: Yale University Press, 2000. xvi + 208 pp. \$19.95 (cloth). ISBN 0-3000-9128-1. \$11.95 (paper) ISBN 0-3000-8372-6.

The relation of science to religion raises the same deep questions as the attempt to find, in our current scientific understanding of Nature, room for psychic phenomena. If the success of science is interpreted in reductive

materialist terms, then divine interventions and psychic phenomena must both be illusions. Therefore religion and parapsychology face similar dilemmas:

- “How could God or Spirit be an agent in the world?”
- “How can mind or consciousness exert agency in the world?”

The task is to find an intellectually respectable basis for conceiving how non-material intervention can be genuinely efficacious without violating the cause-and-effect processes that we know to govern material phenomena. There is no lack of discourse on these matters that is *not* intellectually impressive, and Polkinghorne has little patience with the superficial hand-waving about “science and religion” that goes on among scientists, humanists, philosophers, and theologians who fail to respect the intellectual traditions and demands of *both* these disciplines; for example: “The dazzling speculations with which the quantum cosmologists regale us in their popular books are intellectual arabesques performed on extremely thin intellectual ice” (p. 9).

John Polkinghorne practiced physics before he became an ordained Anglican minister, and he has written widely about science, religion, and the relation between them. This book he characterizes as “second thoughts” on some salient points. Though he says nothing about parapsychology or psychic phenomena, I believe that his discussion is well worth reading by people who seek a scientific basis for possible explication of psychic phenomena as well as by those looking for a rational basis for religious faith.

Science and theology, Polkinghorne argues, are both human enterprises. Both can and should seek to develop understanding based on or at least compatible with actual experience: revelation is for theology what observation and experiment are for science. Both disciplines need to be pursued with an appropriate blend of intellectual daring and humility. But there is no universal epistemology: the manner in which science develops explanations for material events cannot be precisely the same as the manner in which theology develops creeds that incorporate human religious experiences. Whereas science wants to solve every mystery in its domain, religion seeks to accept and worship some ultimately mysterious essence.

This book has three parts. Part I, “Issues”, tackles “Theology in the university”, “Motivations for belief”, “The role of revelation”, “Design in biology”, and “Second thoughts”. The last of these comes in five sections: “Critical realism”, “Quantum cosmology and the Anthropic Principle”, “Panentheism”, “Dual aspect monism”, and “Chaos theory”. Part II is concerned with “Divine agency”, while Part III, “Significant thinkers”, comments on others’ views on these matters with concluding remarks on “Science and theology in England”.

For Polkinghorne, chaos theory and complexity theory offer the best opportunity to resolve the dilemma of physical causality and spiritual influence. Chaos theory recognizes a region within physical determinism in which the actual outcome of any *individual* process results from a series of contingent steps that might conceivably be subject to *choice*, be it divine or human: “The

openness that a chaotic system can be interpreted as possessing corresponds to the multiplicity of possibilities contained within this strange attractor, and any one of the motions that is actually executed can be understood as corresponding to an expression of the information specifying its detailed structure ('this way, then that way, etc.')" (pp. 121–122). Such a framework might go some way to accommodating the human experience that individuals exercising free will nevertheless, on average or on the whole, act in accordance with stereotypes or common generalizations about people.

Studies of complex systems imply that apparently random assemblages can spontaneously achieve precisely ordered organization that results not from physical causality (or "energetic exchanges") but from *information* (p. 122). Such information therefore has a real existence of some sort, perhaps analogous to the case of mathematics in the view of those who take mathematics to be a matter of discovery and not of human invention. A role for divinity could then be conceived in the form of what Polkinghorne calls "active information", "a pattern-forming causality". Thus Polkinghorne envisages a "fundamental concept of a pattern-forming character that will embrace these emergent properties of holistic order. Information might be a suitable word for it. It carries with it just a *glimmer* (no more) of the integration of the material with something that begins to look a little like the mental" (pp. 96–97). Parapsychology could argue quite analogously to envisage opportunities for consciousness to participate actively in psychic events, "a genuinely instrumental role for mind" (p. 114).

Scientists who become smitten with unorthodox beliefs are often said to have lost their intellectual acuity, whereas in reality their approach to knowledge-seeking has not changed (Bauer, 2001: chapters 9 & 10). So too Polkinghorne believes that, when he turned to the study of religion from the study and practice of physics, there was no change in his "openness as to what is actually the case"; he remained a "bottom-up" thinker who proceeds "from evidence to theory, from experience to understanding... very wary of claims to know general principles in advance of particular encounters with reality" (pp. 29–30). Accordingly, he also believes (I think most properly) that science is best understood through observing what it is that scientists actually do rather than by "speculations concerning general epistemological principles" (p. 30). Approvingly, Michael Polanyi is cited for the desirability of "a frame of mind in which I may firmly hold to what I believe to be true, even though I know it may conceivably be false" (pp. 33–34).

Anomalists are often confronted with a simple-minded assertion that science demands repeatability. Polkinghorne points out that no discussion of, for instance, Grand Unified Theory or any conceivable test of it could meet that criterion. Science turns to singularities and unique events in its attempt to understand cosmological events, so other disciplines can hardly be criticized as "unscientific" when they do the same in analogous circumstances. (As noted

earlier, Polkinghorne in any case denies that what works in scientific knowledge-seeking necessarily will serve in seeking other kinds of knowledge.)

Appealing and impressive as Polkinghorne's discourse is, there are places where he seems to substitute personal taste for reasoned argument, for example when he labels pantheism "the theologically unacceptable equation of the Creator with creation" (p. 89). On the one hand, I find congenial Polkinghorne's argument concerning a Unity of nature, an Integrity as opposed to a random branching, and that there is Meaning in the world and not a fundamental lack of significance. I can also follow him in feeling that a "balance is needed between transcendence and immanence" (p. 90). On the other hand it remains a large step, not entailed by Polkinghorne's arguments, from these statements to belief in a *personal, interactive* God. Still, much of this book can provide food for useful thought for agnostics, for instance "interpreting the intrinsic unpredictabilities that are found in modern physics as signs of an openness of physical process to the future, so that what might have seemed to be unfortunate epistemological deficiencies are reinterpreted as fortunate ontological opportunities" (p. 96).

In analogy to complementarity in physics, Polkinghorne envisages a "dual aspect monism" in which entities incorporate varying degrees of materiality and mentality. Stones and the like are at the one, material, extreme whereas the Platonic laws of mathematics are at the other, mental, extreme; most worldly things would however be of mixed material-and-mental character. This polar continuum is applied in an interesting way to the problem of time: temporality is a property of the material, but purely mental entities like mathematical laws "just *are* and do not evolve". Thus the extreme pole of mentality would be non-material information that is also unchanging, a parable for an Eternal Divinity.

Polkinghorne's discourse is both urbane and outspoken, but with occasional flashes of irascibility. About Frank Tipler's "physical theology", Polkinghorne allows himself the comment that "we can regard the baroque conjectures of physical eschatology as giving a measure of the actual theological vacuity of this point of view of the nature of time" (p. 143). Loose talk widely indulged in about relativity, the Uncertainty Principle, and "fields" is dealt with firmly: there is nothing immaterial about electromagnetic or gravitational fields (pp. 162, 174), they effect energetic exchange just as much as do, in Newtonian terms, the collisions of particles. As to "uncertainty", Heisenberg's Principle has to do with *knowledge about* physical events, and it is no proof that physical events are anything but strictly determined. Polkinghorne reminds us here that as to the *significance* of quantum-mechanical theory, the "choice between Bohr and Bohm is metascientific" (p. 144). Again, within chaos theory there is a metascientific choice as to the significance of strange attractors: that "apparently complex and random behaviour can have a simple and deterministic underlying

origin" (p. 147), or that the classical unpredictabilities can be taken as signals of openness (p. 148).

Irrespective one's religious belief or non-belief, this book provides intellectual stimulation of a high order.

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FURTHER BOOKS OF NOTE

Meteorite Hunter: The Search for Siberian Meteorite Craters by Roy A. Gallant. New York: McGraw-Hill, 2002. 231 pp. \$24.95. ISBN 0-0713-7224-5.

Part detective story, part travelogue, part popular science, this readable account describes the author's personal visits and research at seven meteorite-related sites in Siberia. Gallant, Professor Emeritus and Director of the Southworth Planetarium at the University of Southern Maine, made his meteorite journeys between 1992 and 2000, and in the process consulted with many Russian meteorite experts. Not the least value of this book is his description of Russian meteoritics and its practitioners, along with the scientific, historical and cultural details about the seven sites associated with meteorite falls.

The most famous site is associated with the Tunguska event of June 30, 1908, when a blinding fireball thundered across the Siberian sky in the early morning hours, felling trees in a radial pattern extending ten miles or more. Although many have favored the 1992 hypothesis of Chyba, Thomas and Zahnle that the cause was the fall of a stony asteroid, Gallant found Russian meteoricists skeptical of that explanation. After running through a gauntlet of explanations proposed over the years, including the 1946 Hiroshima-inspired theory of the Russian engineer Aleksander Kazantsev that the event was due to an exploded nuclear powered spaceship, Gallant considers the blast still a mystery.

That the other sites are meteoritic in nature is clear due to craters or actual remnants of the meteor, such as the solid iron Sikhote-Alin fall of February 12, 1947, which caused 122 craters or pits in the Sikhote-Alin Mountains near the Sea of Japan. These accounts are interesting for what they tell us about the