

Having myself written about science, scientism, and the role of science in society (Bauer, 1992, 2001), I found Ridley's book a rare treat, sound in its treatment of matters with which I was already familiar but going well beyond those to expand my understanding in a number of pertinent and significant ways. I recommend the book unreservedly.

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The End of Time, by Julian Barbour. Oxford University Press, 1999. \$32.50, cloth, ISBN 0195117298. Paperback edition 2001, New York, 384 pp., ISBN 0-19-514592-5 (Pbk).

Julian Barbour states right at the beginning (p. 7) that he has written this book for money. That is okay, and it is better to say it. I remember when I first saw Penrose's first book¹, I immediately thought to myself "aha, they all want to be like Hawking², to make a lot of money off a popularization". So it is indeed better to say it. And these books are intellectually of much greater value than, say, another mundane long Calculus book, isomorphic to many already written and also written for money.

The fact that well written popularization books can make money is also a positive commentary on the general public. The general public wants to understand the world around it, more now than in the past. That is because in this information age we surf instantly from bombing runs on Afghanistan to Enron scandals to how we evolved from finned fish crawling onto land many millenia ago. Everything now affects everything so we need to know everything.

When I was first asked to review this book I hesitated. Oh god, is it another relativity nut book? I am not a relativity nut, nor even an aficionado of the subject. On the other hand, I have recently expressed my own views on Time^{3,4}. Also somehow I remembered vaguely hearing about the book, or the author's name rang a faint bell... so I said, okay, send it to me. It arrived today. I am pleased to report that the book has a wide scope, is not nutty, and immediately caught my attention. As I browsed it this afternoon, I noticed that in Part 4: Quantum Mechanics and Quantum Cosmology, Chapter 14, The Greater Mysteries, the author gets into the EPR Paradox and Bell's Inequalities. Re-

cently I⁵⁻⁷ have given my own explanation of Bell's Inequalities and also of Zeno's Paradox⁸. So why not review the book?

As I continue to browse the book this first evening, I ask: how shall I review it? The author touches many subjects. He is not afraid of personalizing his presentation, a style I more and more like, in contrast to the dry sterile scientificity in which we must write for technical journals. Should I give a long review, almost a separate treatise, as I did in "Review of Time, Temporality, Now"^{3?} No. I don't have the time. So I shall give a short review, respecting and commenting on Barbour's style and thought, reflecting both his style and thought in this review's style and thought.

First, the theme of the book. On p. 1 Barbour identifies himself with a philosophy that all motion in the universe is an illusion. Not only does motion not exist, but time also does not exist (p. 4). However, instants of time do exist (p. 10): the shifting from one static configuration of the universe to another.

Part 1 (Chapters 1-3) then explores the author's main ideas (shall we say: his philosophy about time) with a minimum of technical details. An example (p. 28): "Newtonian time is an abstract line with direction—from past to future. Boltzmann keeps the line but not the direction. That belongs to the 'washing'. But do we need the line?" Then Barbour calls the set of all configurations of the universe the Nows. They are covered by a "mist" which distributes itself over the Nows so as to make some transitions more likely than others. This is the quantum mechanical influence on his model. Our lives are now trajectories determined by the higher intensity connections of the mist. Parts 2-4, the bulk of the book, then pull in various scientific or philosophical parts of astronomy (Part 2), relativity (Part 3), and quantum mechanics and cosmology (Part 4) to support the author's philosophical views on Time. I won't try to detail these almost 200 pages. Part 5 comes back to his take in Part 1. To quote (p. 249) the introduction to Part 5: "If things simply are, how can history be? If quantum cosmology is merely a static mist that enshrouds eternal Platonia, whence the manifest appearance of motion and our conviction history is real? This is the great question".

It seems that Barbour was greatly influenced by the Wheeler—DeWitt equation. He describes this on pp. 241-248. The idea is that in seeking a fundamental equation of quantum gravity, one is led to the idea (p. 247) that it should be a time-independent Schrodinger equation for one fixed value (zero) of the energy of the universe. This then (p. 242) leads one to believe in a single wave function of the universe. I remark that such is of course the holy grail: relativity, gravity, and quantum mechanics are now reconciled and united. Part 5 then attempts to support Barbour's notion (p. 251) that "the structure of quantum cosmology may well cause the wave function of the universe to 'seek out' time capsules". Remember that "time capsules" is Barbour's terminology for the high intensity mist regions which guide us through the Nows, all those possible configurations of the universe. As Barbour points out in his final Notes (p. 359), his "time capsules" turn out to be essentially the same as Fred

Hoyle's earlier "pigeonholes" and also is reminiscent of a similar John Bell notion.

The evening transfused itself into drowsiness and I went to bed still thinking about thoughts from the book. This morning I decided to finish the review, to keep it short. What are my impressions? First, physicists love models, even fantasized ones. Second, for my views on Bell's inequalities and Time, see references 3–8. Mathematicians become the accountants of science and often we find ourselves in the unromantic role of CPA's, trying to separate fiction from fact, leaving only mundane consistency and what is provable. Third, I recommend the book.

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Atom and Archetype: The Pauli/Jung Letters 1932–1958, edited by C. A. Meier, Princeton, NJ: Princeton University Press, 2001. 312 pp. \$29.95, cloth.

There is something inherently appealing about reading the correspondence of others. That appeal is especially poignant when the correspondence is between two geniuses in their fields, two geniuses in the likes of Carl Jung, the psychologist, and Wolfgang Pauli, the theoretical physicist whom Einstein considered to be his spiritual son. A thought-provoking exploration into the common ground between particle physics and analytical psychology is what the reader is bound to discover in the book *Atom and Archetype: The Pauli/Jung Letters*. You may not find any juicy relationship gossip, but you *WILL* find fascinating journeys into the world of dreams, thoughts on the link between radioactivity and the Self, and deliberations on the concept of acausal connectedness, or synchronicity. You will also find a multitude of de-