Jeffrey A. Barrett and Peter Byrne (eds.), *The Everett Interpretation of Quantum Mechanics: Collected Works 1955–1980 with Commentary*. Princeton and Oxford: Princeton University Press, 2012, Pp. xii+389. ISBN 978-0-691-14507-5. £52.00 (hardback).

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commercialized nature of science in the 1980s. The book concludes with an epilogue which muses upon the place of American science in the post-Cold War world.

This is an interesting book, written in an authoritative tone. It provides just enough detail to tell the story, but not too much for an introductory account (a bibliographical essay at the end of the book provides ample suggestions for further reading). At the end of each chapter, we find a useful summary of the main points of that chapter, which also serves to lead us very smoothly into the next. A small number of photographs and illustrations with informative captions provide added richness along the way. All of these factors, together with the author's very engaging style, combine to produce a book that is particularly easy to read, and hence one that I strongly recommend to anyone with a burgeoning interest in the study of Cold War science.

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The so-called many-worlds interpretation of quantum mechanics is one of the main contenders in current approaches to solve the quantum-measurement problem. Due to the demands it imposes on our imagination and its oftentimes bizarre ramifications, if not to say its – well – craziness, the approach also features prominently in the popular perception of the debates on the foundations of quantum mechanics.

The measurement problem of quantum mechanics arises from the worrisome dualism of the linear, deterministic dynamics of the Schrödinger equation and the non-linear, stochastic dynamics of the wave-function collapse. The Everett interpretation responds to the problem by dropping the projection postulate from the theory altogether. Without a measurement-induced wave-function collapse, it introduces a universal wave function and describes measurement as induced correlations between subsystems of this universal function. Observers are conceived in information-theoretic terms as subsystems that record histories of correlated eigenvalues relative to object systems. Crucially, observations preserve in some sense the object system's superposition of states. This feature was later described in terms of a splitting of the actual world into many different ones, each with equally real observers who subjectively record determinate measurement outcomes.

This interpretation goes back to the doctoral work of Hugh Everett III (1930–1982), who obtained his PhD in physics in April 1957 from Princeton University under the supervision of John A. Wheeler with a thesis entitled 'On the foundations of quantum mechanics'. Everett's short thesis of some twenty pages was published in the same year, under the title '"Relative state" formulation of quantum mechanics', in the issue of *Reviews of Modern Physics* which contains the proceedings of the 1957 Chapel Hill conference on quantum gravity where his thesis had been discussed. Next to Everett's piece, Wheeler published a companion paper in the same issue, commending his student's work as a conceptual turning point comparable to the revolutions initiated by Newton, Maxwell and Einstein.

Hugh Everett III never published anything else on his ideas about quantum mechanics. In fact, he had not even attended the Chapel Hill conference himself, but instead had already left the field for good in favour of a job in military operations research with the Pentagon's top secret Weapons System Evaluation Group (WSEG). The early publications of Everett's interpretation therefore reveal little, if anything, about the genesis of his ideas or about the considerable efforts that Wheeler undertook to convince his own mentor, Niels Bohr, as well as his colleagues in the physics department at Princeton, of the soundness and value of Everett's approach. It was only in 1973

that Bryce DeWitt and Neill Graham included an earlier and considerably longer version of the PhD thesis in an edited volume entitled *The Many-Worlds Interpretation of Quantum Mechanics*.

The present volume includes not only the long and short versions of Everett's thesis, along with Wheeler's companion paper. It also publishes, for the first time, three earlier manuscripts from 1955, in which Everett lays out central ideas of his emerging interpretation for evaluation by his supervisor, Wheeler. Perhaps even more important is the publication of some twenty-five items of correspondence, mostly to and from Everett, but including also some third-party letters. Correspondents include Wheeler, Bohr, DeWitt, Alexander Stern, Aage Petersen and Max Jammer. In addition, the volume presents various notes; the transcript of a recorded conversation between Everett and his Princeton fellow graduate student and roommate Charles Misner; and appendices with facsimiles of draft outlines, revisions and marginal notes by Everett.

All this material came to the fore in the basement of the Los Angeles home of Everett's son Mark, who opened the boxes from his father's estate to the investigative journalist Peter Byrne in 2007, the year of the theory's fiftieth anniversary. For the present volume Byrne teamed up with Jeffrey Barrett, professor for philosophy of science at UC Irvine and author of *The Quantum Mechanics of Minds and Worlds* (1999). Together they selected all available documents from the estate, which document Everett's theory, its genesis, its modifications and its justifications, especially on Wheeler's part, vis-à-vis adherents of the orthodox Copenhagen interpretations, notably Niels Bohr himself.

For all its previously unknown documents, the book is a mandatory read for anyone interested in the history of the philosophy of quantum mechanics. The editors have skilfully grouped the material according to both chronological order and topical concern, and have added a fair amount of useful annotation, assisting the reader without being overly intrusive. Short but expertly written introductions provide necessary context on the biographical and conceptual dimensions.

The book is also a fascinating and rewarding read. It conveys the emergence and elaboration of an idea, entirely at odds with the then standard and orthodox views of quantum mechanics, developed by a brilliant and intellectually daring graduate student, whose later biographical trajectory turned erratic and tragic. Everett's intellectual independence allowed him to bring together concepts from von Neumann's and Bohm's textbook expositions of quantum mechanics with information-theoretic concepts taken from Shannon and Weaver, in a highly original new perspective on the quantum-measurement problem. Perhaps just as interesting as Everett's own intellectual approach appears the struggle of his adviser, Wheeler, who sought to navigate a way between Everett's bold heresy and Bohr's stubborn scepticism. In the process, he forced Everett to cut down his initial thesis by some 75 per cent, but at the same time arranged for its publication in a prominent place together with an endorsement of his own. For the historian of quantum mechanics, these documents therefore also open up a new perspective on the history of the Copenhagen orthodoxy.

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David Sepkoski, **Rereading the Fossil Record: The Growth of Paleobiology as an Evolutionary Discipline**. Chicago and London: University of Chicago Press, 2012. Pp. viii + 432. ISBN 978-0-226-74855-9. £38.50 (hardback).
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David Sepkoski's new monograph is a signficant archival achievement. Few histories of twentieth-century evolutionary biology have moved beyond a consideration of the events of the mid-century evolutionary synthesis. Those that have have largely been written either by the practitioners themselves or by philosophers weighing in on the theoretical and logical state of evolutionary theory. Both are necessary perspectives, but they do not substitute for a historically grounded