

Book Review

At Home in the Universe. By John Archibald Wheeler. American Institute of Physics Press, Woodbury, New York, New York, 1994, 365 pp., \$25.95 (cloth), \$15.95 (paperback).

Badly edited! In a heading at the top of page 126 a big bold typo that even a spell-checker would not miss; an index that puts Kip Thorne on page 298, but misses him on pages 88 and 173 and that misses, for example, Democritus (page 190) and Klaus Fuchs (page 209) entirely; a promise in “About the Series” [*Masters of Modern Physics*, of which this is Volume 9] that “once selected for inclusion, the essays are carefully edited and updated,” but on page 57 we read that “try as many have, no one has detected with a telescope anything near the center of the Crab Nebula that can be identified with a residual core from that supernova explosion,” and later on that same page, “to detect whether the x-ray source varies in time with the period of the binary will be much more difficult. An x-ray detector shot up from earth remains above the atmosphere only five minutes.” And there has been no editing to remove redundancy; we read on page 133 about the bears of Bern, and then on page 144 we find ourselves again reading about the bears of Bern (and neither “bear” or “Bern” in the index!)

I had hoped and expected that this was a new book by John Wheeler, but it is a collection of essays from across many decades. It would have been better to place the notes identifying the original source (and date) at the beginning of each piece rather than at the end, so that one is not startled by what one reads (examples above).

But enough of complaints: strike for the core, as Wheeler himself would do without delay: the mysteries! the challenges! There is no better guide than John Wheeler to the unsolved mysteries of the universe and of existence. Indeed, for mainstream physicists, we followers of the original Copenhagen interpretation of quantum mechanics, John Wheeler is the closest that we have to a hero. But he too is of course terribly perplexed by the difficulties. On page 272 he summarizes the problem the best I have ever seen it summarized: “The universe exists “out there” independent of acts of registration but the universe does not exist out there independent of acts of registration.” To this he couples a second paradox, the bounds of time. (He tells us that all Bohr asked for, to make progress, was *two* paradoxes!) Wheeler emphasizes that Einstein’s conclusion that the universe must be closed flowed from considerations similar to those that led to General Relativity itself, but while the beginning of time is today more firmly established than ever (although not *certain*), an end for time is unfashionable. There are many places Wheeler emphasizes the key role of the “irreversible act of amplification,” and on page 290 he implies to Bohr explicit rejection of a role for consciousness, but I believe these views have been superseded. To me ⁽¹⁾ quantum mechanics seems to flow directly out of observation of the world, inevitably. (There is of course *one* banner, solipsism, that can, *most* ironically, expect *no* followers!) But despite his hesitancy, John Wheeler is still acutely aware of what seems to be the key

issue: page 309, “except via those time-leaping quantum phenomena that we rate as elementary acts of observer-participancy, no way has ever offered itself to construct what we call ‘reality.’ ”

While I suspect that the typical reader will have greatest interest in what Wheeler has to say on these greatest of all questions, there is important material on lots more. There is (page 247) a precursor of chaos, paeans to engineers (page 222) and politics (page 223), wonderful quotes from Maxwell (page 161), Madame Curie (page 166), and also, of all things, a vigorous and rational defense of dowsing (page 150)! There are views on secondary education (page 79) and extensive rational discussion of risk and radiation. There is a wonderful essay from 1977 on the morale of research people that is far more relevant today than when it was written; it should be posted on the barricades! It is the taxpayer’s universe. We, the priests of today’s society, have not fulfilled our role! And the taxpayer is punishing us for our failure. And why do we have no loud Hero expounding the perfectly genuine wonders we have discovered? Batten ⁽²⁾ has implicitly, I think, called for such a Hero, recalling Eddington in that role: Eddington, and also Jeans, telling the public that the world has a spiritual and not material nature, which is surely true. Why not today? Because, as Wheeler says, “against trying to be any more specific at the present stage of our knowledge, it is warning enough to pick up an old book on the subject of heat and read the dreadful foolishness that was written on the subject of ‘caloric,’ ” We know too much today! In an earlier time our priests could present determinism as fact with vigor; today some of our priests say “many worlds,” but not loudly. Wheeler says “What a recovery we have made from being ranked by Newtonian dynamics as mere cogs in a deterministic machine!” Wheeler’s hope for physics and for humanity shines through in this collection of essays: Wheeler cries out to Copernicus,

“Remind us that there is no other universe

Than the universe of mind and man,

The universe that is our home.”

REFERENCES

1. R. C. Henry, in *Bell’s Theorem, Quantum Theory and Conceptions of the Universe*, M. Kafatos, ed. (Kluwer Academic, Dordrecht, 1989), pp. 175-177; *Am. J. Phys.* **58**, 1087 (1990).
2. A. H. Batten, *Q. J. Roy. Astron. Soc.* **35**, 249 (1994); *J. Sci. Explor.* **9**, 231 (1995).

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