

How Come Existence?

How come the Quantum?

Biweekly dictation by John A. Wheeler

The time left for me on Earth is limited. And the creation question above is so formidable that I can hardly hope to answer it in the time left to me. But each Tuesday and Thursday I will put down the best response I can, imagining that I am under torture. There is no rule that the confession of one day has to be consistent with what I blurted out some previous day. My model, my ideal is Charles Darwin confronting the variety of finches on the Galapagos Islands. Let no sense of shame inhibit me as I make my foolish tries.

Try No. 1: This whole show has no more reality than something we imagine (recall Shakespeare's *Tempest*. "We are such things as dreams are made on...") This proposal lends itself to analysis under two heads: (a) Can we consistently view everything that we see happening here and now as built of "imagination all compact?" (b) Can we consistently extend this concept of "an imaginary universe" to cover all we know today of Big Bang cosmology?

(The present) "To be is to be perceived." That Francis Bacon's idea has some similarity to Niels Bohr's dictum, "No elementary quantum phenomenon [rates as such] . . . until it has been brought to a close by an irreversible act of amplification."

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The discussions with Niels Bohr and Heisenberg in Copenhagen the summer of 1927, focusing on the concept of indeterminism, led to many a disagreement and clarifying resolution of disagreement. As the news of each step made its way around Copenhagen, among those fascinated by the encounter of the two men, was Harald Høffding, first tenant of the Copenhagen Academy's "House of Honor" (later residence of Bohr himself) and the professor that Bohr as a student had most liked and admired. Høffding invited the two men to his place one evening to "Explain to me what you agree on, what you disagree on, and how to settle the disagreement."—so tells us Henrick Casimir who accompanied the two older men. Soon they had made a drawing of the double-slit experiment, to clarify one of their points of disagreement. Høffding (with his finger on the space between point of entry of the photon and point of detection) asked, "Where can the photon be said to be?" Bohr replied, "To be? To be? What does it mean 'to be'?"

Bohr's question stands unanswered to this day. Let it serve as the point of take-off for more questions—questions not about the photon but about this or that everyday experience. A stone? Look at it with a skepticism as born of a childhood study of a book of magic tricks, followed by putting on a personal magic show for even younger members of the family. Ask oneself if that "stone" is not really a fake, a hollow shell of paper mache.

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