

Thinking Quantum

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To think quantum we discard absolute reality and the simple declarative "is" and work with input-output operations.

Thinking quantum stretches us more than thinking relativity. While physics assimilated relativity swiftly, quantum theory still sticks to its collective inaccessibility. This reflects the sizes of these evolutions. It also mirrors a difference between Einstein and Bohr, the major agents of these evolutions. Einstein was the iconoclast seeking a total victory of Spinozan truth over error, joyfully wielding Ockham's razor. Bohr preferred a perpetual Kierkegaardian tension between conflicting world-views. When Heisenberg discovered quantum theory he had withdrawn from Bohr and so could apply Einstein's radical Ockhamism, but he applied it to Einstein's own hard-nosed realism. Absolute reality is unobservable according to the Quantum Principle and Heisenberg dropped it. Bohr, however, offered a less radical compromise, preserving the reality of the physicist, which Heisenberg accepted, creating their Copenhagen theory. Today that compromise is largely forgotten in favor of a stranger, more conservative, less tenable theory, first called "orthodox" and mistakenly renamed "Copenhagen" by most of its critics. The defects in this pseudo-Copenhagen theory have led in turn to several even stranger compromises between quantum theory and realism.

Now that quantum theory has proven so useful, we no longer need to compromise with realism. We should return to Heisenberg's radical simplicity. It leads to an input-output logic that is more coherent than Boole's Laws of Thought, and violates them as presaged by Boole himself. While some still find the loss of absolute reality unbearable, many find it liberating and supportive. Thinking quantum may be as useful for further progress in physics as it was for Heisenberg's original discovery.