

# Explaining the Unobserved: Why Quantum Theory Ain't Only About Information

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## Abstract

A remarkable theorem by Clifton, Bub and Halvorson (2003) (CBH) characterizes quantum theory in terms of information--theoretic principles. According to Bub (2004, 2005) the philosophical significance of the theorem is that quantum theory should be regarded as a "principle" theory about (quantum) information rather than a "constructive" theory about the dynamics of quantum systems. Here we criticize Bub's principle approach arguing that if the mathematical formalism of quantum mechanics remains intact then there is no escape route from solving the measurement problem by constructive theories. We further propose a (Wigner--type) thought experiment that we argue demonstrates that quantum mechanics on the information--theoretic approach is incomplete.

**Keywords:** Quantum information; Collapse theories; Crucial experiments; Principle vs. Constructive theories.

**Subjects:** [Specific Sciences: Computation/Information: Quantum](#)  
[General Issues: Theory Change](#)  
[General Issues: Operationalism/Instrumentalism](#)  
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