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Is Information Gained, Conserved, or Lost in a Quantum Observation? LIONEL D. HEWETT, Texas AM University-Kingsville — As with any observation, one would hope that a quantum observation would increase one's knowledge about the system and, therefore, the amount of information contained in the universe. But the Law of Conservation of Information says that information cannot be created or destroyed in any physical process (including a quantum observation). And quantum mechanics says that it is impossible to make any quantum observation without disturbing the system unpredictably. (So some kind of information must surely be lost in a quantum observation.) Since neither common intuition nor a survey of the literature provides a clear answer as to what actually happens to information during a quantum observation, this paper addresses such questions as: what is information, under what circumstances is it conserved, what is a quantum observation, does it require a sentient being, and what happens to information during a quantum observation?

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