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Leonard Mandel and Experimental Tests of Quantum Mechanics

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Everybody knows the “mind-boggling” experiment that Leonard Mandel published in 1991, with Xingyu Zou and Lijun Wang, which showed that it was not the making of an observation that determined which of two complementary properties would manifest itself, but rather the setting up of an experiment that would permit such an observation to be made. I argue that the roots of this experiment go back to Mandel’s work in the 1960s. Further, he proposed the actual experiment first in the context of the debate over the adequacy of semiclassical theory, then in the context of de Broglie’s interpretation of quantum mechanics, and finally in the context of down conversion. I speculate that his habit of examining and re-examining each idea in changing contexts was one source of Mandel’s creativity and profound insight into physics.