

How to be a classical realist and still do Quantum Mechanics

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In the recent literature it has become an article of faith that Bell's theorem proves that, given certain plausible background assumptions, the conjunction of QM with realist metaphysics entails the existence of paradoxical causal anomalies. The anomalies take the form of so-called "non-local" causal effects: namely simultaneous, space-like separated events, which, despite being so far apart that no signal can travel from one to the other, are causally connected. For example, in a respected review article, Clauser and Shimony write: "The philosophical point of view which most working physicists have found natural, at least until quite recently, requires a local realistic theory. Because of the evidence in favor of quantum mechanics from the experiments based upon Bell's theorem, we are forced either to abandon...a realistic view of the physical world (perhaps an unheard tree falling in the forest makes no sound after all) – or else to accept some kind of action-at-a-distance. Either option is radical, and a comprehensive study of their philosophical consequences remains to be made" (Clauser and Shimony, 1921)

This paper questions this canonical reading of Bell's theorem, and thus reopens a question that Bell's theorem has effectively closed, namely the possibility of a local realist interpretation of QM of the sort for which Einstein searched so persistently. Indeed, the possibility will be considered of a local realist interpretation of QM that is specifically *classical* in the sense of positing elements of reality that take the form of physical quantities having particular values.