

experiments, without positing any "elements of reality" (counterfactuals), even the above non-local stochastic ones. Thus the question of their existence is not a scientific question, as it is not subject to empirical test and our most successful scientific theory, quantum mechanics, has no need of them. This is appealing to physicists because it restores locality in the following sense. To become entangled two particles must interact and this interaction, even in the laws of quantum mechanics, occurs locally. Entanglement leads to correlated measurements. Once entangled, these correlations will persist irrespective of the particles' separation as described earlier. However, following the Copenhagen school, to say counterfactuals $Y_i(x_1, x_2)$ do not exist is to say that question of whether the measurement of the spin of particle 1 had an effect on the spin on particle 2 cannot be asked; not every event has a cause. In all physical theories prior to quantum theory, it was possible to imagine, alongside the actual measurements of actual experiments, what would have been observed had we done something differently (i.e. counterfactuals), while still preserving locality. This is not possible with quantum mechanics. In summary, Bell's inequality (and its experimental support) show that the Copenhagen standpoint of abandoning counterfactuals is not only possible, it is also necessary to take this standpoint if we want to retain "locality" as a fundamental part of our world picture.

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