

Abstract Submitted
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The necessity of entanglement and the equivalency of Bell's theorem with the second law of thermodynamics¹ IAN DURHAM, Saint Anselm College — We demonstrate that both Wigner's form of Bell's inequalities as well as a form of the second law of thermodynamics, as manifest in Carathéodory's principle, can be derived from the same assumptions. The results suggest that Bell's theorem is merely a well-disguised statement of the second law. It also suggests that entanglement is necessary for quantum theory to be in full accord with the second law.

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