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Coherence is not Catalytic SALIL BEDKIHAL, JOAN VACCARO, Centre for quantum dynamics, Griffith University, Brisbane, Australia, S. M BARNETT, School of Physics and Astronomy, University of Glasgow, United Kingdom — Aberg has claimed in a recent Letter," Phys. Rev. Lett. 113, 150402 (2014)", that the coherence of a reservoir can be used repeatedly to perform coherent operations without ever diminishing in power to do so. The claim has particular relevance for quantum thermodynamics because, as shown in "Phys. Rev. Lett. 113, 150402 (2014)", latent energy that is locked by coherence may be extractable without incurring any additional cost. We show here (arXiv:1603.00003 [quant-ph]) , however, that repeated use of the reservoir gives an overall coherent operation of diminished accuracy and is necessarily accompanied by an increased thermodynamic cost.

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