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The memory loophole DANIEL SHANAHAN — The memory loophole supposes that the measurement of an entangled pair is influenced by the measurements of earlier pairs in the same run of measurements. To assert the memory loophole is thus to deny that measurement is intrinsically random. It is argued that measurement might instead involve a process of recovery and equilibrium in the measuring apparatus akin to that described in thermodynamics by Le Chatelier's principle. The predictions of quantum mechanics would then arise from conservation of the measured property in the combined system of apparatus and measured ensemble. Measurement would be consistent with classical laws of conservation, not simply in the classical limit of large numbers, but whatever the size of the ensemble. However variances from quantum mechanical predictions would be self-correcting and centripetal, rather than Markovian and increasing as under the standard theory. Entanglement correlations would persist, not because the entangled particles act in concert (which would entail nonlocality), but because the measurements of the particles were influenced by the one fluctuating state of imbalance in the process of measurement.

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