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Eliminating remnants of classical mechanics and the birth of the Schrödinger equation WOLFGANG P. SCHLEICH, Institute of Quantum Physics, Ulm University, DANIEL GREENBERGER, City College, City University of New York, DONALD H. KOBE, Department of Physics, University of North Texas — We show that the Schrödinger equation emerges from the Hamilton-Jacobi equation for a specific choice of the amplitude R of a wave $\psi \equiv R \exp[IS/\hbar]$ where S is the classical action. This choice eliminates in the wave equation for ψ all remnants of classical mechanics associated with S but at the same time builds via the wave equation for R a bridge to classical mechanics and to the de Broglie pilot wave theory.

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