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【83】 Boltzmann's H-theorem and the interpretation of thermodynamic and informational entropy

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Boltzmann's H-theorem has revolutionized the thinking about the evolution of entropy in thermodynamics. It has proved the unidirectional tendency of irreversible processes contradicting the time-reversed laws of physics (Loschmidt's and Poincaré's paradox). However, the entropy is quantified as a state variable and defines quasistatic equilibrium in an infinite time limit. The H-theorem flashed over to information theory and was first investigated in a thought experiment by L. Szilard, later culminating in Landauer's erasure principle. Shannon's measure of information has been allegedly suggested by J. von Neumann as "entropy", or "negentropy" (E. Schrödinger, L. Brillouin). The (mis)interpretation of disorder and informational entropy and their relationship is outlined by means of examples.

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