

of the foundation of thermodynamics.¹ Today we know that just so much heat, neither more nor less, may be obtained by the complete conversion of a unit of electrical energy or by a given chemical process. We know, moreover, that not every conceivable change from one form of energy to another is possible. On the whole, energy can flow in but one direction; perpetual motion is impossible; and useful energy is steadily becoming degraded, dissipated, and useless.

Such laws are fully worthy of a place beside the periodic law, and they justify equal confidence in the adequacy of our current descriptions of matter and of energy for the purposes of biology.

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SPACE AND TIME

Since Kant revolutionized modern philosophy, the whole world has steadily realized that between matter and energy on the one hand, and space and time on the other, there is a real and highly significant difference.²

¹ An excellent account of this period may be found in Merz's "History of European Thought in the Nineteenth Century," Vol. II, Chap. VII, "On the Physical View of Nature."

² For a brief statement of Kant's argument see Royce, "The Spirit of Modern Philosophy," pp. 121-125.