to be an axiom with them, but even this apparently simple article of faith in natural philosophy meant something different to different thinkers according to the greater or less clearness of their physical conceptions. Helmholtz, in his celebrated memoir of 1847, conceives all natural processes to be ultimately reducible to purely mechanical processes, and in doing so he sees that a well-known law in mechanics, the conservation of the *vis viva*, must have a meaning for all natural forces. This he proceeds to develop. Others, like Faraday, Mohr, Grove, have a silent conviction that besides ponderable matter there is some other quantity in nature which is indestructible and cannot be created, but only changed and transferred; they frequently call it force, and thus entangle themselves or their readers in

destroyed. Under the influence of Oersted's philosophy Colding expresses similar ideas in 1843 (see 'Phil. Mag.'), 4th series, vol. xxvii. p. 58). In fact, during the fifth decade of the century the three conceptions of the impossibility of creating power, its indestructibility, and the convertibility of its different forms, were more and more clearly enunciated. They were at last expressed in the formula of the "conservation of energy." It was Thomson (Lord Kelvin) who then—in 1852—first clearly recognised that the old phantom of a perpetual motion was turning up again in a new form. (See his Essay on "Dissipation of Energy" in the 'Fortnightly Review,' March 1892, reprinted in 'Popular Lectures and Addresses,' vol. ii. p. 452.) Ever since Thomson's essay of 1852 naturalists and philosophers may be said to be trying to formulate in the simplest terms the great principle of nature, that though energy is never lost, it becomes — for our practical purposes — unavailable. Prof. Ostwald has expressed this by reviving the terminology of the perpetual motion. "It is not generally recognised that the principle of perpetual motion has two sides. On the one side . . . perpetual motion could be realised if one could create energy. . . . The expression of the impossibility of doing this is the first law of Energetics. . . . A perpetual motion could, however, on the other side be attained if it were possible to induce the large store of energy at rest to enter into transformations. . . . This might be termed a perpetual motion of the second kind." The impossibility of this Ostwald terms the second principle of Energetics ('Allgemeine Chemie,' vol. ii. part 1, p. 472; cf. Helm 'Energetik,' p. 304).