has taken such pains as he to gauge the value of many single and isolated steps that had been taken before him, and to combine them all through his own researches into a comprehensive doctrine. The practical importance of these labours—so long insufficiently understood—will doubtless in the near future be realised in proportion as the increasing competition of industry shall emphasise the necessity of studying the economics of production: this economy consisting not only in the absence of waste of matter, but likewise in the saving of work—*i.e.*, in the absence of waste of energy.[1]

1885-87); the second edition, of which the first volume appeared in 1891, is in progress, and will comprise three volumes. It is divided into three parts: *Stöchiometrie*, *Chemische Energie*, and *Verwandtschaftslehre*. Nothing can give a better idea of the enormous development of chemical science in the nineteenth century than a glance at those two monuments of learning and research, Beilstein's 'Organische Chemie' (Leipzig, 1893-1900, 5 vols., 3rd ed.) and Ostwald's 'Allgemeine Chemie.' They form the basis for future development, as did Leopold Gmelin's 'Handbuch der Chemie' for the greater part of the past century. The first edition of Gmelin appeared in 1817. See Kopp's 'Geschichte der Chemie' (vol. ii. p. 100). Since the publication of his great text-book, Prof. Ostwald has done enormous service to science by the foundation jointly with Prof. van't Hoff of the 'Journal für physicalische Chemie,' in 1889, and still more by the opening of the first laboratory specially designed for physical chemistry, in Leipzig, in the year 1887. But perhaps the most original and suggestive work o Ostwald is his work on the scientific foundations of Analytical Chemistry (Leipzig, 3rd ed., 1901. Transl. by G. M'Gowan).

[1] How recent is the systematic treatment and general recognition of physical, theoretical, or general chemistry can be seen from the historical sketches which had been published prior to Ostwald's great work. Kopp, in his excellent account of the development of chemistry, published in the Munich collection, and frequently referred to in the fifth chapter of this work (vol. i. pp. 382, &c.), has hardly any occasion to refer to physical chemistry up to the year 1870. This is the more remarkable, as Kopp himself was a solitary ingenious worker in this isolated province. A good account of his labours is contained in Thorpe's 'Essays in Historical Chemistry,' 1894, p. 299. A later and brilliant writer on the historical growth of chemical knowledge, Dr A. Ladenburg, in his 'Vorträge über die Entwicklungsgeschichte der Chemie' (2nd ed., Braunschweig, 1887), condenses all he has to say regarding this subject into a few pages in his last lecture. If German science is destined to