simple and plausible, governed research for a long period, but has finally been abandoned as insufficient.[1]

16. Discovery of isomerism.

Another blow was dealt at the simple theory by which

[1] The electro-chemical theory of Davy and Berzelius was, after about fifteen years of development, during which period the use of the significant terms electro-positive and electro-negative was not consistent, finally enunciated by Berzelius in 1818 in his 'Essay on the theory of Chemical Proportions and on the Chemical Action of Electricity.' From that time it reigned almost supreme for twenty years, when both physical and chemical discoveries began to show its insufficiency. A very concise account of it is given in Kopp's 'Entwickelung der Chemie,' and in E. von Meyer's 'History of Chemistry,' translated by M'Gowan (Macmillan & Co., 1891). Berzelius clung to it to the last, and at the present moment there exists a widespread opinion that the future will see a revival and modified acceptance of the Davy-Berzelius theory. In relation to this Helmholtz's celebrated Faraday lecture of the year 1881 should be read (see the reprint in Helmholtz's 'Vorträge und Reden,' vol. ii.) The peculiarity of the electro-chemical theory was that it was an atomic theory as well as a theory of chemical affinity. When it was abandoned, the two distinct interests, that of developing the atomic view, so as to give a correct description of the constitution of chemical compounds and reactions, and that of giving an explanation of chemical affinity, fell for a time asunder. The former interest preponderated, owing mainly to two reasons, the one theoretical, the other practical. The theoretical reason was the need of a different method of systematically arranging the chaos of new organic compounds with which chemistry became crowded about the year 1840. Berzelius had created the nomenclature and notation of chemistry; but this proved insufficient to describe and grasp the processes and products of the many carbon compounds. The practical reason which cast into the background the study of chemical affinity and its nature was the growing demands of manufacturing chemistry. This was during a long period occupied mainly with the analysis and synthesis of new products, or with new and simpler methods for producing well-known compounds. The study of reactions and of the products of bodies was practically of more interest than that of the forces which governed them. The question of the cost of producing chemical products was for a long time a secondary one. Towards the end of our century both theoretical and practical considerations forced upon chemists the necessity of making themselves acquainted with the different forms of energy which are at our command in chemical as well as in mechanical operations, and this has led to a renewal of the study of chemical and mechanical energy, and of the nature and laws of chemical affinity. Economy in practical chemistry can be divided into two branches: the economy of materials and the economy of energy. The great developments in the course of this century have consisted largely in utilising by-products and in avoiding waste of substance. We are now only approaching the second problem: how to put the energy which is at our command to the best use.