

certain stable qualities with a multitude of changing varieties was a notion familiar to other branches of natural history. The idea of substituting one element for another gave the death-blow to the theory of Berzelius, which assumed that elements paired with each other, according to some polar contrast. It was found, for instance, that the element chlorine, which stood on one side of the scale—the electro-negative—could take the place of the opposite electro-positive element hydrogen.

In the course of time the conception of types was much changed, and became more and more complicated; it had however the effect of finally destroying the binary view of chemical composition, and restoring in its place the older unitary conception.

All these attempts to simplify the study of chemical compounds, by reducing them to simple or complex elements, or to pairs of simpler combinations, or by ranging them according to types, were useful in many ways in extending the knowledge of bodies, in indicating new methods of inquiry, and in suggesting instructive experiments:<sup>1</sup> none of them were universally accepted in the

<sup>1</sup> About that time—so far as chemistry proper, *i.e.*, the study of compounds and of reactions was concerned—there existed two main currents of thought, the most illustrious and influential representatives of which were Kekulé (1829-96, first professor at Ghent, then since 1865 at Bonn), and Kolbe (1818-1884, first professor at Marburg, then since 1865 at Leipsic). As teachers and centres of academic influence, though in different, frequently opposite directions, these two eminent men continued the work started in Germany by

Liebig, Wöhler, and Bunsen. To them as a third can be added the name of A. W. von Hofmann (1818-1892), who, through his twenty years' residence in London, did much to introduce a knowledge of German chemistry and German teaching methods in England, and who from 1865 established the modern Berlin school of chemistry. It would be impossible to enter here into details as to how—mainly through the influence of these three men—the work begun by Liebig and Wöhler was extended, and how especially also the great development of chemical