

48.
The carbon
tetrahedron.

In 1874 two chemists, Le Bel and Van't Hoff, suggested independently a picture of the tetravalent carbon atom, which would explain how it could enter with its four points or capacities of saturation into two compounds having the same saturating substances, but arranged in ways which were not geometrically superposable, but only symmetrical, like a right- and left-hand glove, or the images in a mirror. The suggestion amounts to this, that the carbon atom has the shape of a tetrahedron, the four corners representing the four valencies or capacities of saturation.¹

The carbon tetrahedron is the last step which has been taken in the development of the atomic view of matter and of nature. No book on organic chemistry can now well avoid introducing this and other similar ways of representing chemical relations. On the further specialisation of this conception will probably depend to a large extent the future of our chemical theory—*i.e.*, of our attempts to grasp the qualitative nature of different substances. It is clear that we are far on the way to realising Wollaston's prophecy of the year 1808—*viz.*, "that the

¹ This speculation was at first looked upon with very great doubt. Only few chemists of note took it up; others, such as Kolbe, who led a consistent opposition to the ideas and developments of structural chemistry, treated it with ridicule. Van't Hoff, ten years after the publication of the first edition of his pamphlet, 'La Chimie dans l'Espace' (Rotterdam, 1875) reviewed the position in his 'Dix Années dans l'Histoire d'une Théorie' (translated by Marsh, Oxford, 1891), and, after reproducing the

two opposite reviews, with which the original theory was met by Wislicenus and Kolbe, was able to state "that the theory in question now forms part of elementary chemical teaching, and is to be found enunciated in the most widely used text-books" (translation, p. 19). Further applications of the theory, especially to the compounds of nitrogen, will be found in the 2nd edition of the German translation 'Die Lagerung der Atome im Raume' (Braunschweig, 1894).