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VALENCE[1]

THE theory of valence is one of the most important theories of chemistry. Scarcely any other except the atomic theory, with which it is inseparably connected, has been so fruitful in results which have led to industrial applications and also to the development of chemical knowledge. In spite of these results, which no one can dispute, the theory is more or less in disrepute, especially among physical chemists and students and teachers of inorganic chemistry. In many of our elementary text-books structural formulas are used so sparingly that they make no impression on the student and in some of them they are not even mentioned.

This attitude is due, in part, to a reaction from the overemphasis given to the subject at a time when nearly all chemists were working on the structure of organic compounds. It is due, also, to confused and conflicting ideas about the philosophy of science.

Some have gone so far as to claim that speculations and hypotheses form no part of genuine science. To such persons science is only an orderly description of phenomena which we can see and handle, which we can weigh and measure and connect by mathematical processes. An attempt to acquire knowledge about atoms and electrons and molecules, so long as they remain beyond the direct cognizance of our senses, may be interesting but to followers of this school such attempts form no part of science.

To an organic chemist the achievements in the determination of the structure of carbon compounds demonstrate the falsity of such a claim. It may be remarked, in passing, that

[1] Address of the chairman and retiring vice-president of Section C—Chemistry, American Association for the Advancement of Science, Baltimore, December 27, 1918.