formulas of hydrochloric acid, water, and methane, as follows: —

$$H-Cl, \quad H-O-H, \quad \overset{H}{\underset{H}{>}}C\overset{H}{\underset{H}{<}}$$
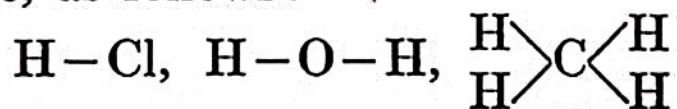
Accordingly, oxygen appears to possess two valences and carbon four. These conclusions are justified by an almost inconceivable wealth of experience; they are the means of constructing the elaborate constitutional formulas which are so necessary a part of organic chemistry; and there can be no doubt that in almost all the compounds with which we shall be concerned hydrogen is invariably univalent, oxygen bivalent, and carbon quadrivalent. On this basis the construction of possible formulas of organic compounds is merely an exercise in a somewhat peculiar department of mathematics.

B

HYDROCARBONS

The compounds of carbon and hydrogen may first be considered. With but a single atom of carbon in the molecule one only is possible: —

$$\begin{array}{c} H \\ | \\ H-C-H \\ | \\ H \end{array}$$