http://geology.19thcenturyscience.org/books/1906-Merz-HistEurThot/README.htm

found that one or more atoms in an organic compound, notably of hydrogen, might be replaced by an equal number of atoms of other elements, and that such products of substitution retained similar qualities, and could be mutually converted into each other, the type of the compound remaining the same. The process of substitution led to the conception of "Types," which remained the same whilst the individual compounds varied according to the different elements which were introduced.

gen acids of chlorine, bromine, and iodine, and the investigations of Graham into the salts of phosphoric acid and its different modifications. Davy, though together with Berzelius the founder of the electro-chemical theory, had found it necessary to modify the oxygen theory of Lavoisier—*viz.*, that oxygen was necessarily the acid-forming element: he, and after him Dulong in France, had explained the so-called oxygen acids like sulphuric acid as hydrogen compounds of certain compound radicles (SO_4) exactly as hydrochloric acid is a hydrogen acid of the simple radicle chlorine. Graham's discovery of three modifications of phosphoric acid, and of the different power of saturation of these three modifications, led to long discussions as to what is really meant by a neutral salt. Liebig in the year 1838, in an important memoir gathering together the conclusions which these facts, not easily reconciled with Berzelius's system, had led him to, emphasised there the twofold possibility of regarding metallic salts either with Berzelius as binary combinations of oxides with anhydrous acids, or else as products of substitution of hydrogen compounds, hydrogen being replaced by metals. The choice might then depend on considerations of convenience: the one view might be more suitable for inorganic—notably metallic—compounds, the other for organic compounds. The hydrogen theory was thus introduced alongside of the oxygen theory; substitution was introduced alongside of simple combination. Though in this stage the radicle theory was already threatened, it was still possible to uphold the binary theory, though it was not necessary. Chlorine could act in the same way as oxygen, being an electro-negative element. But when, in pursuing the line of investigation opened out, it was found that chlorine, the electro-negative element, could take the place of hydrogen in organic compounds without changing their chemical character, the binary theory, based upon polar (electrical) contrasts, became insufficient as a means of explanation or even of classification. Dumas was the first to indicate this (1834), though he attempted to save the electro-chemical or polar theory by stating that the two electrically opposite constituents of an organic compound might contain the same elements in the opposite electrical positions (Kopp, 'Entwickelung der Chemie,' pp. 564, 595, &c.)