

the image in a mirror from the original. Was it possible any longer to suppress the conviction that the smallest particles of matter, in forming chemical compounds, do so not only in definite proportions of weight, but also in definite geometrical distances and positions?

About the middle of the century the atomic view of matter had thus received considerable modifications. Originally suggested only to explain, describe, or symbolise the fact that different substances combine in fixed, and especially in fixed multiple proportions, it had to be modified by a recognition of the fact that in gases at least a distinction exists between particles which are closely knit together—as it were, geometrically inseparable—and such as can move away from each other. The latter explain the increase of volume under increasing temperature or decreasing pressure. Geometrical distance came in as the means of distinguishing the molecule from the atom. And lastly, about 1850, the phenomena of right- and left-handedness,¹ discovered by Pasteur, suggested the idea of geometrical position as well as of distance. The atom had become a molecule, with a definite geometrical arrangement.

33.
Atom and
molecule.

It took, however, a full generation before, in the second half of the century, these different suggestions for a modification of the atomic view became clear, before philosophers took seriously the opinion that molecules and atoms existed in reality, and were not merely a convenient symbolism, as many great chemists during the first half of the century were inclined to think. This change in the habit of chemical thought has no doubt been greatly

¹ Called by Lord Kelvin "chirality."