

specially on the lines marked out by the atomic view of nature have, in the course of time, reasserted themselves, the atomic view itself has been regarded with less favour by students who have made these problems their especial study. In fact, one meets not infrequently with an inclination to disparage the atomic theory, to point out that it is merely a hypothesis, and that as such it should only assist, but not govern, scientific research.¹

In the domain of specially chemical reasoning we meet with severe criticisms of the one-sided and formal development to which the atomic view has led, of the playing with symbols and of their empty formalism; notably structural chemistry and stereo-chemistry have not escaped severe ridicule.² Whilst it is not very evident how the school from which these criticisms proceed can in the long-run escape those logical consequences which are embodied in stereo-chemistry, other criticisms claim our attention

59.
Criticisms of
the atomic
view.

¹ See Berthelot, 'La Synthèse chimique,' 7^{me} éd., 1891, p. 167. 'Le principal reproche, que l'on puisse adresser à la théorie atomique, comme à toutes les conceptions analogues, c'est qu'elles conduisent à opérer sur ces rapports numériques des éléments et non sur les corps eux-mêmes, en rapportant toutes les réactions à une unité type, nécessairement imaginaire. Bref elles enlèvent aux phénomènes tout caractère réel, et substituent à leur exposition véritable une suite de considérations symboliques, auxquelles l'esprit se complait, parce qu'il s'y exerce avec plus de facilité que sur les réalités proprement dites . . . les symboles de la chimie présentant à cet égard d'étranges séductions par la facilité algébrique de leurs combinaisons et par les tendances

de l'esprit humain, naturellement porté à substituer à la conception directe des choses . . . la vue plus simple . . . de leurs signes représentatifs."

² The late eminent Professor Hermann Kolbe of Leipsic, whose labours both alone and jointly with Frankland have done so much to break down the formalism of the older type theory, was especially conspicuous by his virulent attacks on the representatives of 'Modern Chemistry.' The controversy is elaborately and lucidly treated by A. Rau in 'Die Theorien der modernen Chemie' (Braunschweig, 1877-84, 3 parts), which contains very valuable historical references. I am afraid it is greatly owing to this party spirit that Kolbe's own greatness is hardly sufficiently known in this country.