

and an extended reality, and he thereby fixed the immediate problem for the speculations of his followers.

For our present purpose it is unnecessary to dwell upon the questionable logic in Descartes' reasoning; it is sufficient to point out that nearly all the different aspects which the problem of knowledge presents, and which have occupied thinkers up to the present day, are either implied or distinctly brought out in Descartes' speculation. Such are, *e.g.*, the question of innate ideas, of the deductive as compared with the inductive processes of thought, the identification of certainty with mathematical precision or clearness, and many others. The way out of the uncertainty of knowledge, which for Continental thinkers was at that time by far the most important problem, seemed indeed to be solved in a promising manner by the appeal to the mathematical method. This was exactly that aspect of thought for which the philosophy of Bacon had no appreciation. The latter seemed to be unaware of the important part which the application of mathematics was to play in the extension of natural knowledge as well as in giving it precision and value.¹ The exact methods practised by Galileo were extended and

24.
Mathe-
matical
methods.

¹ It is, however, well to remember that Bacon (1561-1626) preceded Descartes (1596-1650) in time; that his most important works dealing with the "advancement of learning" were written in the first years of the seventeenth century; that at that time neither 'Kepler's Laws' (1609-1618) nor Galileo's 'Laws of Falling Bodies' (1612) were yet known or published; that the principal discoveries which were accessible to Bacon, such as those of Gilbert ('de Magnete,' 1600) and Harvey ('Circulation of the Blood,'

1619), had nothing to do with mathematics. The Works of Hariot and the 'Logarithmic Tables' (1594-1614) of Napier, on the other side, were probably too exclusively mathematical to come within the sphere of Bacon's interest in the extension of natural knowledge. Descartes' 'Discourse on Method' appeared in 1637. He had thus before him much of the best that, during that age, had been achieved in astronomy and physics through the application of measurement and calculation.