

of Mechanics may assume the various aspects which belong to the different modes of dealing with mathematical quantities. Mechanics, like pure mathematics, may be geometrical or may be analytical; that is, it may treat space either by a direct consideration of its properties, or by a symbolical representation of them: Mechanics, like pure mathematics, may proceed from special cases, to problems and methods of extreme generality;—may summon to its aid the curious and refined relations of symmetry, by which general and complex conditions are simplified;—may become more powerful by the discovery of more powerful analytical artifices;—may even have the generality of its principles further expanded, inasmuch as symbols are a more general language than words. We shall very briefly notice a series of modifications of this kind.

1. *Geometrical Mechanics, Newton, &c.*—The first great systematical Treatise on Mechanics, in the most general sense, is the two first Books of the *Principia* of Newton. In this work, the method employed is predominantly geometrical: not only space is not represented symbolically, or by reference to number; but numbers, as, for instance, those which measure time and force, are represented by spaces; and the laws of their changes are indicated by the properties of curve lines. It is well known that Newton employed, by preference, methods of this kind in the exposition of his theorems, even where he had made the discovery of them by analytical calculations. The intuitions of space appeared to him, as they have appeared to many of his followers, to be a more clear and satisfactory road to knowledge, than the operations of symbolical language. Hermann, whose *Phoronomia* was the next great work on this subject, pursued a like course; employing curves, which he calls “the scale of velocities,” “of forces,” &c. Methods nearly similar were employed by the two first Bernoullis, and other mathematicians of that period; and were, indeed, so long familiar, that the influence of them may still be traced in some of the terms which are used on such subjects; as, for instance, when we talk of “reducing a problem to quadratures,” that is, to the finding the area of the curves employed in these methods.

2. *Analytical Mechanics. Euler.*—As analysis was more cultivated, it gained a predominancy over geometry; being found to be a far more powerful instrument for obtaining results; and possessing a beauty and an evidence, which, though different from those of geometry, had great attractions for minds to which they became familiar. The person who did most to give to analysis the generality and sym-