pertuis conceived that he could establish *à priori*, by theological arguments, that all mechanical changes must take place in the world so as to occasion the least possible quantity of *action*. In asserting this, it was proposed to measure the Action by the product of Velocity and Space; and this measure being adopted, the mathematicians, though they did not generally assent to Maupertuis' reasonings, found that his principle expressed a remarkable and useful truth, which might be established on known mechanical grounds.

15. *Analytical Generality. Connection of Statics and Dynamics.*—Before I quit this subject, it is important to remark the peculiar character which the science of Mechanics has now assumed, in consequence of the extreme analytical generality which has been given it. Symbols, and operations upon symbols, include the whole of the reasoner's task; and though the relations of space are the leading subjects in the science, the great analytical treatises upon it do not contain a single diagram. The *Mécanique Analytique* of Lagrange, of which the first edition appeared in 1788, is by far the most consummate example of this analytical generality. "The plan of this work," says the author, "is entirely new. I have proposed to myself to reduce the whole theory of this science, and the art of resolving the problems which it includes, to general formulæ, of which the simple development gives all the equations necessary for the solution of the problem."—"The reader will find no figures in the work. The methods which I deliver do not require either constructions, or geometrical or mechanical reasonings; but only algebraical operations, subject to a regular and uniform rule of proceeding." Thus this writer makes Mechanics a branch of Analysis; instead of making, as had previously been done, Analysis an implement of Mechanics.[16] The transcendent generalizing genius of Lagrange, and his matchless analytical skill and elegance, have made this undertaking as successful as it is striking.

The mathematical reader is aware that the language of mathematical symbols is, in its nature, more general than the language of words: and that in this way truths, translated into symbols, often suggest their own generalizations. Something of this kind has happened in Mechanics. The same Formula expresses the general condition of Statics and that of Dynamics. The tendency to generalization which is thus introduced by analysis, makes mathematicians unwilling to acknowl-

[16] Lagrange himself terms Mechanics, "An Analytical Geometry of four dimensions." Besides the *three co-ordinates* which determine the place of a body in *space*, the *time* enters as a *fourth co-ordinate*. [Note by Littrow.]