into many elements, such as can be separated; to invent artifices for dealing with each of these; and then to recompound the laws thus obtained into one common conception. The moon's motion cannot be conceived without comprehending a scheme more complex than the Ptolemaic epicycles and eccentrics in their worst form; and the component parts of the system are not, in this instance, mere geometrical ideas, requiring only a distinct apprehension of relations of space in order to hold them securely; they are the foundations of mechanical notions, and require to be grasped so that we can apply to them sound mechanical reasonings. Newton's successors, in the next generation, abandoned the hope of imitating him in this intense mental effort; they gave the subject over to the operation of algebraical reasoning, in which symbols think for us, without our dwelling constantly upon their meaning, and obtain for us the consequences which result from the relations of space and the laws of force, however complicated be the conditions under which they are combined. Even Newton's countrymen, though they were long before they applied themselves to the method thus opposed to his, did not produce any thing which showed that they had mastered, or could retrace, the Newtonian investigations.

Thus the Problem of Three Bodies,¹⁹ treated geometrically, belongs exclusively to Newton; and the proofs of the mutual action of the sun, planets, and satellites, which depend upon such reasoning, could not be discovered by any one but him.

But we have not yet done with his achievements on this subject; for some of the most remarkable and beautiful of the reasonings which he connected with this problem, belong to the next step of his generalization.

5. Mutual Attraction of all Particles of Matter.—That all the parts of the universe are drawn and held together by love, or harmony, or some affection to which, among other names, that of attraction may have been given, is an assertion which may very possibly have been made at various times, by speculators writing at random, and taking their chance of meaning and truth. The authors of such casual dogmas have generally nothing accurate or substantial, either in their conception of the general proposition, or in their reference to examples of it; and, therefore, their doctrines are no concern of ours at present. But among those who were really the first to think of the mutual at-

¹⁰ See the history of the *Problem of Three Bodies*, ante, in Book vi. Chap. vi. Sect. 7.