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rules of navigation, for instance, are in part based on astronomy. Kepler's Laws are foundation-stones of that science, but Kepler discovered that Mars moves in an ellipse round the sun in one of the foci by a deduction from conic sections. As Laplace said, "Without the speculations of the Greeks on the curves formed from the section of a cone by a plane, these beautiful laws might have been still unknown." Yet the historical fact is that these conic sections were studied as an abstract science for eighteen centuries before they came to be of their highest use.

Those who doubt the value of "theoretical researches" should study Pasteur's life and observe how his services to mankind were based on inquiries which seemed at first sight remote from human application. It is true that Pasteur may be interpreted as the master-peasant, and the tanner's son (see *Evolution*, p. 224), but this need not keep us from recognizing that his researches form an intellectual chain, the first link of which was a study of the crystalline forms of tartrates. Thus, justly, the list of his achievements, recorded around his tomb, begins with "Molecular dissymmetry, 1848," an almost diagrammatically theoretical beginning for a series of researches which have had such a deep and extensive influence on the life of Man.

The twitching of the legs of Galvani's frogs