It must, however, in all fairness be stated that about the period from 1822 to 1830 this great simplification and unification of geometric science was as it were in the air—that it had presented itself to various great thinkers independently, being suggested from different points of view. The beginnings can no doubt be traced in the beautiful theorems of older French mathematicians, such as Pascal and De la Hire, and more generally in the suggestive methods of Monge and Poncelet; its first formal enunciation is in the memoirs of Gergonne: but the comprehensive use of it—the rewriting of geometry from this point of view—was the idea of Jacob Steiner, who, in his great but unfinished work on the "Systematic Development of the Dependence of Geometric Forms" (1830), set himself the great task "of uncovering the organism by which the most different forms in the world of space are connected with each other." "There are," he says, "a small number of very simple fundamental relations in which the scheme reveals itself, by which the whole body of theorems can be logically and easily developed." "Through it we come, as it were, into possession of the elements which Nature employs with the greatest economy and in the simplest manner in order to invest figures with an infinite array of properties."[1]

30. Steiner.

rebut, de leur substituer des traités d'une forme tout-à-fait différente, des traités vraiment philosophiques qui nous montrent enfin cette étendue, réceptacle universel de tout ce qui existe, sous sa véritable physionomie, que la mauvaise méthode d'enseignement adoptée jusqu'à ce jour ne nous avait pas permis de remarquer; il s'agit, en un mot, d'opérer dans la science une révolution aussi impérieusement nécessaire qu'elle a été jusqu'ici peu prévue."

[1] See the Preface to the 'Systematische Entwickelung, &c.,' in Jacob Steiner's 'Gesammelte Werke' (ed. Weierstrass), vol. i. p. 229. "In the beautiful theorem that a conic section can be generated by the intersection of two projective pencils (and the dually