

of motion of points, lines, planes—corresponded accordingly to the notion of variability in analysis. The introduction of motion, gradual and continuous, would give to purely geometrical or descriptive reasoning the same flexibility which analysis had acquired in the calculus of fluxions and of variations. Figures would lose their rigidity and isolation and limited nature and become movable, related to each other, filling the whole of space instead of a restricted and confined area or region. It is the peculiarity of the modern as opposed to the older geometry, never to let figures become motionless or rigid,¹ never to consider them in their isolation, but always in their mutual relations; never to have regard only to a finite portion of a line or surface, but to conceive of it in its infinite extension. By a reaction of analysis and geometry on each other, freedom and generality have been gradually acquired.

But this moving about of figures in space in order to learn their properties and mutual relations must be according to some method; otherwise it will not lead to scientific and exact knowledge. Poncelet, in considering how the two successful methods in geometry—the Cartesian and the Descriptive—had attained to their perfection, discovers a general principle which underlies their proceedings, and which is capable of great extension: this is the principle of projection.²

¹ See, *inter alia*, what Geiser says of Jacob Steiner's method in his pamphlet 'Zur Erinnerung an Jacob Steiner,' Schaffhausen, 1874, p. 27.

² 'Traité des Propriétés projectives,' vol. i. p. xviii: "En réfléchissant attentivement à ce

qui fait le principal avantage de la Géométrie descriptive et de la méthode des coordonnées, à ce qui fait que ces branches des Mathématiques offrent le caractère d'une véritable doctrine, dont les principes, peu nombreux, sont liés et enchaînés d'une manière nécessaire