

can be applied also to geometry in space, the point being conceived as generating a plane by its motion; or three planes defining a point by their intersection, leads us to the same idea of dual correspondence or reciprocity which Poncelet and Gergonne had arrived at by entirely different considerations. Plücker's was an analytical mind, and with him the principle of duality at once assumes an analytical form. He saw that the same equation lent itself to a twofold interpretation, accordingly, as we adopt point co-ordinates or line co-ordinates—*i.e.*, according as we refer our geometrical figure to the point or the line as the moving and generating space element. Through this step the idea of co-ordinates was generalised, and the dualistic conception of figures in space received an analytical expression. It was the junction of analytical and descriptive methods on a higher level, from which an entirely novel and fertile development of geometry became possible.

34.
Generalised
co-ordin-
ates.

Whilst the labours of Plücker lay in the direction of making analytical formulæ more natural, better adapted to the expression of geometrical forms and relations, and of reading out of these remodelled formulæ novel geometrical properties, the French school, with Michel Chasles¹

¹ In addition to numerous valuable memoirs, Chasles published, among others, two works of paramount importance, inasmuch as they for a long time dominated purely geometrical research, not only in France but also in Germany and England,—the 'Aperçu historique sur l'origine et le développement des méthodes en géométrie' (1837), and the 'Traité de géométrie supérieure' (1852). These works, through their bril-

liant style, not only threw into the shade for a time the labours of contemporary German mathematicians, such as Möbius, Steiner, Plücker, and Von Staudt, but also obscured some of the single discoveries of the author himself. The 'Aperçu' was early translated into German; whereas in this country it was the Dublin school, notably Townsend and Dr Salmon, who spread a knowledge of Chasles's work.