CHAPTER IV.

CENTRE OF PARALLEL FORCES, AND OF GRAVITY.

Resultant of two parallel Forces has its moment about a perpendicular line

40. It has been shown that two parallel forces (not forming a couple) acting on a rigid system, have for Resultant a single force in the same plane; its direction being parallel to that of the two, its magnitude being the algebraic sum of their magnitudes, and its moment about any point in this plane being the algebraic sum of their moments about this point.

Also, the moment of a force about a line to which its direction is perpendicular has been defined to be the product of the number expressing the magnitude of the Force, by the perpendicular distance between its direction and the line.

41. It will now be shown that the moment of this Resultant of two parallel forces, *about any line* perpendicular to their direction, is equal to the algebraic sum of the moments of the two forces about this line.

equal to the sum of the

Suppose the forces P, Q, to be acting in the same direction perpendicularly to the plane of the figure and meeting this plane in the points B, C; and their Resultant R (which $= P + Q$, and acts parallel to and in the same plane with them), to meet the plane of the figure in A. Let $b\,a\,c$ be any line in this plane, and draw to it the perpendiculars Aa, Bb, Cc. Then, if $B\,A\,C$ be parallel to $b\,a\,c$, Aa, Bb, Cc, are all equal, and the proposition is manifestly true, for

$$R.\ Aa = (P + Q)\ Aa = P.\ Bb + Q.\ Cc.$$