from the neutral axis, it would be represented by the perpendicular erected upon the base \((\frac{1}{2} d)\) of a right angled triangle whose altitude is \(R\), and the whole pressure would be represented by the area of this triangle or by \(\frac{1}{2} d \times \frac{R}{2} = \frac{dR}{4}\).

**Fig. 2.**

The several forces which act upon the beam may be considered as tending either to cause, or to prevent motion around the point \(n\), and their effects must be ascertained by comparing the products of their intensities by the distances from the point of rotation at which they act.

If, for example, a weight should be applied at the extremity of a lever, its effect would not be represented by the weight alone, but by the weight multiplied by the distance from the fulcrum at which it acts; this product is the moment of the force, and it is these moments, in reference to the axis or point of rotation, and not simply the absolute intensities of the forces, that must be compared in determining the conditions of equilibrium in any system.

Now the weight of any body may be supposed concentrated at its centre of gravity; and, in general, any number of parallel forces may be replaced by a single force called the resultant. In the present case, the pressure of the triangle, which represents the sum of all the forces upon the fibres of the lower half of the section \(A\ B\), will be the same, as if a single force equal to its area was applied in the direction of a line passing through its centre of gravity.

As the centre of gravity, or centre of parallel forces of a triangle, is in a line drawn from the vertex to the middle of the base, and at a distance from the latter equal to one-third the length of the bisecting line, it follows that the leverage of the triangle of pressure will be two-thirds of \(n\ B\) or \(\frac{1}{3} d\); this multiplied by the area of the triangle, (i. e.), by the resisting force along \(n\ B\) which we have found to be equal to \(\frac{dR}{4}\), will give