We will continue the hypothesis, that the neutral axis is on one side and the direction of the pressure on the other.

When the line of direction of the weight coincides with the axis of a column, the strength will be \(\frac{1}{4}\) as great as when it coincides with one side.

**Fig. 10.**

Let \(AB\) represent the line of direction of the weight, \(CD\) = the neutral axis, \(R\) = strain upon \(n'\), the strain upon any point \(p\) would be represented by a perpendicular through that point terminated by the oblique plane \(An\), the whole pressure would consequently be represented by the semi-cylinder \(A nn'\). The vertical line, through the centre of gravity, passes at a distance from \(n = \frac{5}{4}\) radius.\(^*\)

\(^*\) As the centre of gravity of this solid is not given in any mathematical work to which the author has access, he thinks it proper to explain the method by which he has obtained the distance \(\frac{5}{4} r\).

To find the volume and centre of gravity of a semi-cylinder cut off by an oblique plane passing through the edge of the base.

**Fig. 11.**

Let \(r =\) radius, \(x =\) any abscissa, \(y =\) the corresponding ordinate of the circle.

Then \(2r : x : : R : \frac{R}{2r} x =\) perpendicular of elementary rectangle