(b w), the equation of equilibrium becomes \( \frac{b^2 R}{3} = b w \), or \( W \)

\[ -\frac{b R}{3} \]

**Fig. 8.**

When the weight is applied directly in the axis, every part of the section \( n n' \) sustains an equal portion.* We have therefore \( w = b R \). Hence it appears, that a post will sustain three times as much, when the weight is applied along the axis, as it will when the line of direction coincides with one of the sides, provided, the dimensions are such, that flexure can take place only in the direction of \( b \).

Tredgold, in his treatise on cast iron, page 234, makes the resistance one-fourth when the weight acts on one edge of a block. This requires, that the neutral axis should be within the rectangle at a distance from the line of pressure equal to \( \frac{1}{2} \) the breadth, and that, beyond the axis, the parts oppose no resistance, a supposition, which, we think, is less nearly correct than that which we have assumed.

* This would be true in all cases were the material perfectly unelastic; but if the lateral cohesion of the fibres be not so great as to prevent any motion, some variation in the degree of pressure upon different parts of the cross section must ensue. This will certainly be the case when the support is very short in proportion to its width; for example, a weight applied at \( A \) would produce a tendency to flexure in the direction of the dotted lines, and then the pressure at \( p \) would be greater than at \( n \) or \( n' \). This objection is of no practical importance, as supports are always too long to allow of flexure in this way.

**Fig. 9.**