iron, experiment shows the transverse strength to be fully twice as great as it is made to appear by the above formula.

If in the expression $\frac{c.t.D^2}{6L}$, we make $L = D$, it may be reduced to $\frac{1}{6} C.t.D$; showing that the power of a projecting rectangular beam to sustain weight at a distance from the fulcrum equal to the depth of the beam, is only one-sixth as great as the positive (or negative, in case that be the smaller), strength of the material. This is a convenient way of expressing transverse strength, viz.: as equal to a force of so many pounds to the square inch of cross-section, the force being understood as acting upon a leverage equal to the breadth of the beam in the direction of the acting force.

If we call 18,000 lbs. to the square inch, the positive strength of cast iron, we may call the transverse strength (according to the above deduction), $\frac{1}{6} 18,000 = 3,000$ lbs.; meaning that a bar one inch square will sustain upon its projecting end, 3,000 lbs. at 1 inch from the fulcrum, and proportionally less, as the distance is greater.

Now, experiment shows that it will sustain twice this amount, and frequently more, so that we may in reality, reckon the transverse strength of cast iron at about 6,000 lbs. to the square inch.

I know of nothing to which to attribute this great discrepancy between theory and experiment, except a want of complete elasticity in the material, and perhaps, also to the assumption of too low an estimate (18,000) lbs. for the cohesive power of cast iron.

Cast iron, when exposed to a transverse strain, suffers extension on one side, and compression on the other; and the power of resistance to both these effects, increases very nearly as the amount of extension or