this case, represent the pressure on the top of the column, but the cross strain at the middle.

The value of the constant, in rectangular beams, was determined by the condition, that the flexure should be \( \frac{1}{480} \) of the length, or \( \frac{1}{40} \) of an inch per foot. The same constant would give for a column 10 feet high a deflection of \( \frac{1}{4} \) of an inch. If this be considered too great, the constant must be increased: but it must be remembered that this is the maximum deflection. on the supposition, that the weight is thrown altogether upon one side of the column, the most unfavorable case that can occur; it is therefore probable that no change in the value of the constant is required.

When the height of a column does not exceed about nine times the diameter, it is found, that the fibres will crush before they will yield laterally, and the strength will therefore be proportional to the area of the section, or \( d^2 \); we have in this case, \( d^2 R = w \).

**Resistance of Posts to Flexure.**

The ordinary formula for the stiffness of beams, supported

\[
\begin{align*}
\text{If } AD & \text{ be supposed to represent the neutral axis, and } R \text{ the maximum strain upon the fibres } BC; \text{ the pressure upon any part of the section } nn' \text{ would be represented by a perpendicular to } nn' \text{ terminated by the oblique plane } pn. \text{ The solid } nn'p, \text{ whose altitude } R \text{ is constant, and whose base is equal to the area of the section, will therefore represent the pressure upon } nn', \text{ and will be proportional to } d^2. \text{ The leverage, being the distance from } n \text{ to the perpendicular, through the centre of gravity, will also be proportional to } d, \text{ and therefore the strength of the cross section would be in proportion to } d^3, \text{ and the strain inversely as } d^3. \text{ The strain will also be as the deflection, which, as in the case of horizontal beams, can be shown to be inversely as the diameter; hence, combining all these results, the strain will be inversely as } d. 
\end{align*}
\]