side fibre represented by $a b$ or $a' b'$, $d =$ depth of beam, and let the width of beam be taken as unity. Then from what has preceded we have the average force P or P′ (equal to the areas of either triangle or $\frac{1}{2} C \times \frac{1}{2} d = P$) multiplied by the leverage of action, or the distances apart of the centres of gravity of the triangles. That is to say, $P = \frac{1}{2} C \times \frac{1}{2} d \times \frac{4}{6} d = \frac{\ }{6} C d^2$. For any breadth b other than unity, this expression becomes

$$P = \frac{b d^2}{6} C = \frac{\text{area of cross-section}}{6} \times d C \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

This is a general expression for the resistance of any beam having a rectangular cross-section, and is called the *moment of resistance* of the cross-section (usually designated by the letter R). When this value equals that due to the weight multiplied by its leverage of action, called the *moment of rupture*, or M, there is perfect equilibrium between the rupturing and resisting forces, or, in algebraic expression, " M " = " R."

The constant C is called the *modulus of rupture*, and were it not for certain discrepancies that occur in the resistance of material when subjected to *direct* compression or tension, and to *cross breaking*, its value would be given experimentally by the force necessary to tear apart or compress a bar of a given material. It is unnecessary in this place to point out what these discrepancies are, but simply the fact. Professor Rankine recommends that the value of C for any kind of material be determined by taking eighteen times the force necessary to break with a centre load a bar one inch square, placed