It cannot be the arithmetical mean, for there is no such mean between \( v = 0 \), and \( v = \) infinity. Undoubtedly, we shall be unable to do more than answer this question approximately; and that, only with reference to specific cases; for the ratio suitable for one length of span, and in one set of circumstances, will often be found quite unsuitable under different circumstances.

We have seen that the material required in chords, is in general, inversely as the depth of truss, or as \( \frac{1}{v} \). Also, that the material for verticals and diagonals, increases with increase in the value of \( v \); though not in a determinate ratio. But assuming the latter classes of members, including the main end braces of the Trapezoidal truss, to increase in the ratio at which \( v \) increases, while the chords diminish at the same rate, we might reasonably assume, that the minimum amount of action upon materials would occur when the amount of action upon chords were just equal to that upon all other parts of the truss.

By recurrence to the analysis of truss Fig. 12 [XLIII], we find amount of action upon chords, represented by \( 56\frac{h^2}{v} \) m., and that upon all other parts, by \((16\frac{h^2}{v} + 22.57v)\) m. Here, \( h \) is equal to \( \frac{1}{4} \) part of the length of truss, while \( v \) is variable; and, by making these two co-efficients of m equal, and deducing thence the value of \( v \), we have the depth of a 7 panel truss in which the amount of action upon chords, equals that of all other parts. Thus, putting \( 56\frac{h^2}{v} = 16\frac{h^2}{v} + 22.57v \), subtracting \( 16\frac{h^2}{v} \), and multiplying by \( v \), we have \( 40h^2 = 22.57v^2 \); whence \( v = \sqrt{\left(\frac{40h^2}{22.57}\right)} \), \( = 1.34h \) nearly. This gives length to depth of truss, as 5.2 to 1.