giving horizontal pull \(=1\frac{1}{9} W^h_o\) to be added to \(8\frac{1}{9} W^h_o\) making \(9\frac{1}{9} W^h_o\) = tension of ef.

Upon the non-decussation hypothesis, sr and ml, of the upper chord sustain thrust equal to \(8W^h_o\), and the remainder of the chord, \(10W^h_o\). By the other hypothesis, sr and ml sustain \(8\frac{1}{9} W^h_o\), ry and nm sustain \(9\frac{1}{9} W^h_o\), and the other 3 sections, \(10\frac{1}{9} W^h_o\).

LX. We may derive some more light upon this subject, by considering the conditions resulting from the elasticity of materials. Supposing the upper and lower chords to be so proportioned as to be uniformly contracted or extended under a uniform load of the truss, this does not require or imply any appreciable difference in lengths of diagonals. But the stress upon chords being produced by the action of diagonals, the latter, when, as here supposed, acting by tension, necessarily undergo extension, by which means, the panels (except the centre one), are changed from their original form of rectangles, to that of oblique trapezoids. For instance, the figure gjln becomes longer diagonally from g to l, than from n to j, whence the point g falls lower than it would do, if the diagonal suffered no change.

Suppose then the truss to be fully loaded, and the diagonals il, gl and fm, to be each exposed to the same stress to the square inch of cross-section. In that case, il and gl suffer extension proportionally to their respective lengths, thereby causing depression of the points i and g respectively as the squares of those lengths. [See note in section xlix.] Hence, the point g is de-