The problem therefore is the following:

A wire, fastened at $mm$ and supported at $gg$, is suspended with a deflection $f$. It is supposed that no friction exists at points $g$; hence the three parts hang in perfect equilibrium, and the tension in the wire on both sides of $g$ is the same. Now the supports $g$ are raised to $g$, and the points $m$ moved horizontally to $n$, which causes the wire in Fig. 10 to take the position of the dotted curve with a fixed deflection $f'$. The distance $m$ $n$ shall be determined. It will first be necessary to calculate the length of the whole wire in its first position, or, as the curve is symmetrical to the center line, half its length: $mg + gp$.

If the wire were to consist of perfect homogeneous material, it would hang in a catenary. This not being the case, we have a right to assume that the weight is equally distributed over the horizontal projection of the curve, or, in other words, that it forms a parabola. This assumption is the more justified by