curve of the middle span to shorten 0.0423 feet, and as a result the centre of the lower cables to rise $\frac{15}{100}$ feet, making the total deflection $62\frac{32}{100}$ feet. The difference between the total deflections of the lower and upper cables will then be $10\frac{2}{100}$ feet, or but *one-fourth of an inch in excess of the mean difference.* We learn, therefore, that the transfer of only 18 tons gross ( = $20\frac{16}{100}$ net tons) to each upper cable, is sufficient to counteract the effect of a temperature of 20° below zero.

It remains yet to be shown, what the actual strain in the upper cables will be under these conditions; and here I will use the load assumed by Mr. Wasell. He places

| | | | |
|---|---|---|---|
| The total dead load at - - - - - - - - - - - | | 900 | tons. |
| " " moving load at - - - - - - - - - - - | | 630 | " |
| Total - - - - - - - | | 1530 | |
| Load on each of four cables if all bear alike then | = | 382 | tons. |
| Add the load transferred to each upper cable at 20° below zero - - - - - - - - - - | = | 20 | " |
| Total load on each upper cable - - | = | 402 | " |
| Total tension resulting from this load will be 402×1.95 - - - - - - - - - - - - - | = | 788 | tons. |
| Ultimate strength of one cable - - - - - - | = | 2657.6 | " |
| *Consequent factor* of *safety* = $\frac{2657.6}{788}$ | = | $3\frac{4}{10}$ | |

This is a very different matter from the low factor given by Mr. Wasell, viz., $2\frac{2}{10}$, and shows that even when we assume the *monstrous load he has given, we find the bridge to be safe; the total excess in strain caused by a change from mean to extreme temperature*