mount bridge, consequent on the application of a given force, will be five times the greater.

But the deflection of the cables in the Fairmount bridge is 60 per cent. greater, in proportion to their span, than the deflection of those in the Middletown to the span of the latter work. From this cause, also, the stiffness of the latter will again be 60 per cent. greater than that of the former.

The combination of these two elements shows that the Fairmount bridge will be bent *eight inches* by a weight, which, on the proposed bridge, would produce a movement of but *one inch*. And we have already seen, that a train of more than one hundred tons, drawn by horses over the rough planks of the former, produced no injurious effect. It is clear, then, that a bridge, of which the cables are nearly ten times as strong, and which is eight times more stable, cannot be injuriously affected by the same weight, which in fact exceeds that of the ordinary trains likely to traverse the proposed road.

We have now gone through this branch of the subject, and have given full evidence of the sufficiency of the bridge proposed, so far as the considerations of strength and stability are at issue. This evidence is presented in the most conclusive form, by laying down rules for computing all the essential strains and motions, to which the work will be subjected in rail-road service: by showing how the accuracy of the rules may be tested, and inviting the experiment to prove their correctness: by giving the calculated deflections