

It has been already explained that when the bottom of a tube was fairly riveted together and completed, the engineer in charge of the work gave level marks at every 20 feet distances, showing the exact cambre to which the bottom was adjusted. These level or bench marks were adjusted daily, and the workman made his work as it progressed correspond as nearly as possible with them. Nevertheless, it frequently happened with all his care that, if the staging subsided, the work, when it was completed and ready for launching, would not show precisely the same cambre as that first laid down. This variation is shown in the second column of Table No. 1, while the third column shows the difference, which is called "subsidence during construction." The fourth column shows the position of the underside of the tube immediately after the wedges were struck, and it was left unsupported; while the fifth shows the position some few days before the final testing of the tubes on the 1st of December, 1859, after the roof and permanent way were laid. The last column was not so accurately ascertained as the others, or rather as the levels could not be taken immediately upon the same places as those by which the work was constructed, it is probable there may be in some instances a variation of probably $\frac{1}{4}$ th of an inch from what they might have been if taken upon the original marks. They are, however, very near the truth; and if they do nothing more than show the accuracy with which the work was done, the writer has the greater pleasure in giving publicity to this Table, as a tribute of praise to those assistants who had the entire charge of these levels, and of the setting out of the whole of the work, in addition to the onerous duties of superintending the work itself.

In tubes Nos. 11, 12, 14, and 15, the permanent way was laid, or rather the materials for it were in place, before the wedges were struck, which will to some extent explain why there was not so much of subsequent subsidence or deflection as with the others. It should also be mentioned that, at the time of striking the wedges, some of the tubes were more heavily burdened with spare materials, both on the top and inside, than others. This was unavoidable, and may explain why the deflection or subsidence, from the time of striking the wedges to the time of testing, was greater in some than in others. Although this may appear to detract from the extreme accuracy which would have given greater value to these observations, yet they are such as will be understood by practical men.

The mode of testing the tubes was very simple. A piece of steel wire, about as large as common wire, of No. 16 gauge, and which by experiment was ascertained would bear a weight of 380 lbs. without breaking, was strained along the side of each tube. One end was fastened to a bracket at one extremity, while the wire passing over a grooved wheel attached to the other end of the tube, was kept in a state of tension by means of a weight of over 300 lbs., and which, although sufficient to keep the