Under certain circumstances it would have been possible to omit this coffer-dam and save the considerable expense attending it. On the Brooklyn foundation no outer coffer-dam was used, the depth of water being too shallow.

In any case it was necessary to carry up the dam for a height of twenty-five feet. When the last course of timber was laid, the caisson was still floating two feet from the bottom at low water, and ten feet at extreme high water. To keep it on the bottom at extreme high water required four courses of masonry, and when inflated with air, three additional courses were required.

Owing to the rise and fall of the tide and the great top-weight of the structure, the requisite buoyancy and stability could only be attained by the displacement of a coffer-dam, especially as the usual appliances of suspended screws for keeping the structure level when afloat were obviously inapplicable.

It had also been intended to surround the tower by a permanent dock of stone and concrete, the foundations of which could now be laid within this coffer-dam at a moderate expense. This intention was, however, abandoned owing to the necessity of strictly confining the expenditure of money to the bridge proper. At present the coffer-dam has been designedly filled up with sand, and forms part of the timber dock extending to the tower masonry.

It will last for fifteen years without renewal.

The coffer-dam also formed a protection to all the caisson pipes, and made it possible to repair them when out of order.

These pipes consist of four supply shafts of two feet diameter, and fifty pipes of four inches and three and a half inches. None of them were built in the masonry, but came up between the wall and the coffer-dam.

On one occasion, through the accident of a large stone falling, a supply shaft was broken off at the timber-line, and would have been lost but for the coffer-dam. But the chief benefit derived from it was the fact that the masonry was laid below the water during the most of the winter. The work of sinking the caisson could, therefore, proceed uninterrupt-