

A COPY of Mr. Mylne's Opinion and Report, delivered to the Magistrates of Northumberland, respecting the Practicability of building a permanent Bridge at Hexham, on the Site of that built by H. Errington, Esq.

Hexham, April 24th 1783.

To the Magistrates and Justices of the Peace in and for the County of Northumberland, in General Meeting assembled.

Gentlemen,

**B** EING requested by you to view and examine the present state of the Bridge across the river Tyne, lately built by, and at the expense of Henry Errington, Esq., agreeably to the plan and advice of Mr. Smeaton, and to inspect the site and nature of the bed of the

the river, whereon the same was constructed, I beg leave to report, that it fully appears, this bridge was undermined by the great flood, which happened on the eleventh day of March 1782, and that the soil and substance of the bed of the river, of whatever matter and quality the same consisted, was dug or scooped out from below the greatest part of the piers, and *that* towards the west or upper side of the bridge,—and the advanced or guard works, inclosing a space round the piers, for the better security and maintenance of the soil immediately under the piers, whereon the whole weight of the structure had been charged, were also undermined by the gravel and sand, into which they had been driven, being worn away by the velocity of the stream; thus circumstanced during the height and greatest rage of a flood, it will appear no wonder that the piers, having a fourth, half, and even to three-fourths of their base taken out from below them, the arches split in two longways, by some of the piers breaking across, into two parts, precipitated into ruin themselves, and the parts constructed upon them.

All the piers fell towards the stream, but took different inclinations towards the excavation of the bottom, sometimes made more on one shoulder than on the other of each pier.

The surface of the water-line is now twenty-two inches lower than in the time during which the bridge was constructed; I have bored the river at the bridge to the depth of twenty-three feet below the latter water level, in a place where I might not be led astray by any alteration formed by the said flood, in the height of its impetuosity; and skimmed over again in its milder velocity; and I have found under the testimony and perseverance of Mr. Wake, that the soil and texture of the bed of the river at this place, is uniformly a composition or congeries of roundish and flat stones, gravel and sand, of equal quality and consistence in the whole of that depth.

The piers which were founded by means of a batter d'eaux, have stood tolerably well, and those which were laid by caissons, having no piles directly under the piers, were the easiest prey to the vast powers of this flood.

The depth to which all the works in general, whether immediate or preservative, were carried was far too shallow, and too little into the bed of the river, which (though hard to the touch of boring and compact to the eye, and feeling of instruments) is wonderfully loose, and unconnected in its parts, in so much, that the bed of the river Tyne seems to shift and alter its form, extent and situation, with every flood more or less, and tearing up at one time to a great depth, that fair moulded and well laid hollow, which the stream had laid for itself on some former occasion.

In such a situation, under these circumstances, with the additional one of many piers being to be fixed as obstacles to its violence, the foundations could not be laid too low. To what depth they ought to have been laid, and the means to be devised for that purpose, lay and remain with the parties engaged in the performance.

Mr. Smeaton, than whom there is no person or artist better instructed, more knowing, and of a more penetrating and correct judgment, must have been deceived in the collection of facts and materials, on which he established his plan of operations.

A great mind is often deceived by its own virtues. Habituated to give, on all occasions, the genuine and honest productions of its faculties, it often relies too much, and implicitly, on that which appears to be the same of other persons.

The existence of a sand below, and a supposed hardness and concretion of five feet or any such measure of the upper parts, seem to have precipitately and fatally determined the plan of operations, at first setting off, and appear to me to be equally the cause of the present precipitate opinion, for abandoning the proposition as impracticable.

Art furnishes the means, I humbly presume, of going to a sufficient depth, with all the foundations, and that too, on the spot, notwithstanding the damage which this site has received.

To compare the eligibility of this situation with that of any other near to Hexham, and the direction of the Alenmouth road, is perhaps useless to discuss at present.—But in my opinion, if nothing had hitherto been done, (as too much has unfortunately been done) I would have recommended a place of deep water, and fixed elevated banks, like to that opposite to the west end of the dwarf wall of the Spital Green within Mr. Wastell's inclosures.

To enable me to form the opinions, which I have now the honour to report to you, I have seen and examined all Mr. Smeaton's papers, I have heard all the particulars, and history of his proceedings, and motives for the method of operations which he adopted, I have examined every part of the works, and many persons concerned, and employed in the detail of its execution; and it was my lot to pass here in August 1778, when I viewed the effects then produced, in those very foundations, by floods previous to that time, making for my own instruction, minutes of what then I saw.—I mention these things to enable you to judge of that reliance, you and all other parties interested in this business, may be pleased to give to these opinions, and to this report, which is made by

Your most obedient, and very humble servant,

ROBERT MYLNE.