

## The earliest recorded bridge at Rochester: corrections and additions regarding the modern bridges

(1) Before work got started on the new bridge, a subcontractor, J. H. Ball,\* was brought in to clear the bottom of the river of any detectable obstructions. Some wooden piling was discovered, along the line where the new bridge was about to be built, which was taken to be the remains of the ancient bridge.† In 1853, when the British Archaeological Association held its annual meeting in Rochester, a local litterateur, Henry Gardiner Adams (d 1881), read a paper about Rochester bridge.‡ (The medieval bridge was still operating at the time; the modern bridge was under construction.) This paper includes a report of "the discovery of wooden piles, evidently the remains of an old bridge foundation, during the progress of the present works. These piles were, many of them, shod with iron, and driven far down into the bed of the river, out of which they had to be drawn. I am informed by the overseer of the works [meaning Ball, I suppose] that as much as six hundred and sixty cubic feet of timber, chiefly oak, was recovered in this way; a great portion of it was perfectly sound, as is shown by a piece which he has had converted into a tea caddy" (*Journal of the British Archaeological Association* 9:350 (Jan 1854); similarly *Gentleman's Magazine*, Sep 1853, 292).

Hughes's comments, in the paragraph which I described (fairly, I think), as "a jumble of half-remembered (or half-forgotten) facts" (Flight 1997:33), seem to refer to Ball's discoveries as well as to his own.

\* John Howell Ball (1814--1885), originally from Oxfordshire, who went into business as a building contractor in Strood. He was also involved in the demolition of the superstructure of the medieval bridge -- but not (see below) in the removal of the piles underneath it.

† Or else to be the "traces of a submerged forest" (*Archaeological Journal*, 20:383 (Dec 1863)); "and hazel nuts were brought up from the bed of the river in a perfect state" (*Gentleman's Magazine*, Sep 1863, 303).

‡ In 1856, to celebrate the opening of the new bridge, he published a 64-page pamphlet -- favourably noticed in *Gentleman's Magazine*, Dec 1856, 689 -- and a poem, neither of which has come my way. The paper summarized in *JBAA* (where his second name is wrongly given as "George") is derivative from start to finish, except for the quoted passage.

Forty years later, George Payne mentions the fact that "when the present Bridge was constructed upon the site of the ancient wooden one, the late Mr. John Ball, the contractor, met with the piles

upon which the later [r latter] structure had been erected" (1895:12); but he then confounds the piles retrieved by Ball with the vastly greater quantity of piling (estimated at 250000 cubic feet) which was extracted some years later, by a different contractor, Foord and Sons, from the site of the medieval bridge.\* (Smetham (1899:2) makes the same mistake.)†

\* The piles extracted by Foord's workmen were mostly of elm. They were carted off to a patch of marshland near the gas-works. They were there in 1863 (*Archaeological Journal* 20:382-3) and still there in 1895 (Payne 1895:12); but some time later -- perhaps when the river burst its banks on 29 Nov 1897 -- the marsh got flooded, and the piles all floated away, never to be seen again (Arnold 1921:135).

† He says that the piles were still "rotting away in the marsh near the Rochester Gas Works". But I suspect that his information was slightly out of date.

(2) The engineer who supervised the construction of the foundations for the new bridge was John Hughes (1807--1874). He had a long, successful and adventurous career, recounted in the memoir written for the *Minutes of proceedings of the Institution of Civil Engineers*, 40, part 2 (1875 for 1874-5), 255--8. (There he is called "John d'Urban Hughes"; but he is always "John Hughes" in reports of his work at Rochester.) The memoir speaks of his having been responsible, among much else, for the construction "in 1850-2 of the iron bridges on the Great Northern railway between London and Peterborough, including one of three arches over the Ouse at Huntingdon on cylinder foundations, and another of like dimensions over the Nene at Peterborough on cast-iron caissons -- sunk in both cases by Dr. Potts's vacuum method;\* and later, in 1851-2, of the foundations of Rochester Bridge, where it was intended to use Dr. Potts's method for sinking the cylinders. The nature of the ground, however, and other obstacles made it impossible to use the vacuum process. In order to overcome these difficulties, Mr. Hughes invented the compressed air or "plenum" process of sinking cylinders. This was completely successful, and the works at Rochester were visited by numbers of professional men, foreign as well as English; but although the plenum process, or modifications of it, has come into general use, Mr. Hughes never received any pecuniary advantages from his invention. In many cases even his name has been ignored, and, as frequently happens, the credit claimed by other people" (p 256).

\* Dr. Potts, by the way, was Laurence Holker Potts (1789--1850), whose mother, Ethelinda, was the younger daughter of John Thorpe (1715--1792) of Bexley. So Dr. Potts was Dr. Thorpe's great-grandson.

The publication of his paper was much delayed. In its early days, the Institution of Civil Engineers did not have the funds to publish its proceedings in full. Each year, it started a new volume; but it only printed part of the volume, as much as it could afford to pay for, leaving the rest for later. Vol 10 became one of this backlog of incomplete volumes. The first part of it was "ready to be issued" by December 1851 (*Minutes of proceedings* 11:89); "part 2" was not printed till 1857 (17:86). Since authors were given a chance to make corrections before their papers went to press (14:116), the published version of a paper might be significantly different from the version which had actually been read. That, I think, is the case with Hughes's paper: that is why we find questions being anticipated in the body of the paper which only came up in the discussion at the end of it. (Again, that is why the footnotes added by the editor are dated 1857.) At all events, this paper needs to be cited as "Hughes 1857", not as "Hughes 1851".

(3) The East Kent Railway bridge was built in 1854--6, to a design by Joseph Cubitt. The same contractors were employed as for the road bridge, Fox and Henderson, and a modified version of Hughes's "pneumatic method" was used for sinking the foundations. We only know that (or, at least, I only know it) because of a frightful accident on 11 Aug 1855, in which three of the workmen lost their lives. The London and local papers have reports of the accident (*Times*, 13 Aug 1855, 8; *South Eastern Gazette*, 14 Aug 1855, 5) and of the ensuing inquest (*Times*, 14 Aug 1855, 12; *South Eastern Gazette*, 21 Aug 1855, 6).

(4) The South Eastern Railway bridge was built in 1885--8. I do not know what method was used for constructing the foundations; if any discoveries were made, I have seen no report of them. The finds mentioned by Arnold (1889) were made during the construction of the eastern approach in 1888--9.

## References

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