

### Bridge End, Birkenhead

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The construction of the dock system between Birkenhead and Wallasey was begun in 1844 and generally completed in 1877, with later additions in 1909 and 1933.

The area around the junction of Freeman Street, Bridge Street and Marcus Street is shown on some of the older maps as 'Bridge End', the exact site being 'occupied by railway bridge' (NMGSMR record card ref 3289/2; NGR SJ 32208938). The site is at present a road bridge across the docks and extensive changes to the traffic pattern have recently been completed.

In 1845, whilst working on the docks, the remains of oak beams and stone piers were discovered. The details of the site and excavation were given in a lecture by the Rev William H Massie on 1 April 1850, the drawings

being prepared by Mr Snow, one of the engineers involved in the railway construction (Massie 1850).

The workmen cut through a surface layer some four foot six inches deep, the composition not being labelled in the report, to reach what Snow described as 'Level of twenty foot tide and level of silt'. Under this was nine foot six inches of loose sand, bluish marl and deposited silt, as found on the bed of Wallasey Pool.

The next two foot three inches consisted of four parallel rows of timbers arranged in three layers and three sections of approximately thirty three feet, the total length being almost exactly one hundred feet and the total width twenty four feet (Fig. 1a).

On completing the excavations for the new railway bridge, sufficient timber and stone remained to be recognisable as a timber bridge, over the bed of a small rocky stream (Fig. 1b).

The beams were eighteen inches wide by nine inches thick, well squared off by axe, and Massie states that the beams would have been originally covered by

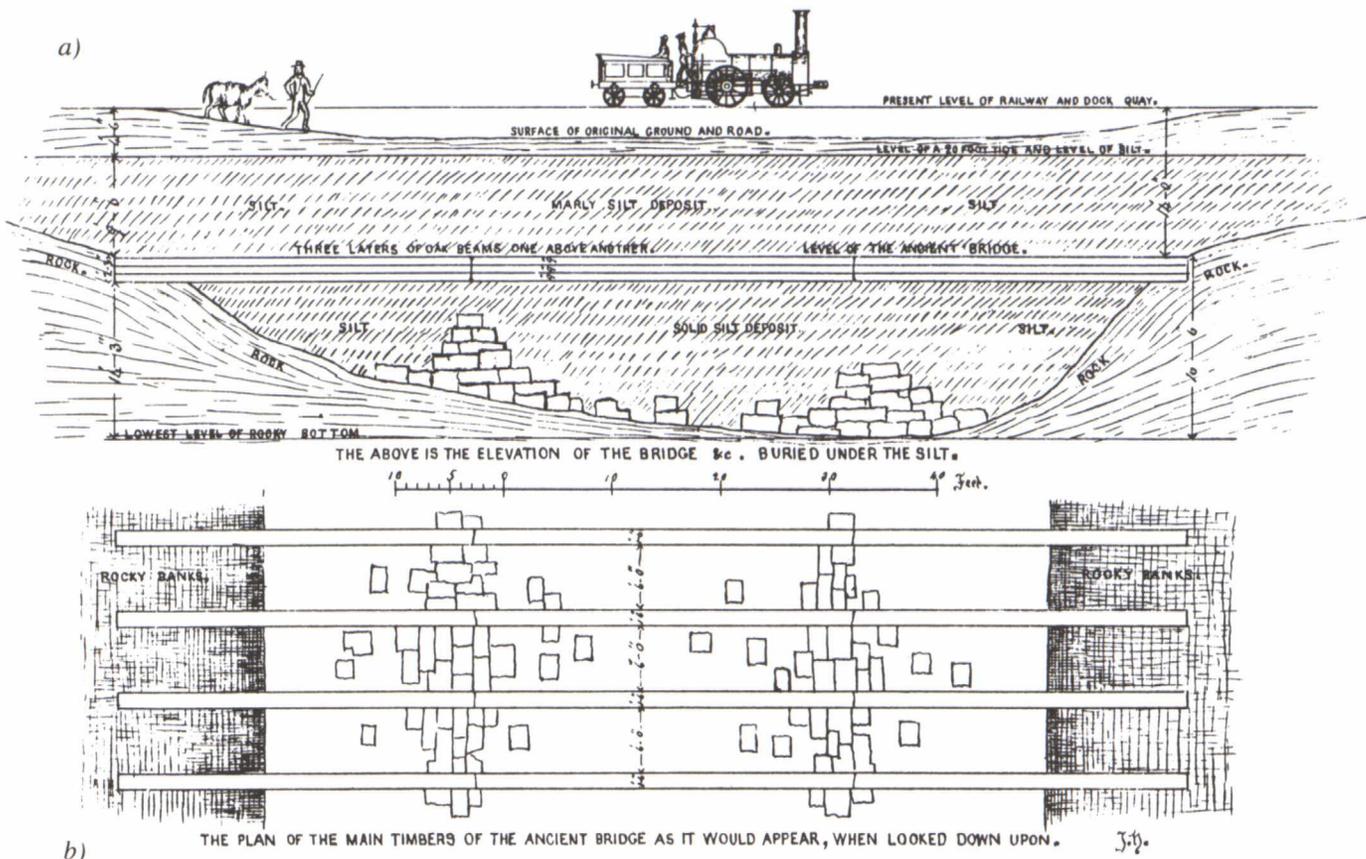


Figure 1: Illustration of the bridge as it was found in 1845 reproduced from Massie (1850). a) elevation of the bridge and b) plan of the main timbers of the bridge.

smaller rafters which 'had mostly perished'. The beams were mortised, the suggestion being that these were for the upright supports of a railed parapet, as shown on a coin of Marcus Aurelius (Fig. 2).

The measurement of the timbers is comparable with the remains found at Aldwinckle, Northamptonshire, where a Roman timber bridge once crossed the River Nene. The unusual state of preservation at that site showed that the timber piles were up to eighteen inches thick, and had there been strengthened with iron sheaths (de la Bedoyere 1991).

Massie was convinced that the Birkenhead bridge was Roman in origin, partly because of the method of construction and partly because of the Wirral Roman road. The depth he explained as being due to sedimentation at the confluence of the Birket and the Mersey, and postulated that the 'moderate spring tide' would then have been sixteen feet lower than present, i.e. 1850. In 1960 an anonymous writer (Anon 1960), quoting North (1957), came to the conclusion that the land in this area may well have sunk to a depth of fifteen to twenty feet in the relevant period.

A second suggestion mentioned by Massie is that the bridge was constructed by the monks at Birkenhead Priory, but he discards this theory on the grounds that the measurements and structure of the bridge are far more substantial than one found some fifteen miles upriver from Chester, and that the depth of the remains at Birkenhead would be too great.

Irvine (1894) quotes a Court Roll of the Manor of Claughton, dated 22 October 1689, which reads 'Wee present ye Lord of ye Manor and John Wilson for not repairing ye Malings hay Bridge, to be done betwixt [this] and Midsummer in paine of x s'. Irvine suggests that this bridge 'was probably the one at Bridge end in Birkenhead'. He later seems to have changed his mind, as in 1957 he wrote (Irvine 1957) 'That this bridge cannot have been built by the monks of Birkenhead Priory (founded late twelfth century) is shown by the fact that there is documentary evidence that it had disappeared at a date prior to 1291'. In the next issue he stated, 'That the site of the Roman bridge had been buried before 1291, is shown by the mention of Birkenhead mill in the Taxation of Pope Nicholas. That this mill was the water-mill at Bridge-end, is proved by its mention in 1304 in Chester Plea Roll 16,m.1d'. The reader is left to realise that the mill was on the same site.

It is virtually impossible to date sites of this kind, excavated without the benefits of modern methods and professional archaeologists. Modern techniques of surveying, stratigraphy, photography, and so on, combined with a proper site archive would make a great difference. One possible way of determining at least an approximation of the date is by examining changes in sea level.

Edge, in a paper published in 1986, suggested that the bridge must date from the Bronze Age, 5,000 BP, due to the depth at which it was found. He uses graphs showing the oscillations of sea levels since 10,000 BP. These graphs are based on data quoted in Edge (1989) from Tooley (1974). He argues that the changes in sea level since Roman times have been relatively insignificant, and nowhere near the 16ft mentioned by Massie. The construction technique he compares to some of the trackways across the Somerset Levels, which used wooden pegs driven through notches, 'a not dissimilar sort of joinery to that described by Massie'. The mortice joint as found on the bridge timbers at Birkenhead is shown in Figure 2 for comparison. He suggests that the bridge was part of a crossing to the Wallasey 'island', which was larger at the time.

COIN OF MARC: AURELIUS SHOWING THE USUAL FORM OF ROMAN PARAPET -



FRAGMENT OF BEAM, DUG UP AT BIRKENHEAD: EIGHTEEN INCHES WIDE BY NINE DEEP SOLID OAK. THE WHOLE BEAM WAS MORE THAN THIRTY FEET LONG THESE LAY ONE UPON ANOTHER IN THREE LAYERS.



SECTION OF THREE BEAMS RESTING ON ROCK.

Figure 2: Illustration reproduced from Massie (1850) showing a coin of Marcus Aurelius, fragment of beam from the bridge showing mortice joint and section of three beams from the bridge.

Extensive research into sea-levels in the Roman era was carried out by Waddelove and Waddelove (Waddelove 1990). During research into the Roman road system in Cheshire and Clwyd they found much of the previously published work to be inconsistent, dependent on the discipline involved, contradictory and often simply ignored.

They set out to propose a new, consistent method of assessing archaeological evidence and comparing it with particular sites and periods during the Roman era. They started with the Dee and Mersey areas, and then investigated other coastal and estuarine sites around Britain.

The initial problem was to define a suitable datum point for measurements. Since 1975, published tide tables have been based on Chart Datum (CD), which differs with each location, and in 1850 Liverpool measurements were taken relative to the Old Dock Sill (ODS). It was therefore necessary to work from Ordnance Datum (OD), which is the Mean Sea Level as calculated by the Ordnance Survey at Newlyn in Cornwall.

Obviously structures close to tidal waters have to be built in such a way to allow for the highest possible tide, plus a safety margin. For the Birkenhead site the Waddeloves calculated that the Highest Astronomical Tide (HAT) would be seventeen foot seven inches above OD, and in the case of bridges a safety margin of one foot would suffice.

The original report by Massie gave the depth of silt as nine foot six inches and the timbers at two foot three inches. If we then add a one foot safety margin, we get a total of twelve foot nine inches. When this is deducted from present HAT at seventeen foot seven inches this gives us a calculated Roman HAT of four foot ten inches. Possible variations on this figure are three foot ten inches if we use the AHW (average high water mark) of Equinoctial Spring Tides (twenty one foot one inch) or two foot nine inches if we work from Snow's 'twenty foot tide'.

These figures are well within the range of figures calculated by the Waddeloves for the fourteen other sites they investigated. There is variation at each site, partly due to topographical conditions, partly due to the length of the Roman era and partly due to the figures indicating that many tide changes were sudden inundations rather than gradual progressive rises.

In their summary, the Waddeloves, correctly, printed a question mark against the word 'Roman' as the structure cannot be *independently* dated. However, the suggested dating of other sites they investigated and the similarity in construction to acknowledged Roman bridges led them to conclude it should be placed firmly in the Roman era. They also stated how difficult it is to postulate any other builders in an age before written records, not just of such an imposing structure, but also

of the major road it was built to carry and the road system to which it would have led.

Having studied the available sources, I feel compelled to agree with Massie that the remains were Roman, for two reasons. Firstly, I am unconvinced by the graphs of sea levels used by Edge. Two of the four curves are based on global figures and one, on the Lower Somme—'possibly acceptable for Southern England'—leaving just one calculated on local (South Lancashire) data. The Waddeloves' figures are, however, based on 15 British sites and on a much more relevant time scale. Secondly, it must be remembered that the account by Massie and the drawings by Snow are the only known records of the site when it was revealed in 1845.

#### Postscript

The aim of this 'note' was to consider *all* the published research on this site, and to attempt to draw a conclusion with regard to the date. Since completing the 'note' an article entitled 'The Ancient Birkenhead Bridge' has been published in *Archaeology North West Edge* (1994). Unfortunately, this does not include any new data and is based mainly on the graphs published in 1986, which are at a very small scale, unsuitable for showing sea-level changes since over the past 2000 years. I am therefore still in agreement with Massie.

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