



Bridge of the Month No50, February 2015 Warwick Castle Estate



If I get this out today as planned, I will be back on schedule for number 50. Something of a milestone and rather amazing to think I have been doing this for over 4 years.

I am still very busy (or ineffective, which has the same result). A presentation to prepare for students for Monday. One for the IStructE History group for 10th March (On old New Zealand cable supported bridges). A paper in preparation on Measurement of Arch Behaviour with Brian Duguid of MottMacdonald. Another two urgently needed on newly understood aspects of viaduct behaviour. I need to get going again on Archie User Group meetings.....

This bridge was almost certainly designed by Robert Mylne. It is believed to have been built as a warm up for the main Castle Bridge in Warwick itself. It is an estate bridge of magnificent proportions, crossing the [Stratford Avon](#). Ted Ruddock describes it as follows:

“The Warwick Bridge is large and high, but very delicate. Warwick is the only bridge built to his design which has a really difficult gradient, but that was probably consciously accepted, for the bridge’s chief purpose must have been to decorate the park.”

Perhaps this would be an appropriate point to bid farewell to Ted who died in the past month. He was an engineer of real stature and will be missed by many of us.



By 1765, when this bridge was designed, William Edwards had been through his tremendous trials at Pontipridd and the idea of creating voids in the fill of the haunches was established for his 1756 design. I hope to get there soon to photograph it and prepare another BoM.

But back to Warwick Castle Estate. Ted's great work was first published in 1979. His photograph, reproduced in a different era of printing, shows a bridge in remarkably good condition at 220 years. By the time I first saw it in the late 1980s it was in a much sorrier state. Entropy has taken further toll since then, though I haven't been back since about 2006 when there was some talk of me doing an assessment.



This looks bad enough, but the other side is even worse.



The main thing to note here is the voids in the fill. I think there are four of steadily increasing size towards the abutment. They are there to tune the line of thrust to follow the curve of the arch and were probably developed for Edwards' bridge to which I will return as soon as I can get there.

In the meantime perhaps we should think a little about how a bridge might get into this state. It is likely that the parapets were either "quarried" for use elsewhere or simply toppled into the river in an act of vandalism. The latter seems more likely as that might also lead to the destruction of part of the spandrel wall. The crude concrete patching is surely better than a bridge of this quality deserves, though it was no doubt an emergency response to the danger of losing a vehicle over the side.

The combination of vegetation and weather are continuing the work of the vandals in quite an effective way and these pictures show how quickly neglect can take its toll.



This one is greyed out but I think at least one void is visible through the spandrel



General weathering of the stone is visible here

Prompted by some recent issues raised by Archie-M users, I am in the process of writing a note on the measurement of arches for assessment. I hope to show how poor measurement can be detected and how a reasonably set of dimensions can be achieved from erroneous data if there is a photograph to confirm the results. I think that a large part of the problem is people who are doing the measurement (especially if they are surveyors rather than engineers) not being given a sensible specification.