

The unbroken chain of history

Ten years ago, an historic landmark in British engineering history was deteriorating, and an uncertain future lay in store.

Ten years on and the Union Chain Bridge over the River Tweed is fully restored, able to carry vehicular traffic, and serves as a living monument to the engineering ingenuity of a Fellow of the RSE, Captain Samuel Brown FRSE.

Professor Roland Paxton FRSE was one of the many people who saw the significance of the Union Bridge and set about securing its future. RSE Fellows and various groups including the Friends of the Union Chain Bridge saw to it that the landmark would be preserved.

Built in 1820 and designed by Captain Samuel Brown FRSE, it enjoys legendary status in engineering circles – the first in a continuing line of ‘bridges of suspension’ with the longest-ever spans.

“It took long-span bridge design into a totally new era, and this is why I wanted to get it saved,” Professor Paxton explained. Owing to the elegance of the design, and the solid construction, around half of the original ironwork was preserved. He added: “Basically, all he did was sling 12 chains from two supports, and it is that simple.”

The design was so successful that on the day of the official opening of the bridge in 1820, people swarmed the bridge deck after Captain

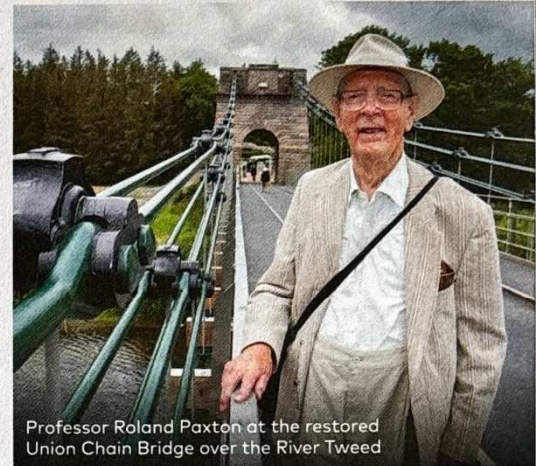
Brown had demonstrated it himself. The estimated combined weight was some 47 tonnes.

Not only did the design prove successful on the day, but the design and the work to make it a reality had made such an impression as to attract the likes of Robert Stevenson, George Buchanan, and John Leslie – all RSE Fellows. It had garnered attention years before the Institute of Civil Engineers began publishing papers, with the RSE providing the forum for innovations like it.

The original structure took only 12 months to lay down, however, the restoration project took three years to complete. Professor Paxton said: “They ran into all sorts of problems because they discovered that a lot of the material was not up to modern standards, but nevertheless they still finished up with about half of the original ironwork. It is not just a ‘look-alike’ bridge, people are still crossing partly on the original ironwork.”

The bridge, spanning the River Tweed between Fishwick in the Scottish Borders and Horncliffe in Northumberland, England, had been registered as ‘at risk’ by both Historic Environment Scotland and Historic England.

When it was completed in 1820 it was the longest span vehicle-carrying suspension bridge in the world, with a span of 437 feet. Prior to that, the standard bridge building technique had been to use stone, with piers at regular intervals along the bridge’s length. Captain Brown’s design was to change that,



Professor Roland Paxton at the restored Union Chain Bridge over the River Tweed

and that legacy has carried on. Professor Paxton added: “It was absolutely on the ball, and it has done nothing but get bigger and bigger and bigger ever since, and Union Bridge was the first large iron suspension bridge that carried traffic, of modern times.”

As the longest spanning bridge when it was built in 1820, countless suspension bridges around the world – many of which are famous in their own right – can trace their roots to the Union Bridge, among them the Golden Gate Bridge in San Francisco, the Brooklyn Bridge in New York, and the Strait of Messina Bridge connecting Sicily with the Italian Peninsula, the construction of which is set to begin this summer. When completed, its longest span will be some 10,800 feet.