100 Years of the Forth Bridge
Edited by Roland Paxton
Thomas Telford Ltd, 1990
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This book takes the reader through time starting in the 3rd century up to the present, with a peek into the future, by looking at a site that cried out for a bridge ever since man populated the lands around the Firth of Forth. It is a compilation of six articles which were prepared based upon a lecture series sponsored by the Institution of Civil Engineers and the National Museums of Scotland. It begins with a historical review of the 'early plans' for transport across the Firth and them moves into the design of the bridge, the construction of the bridge, the maintenance of the bridge, the men behind the bridge and ends with a look into the future of bridge construction. The book would be of interest to engineers, historians of early railway and bridge construction, industrial archaeologists and the general reader who is interested in 19th century Scotland.

Paxton gives a fine review of the attempts to improve on crossing times, both on paper and in the field, that were made before the coming of the railway by several of the engineering giants of 18th and 19th century such as Smeaton, Telford and Rennie. He then discusses the attempts to have the railway cross the Forth starting with the railway ferry and leading up to Sir Thomas Bouch's suspension bridge with its two suspended spans of 1600 ft. He makes nice links with the Tay Bridge and the issue of appropriate wind pressures to be used in the design of the bridge. A proposed iron lattice girder bridge at nearby Charlestown, with spans of up to 500 ft, is also covered in some depth.

Shipway performs an analysis of the Bouch suspension bridge design concluding that it might have worked if the bracing in the towers and girders were adequate. The evolution of the Baker and Fowler plan is given, with a brief look at earlier cantilever bridges as well as subsequent designs. I am not sure why these were added as the previous bridges were of a different design and surely of a different scale and none of the subsequent bridges followed the lead of the Forth Bridge. Maybe he was trying to show that the bridge had no precedent and never became a model for subsequent cantilever bridges around the world.

Cox gives a fine description of the construction of the bridge based heavily on the Westhofen article on the Forth Bridge. It is illustrated with photographs and schematic diagrams. He also describes the fabrication techniques, developed by Tancred, Arrol and Company, to bend, drill and rivet the parts in the yard as well as the method of erection.

The article on Maintaining the Bridge by Grant is interesting as it describes how the maintenance of the bridge has permitted it to render over 100 years of service in an environment hostile to steel structures. Baker's words 'as long as men painted it, so would it stand' ring true as much in the 1990s as in the 1890s. His creation is being threatened by those whose concern for cost and the absolute safety of the painters, only one of whom has died from injuries sustained while painting the bridge in 100 years, has slowed down the repainting of the bridge in recent years.

The Men Behind the Bridge by Birse gives an excellent description of those men who made the bridge possible, ranging from men of vision to men of muscle. This type of analysis emphasizes the importance of having different types of men available at different times in the life of a project as large and extended over a quarter of a century as the Forth Bridge. I would like to have seen more on the rest of the men who were depicted on the commemorative portrait shown on page 111 and their role in the conception, design and construction of the bridge. They, probably more than Maxwell and Rankine, were the real men behind the bridge.

The concluding article by Happold seems to lack focus as it starts out by describing some of the 19th century accomplishments of civil engineering and then goes into a brief biography of Fowler and Baker. This is followed by a commentary on wood and the use of light-weight materials for roof structures

with a brief sidetrack into wood epoxy interaction. He ends by stating that if we were to build the bridge in 2090 it would be a double cantilevered structure built out of tubes made of an organic material.

In summary the book contains much useful information but is more of a series of loosely connected articles than a book. This might be expected considering that the papers were selected for an oral presentation format. The authors apparently coordinated their coverage of the material only through a choice of topic. The illustrations are good, but references are inconsistent and absent in some of the articles. However, even with these faults, it is another fine contribution to our understanding of 19th century civil engineering and engineers. It also spotlights the importance of bridge maintenance, an area that doesn't receive enough attention in print or in the field. Its look into the future confirms Newton's statement that 'If I have been able to see further it's because I have stood on the shoulders of giants'. According to Happold, a bridge of a century hence at this site would be a bridge similar in appearance and design to the current bridge only using different materials.

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