

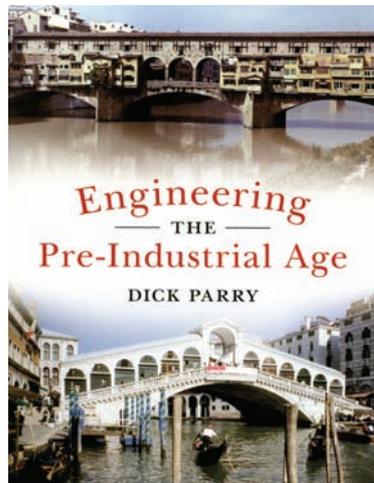
Review



Dermot O'Dwyer comments on an easily accessible overview of a fascinating engineering era.

Engineering: The Pre-Industrial Age

Author: Dick Parry
Publisher: Amberley Publishing
Price: £17.29
ISBN: 978-1-445-61445-8



This book is a natural sequel to Dick Parry's earlier book *Engineering the Ancient World*. Here, the author examines the period following the collapse of the Roman Empire through to the start of the industrial revolution. The book is written in an easy style for an engineering audience. However, it would not present a general reader with significant difficulties.

The first chapter, 'The Creators', comprises a series of biographical sketches of 16 of the period's most significant engineers, builders and designers. The list starts with Abbot Suger and concludes with John Smeaton. It includes a number of the French engineers including Vauban and Perronet and many Italian engineers. Interestingly both Leonardo Di Vinci and Michelangelo are included but neither Galileo nor any of the other theoreticians get a spotlight. This is in keeping with the book's overall emphasis on the historical aspects of pre-industrial engineering. The second chapter, 'Materials and Methods', looks at the variety of materials, construction techniques and machines that were available to medieval builders. Together, these first chapters give a good overview of medieval and renaissance engineering.

Chapter three, 'Water Controlled', covers water supply, irrigation, water power and the drainage of the fens in East England, while

the fourth chapter, 'Water Transportation', addresses the construction of ports and harbours, and inland navigation.

Chapter five, 'Traversing the Land', deals with road construction and chapter six, 'A Span of Bridges', considers a range of bridge types from Palladio's trusses to Perronet's fine masonry arches. This chapter has a detailed account of the history of the medieval London Bridge and describes some well known bridges in Florence, Venice and Paris. The Pul-i-Khaju bridge in Isfahan is also discussed, with Islamic engineers and engineering achievements being well represented throughout the book.

Chapter 7, 'Castles and Fortresses', describes the history of fortress design but from a largely non-technical perspective, starting with Norman Castles and ending with the 18th century fortifications of Vauban.

Chapter 8, 'Towers Vertical and Towers

Leaning', begins with the Eddystone lighthouse and works back to Italian towers, including the leaning tower of Pisa and the collapse of the San Marco tower in Venice.

Chapter 9, 'Soaring Vaults and Flying Buttresses', concentrates on the construction of gothic cathedrals. This chapter focuses on the technical aspects to a much greater extent than most other chapters. As one would expect, the author refers to Jacques Heyman's work on masonry arches and vaults, to the extent that some of Heyman's key conclusions are given in detail. Nevertheless, given the brevity of the account, it would be prudent for structural engineers to follow up by reading the original text¹, where his theorems are presented in context and with caveats.

Chapter 10, 'Heavenly Domes', will also be of particular interest to structural engineers. This chapter describes the construction of many of the world's greatest masonry domes; from the Hagia Sophia in Istanbul and St. Peter's in Rome, to Brunelleschi's dome in Florence.

The book is well written and is very engaging. Because the book is aimed at a general readership, the absence of referencing is appropriate. Nevertheless, the author has included an extensive bibliography that will guide readers who are interested in delving further.

References

- ▶ 1) Heyman J. (1997) *The Stone Skeleton: Structural Engineering of Masonry Architecture* (reprint edition) Cambridge: Cambridge University Press



Dermot O'Dwyer

Dr. Dermot O'Dwyer is an Associate Professor in the Department of Civil, Structural and Environmental Engineering at Trinity College Dublin, where he lectures in structural and railway engineering. His research interests include engineering history and the assessment and conservation of historic structures. He is a member of the ICE's panel for historic engineering works (PHEW) and sits on the committee of Engineers Ireland's Heritage Society.