Book review

Geometry and Mechanics of Historic Structures

Jacques Heyman. Instituto Juan de Herrera, Escuela Técnica Superior de Arquitectura, Universidad Politécnica de Madrid, Madrid, Spain, 2016, ISBN 978-84-9728-554-4, €28·00, 259 pp.

This book is an easy one to review – Heyman is universally acknowledged as the greatest living writer on the history of structural engineering and his contribution to understanding of masonry structures is widely acknowledged. This volume, collected by Santiago Huerta and published by the Instituto Juan de Herrera in Madrid, Spain, contains 25 papers by Heyman written between 1993 and 2014. Although most are on masonry structures, there are several focusing on timber designs and the broader theme of structural analysis of existing structures.

These papers are unsurpassed for the quality and range of studies of the history of structures. All the papers are quite short, demonstrating Heyman's talent for presenting succinct and highly-readable essays on even the most complex of subjects. The papers are all excellent and, unusually in the history of structures, even allow a little of the author's sense of humour to come through, both in some of the titles – 'Navier's straitjacket', 'Wren, Hooke and partners', and 'A peculiar tale' – and in some of the papers. The book helpfully contains three indices to names of persons and places, and to things.

The titles of the papers included in this volume are as follows (two, marked with *, were published in *Engineering History and Heritage*):

The roof of the monk's dormitory, Durham (1993)
 Hambly's paradox (1996)
 The vibration of masonry pinnacles (1997)
 Hooke's cubico-parabolical conoid (1998)
 Coulomb's analysis of soil thrust (1998)
 Naviers straitjacket (1999)
 Palladio's wooden bridges (2000)
 An observation on the fan vault of Henry VII Chapel, Westminster (2000)
 Rose windows (2003)
 Truesdell and the History of the Theory of Structures (2003)
 Wren, Hooke and partners (2003)
 The history of the theory of structures (2005)
 Theoretical analysis and real-world design (2005)
 A peculiar tale (2005)
 Timber vaults (2006)
 Hooke and Bedlam (2006)
 The plasticity of unreinforced concrete (2007)
 Gothic piers and columns (2008)
 La coupe des pierres (2009)

The establishment of plastic design in the UK (2009)*
 Mathematics and structural engineering (2010)
 The architect and the engineer (2010)
 Scamilli impares (2012)*
 The membrane analysis of thin masonry shells (2012)
 Wren's domes (2014)

Santiago Huerta is to be congratulated on ensuring these papers are made available to everyone at such a modest price.

This review provides an opportunity to remind readers of a previous collection of earlier papers by Heyman, called *Arches, Vaults and Buttresses: Masonry Structures and Their Engineering* (published by Ashgate/Variation in 1996). Though now out of print, it is available in many libraries. A total of 26 papers written between 1966 and 1995 are included, covering the same scope as the volume reviewed here, and it is worth listing the papers below to give the reader interested in extending the life of existing masonry and timber structures the full view of Heyman's work.

The stone skeleton
 On shell solutions for masonry domes
 Spires and fan vaults
 Westminster Hall roof
 On the rubber vaults of the Middle Ages, and other matters
 The safety of masonry arches
 Beauvais Cathedral
 'Gothic' construction in ancient Greece
 Two masonry bridges: I. Clare College Bridge
 Two masonry bridges: II. Telford's bridge at Over
 The strengthening of the West Tower of Ely Cathedral
 Couplet's Engineering Memoirs, 1726–33
 Inertia forces due to bell-ringing
 An apsidal timber roof at Westminster
 The rehabilitation of Teston bridge
 The estimation of the strength of masonry arches
 Chronic defects in masonry vaults: Sabouret's cracks
 Calculation of abutment sizes for masonry bridges
 The crossing piers of the French Pantheon
 The timber octagon of Ely Cathedral
 Poleni's problem
 Hemingbrough spire
 Leaning towers
 The collapse of stone vaulting
 Gloucester Cathedral: The fourteenth-century choir vault
 The mechanics of masonry stairs

Bill Addis