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CONTENTS

technical papers

book review

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Cover image
The jetty and gangway at Mason Cove, Carnarvon Bay, Port Arthur, Tasmania. This facility services tourist cruise vessels and was developed by the Port Arthur Historic Site Management Authority (PAHSMA). The gangway is fabricated from marine grade aluminium and is adjusted to suit the height of tides and different vessels with the hydraulic rams. The shed framing utilised recycled ironbark timber sourced from Queensland. The coordinating architect was Peter Romey, PAHSMA. The architect for the passenger shelter shed was James Morrison of Morrison and Breytenbach Architects, Hobart. All the structural and coastal engineering design was undertaken by Carroll Consulting Engineers, Hobart. Photo: Carroll Consulting Engineers.

The History of the Theory of Structures: From Arch Analysis to Computational Mechanics *

by K-E Kurrer

Review by
R Melchers

The theory of structures taught to civil and structural engineering students at most universities today appears well-organised, clean-cut, analytical and, not to put too fine a point on it, often somewhat boring. But it was not always so and, in a remarkable piece of scholarship, Karl-Eugen Kurrer, one time chief editor of that famous German journal *Stahlbau*, has used his long interest in structural engineering and its historical development to show that structural engineering is exciting and that it has a history rich in controversy and conflict. Indeed Kurrer's book must be one of the few books in structural engineering to devote a whole chapter to controversies – 12 in fact – ranging from the famous dispute between Liebnitz and Descartes about the true meaning of force (with which some of our students still struggle) to the more modern antithesis between elastic and plastic methods of analysis (which still bothers some of our colleagues).

The English language version of this book, which first appeared in German around 2002, is well-written and highly readable. It is clearly expressed, often in very direct language, with liberal use of quotations and diagrams from original sources. It is clearly not a novel that can be read from cover to cover in one sitting, but it is a volume for dipping and browsing, being caught by an interesting technical point here, a quote there or an interesting diagram or photograph elsewhere. And there is a lot of that possible in this handsome, richly-illustrated book of some 848 pages.

Kurrer shuns a chronological approach, instead aiming to interpret and classify, describe and identify, present trends and directions. He covers topics as diverse as learning from history, the relation between structural theory and applied mechanics, masonry and elastic arches, and the gradual development of structural theory starting somewhere around the time of Galileo, the introduction of iron and the development of steel structures that led to spatial frameworks, and the developments resulting from the introduction of reinforced concrete. There is also a perspective on the growth of the modern theory of structures and its connection to modern computational methods. The discussion on the relationship between structural and aesthetics has a rather neo-classical twist. Some readers might compare this with an exposition using a cultural context perhaps more familiar to Australian engineers in Alan Holgate's *The Art in Structural Design*.

To Australian readers accustomed to an Anglo-American version of history and engineering achievements, some of the descriptions and discussions might appear at first sight somewhat Euro-, even German-centred. But they might return to an old favourite, Timoshenko's *History of the Strength of Materials*, written about 1952 in California after he had spent already many years in the US, to convince themselves that many great achievements, particularly in structural theory and mechanics, were also seen by him as having been made in continental Europe and Russia.

Undoubtedly for many readers Kurrer's book will represent an excellent opportunity to gain different perspectives and to broaden horizons. For others it will simply be a pleasure to browse and read, and to be reminded of structural engineering's incredible intellectual underpinnings. Highly recommended.

* Published by Ernst & Sohn, Berlin, 2008.
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