

ARCHITECTURAL SCIENCE REVIEW

NEWSLETTER

THIRD QUARTER 2018

VOLUME 4 No 3

*Impact Factor



From the editor ...

Welcome to this newsletter. I would like to bring to your attention some news regarding forthcoming Editions in ASR, first though I welcome **Dr Christhina Candido** who has kindly agreed to act as an Associate Editor.

This newsletter features a recent Special Edition target publication date August 2018.

Special Issue on 'Recent Advancements in Architectural Science for the 21st Century'

This has been developed from the 50th Architectural Science Association Conference, held in Adelaide, South Australia, from 7-9 December 2016. Seven papers were selected to fit this theme.

- 1) **Ehsan Sharifi and John Boland**, "Limits of thermal adaptation in cities: outdoor heat-activity dynamics in Sydney, Melbourne and Adelaide".
- 2) **Wei You, Jialei Shen and Wowo Ding**, "Improving residential building arrangement design by assessing outdoor ventilation efficiency in different regional spaces".
- 3) **Weiwen Wang and Edward Ng**, "Large-eddy simulations of air ventilation in parametric scenarios: Comparative studies of urban form and wind direction".
- 4) **Yi He and Marc Aurel Schnabel**, "A methodology to calculate daylight in a space of a building with BIPV facades".
- 5) **James Sullivan and Michael Donn**, "Some simple methods for reducing daylight simulation time".
- 6) **Robert Doe**, "Facilitating integration of computational

Continued on page 3...

ASR 61.4 Guest editors: Professor Veronica Soebarto and Emeritus Professor George Baird

Special Issue on Recent Advancements in Architectural Science for the 21st Century

George Baird is Emeritus Professor of Building Science at the School of Architecture, Victoria University of Wellington, specialising in building environmental science and the assessment of building performance from the point of view of the users.



He is a Fellow of the Chartered Institution of Building Services Engineers (UK) and of Engineering New Zealand, and Life Member of the Energy Management Association of New Zealand.

He received the NZ Science and Technology Bronze Medal in 1999, the international "Pioneers of the World Renewable Energy Network" Award in 2006 and was appointed a Fellow of the Architectural Science Association at their 50th Annual Conference in 2016.

Dr Baird has authored innumerable technical papers over the last half century. Major books include: Energy Performance of Buildings; Building Evaluation Techniques; Architectural Expression of Environmental Control Systems; and most recently Sustainable Buildings in Practice, a worldwide survey of sustainable buildings.

Still active in his field, he was an invited speaker at the recent World Sustainable Building Conference in Hong Kong and the Passive and Low Energy Architecture Conference in Edinburgh, and is a member of the editorial boards of several journals in the field of architectural science, including *Architectural Science Review*.

For further details see: <http://www.victoria.ac.nz/architecture/staff/george-baird.aspx>



Veronica Soebarto is a Professor at the School of Architecture and Built Environment and joined the University of Adelaide in 1998 after completing a Post-Doctorate Research Associate position at Texas A&M University in College Station, Texas, USA, and PhD and Master of Architecture degrees from the same university.

Veronica is the leader of the Sustainable Built Environment research group and her research interests span from age-friendly built environment, environmental performance assessments of buildings, building performance simulation, building monitoring, human thermal comfort, to the social dimension of sustainable design.

She currently leads an ARC Discovery Project "Improving thermal environment of housing of older Australians" (2018-2020). She is an Associate Editor of *Architectural Science Review* and Editorial Board member of *Journal of Building Performance Simulation*.

For further details see: <https://researchers.adelaide.edu.au/profile/veronica.soebarto>

*ASR and Journal Metrics

ASR is currently Indexed through Scopus.

The link: <https://www.scopus.com/sources.uri?zone=TopNavBar&origin=sbrowse>
Taylor & Francis ASR website (<http://www.tandfonline.com/tasr>) also gives the number of reads and citations for each paper, as well as information on 'most read' and 'most cited papers'.

For more information about *Architectural Science Review* please visit: <http://www.tandfonline.com/tasr>; Subscriptions email: salesportland-services.com

Information for authors: Author Services at <http://journalauthors.tandf.co.uk>

We invite readers to suggest topics, submit book reviews or other material which may be of interest to our readers. We will consider advertising material. Please contact us at: sue.macleod8888@gmail.com



Figure 1: Developed design overview.

Abstract

by Mathew Rowland

Mathew Rowland graduated last year from Victoria University of Wellington with a Masters of Architecture (Professional)

The oil industry is responsible for massive amounts of pollution across the world. A significant amount of this is due to the impact of large infrastructure created by drilling operations, which are hostile work environments and often damage the ecosystem they inhabit. Because Oil is one of the primary energy sources around the world its continued exploitation is guaranteed to happen for decades to come. As technological advancements facilitate new ways to obtain oil for the ever increasing demand, old facilities and their megastructures are abandoned with no plan for re-use. This thesis is an exploration into architecture's current role as a facilitator of offshore oil



infrastructure. It explores the scale of investment for the multinational corporations and how this investment is disposed of after there is no more oil in the well. More often than not there is little consideration as to what happens after the drilling and this causes a multitude of problems that push the area closer to the brink of ecological disaster.

The design project proposes deploying new machinery onto an architectural construction to develop a symbiotic relationship between the two. The way new machinery interacts with the architecture it inhabits is considered by discussing the life cycle of current technology and what future developments might hold for the sustainability of coastal regions.

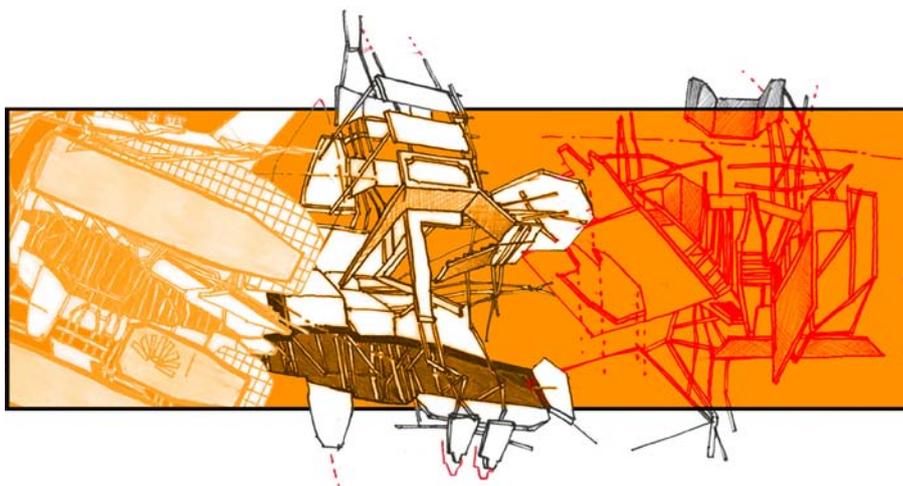


Figure 2: Design development sketch.

Books

The History of the Theory of Structures

Searching for Equilibrium

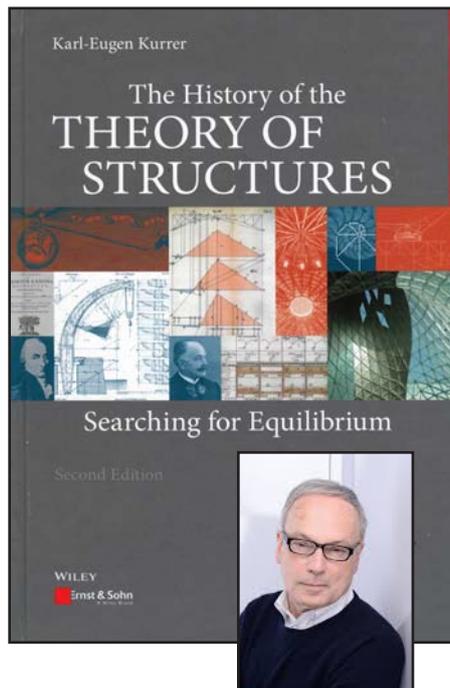
by Karl-Eugen Kurren

Publisher: Berlin: Ernst & Sohn 2018
Review: Dr David Gunaratnam

Second, considerably enlarged edition.
Translation by Philip Thrift.
Construction History Series/Edition
Bautechnikgeschichte,
edited by Karl-Eugen Kurren and
Werner Lorenz.

The second edition of 'The History of the Theory of Structures' is considerably enlarged in content. This has resulted in new chapters as well as significant additions to some of the other chapters. The subtitle of the book is changed to 'searching for equilibrium' to reflect the unified framework emphasised in this edition, where the search for equilibrium states is conducted in the space defined by the various behavioural models, with their theories and methods. The structural types and systems for which these models are discussed are themselves the result of searching for 'optimum' equilibrium states in the structural feature space.

When a feature like form or pattern is used to transfer external loads by developing axial forces, hence more efficient use of material, rather than by developing bending moments. Essentially resisting the external bending moments from loads and span by developing internal forces that utilise the material efficiently. The equilibrium states searched in the book are in the behavioural model space (for known features) and not in the feature space.



Even though the book provides a very broad coverage of developments from 1575 – to date, the material presented is treated in detail to a remarkable depth. The book will thus be a very useful reference text and can provide an entry point to the study of some of the advanced structural types, such as space frames and shell structures, before consulting more specialised and advanced texts.

As stated in the foreword, the book is the author's version of the History of Theory of Structures and evolved out of the interest and projects of the author and his collaborators. The rationale for an approach based on different perspectives and the structuring of the information have been discussed and justified in the first chapter. Still, for those who are mainly interested in the evolution of structural ideas, the apparent diversions can at times be distracting.

The book organises the information on the evolution of the theory of structures around the three dimensions of time, structural types and systems (including elements and materials), and behavioural models, with their theories and methods. The first section of chapter 2 discusses how the time frame covered by the book is further subdivided into several periods and phases on to which the developments in the structural types and behavioural models are then mapped. Chapters 4 and 6 to 10 explore the development of theories and behavioural models for structural elements, assemblies and systems, in masonry, steel and concrete that were used in bridge and building applications. Chapters 11 and 12 focus on numerical methods for structural analysis, including matrix and finite element methods. Thus, these groups of chapters capture a logical progression of ideas within a given structural type as well as within a given design application.

The inclusion of the chapter on the history of the earth pressure theory, though justified, does not appear to dovetail into the rest of the chapters, possibly as this topic differs from the others in a fundamental way. Though the book provides a detailed and comprehensive study of the behavioural models, along with the theories and methods, for compression and flexural structural members, types and systems, there is very little reference to tensile structural systems. There is some discussion about suspension bridges, but behavioural models for the bulk of the tensile structural systems developed to date, such as cable nets and membranes are not discussed. Thus, excluding systems and their models arising from some of the more optimum equilibrium states available in the structural feature space.

Chapter 13 on controversies and chapter 15 on the biography of 260 protagonists provide additional background information that greatly enriches the presentation.

...continued from page 1

design processes in the design and production of prefabricated homes".

7) **Gregory Nolan**, "Managing risk while translating architectural research into construction innovation".

I would like to thank **Veronica Soebarto** and **George Baird** and their scientific panel of referees for the time and energy to bring this Edition together. Thanks also to the authors for all the hard working and good to see PhD students fronting up and publishing their work.

We look forward to the ASA conference later in the year in Melbourne, Australia.

Conference Index

ASA Conference (ANZAScA),
28 November - 1 December 2018
52nd International Conference of the
Architectural Science Association
Melbourne, **Australia**

World Architecture Festival
28 - 30 November 2018
Amsterdam, **Holland**

34th PLEA Conference
10 -12 December, 2108
Hong Kong, **China**

International Conference on Architecture and Civil Engineering 2019
3 January 2019
London, **United Kingdom**

The Aesthetics of Decay: Ghost Stories and Mysteries Conference
23rd February 2019
London, **United Kingdom**

2nd International Conference on Information, Technology Communication and Engineering
15th March 2019
Dubai, **United Arab Emirates**

The 3rd International Conference on Materials Engineering and Nano Sciences (ICMENS 2019)
26th March 2019
Hiroshima, **Japan**

Architectural Science Review Special Edition

Socio-technological approaches to understanding and measuring performance of the built environment

Deadline: 15 December 2018

ASR would like to publish a Special Edition with the theme of developing and applying integrated socio-technological approaches to understanding and measuring the performance of our built environment in order to improve our living experience. This means understanding the ways people are involved with real world events and evolving life styles and how the built environment planning and design respond to these events and changes. ASR has a tradition of working in this research area with some notable papers^{[1][2][3]} This special edition will build on and extend these and other similar research, with an emphasis to reflect on the emerging technologies and methodologies.

The focus subject areas are as follows.

- Holistic building performance in terms of environmental, design, and related social and cultural aspects;
- Performative, social, design and other integrated indicators for more liveable, sustainable, age-friendly environments;
- Disruptive technologies and smart buildings and cities;
- Building and urban informatics and opportunities with big data;
- New technologies and methods of built environment planning and design for advancing holistic building performance and life styles.

In this Special Edition, we will assemble a range of papers by leading authors and research teams on a wide range of topics that are intimately related to the themes above.

Call for papers

The background and rationale for the theme is based on the following two emerging opportunities in the field. Firstly, the emergence of new technologies and innovative methodologies provide alternative ways of conceptualising and conducting building performance research. Secondly, the increasing levels of interdisciplinary collaboration have enabled the broader research communities to work closely together to address grand challenges and to develop much more integrated and comprehensive understandings about building performance and environmental research. To address and improve our overall living experience in the urban and built environment will require systematic, socio-technological approaches to consider and optimize the performance of the built environment from a wide range of perspectives, including from the environmental, design, and related social and cultural areas.

Reflecting on these emerging opportunities, this Special Issue calls for original research and significant critical review from the international research communities, aligning with but not necessarily limited by the specific focus subject areas highlighted above.

SUBMISSION INSTRUCTIONS

Abstract

Please submit an extended abstract (500-750 words) to Professor Ning Gu (Ning.Gu@unisa.edu.au) and Professor Veronica Soebarto (Veronica.Soebarto@adelaide.edu.au) by December 15, 2018.

The abstract should outline the scope, method and results of your original research and should clearly refer to advancing the field in one of the specific subject areas of the Special Issue.

Invitation for a full paper

After a positive evaluation of your abstract, we will invite you by January 31, 2019 to submit a full paper to the Special Issue.

Full paper submission

Please submit the full paper no later than April 30, 2019. The length of the manuscript should be no more than 6000 word plus illustrations. The paper will be reviewed by selected reviewers in a double blind process as per normal ASR paper reviewing procedure but we will fast track this reviewing process to guarantee publication by the end of 2019 (online). See details of deadlines below. Please see links to the ASR home page for the instructions to authors: <http://www.tandfonline.com/loi/tasr20#.V43XqSN968U>

EDITORIAL INFORMATION

Guest Editors

Professor Ning Gu, School of Art, Architecture and Design, University of South Australia

Professor Veronica Soebarto, School of Architecture and Built Environment, University of Adelaide



Invited Scientific Committee

Dr David Kroll, University of South Australia, Professor Michael Ostwald, University of New South Wales, Dr Paul Raftery, University of California Berkeley, Professor Marc Aurel Schnabel, Victoria University of Wellington, Associate Professor Tristan d'Estree Sterk, School of the Art Institute of Chicago, Professor Mark Taylor, Swinburne University of Technology

[1] R. Samuels, J. A. Ballinger, S. Coldicutt & T. J. Williamson (1993) Thermal Zoning in Solar Efficient Design: User Experiences and Designer Preconceptions, *Architectural Science Review*, 36:4, 151-156, DOI: [10.1080/00038628.1993.9696755](https://doi.org/10.1080/00038628.1993.9696755)

[2] I. G. Monfared & S. Sharples (2011) Occupants' Perceptions and Expectations of a Green Office Building: A Longitudinal Case Study, *Architectural Science Review*, 54:4, 344-355, DOI: [10.1080/00038628.2011.613636](https://doi.org/10.1080/00038628.2011.613636)

[3] T. Sharpe, G. McGill, R. Menon & P. Farren (2018) Building Performance and End-user Interaction in Passive Solar and Low Energy Housing Developments in Scotland, *Architectural Science Review*, 61:5, 280-291, DOI: [10.1080/00038628.2018.1502150](https://doi.org/10.1080/00038628.2018.1502150)