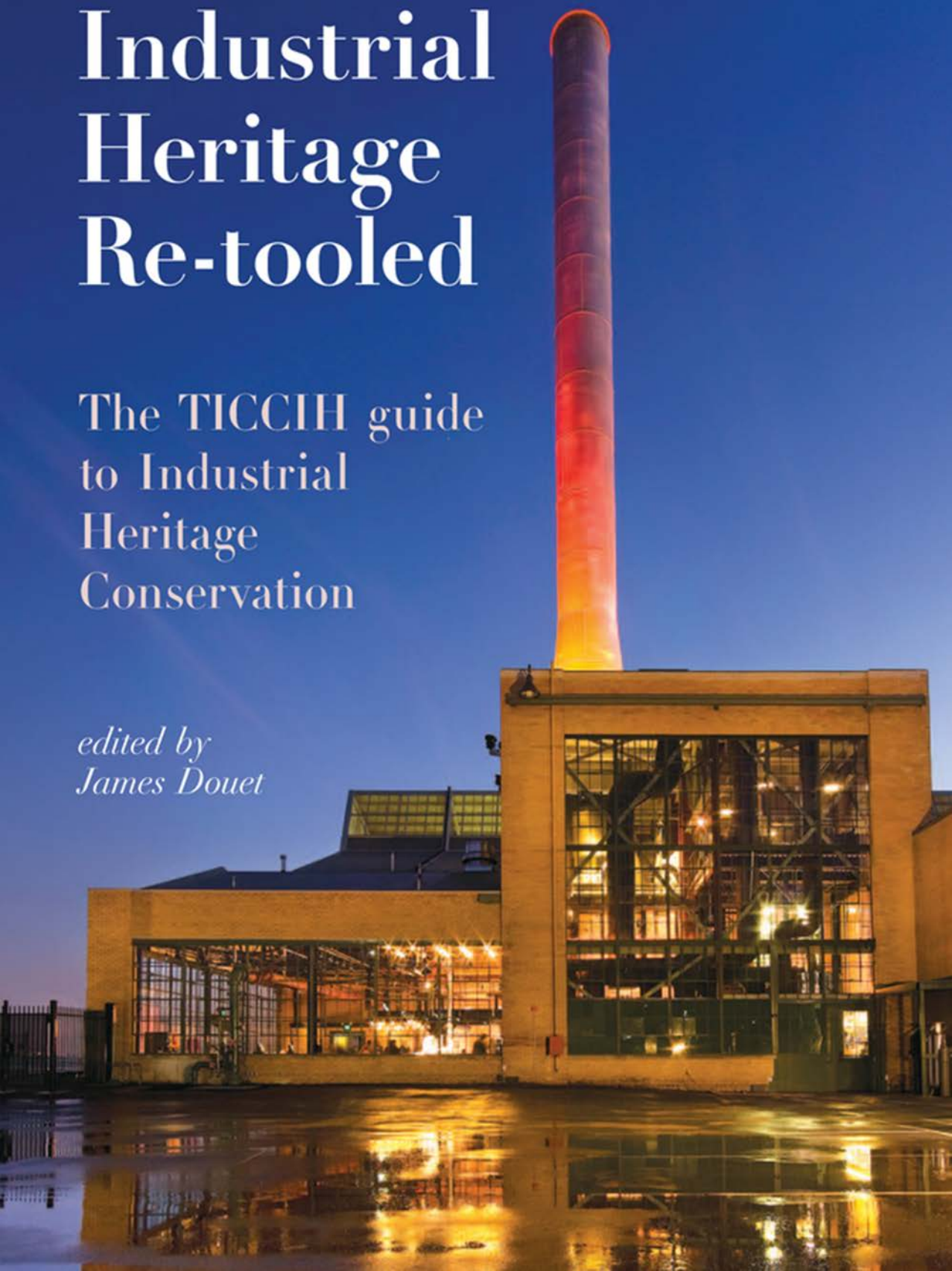


Industrial Heritage Re-tooled

The TICCIH guide
to Industrial
Heritage
Conservation

*edited by
James Douet*



THE
TICCIH
GUIDE TO
INDUSTRIAL HERITAGE
CONSERVATION





INDUSTRIAL HERITAGE RE-TOOLED

The TICCIH guide to
Industrial Heritage Conservation

edited by
James Douet



 **Routledge**
Taylor & Francis Group
LONDON AND NEW YORK

TICCIH – The International Committee for the Conservation of the Industrial Heritage – is the international organisation for industrial archaeology and the industrial heritage. Its aim is to study, protect, conserve and explain the remains of industrialisation.

Frontispiece:

The challenge faced by industrial heritage:
empty and maltings in Lincolnshire, UK. (Masaaki Okada)

Industrial Heritage Re-tooled: The TICCIH guide to Industrial Heritage Conservation

First edition published in 2012
in association with

The International Committee for the Conservation of the Industrial Heritage (TICCIH)
by Carnegie Publishing Ltd

Published 2016 by Routledge
2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN
711 Third Avenue, New York, NY 10017, USA

Routledge is an imprint of the Taylor & Francis Group, an informa business

Text copyright © individual authors, 2012

The moral rights of the respective authors have been asserted by them
in accordance with the Copyright, Designs and Patents Act 1988

All rights reserved. No part of this book may be reprinted or reproduced or utilised in any form or by an electronic, mechanical, or other means, now known or hereafter invented, including photo-copying and recording, or in any information storage or retrieval system, without permission in writing from the publishers.

Notice:

Product or corporate names may be trademarks or registered trademarks, and are used only for identification and explanation without intent to infringe.

British Library Cataloguing-in-Publication data

A catalogue record for this book is available from the British Library

Designed, typeset and originated by Carnegie Publishing

ISBN 13: 978-1-62958-203-0 paperback

Contents

List of contributors	vii
Introduction <i>James Douet</i>	1
Part I Values and meanings	
1 Why preserve the industrial heritage? <i>Neil Cossons</i>	6
2 What does the Industrial Revolution signify? <i>Helmuth Albrecht</i>	17
3 Industrial archaeology: a discipline? <i>Barrie Trinder</i>	24
4 The heritage of the industrial society <i>Louis Bergeron</i>	31
Part II Understanding the evidence	
5 Industrial archaeology <i>Patrick Martin</i>	40
6 Identifying industrial landscapes <i>Iain Stuart</i>	48
7 Recording and documentation <i>Miles Oglethorpe and Miriam McDonald</i>	55
8 Process recording <i>Gustav Rossnes</i>	63
9 Industrial archives and company records <i>Belem Oviedo Gámez</i>	70
10 Photography and image resources <i>Jan af Geijerstam</i>	77
Part III Realising the potential	
11 Choosing what to preserve <i>Paul Smith</i>	86
12 Legal protection <i>Keith Falconer</i>	94
13 Urban regeneration and planning <i>Massimo Preite</i>	101
14 Adaptive re-use <i>Benjamin Fragner</i>	110
15 Financial and fiscal incentives <i>Bode Morin</i>	118
16 Heritage at risk surveys <i>Jaime Migone</i>	125

17	Conservation plans	<i>Helen Lardner</i>	129
18	Adaptive re-use and embodied energy	<i>Mark Watson</i>	136
19	Post-industrial landscapes	<i>Norbert Tempel</i>	142
20	Industrial ruins	<i>Masaaki Okada</i>	149
21	Conservation and community consciousness	<i>Hsiao-Wei Lin</i>	155
22	Industrial Heritage and the World Heritage Convention	<i>Peter Stott</i>	161
23	World Heritage, concepts and criteria	<i>Michel Cotte</i>	167
24	Thematic World Heritage Studies	<i>Stephen Hughes</i>	174

Part IV Sharing and enjoying

25	Industrial museums	<i>Massimo Negri</i>	182
26	Care of industrial and technical collections	<i>Johannes Großewinkelmann</i>	188
27	Conserving industrial artefacts	<i>Eusebi Casanelles and James Douet</i>	195
28	Industrial heritage tourism	<i>Wolfgang Ebert</i>	201

Part V Teaching and learning

29	Teaching in schools	<i>Gràcia Dorel-Ferré</i>	208
30	University training	<i>Györgyi Németh</i>	211
31	Distance and on-line learning	<i>Tuija Mikkonen</i>	216

Part VI TICCIH

32	The work of TICCIH	<i>Stuart B Smith</i>	222
33	TICCIH's Charter for Industrial Heritage	<i>Eusebi Casanelles</i>	228

	Appendix: The Nizhny Tagil Charter for the Industrial Heritage		233
--	--	--	-----

	Index		239
--	-------	--	-----

List of contributors

PROFESSOR HELMUTH ALBRECHT is head of industrial archaeology and the history of technology and director of the Institute for Industrial Archaeology, History of Science and Technology in Freiberg, Germany. Since 2006, he has been a member of the board of directors of TICCIIH and organised the XIV TICCIIH Congress in 2009 in Freiberg. His research interests include the industrial archaeology of Germany, world heritage studies as well as the history of technology, of physical sciences and of innovation processes. Helmuth.Albrecht@iwtg.tu-freiberg.de

PROFESSOR LOUIS BERGERON taught as Directeur d'études at the École des Hautes Études en Sciences Sociales, Paris, from 1971 to 1997. Honorary president of the French National Association for Industrial Archaeology and Heritage (CILAC) and President (1990–2000), Honorary President for life (2000) of TICCIIH. He was President of the Eco-museum in Le Creusot-Montceau les Mines (France), 1996–2004, co-founder of Koinetwork e.g.e.i., 2002 and co-publisher of the TICCIIH *Journal Patrimoine de l'industrie/Industrial Patrimony*. His research interests cover the industrialization of Europe in the eighteenth and nineteenth centuries. lbergeron@wanadoo.fr

EUSEBI CASANELLES is the founder and director of the Museu Nacional de la Ciència i de la Tècnica de Catalunya (MNACTEC), the Catalan national museum of science and technology. It was set up in 1984 and has developed into a network of over 25 industrial museums, each one dealing with a distinct industrial and technical topic. He was first Executive President and then President of TICCIIH from 1997 until 2009 and president of the Spanish Association of Industrial Heritage from 1987 until 1992. ecasanelles@gencat.cat

SIR NEIL COSSONS has been engaged in industrial heritage and archaeology for over fifty years and is a founder of TICCIIH. He was the first Director of the Ironbridge Museum, from 1971 to 1983 and Director of the Science Museum, London – the National Museum of Science & Industry – for fourteen years. From 2000 to 2007 he was Chairman of English Heritage, the United Kingdom Government's principal adviser on the historic environment of England. nc@cossons.org.uk

PROFESSOR MICHEL COTTE is emeritus professor of the history of technology at the University of Nantes. He currently works as ICOMOS' advisor for the implementation of the World Heritage Convention. He pays specific attention to the technical and scientific heritage, editing recently with Clive Ruggles (UAI) a joint thematic study: *Heritage Sites of Astronomy and Archaeoastronomy in the context of the UNESCO World Heritage Convention*. michel.cotte@univ-nantes.fr

PROFESSOR GRÀCIA DOREL-FERRÉ is a professor of the history of industry and teaching industrial archaeology. She is the founder and president of the Association pour le patrimoine industriel de Champagne-Ardenne (APIC), France. After her thesis on the industrial colonies of Catalonia her main research interests have been the evolution of workers' housing and industrial settlements. Her publications include 'La contribution des indianos à la formation du territoire et du paysage industriel catalans durant la seconde moitié du XIX siècle', and *Atlas du patrimoine*

industriel de Champagne-Ardenne. She is secretary of the TICCIH agricultural industry section and organiser of several TICCIH section conferences. gracia.dorel@gmail.com

JAMES DOUET is a historic buildings consultant advising on conservation plans and exhibition projects, and editor of the *TICCIH Bulletin*. He trained in geography and industrial archaeology, and undertook various thematic studies for English Heritage including naval dockyards, pumping stations and military barracks, from which came his principal publication, *British Barracks, 1600–1914*. He teaches heritage management and urban history in Barcelona and is researching a publication on royal manufactories. jdouet@movistar.es

DR WOLFGANG EBERT was the developer of the European Route of Industrial Heritage (ERIH) industrial heritage networks. He is Senior Consultant to MSP Impulsprojekt, a German developing agency dealing with any kind of developments of industrial heritage sites on a global level. ebert@industriekultur.de

KEITH FALCONER was appointed in 1971 to undertake the British Industrial Monuments Survey and became Head of Industrial Archaeology at English Heritage, with general oversight for industrial heritage and helped develop a thematic approach to the UK's industrial World Heritage Sites. He has advised on World Heritage Site proposals in Japan, northern France and Uruguay. He is a founder member of TICCIH and a founder council member of the UK Association for Industrial Archaeology. He has co-authored several books including *Guide to England's Industrial Heritage* (1980), *Swindon: Legacy of a Railway Town* (1995) *Ancoats: cradle of industrialization* (2011). keithfalconer@blueyonder.co.uk

DR BENJAMIN FRAGNER has been the director of the Research Centre for Industrial Heritage (VCPD) at the Faculty of Architecture of the Czech Technical University in Prague since 2002. He is a member of the Czech Ministry of Culture's Permanent Committee for the assessment of sites nominated for cultural heritage status. He is currently coordinating a research project on the Industrial Topography of the Czech Republic – Adaptive Re-use of Industrial Heritage, as Part of National and Cultural Identity, and also organises the popular international biennial Vestiges of Industry. He is a member of the executive board of the Czech National Committee of ICOMOS and TICCIH Board member since 2009. benjamin.fragnercpd.cvut.cz

DR JAN AF GEIJERSTAM (Industrial Heritage studies, Royal Institute of Technology, Stockholm, Sweden) is an independent researcher and author. Chairman of the Swedish Industrial Heritage Association and TICCIH's National Representative for Sweden. Presently guest researcher at Heritage Studies, Dept of Conservation, University of Gothenburg. His most recent publication is *National Atlas of Sweden. Swedish mining and metalworking, past and present* (edited with Marie Nisser). jan@geijerstam.se

JOHANNES GROSSEWINKELMANN is curator at the Weltkulturerbe Erzbergwerk Rammelsberg in Goslar, Germany. He has worked at various German industry museums and has published papers on the treatment of collected objects and on the history of vocational education in the German metals industries in the nineteenth and twentieth centuries. sammlung@rammelsberg.de

STEPHEN HUGHES is Projects Director at the Royal Commission on the Ancient & Historical Monuments for Wales and Vice-President of ICOMOS-UK. He co-ordinated the TICCIH/ICOMOS *International Canal Monuments List* and *The International Collieries Study* and is a member of the TICCIH Board. He has advised ICOMOS on World Heritage Sites and has represented TICCIH at UNESCO Meetings. His books include *Copperopolis: Landscapes of the Early Industrial Period in Swansea*; *The Archaeology of an Early Railway System: The Brecon Forest Tramroads* and *The Archaeology of the Montgomeryshire Canal: A Guide and Study in Waterways Archaeology*. stephen.hughes@rcahmw.org.uk

DR HELEN LARDNER, architect, is the director of the award-winning heritage conservation firm HLCD Pty Ltd which specialises in providing strategic advice for conservation and adaptive re-use of complex heritage places and undertaking analysis of cultural significance. She is particularly interested in industrial sites and twentieth-century architecture, works internationally and enjoys examining the transfer of technology and knowledge, and its impact on local cultures. She is a member of the Australian Heritage Council, was formerly Vice President of Australia ICOMOS and is currently the National Representative for TICCIH in Australia. h.lardner@hlcd.com.au

DR HSIAO-WEI LIN is an assistant professor of architecture at Chung Yuan Christian University. She is a board member of TICCIH and the chairman of the organising committee of the XV TICCIH Congress 2012 in Taiwan. She researches as well as advises practical heritage sites. Her most recent publication is *The Introduction of Taiwan's Industrial Heritage* which is the first English text book of this subject in Taiwan. Her research interests include planning, reuse and management of cultural heritage, cultural landscape and industrial heritage. linhw23@cycu.edu.tw

PROFESSOR PATRICK MARTIN is Professor of Archaeology and Director of Graduate Studies in the Department of Social Sciences at Michigan State University, US. He is editor of *IA, the Journal of the Society for Industrial Archaeology*, and the Executive Secretary of that organisation. He has been president of TICCIH since 2009. pemartin@mtu.edu

MIRIAM McDONALD is Industrial Survey Project Manager at the Royal Commission on the Ancient and Historical Monuments of Scotland, the body responsible for recording and maintaining records of Scotland's historic environment. She is secretary both of TICCIH GB, and of the Scottish Industrial Archaeology Panel. miriam.mcdonald@rcahms.gov.uk

DR JAIME MIGONE RETTIG, architect, at the Pontifical Catholic University of Chile, Doctor in the Conservation of Architectural Goods, Politecnico di Milan, Italy. Dean, Faculty of Cultural Heritage Studies of the SEK International University and President TICCIH-Chile. He has advised on the UNESCO World Heritage Centre Humberstone and Santa Laura in Chile and the nomination of San Luis Potosi in Mexico, with national and international publications. Heritage buildings restoration projects include cathedral of Santiago, Santiago Post Office, Chilean Historic and Military Museum, Sacramentino Church of Santiago, among others. jaime.migone@gmail.com

DR TUIJA MIKKONEN is senior adviser at the Ministry of the Environment, in Helsinki, Finland, with issues concerning the built heritage and cultural environment. She is the chair of TICCIH-Finland and has advised ICOMOS in assessing industrial World Heritage Sites. Her research interests include industrial buildings and sites and mining industry. She has written about corporate architecture in Finland in the 1940s and 1950s. tuija.mikkonen@ymparisto.fi

DR BODE MORIN is the director of Eckley Miners' Village, an historic coal-mining site operated by the Pennsylvania Historic and Museum Commission, and has nearly twenty years' experience in the heritage field. He holds the first Ph.D. in industrial heritage and archaeology from Michigan Technological University, where his work focused on industrial heritage practices and conflicts with environmental remediation at US Superfund sites. He also has a masters degree in Industrial Archaeology from Michigan Tech. and has worked as an historian for the Historic American Engineering Record of the US National Park Service, curator of Sloss Furnaces in Birmingham, Alabama, and as Historic Fort Wayne project manager for the Detroit Historical Museum. bjmorin@gmail.com

MASSIMO NEGRI was the co-author of the first book published in Italy about industrial archaeology (1978). Founding member of the Italian Society for Industrial Archaeology and then of the Italian Association for the Archaeological Industrial Patrimony (AIPAI). He teaches

museology at the Master Course in Industrial Heritage, and industrial archaeology at the TPTI course both at the State University of Padua. He has also founded the Executive Master Course in European Museology at the IULM University of Milan. Director of the European Museum Forum (UK) for ten years, he is currently director of the European Museum Academy Foundation (NL). Frequently engaged in museum projects, has recently directed the museological program of the new Museum of the History of Bologna. kriterion.negri@libero.it

PROFESSOR GYÖRGYI NÉMETH is associate professor in industrial history and industrial archaeology at the University of Miskolc, Hungary, where she developed the country's first industrial archaeology university programme. She was a member of the TICCIH board between 1993 and 2009, and organised the 1999 regional TICCIH conference in Hungary and Slovakia. Her research interests include the theory and practice of industrial heritage conservation as well as the evolution of heavy industrial landscapes, publishing *Growth, Decline and Recovery: heavy industrial regions in transition*. nemethgeorgie@freemail.hu

DR MILES OGLETHORPE is Head of International Policy at Historic Scotland, the Scottish Government Agency responsible for protecting and promoting the historic environment. He has been a board member of TICCIH since 2003. miles.oglethorpe@scotland.gsi.gov.uk

PROFESSOR MASAOKI OKADA is associate professor at Kinki University, Department of Civil and Environmental Engineering, Osaka, and visiting scholar at the University of Cambridge. He is interested in social and aesthetic value of Technoscape (landscape of industry), industrial, civil engineering and defence heritage. He is on the executive committee of ICOHTEC and member of many committees of academic (JSCE) or national and local governments in Japan. His recent publications are *Technoscape – Landscape Theory of Integration and Estrangement* (Kajimashuppankai 2003) and *Civil Engineering Heritage in Japan* (Kodansha, 2012: co-authorship). okd@orion.ocn.ne.jp

BELEM OVIEDO GAMEZ is director of the Archivo Histórico y Museo de la Minería de Pachuca, Mexico, TICCIH Mexico President (2006–2012) and ICOMOS Mexicano National Vice President (2012–2015). She was elected to the TICCIH Board in 2000. ahmm@prodigy.net.mx

PROFESSOR MASSIMO PREITE teaches urban planning at the Faculty of Architecture in Florence, Vice-Chairman of the Italian Association for the Industrial Archaeological Heritage (AIPAI), board member of TICCIH. He has coordinated numerous projects for the redevelopment of the mining and industrial heritage, the Park/Mining Museum of Abbadia San Salvatore, the National Mining Park of the Colline Metallifere and the new Steel-Working Museum in Piombino. He advised on the nomination of mining and industrial sites as a UNESCO World Heritage Site. His most recent publications are *Paesaggi industriali del Novecento* (Florence, 2006) and *Masterplan, the Development of the Mining Landscape* (Florence, 2009). preite@unifi.it

GUSTAV ROSSNES trained as an ethnologist and works as senior adviser on Industrial Heritage at the Norwegian Directorate for Cultural Heritage. He has taken part on several field works in Polar areas – documenting mining installations in the Arctic (Svalbard) and shore whaling stations in the South Antarctic Islands. gr@ra.no

DR PAUL SMITH is an historian who has been working since 1986 at the Direction générale des Patrimoines, the heritage department of the French Ministry of Culture, with a particular interest in the industrial heritage and in the built heritage of transport systems. He has been involved in several European projects, for example on historic airports and on the future of historic industrial cities ('Working Heritage'). He has published widely on the French tobacco and match industries and is a member of the editorial committee of the French industrial archaeology review. paul.smith@culture.gouv.fr

STUART SMITH OBE was Secretary of TICCIH for 26 years and has attended every General Assembly. Starting at Ironbridge in 1972 as Curator of Technology, he succeeded Neil Cossons as Director and worked there for 20 years. Subsequently he moved to Cornwall to head The Trevithick Trust, which was charged with restoring and creating industrial museums throughout the county to support the successful application for World Heritage Site status for Cornish hard rock mining. He has lectured all over the world on industrial archaeology and TICCIH and since retirement has acted as a consultant on potential world heritage sites, particularly in Asia and Norway. stuartbsmith@chygarth.co.uk

PETER STOTT, the US representative to TICCIH, was a staff member of the UNESCO World Heritage Centre in Paris between 1996 and 2006. Most recently, for the 50th anniversary of the US National Park Service's Office of International Affairs, he has been engaged in the preparation of a history of the National Park Service and the World Heritage Convention, being published serially in 2011 and 2012 in the *George Wright Forum*. He is currently a Preservation Planner at the Massachusetts Historical Commission in Boston, US. ph.stott@gmail.com

IAIN STUART is an archaeologist and historian based in south-eastern Australia. His company, JCIS Consultants, provides professional consulting services in the areas of history, archaeology, heritage management and cultural landscapes. iaain_stuart@optusnet.com.au

NORBERT TEMPEL trained as a mechanical engineer (Dortmund University of Technology), and is Head of the Engineering and Conservation Department, Westphalian Museum of Industry, Dortmund, the largest museum of industry in Germany managing eight former industrial sites, since 1986. Co-Founder (1995) and Associate Editor of the quarterly *IndustrieKultur Magazine*. Research, publications and lectures in the field of conservation of big industrial sites and the history of railways. Member of TICCIH and ICOMOS (Member of the Scientific Committee of ISC 20C), National Representative of TICCIH Germany. Co-organiser of the international conferences BigStuff 2007 and TICCIH 2009 in Germany. Norbert.Tempel@lwl.org

DR BARRIE TRINDER was closely involved with the Ironbridge Gorge Museum in its formative years, was joint organiser with Neil Cossons of FICCIM in 1973, and taught at the Ironbridge Institute between 1980 and 1995. He has written extensively on the history of industry in Shropshire and nationally, edited the *Blackwell Encyclopedia of Industrial Archaeology* (1992), and contributed substantially to the designation documents for the World Heritage Sites at Ironbridge, Blaenafon and Pontcysyllte. His large-scale study, *Britain's Industrial Revolution: the making of a manufacturing people*, will be published by Carnegie Publishing in 2012. barrie@trinderhistory.co.uk

MARK WATSON is a buildings and areas conservation professional, experienced in urban regeneration projects, delivering the adaptive re-use of buildings in partnership with others, and evaluating outcomes with a view to their socio-economic and sustainability benefits. Trained in history and in industrial archaeology, he works in Historic Scotland, the government agency for heritage conservation. He has worked on the nomination, assessment and management of world heritage sites, and is British national representative for TICCIH. His research interests include textile mills and landscapes – drafting the international comparative study of these – iron building structures, and impact evaluation. mark.watson@scotland.gsi.gov.uk

Page Intentionally Left Blank

Introduction

James Douet

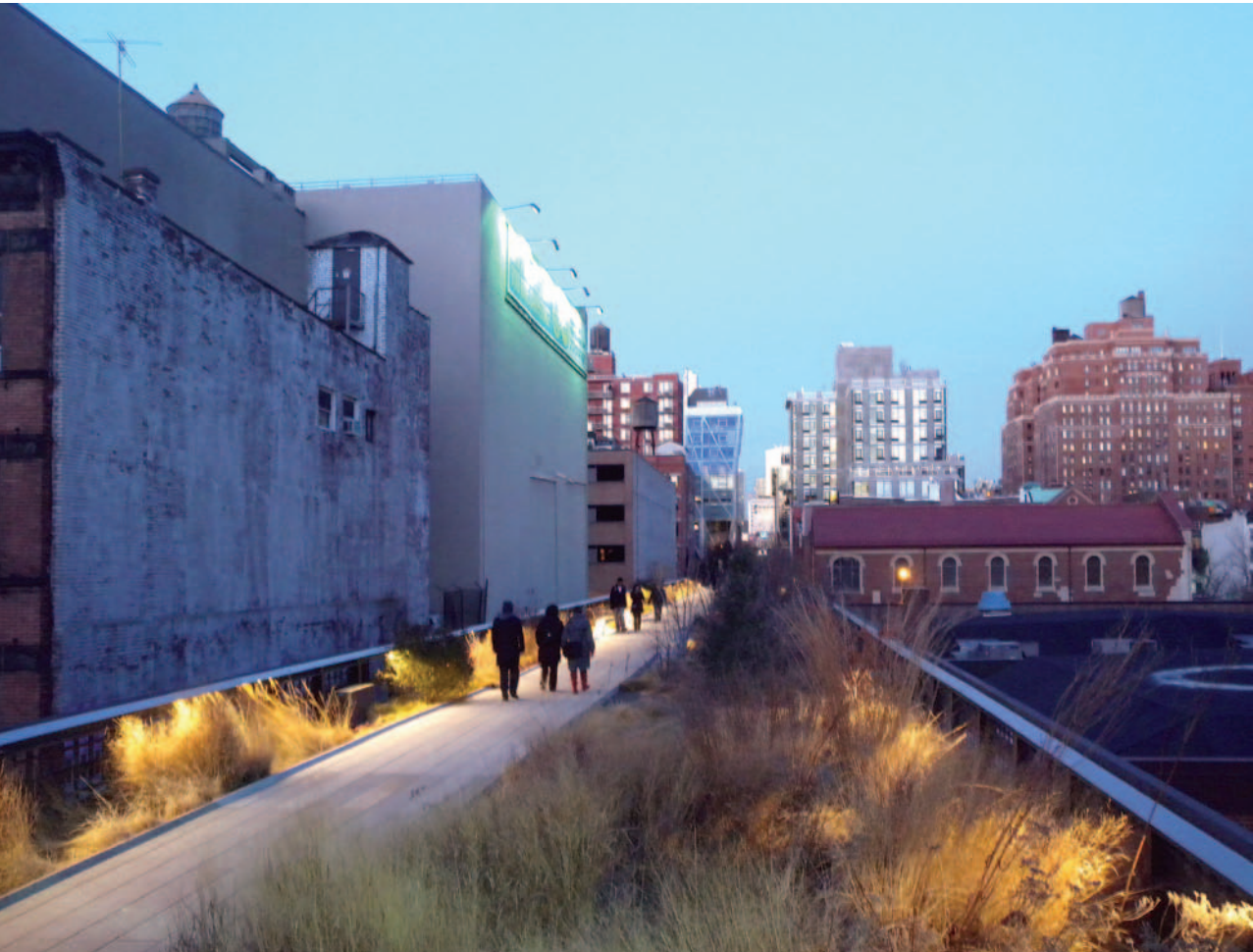
*R*ETOOLING is an industrial engineer's term; it means reequipping a factory with the latest machinery and the most modern methods in order to keep it up to date and competitive. This book aims to perform a similar function for everyone interested in the heritage left by industry, collecting together the most effective techniques and modern practices, tried and tested around the world, for dealing with this singular cultural legacy.

Singular but challenging, too, for its technical complexity, its economic weight, its scale and magnitude, its social consequences as well as the negative perceptions that sometimes hamper its appreciation. What should we make of the industrial heritage, how can we make the most of it, and the best of it?

Consider its scope. Of the 'cultural goods' that modern societies aim to sustain for their future well-being, few are more universal than the industrial heritage. This, therefore, is not a book just for industrial archaeologists and heritage managers. In any part of the world affected by industrialisation, archaeologists are certain to encounter material from the period, while architects and builders have greater opportunities to adapt and re-use old industrial buildings than any other, for their quantity as well as versatility. Their embodied energy helps environmentalists to deliver sustainable development goals. Adapting and repurposing them are now mainstream strategies for urban planners. As tourism becomes central to the economy of many towns, the potential of the industrial heritage is fast becoming apparent. Similarly, the educational possibilities offered by historical industry are a resource of which schools and teachers must be aware. Meanwhile, the 'challenge of the evidence' – the intrinsic evidential value of the places – continues to confront historians and academics wherever industrialisation had, or is having, its transformational consequences.

This phenomenon is not exclusive to the rust belts or ghost towns of post-industrial decline in northern Europe and America. The most striking examples of factory adaptation, urban regeneration or historic interpretation are no longer in the canonical cradles and birthplaces of the Industrial Revolution but likely to be found in Shanghai, New York or Istanbul.

In 2002 The International Committee for the Conservation of the Industrial Heritage, (TICCIH), hammered out a charter, signing it in the great steel-milling and tank-manufacturing town of Nizhny Tagil in the Russian Urals. International charters are a way of formulating key concepts and fundamental methodologies, which the Nizhny Tagil Charter does for industrial archaeology. It proposes some basic definitions



The High Line park in New York is an elevated railway that passes through Manhattan's West Side. It is owned by the City of New York and maintained and operated by a non-profit conservancy, the Friends of the High Line. The linear park is credited with revitalising a swathe of the city, generating \$2 billion in private investment alongside the park and contributing to 12,000 jobs in the area. (Jim Henderson – Creative Commons)

for the scope and period of the subject, while advising on the best ways to understand, maintain and share what is especially meaningful about the remains of industrial culture. In 2011 a further framework document was signed, this time by TICCIH and the International Council for Monuments and Sites (ICOMOS), their *Joint Principles for the Conservation of Industrial Heritage Sites, Structures, Areas and Landscapes*. This took place in Dublin, hence the name 'Dublin Charter'.

To get the most from these skeletal 'doctrinal texts' they need to be fleshed out and clothed, which is the idea behind this book. *Industrial Heritage Retooled* started as a 'glossed' version of the Nizhny Tagil Charter. Specialist authors would be invited to elucidate and expand the sparse text of the Charter's main clauses, illustrating them with examples drawn from outstanding heritage sites around the world.

The title of the book comes from a 2010 symposium held in Tarrytown, New York, co-sponsored by the J M Kaplan Fund. The assembled experts explored the present and future of America's industrial heritage, and asked some tough questions about how the heritage of industry gets treated alongside other more familiar or amenable remains of our past, and what sort of tools and resources can and should be applied to keep it in good shape both for now and in the future.

The symposium was intended as a launching pad for new ideas and this is one of them. Patrick Martin forged the link between the symposium and TICCIH, of which he is President. *Industrial Heritage Retooled* – the book – was also made possible by the open-handed financial support of the J M Kaplan Fund, and the backing of a key member of the Fund's staff, Ken Lustbader. It was he who framed the specific goal that it be a definitive international guide to contemporary best practices. The book was to be presented in an accessible and approachable format and written for a wide audience of enthusiasts, preservationists, community-based not-for-profits and private-sector developers, industrial archaeologists, teachers and scholars.

Through TICCIH's international network, more than thirty expert authors were identified and brought together, each kindly agreeing to contribute a chapter on a subject with which they were intimate through many years of research, reflection and professional experience.

The book opens with four reflective essays which set out the essential values and meanings associated with the Industrial Revolution, industrialisation and its material and cultural heritage. Part II examines the methodological and technical options that we have available to interrogate the raw material, the physical evidence for industrialisation and the societies that developed within it: artefacts, structures, sites, processes and landscapes as well as documents and images.

Part III presents the procedures by which the abundant resources of *industrial archaeology* are transformed into the valued but vulnerable material we try to capture and conserve as *industrial heritage*: what is to be selected and why; how to protect and to manage change while ensuring that historic value is sustained; how conservation can also be an economic catalyst; all the modern techniques for adapting or repurposing sites without disproportionate sacrifice; profiting from the in-built energy in existing buildings; letting nature conserve the industrial ruin; the benefits that community participation inspires; and finally the dynamic of World Heritage and the spin-off and trickle-down effects that nomination and designation can prompt.

The industrial heritage identified, understood, protected ... Part IV examines how it can be shared and enjoyed. The industrial museums and the conserved production sites which have opened to visitors in recent years have brought a sometimes difficult and unapproachable subject to a wide public, including disproportionate numbers of the young. The success of innovative techniques for preserving and interpreting working machinery and for presenting complex processes is evident in their unprecedented visitor figures, as well as in the growing number of people, loosely categorised as tourists, who set out to discover places once thought inimical to tourism.

The fifth section of the book discusses the part education has to play, not only by traditional methods but also through the internet, in making sure that public heritage agencies, non-profit groups, archaeological contractors, architectural practices, consultancies or owners, are suitably equipped to treat the historic material of industry in an informed way.

This publication is an important step for TICCIH and part of a determined effort to reach beyond the organisation's habitual constituency. Patrick Martin takes much of the credit for giving definitive form to the original idea. Neil Cossons' support and advice contributed greatly to the final shape and style of the book. The Nizhny Tagil Charter around which it is structured is one of Eusebi Casanelles' major achievements. All three, together with Terry Reynolds, Benjamin Fagner, Barry Gamble, Massimo Preite, Iain Stuart and Alison Wain made valuable comments on the texts, and thanks are also due to Myrick Howard, Marie-Noëlle Polino and Hans-Peter Bärtschi. All the photographic credits are in the text, but particular thanks to Billy Hustace for permission to reproduce his photograph on the cover. Finally, special recognition is owed to all the authors, each connected with TICCIH over many years, who have tapped an immense reserve of professional experience and personal enthusiasm to produce perceptive and illuminating chapters.

Why preserve the industrial heritage?

- Bluestone, Daniel : *Buildings, Landscape and Memory: case studies in historic preservation*. New York: W W Norton, 2011
- Clark, Kate (ed.): *Capturing the Public Value of Heritage: the proceedings of the London conference, 25–26 January 2006*. English Heritage: Swindon, on behalf of the conference sponsors, the Department for Culture, Media and Sport, English Heritage, the Heritage Lottery Fund and the National Trust, 2006
- Cossons, Neil (ed.): *Perspectives on Industrial Archaeology*. London: Science Museum, 2000
- Cossons, Neil : 'Industrial Archaeology, the challenge of the evidence'. *Antiquaries Journal* 87, 2007, pp. 1–52
- Drury, Paul and McPherson, Anna (eds): *Conservation Principles, Policies and Guidance – for the sustainable management of the historic environment*. Swindon: English Heritage, 2008
- 'Inherited Infrastructure'. *Conservation Bulletin* (Winter 2010), Issue 65, English Heritage, Swindon, 2010
- 'Saving the Age of Industry'. *Conservation Bulletin* (Autumn 2011), Issue 67, English Heritage, Swindon, 2011

What does the Industrial Revolution signify?

- Braun, Rudolf , Fischer, Wolfram , Grosskreutz, Helmut , Volkmann, Heinrich (eds): *Industrielle Revolution*. Köln: Wirtschaftliche Aspekte, Kiepenheuer & Witsch, 1976
- Buchanan , Ralph Angus: *The Power of the Machine. The impact of technology from 1700 to the present day* . Harmondsworth: Penguin Books, 1992
- O'Brien, Patrick (ed.)*The Industrial Revolution in Europe*. Vols 1 and 2. Oxford: Blackwell, 1994
- Paulinyi , Akos: *Industrielle Revolution. Vom Ursprung der modernen Technik* . Reinbek: Rowohlt Taschenbuch Verlag, 1989
- Sterns , Peter N.: *The Industrial Revolution in World History* . 2nd edn, Boulder, Colorado: Westview Press, 1998

Industrial archaeology: a discipline?

- Alfrey, Judith , and Clark, Kate: *The Landscape of Industry: patterns of change in the Ironbridge Gorge* . London: Routledge, 1993
- Cossons, Neil (ed.): *Perspectives on Industrial Archaeology*. London: Science Museum, 2000
- Nevell, Michael (ed.): *From Farmer to Factory Owner: models, methodology and industrialisation*. Manchester: Council for British Archaeology, North West, 2003
- Quartermaine, Jamie , Trinder, Barrie , and Turner, Rick: *Thomas Telford's Holyhead Road: the A5 in North Wales* . York: Council for British Archaeology, 2003
- Trinder, Barrie (ed.): *The Blackwell Encyclopedia of Industrial Archaeology*. Oxford: Blackwell, 1992

The heritage of the industrial society

- Bergeron, Louis and Pontois, Maria Teresa: *Architecture and Engineering. American Ingenuity 1750–1950* . New York: Harry N Abrams, 2000
- Hawkins Ferry, W. : *The Legacy of Albert Kahn*, Detroit: Wayne State University Press, 1987
- Locke, Tim and Locke, Anne: *Bridges of the World: an illustrated history* . Introduction by Eric Delony . Basingstoke: AA Publishing, 2008
- Olmo , Carlo:*Il Lingotto. L'architettura, l'immagine, il lavoro* . Torino: U Allemandi, 1994 Patrimoine de l'industrie / Industrial Patrimony. 2007, 18, 2
- Pinon , Pierre:*Un canal, des canaux* . Paris: Picard, 2000

Industrial archaeology

- Council, R. Bruce , Honerkamp, Nicholas , and Will, M Elizabeth: *Industry and Technology in Antebellum Tennessee, The Archaeology of Bluff Furnace* . Knoxville, University of Tennessee Press, 1992
- Cranstone , David: 'Excavation: The Role of Archaeology'. *Industrial Archaeology Review*, 1992, Volume XIV(2), 119-125
- Gordon, Robert B and Malone, Patrick M: *The Texture of Industry: an archaeological view of the industrialization of North America*. New York, Oxford University Press, 1994
- Martin , Patrick E: *The Mill Creek Site and Pattern Recognition in Historical Archaeology* . Archaeological Completion Report Series, No. 10, Mackinac Island Park Commission, Mackinac Island, Michigan, 1985
- Martin , Patrick E: 'Industrial Archaeology', in *International Handbook of Historical Archaeology*, 285—97, 2009
- Palmer, Marilyn and Neaverson, Peter: *Industrial Archaeology, Principles and Practice* . London and New York: Routledge, 1998
- Walton, Steven (guest editor): 'Theme Issue on Archeology at the West Point Foundry', *IA: Journal of the Society for Industrial Archeology*, Volume 35, Numbers 1 and 2, 2009

Identifying industrial landscapes

- Alfrey, J. and Clark, K. : *The Landscape of Industry: patterns of change in the Iron bridge Gorge*. London: Routledge, 1993
- Becher, Hilla and Becher, Bernd: *Industrial landscapes*. English language edition, Cambridge: MIT Press, 2002
- McClelland, L. F Keller , J. T.G.P. , Keller , and Melnick R Z: *How to identify, evaluate and register Rural Historic Landscapes* . National Register Bulletin No. 30, Washington, D.C.: National Parks Service, 1999
- McDonald, R. C., Isabell, R. F. , Speight, G. , Walker, J. and Hopkins , M S: *Australian Soil and Land Survey: Field Handbook*. Canberra: CSIRO, 2011
- Rippon , Stephen: *Historic Landscape Analysis: deciphering the countryside* . York: Council for British Archaeology, 2004
- Sauer, C. O.: *The Morphology of Landscape*. University of California Publications in Geography, 1925, 2(2): 19-53

Recording and documentation

- English Heritage , *Understanding Historic Buildings. A Guide to Good Recording Practice*. Swindon: English Heritage, 2006
- Falconer, K. : 'The industrial heritage in Britain — the first fifty years', *La revue pour l'histoire du CNRS*. 14, 26-33, 2006
- Hay, Geoffrey and Stell , Geoffrey: *Monuments of Industry* . Edinburgh: HMSO, 1986
- Malaws, Brian A. , 'Process Recording at Industrial Sites'. *Industrial Archaeology Review*, XIX, 1997, 75-98
- Preite, Massimo , Preite, M. : *Masterplan: a Valorizzazione Del Paesaggio Minerario / The Development of the Mining Landscape* . Florence: Polistampa, 2009
- Stamm, Alicia and Peatross, C. Ford (ed.): *Historic America: Buildings, Structures, and Sites Recorded by the Historic American Buildings Survey and the Historic American Engineering Record*. Washington: Library of Congress, 1983

Process recording

- Eppich, R. (ed.): *Recording*, Documentation and Information Management for the Conservation of Heritage Places: illustrated examples. (First published by The Getty Conservation Institute, Los Angeles 2007. Republished with revisions). Vol. 2. Shaftesbury: Donhead Publishing, 2011
- Kemp, E. L. (ed.): *Industrial Archaeology: techniques*. Malabar, Florida: Krieger Publishing, 1996
- Letellier, R. : *Recording, Documentation and Information Management for the Conservation of Heritage Places: guiding principles*. (First published by The Getty Conservation Institute, Los Angeles 2007. Republished with revisions). Vol. 1. Shaftesbury: Donhead Publishing, 2011
- Malaws, B. A. : *Process Recording at Industrial Sites* . *Industrial Archaeology Review*. 1997, *Vol. XIX*. 75–98
- Palmer, M. , and Neaverson, P. : *Industrial Archaeology: principles and practice*. London: Routledge, 1998

Industrial archives and company records

- González Pedraza, José Andrés: *Los archivos de empresa: un estudio comparativo*. España, *Arch-e, Revista Andaluza de Archivos* , January 2010, Nº 2, 31–57
- KuhnMunch, Annie : *Les Archives du Centre Historique Minier. Constitution des Fonds et Exploitation, Actes du VIIIe. Colloque National sur le Patrimoine Industriel*, Lille, 7–8–9, *L'Archéologie Industrielle en France*, May 1987, No. 17–18
- Oviedo Gámez, Belem (ed.): *Guía General del Archivo Histórico de la Compañía de Minas de Real del Monte y Pachuca*. México, Place: Archivo General de la Nación, Compañía Real del Monte y Pachuca, Ahcrdmy, 1993
- Oviedo Gámez, Belem and Hernández Badillo, Marco A. : *Un archivo de empresa, base para el rescate y conservación del patrimonio industrial: El Archivo Histórico de la Compañía de Minas de Real del Monte y Pachuca (1556–1967)*, *Memorias del Primer Encuentro Nacional de Arqueología Industrial*, Date, Volume, 143–149
- Schellenberg, T. R. : *Principios archivísticos de ordenación*. Place: Archivo General de la Nación, Serie Información de Archivos, 1982

Photography and image resources

- Florence Declaration. *Recommendation for the Preservation of Analogue Photo Archives*, Kunsthistorisches Institut in Florenz, 2009
(<http://www.khi.fi.it/en/photothek/florencedeclaration/index.html>)
- Ritzenthaler, Mary Lynn and Vogt-O'Connor, Diane : *Photographs: archival care and management*. Chicago: Society of American Archivists, 2006
- Rose, Gillian : *Visual Methodologies: an introduction to researching with visual materials*, 3rd edn. London: Sage, 2012
- Salgado, Sebastião and Nepomuceno, Eric : *Workers: an archaeology of the industrial age*. New York: Aperture, 1993
- Stremmel, Ralf et al. (eds): *Krupp. Fotografien aus zwei Jahrhunderten*. Berlin/München: Deutscher Kunstverlag, 2011
- Tenfelde, Klaus (ed.): *Pictures of Krupp: photography and history in the industrial age*. London: Philip Wilson Publishers, 2005

Choosing what to preserve

Belhoste, Jean-François and Smith, Paul (dir.): *Patrimoine industriel, cinquante sites en France*. Paris: Editions du Patrimoine, 1997

Daumas, Maurice : *L'Archéologie industrielle en France*. Paris: R Laffont, 1980

Gasnier, Marina : *Patrimoine industriel et technique, perspectives et retour sur 30 ans de politiques publiques au service des territoires*. Lyon: Lieux Dits, 2011

Trinder, Barrie (ed.): *The Blackwell Encyclopedia of Industrial Archaeology*. Oxford, Cambridge (Mass.): Blackwell, 1992

Woronoff, Denis : *Histoire de l'Industrie en France du XVIe siècle à nos jours*. Paris: Editions du Seuil, 1994

L'Archéologie industrielle en France, review of the CILAC association

Legal protection

Cossons, N (ed.) *Perspectives on Industrial Archaeology*. Science Museum: London, 2000

English Heritage *Conservation Bulletin 67: Saving the Age of Industry* . English Heritage, 2011 and *Research News 17/18* English Heritage, 2012

Palmer, M, Nevell M and Sissons, M: *Industrial Archaeology: a handbook* . Council for British Archaeology: 2012

Rose, M with Falconer, K And Holder, J: *Ancoats – Cradle of Industrialisation*. London: English Heritage, 2011

Stratton, M, (ed.): *Industrial Buildings: conservation and regeneration*. London: E&FN Spon, 2000

Urban regeneration and planning

Architectural Bureau Pussinen Oy: *Future of the City: Finlayson, Tampere*. No date

Berens, C: *Redeveloping Industrial Sites: a guide for architects, planners, and developers*. Hoboken: J Wiley & Sons, 2010

Järvi, M: 'The History and the Reuse of the Industrial Buildings on the Banks of Tammerkoski in Centre of Tampere', in Hinnerichsen, M. (ed.): *Reusing the Industrial Past by the Tammerkoski Rapids*. Tampere: City of Tampere, Museum Services, Pirkanmaa Provincial Museum, 2011

Kunzmann, K. R. : 'Creative Brownfield Redevelopment: the experience of the IBA Emscher Park initiative in the Ruhr in Germany', in Greenstein, Rosalind and Yesim Sungu-Eryilmaz , (eds): *Recycling the City: the use and reuse of urban land*. Cambridge (Mass.): Lincoln Institute of Land Policy, 2004, 201–217

Legnér, M. : 'Regeneration, Quarterization and Historic Preservation', in Legnér and Ponzini (ed.): *Cultural Quarters and Urban Transformation*. Klintehamn: Gotlandica förlag, 2009

Taylor, S., Cooper, M. and Barnwell, P. S. : *Manchester: the warehouse legacy*, London: English Heritage, 2005

Adaptive re-use

Latham, D. : *Creative Re-use of Buildings (vols 1 and 2)*. Shaftesbury: Donhead Publishing, 2000

Muñoz-VIÑAS, S. : *Contemporary Theory of Conservation*. Oxford: Elsevier, 2005

Powell, K. : *Architecture Reborn: the conversion and reconstruction of old buildings*. London: Laurence King Publishing, 1999

Stratton, M. , (ed.): *Industrial Buildings: conservation and regeneration*. London: E&FN Spon, 2000

Tiesdel, S. , Oc, T. and Heath, T. : *Revitalizing Historic Urban Quarters*. Oxford: Architectural Press, 2001

Uffelen, C. van : Re-Use Architecture. Salenstein: Braun Publishing, 2011

Financial and fiscal incentives

Environmental Preservation Agency. *A Guide to Federal Tax Incentives for Brownfields Redevelopment*. Washington DC: USEPA, 2011

Howard, J. Myrick : 'Financial Incentives for Saving Industrial Heritage in North Carolin Forum Journal. National Trust for Historic Preservation, 2011, 25(3), 47-52

National Park Service: Federal Tax Incentives for Rehabilitation Historic Buildings, Annual Report Fiscal Year 2010. Washington DC: USNPS, 2011

National Park Service: *Historic Preservation Tax Incentives*. Washington DC: USNPS, 2009

Pickard, Robert: *Funding the Architectural Heritage: a guide to policies and examples*. Strasbourg: Council of Europe Publishing, 2009

Heritage at risk surveys

Migone, Jaime and Pirozzi, Antonio *E: stado de Situación de la Conservación del Patrimonio Construido en Chile – Informe Preliminar*. Santiago: Ediciones de la Universidad Internacional SEK, 1996

Conservation plans

Clark, K. : Conservation Plans in Action. Proceedings of the Oxford Conference. London: English Heritage, 1999

Jokilehto, J. *et al.*: The World Heritage List What is OUV? Defining the Outstanding Universal Value of Cultural World Heritage Properties. Berlin: ICOMOS, 2008

Kerr, J. S. : The Conservation Plan: a guide to the preparation of conservation plans for places of European Cultural Significance. Sydney: National Trust of Australia (NSW), 1990

World Heritage Centre UNESCO , *et al.*: Operational Guidelines for the Implementation of the World Heritage Convention. Paris, France, World Heritage Centre, 2011

Worthing, D. and Bond, S. : Managing Built Heritage: the role of cultural significance. Hoboken: John Wiley and Sons, 2007

Adaptive re-use and embodied energy

Cilac, Dossier : Reconversions. *L'Archeologie Industrielle en France* , 2006, No. 49

CILAC, Actes du colloque de Belfort. *L'Archaeologie Industrielle en France* , Juin 2012, No. 60

Gasnier, M. : Patrimoine Industriel et Technique. Lyon: Lieux Dits, 2011

Historic Scotland: Conversion of Traditional Buildings, Guide for Practitioners, 6. Edinburgh, 2007

Menzies, Gillian F. : Technical Paper 13 – Embodied energy considerations. Research Sustainability Building Management. Edinburgh: Historic Scotland, 2011

National Trust for Historic Preservation in America: *The Greenest Building: quantifying the environmental value of building reuse* . US, 2012

K Powell : Architecture Reborn: the conversion and reconstruction of old buildings. London: Lawrence King, 1999

Stratton, Michael : Industrial Buildings conservation and regeneration. London: E & FN Spon, 2000

Post-industrial landscapes

Fair, J. Henry : *The Day after Tomorrow. images of our earth in crisis.* Brooklyn, NY: Powerhouse Books, 2010

Hauser, Susanne : *Metamorphosen des Abfalls. Konzepte für alte Industrieareale.* Frankfurt: Campus, 2001

International Institute for Environment and Development (ed.): *Breaking New Ground: mining, minerals and sustainable development. The report of the MMSD Project of the IIED.* London: IIED, 2002

Quivik, Frederic L: *Integrating the Preservation of Cultural Resources with Remediation of Hazardous Materials: an assessment of Superfund's re Th coer d Pu .* *Public Historian*, Spring 2001, Vol. 23, No .2, 2001, 47–61

United States Environmental Protection Agency – Office of Solid Waste and Emergency Response (ed.): *Revitalizing America's Mills. a report on Brownfields Mill Project.* Washington: EPA, 2006

Industrial ruins

Edensor, T. : *Industrial Ruins, Space, Aesthetics and Materiality.* Oxford: Berg, 2005

Harbison, R. : *The Built, the Unbuilt, and the Unbuildable – In Pursuit of Architectural Meaning.* Cambridge: MIT Press, 1993

Okada, M. : *Industrial Heritage and Ruin Landscape.* *JSCE Newsletter of Committee on Historical Studies in Civil Engineering*, No.37, 2009

Tanigawa, A. : *Aesthetics of Ruins.* Tokyo: Shueisha, 2003

Conservation and community consciousness

Alfrey, Judith and Putnam Tim : *The industrial heritage – managing resources and uses,* London: Routledge, 2003

Lin, Hsiao-Wei and Chun-Ming Huang (eds): *Introduction to Taiwan's Industrial Heritage,* Taichung: Headquarters Administration of Cultural Heritage, Council for Cultural Affa 2011

Lin, Hsiao-Wei : *Report of 2011 Regional Cultural Heritage Strategic Planning in Jhih-Liao-Wo Paper Making Village, Hsinchu County.* Jhubei: Cultural Affairs Bureau of Hsinchu County Government, 2011

Industrial Heritage and the World Heritage Convention

Jokilehto, J. , comp., *et al.*: *The World Heritage List: Filling the Gaps – An Action Plan for the Future. Monuments and Sites XII.* Paris: International Council on Monuments and Sites, 200

Jokilehto, J. : *The World Heritage List. What is OUV? Defining the Outstanding Universal Value of Cultural World Heritage Properties. Monuments and Sites XVI.* Paris: International Council on Monuments and Sites, 2008

Pressouyre, L. : *The World Heritage Convention, twenty years later.* Paris: UNESCO Publishing, 1996. (Originally published 1992 as *La Convention du Patrimoine Mondial, vingt ans après*)

United Nations Educational, Scientific and Cultural Organization: *World Heritage: Challenges for the Millennium.* Paris: UNESCO, 2007

World Heritage, concepts and criteria

- World Heritage: Science and Technology. An Expert Workshop within the Framework of the Global Strategy for a Balanced and Representative World Heritage List, UK National Commission for UNESCO, London, 2008
- Ruggles, C. and Cotte, M. (ed.): The Astronomical and Archoastronomical Heritage in the perspective of the World Heritage Convention. Bognor Regis: Ocarinabooks, 2011
- World Heritage Center: Operational Guidelines for the Implementation of the World Heritage Convention, e-edition, November 2011

Thematic World Heritage Studies

- Hughes, S. : The International Collieries Study: Part of the Global Strategy for a Balanced World Heritage. *Industrial Archaeology Review*, November 2004, Volume XXVI, Number 2, 95–111
- Hughes, S. : The International Canal Monuments Study: Part of the Global Strategy for a Balanced World Heritage List. *Patrimoine de l'Industrie: Industrial Patrimony*, 2007, Volume 18, 19–32
- ICOMOS, Thematic Studies for the World Heritage Convention. Paris, 1996–2010. Available on ICOMOS website

Industrial museums

- Hinnerichsen, M. (ed.): Re-using the Industrial Past by the Tammerkoski Rapids. Tampere: City of Tampere Museum Services, 2011
- Houtgraaf, D. : Mastering a Museum Plan: Strategies for Exhibit Development. Leiden: Naturalis, 2008
- Hudson, Kenneth : Museums of Influence. Cambridge: Cambridge University Press, 1987
- Negri, A. & Negri, M. : L'Archeologia Industriale. Messina-Firenze D'Anna, 1977
- Negri, M. (ed.): New Museums in Europe 1977-1983. Milan: Mazzotta, 1984
- Negri, M. : Manuale di Museologia per i Musei Aziendali. Rubbettino, Soveria Mannelli, 2003

Care of industrial and technical collections

- Feldkamp, J. & Lindner, R. : *Industriekultur in Sachsen. Neue Wege im 21. Jahrhundert*. Chemnitz: 2010
- International Council of Museums: ICOM Code of Ethics for Museums, Chap. 4: Disposal of Collections. Paris: ICOM, 2002
- John, H. and Mazzoni, I. : Industrie – und Technikmuseen im Wandel, Perspektiven und Standortbestimmungen. Bielefeld: Transcript Verlag, 2005
- Prytulak, G. : *Outdoor Storage and Display: Basic Principles*. Canadian Conservation Institute (CCI), Notes 15/8 and 15/9, 2010

Conserving industrial artefacts

- Bailey, M. R. and Glithero, J. P. : The Engineering and History of Rocket: a survey. Report. York: National Railway Museum, 2000
- Canadian Conservation Institute (CCI) : CCI Notes 15/2: Care of Machinery Artefacts Stored Outside. Ottawa: Canadian Conservation Institute, 1993
- ECCO: Professional Guidelines (II): Code of Ethic. Promoted by the European Confederation of Conservator-Restorers' Organisations and adopted by its General Assembly, (Brussels 7 March 2003)

ICOM: Code of Ethics for Museums, 2004

Storer, J. D. : The Conservation of Industrial Collections – a survey. Resource: The Council for Museums, Archives and Libraries, 1989

Industrial heritage tourism

Arwel Edwards, J. and Llurdés i Coit, Mines and Quarries. Industrial Heritage Tourism. Annals of Tourism Research, 1996, vol 23, No .2, 341–363

Conlin, M. and Jolliffe, L. (eds): Mining Heritage and Tourism. A global synthesis. London: Routledge, 2010

Industrial Tourism and Community Building, new directions in industrial tourism, Transactions, Nagoya/Aichi, 2 005

Otgaar, A. H. J. , Berg, L. Van Den, Berger C. and Xiang Feng R. : *Industrial Tourism: opportunities for city and enterprise*. Aldershot: Ashgate, 2010

Pardo, C. J. : *Turismo y Patrimonio Industrial/Tourism and Industrial Heritage*. Madrid: Editorial Síntesis, 2008

www.erih.net

Teaching in schools

Dorel-Ferre, Gràcia : Enseigner le patrimoine industriel, le cas de Saint-Dizier (Haute-Marne), collèges et lycées, Chaumont, 1998

Investigating industrial sites: English Heritage teachers' kit, 2011, <http://www.english-heritage.uk/publications/investigating-industrial-sites-tk/investigating-industrial-sites-tk-02.pdf>

University training

Garçon, A-F , Cardoso De Matos, A. , Fontana, G. L. (eds): Techniques, patrimoine, territoires de l'industrie: quel enseignement? Lisbon: Edições Colibri, 2010

Geijerstam, J. af (ed): Reports/Working Papers. The TICCIH Seminar on Training and Education within the Field of Industrial Heritage. Stockholm and Norberg, Sweden, June 8–11, 2008. See <http://www.mnactec.cat/ticcih/documentation.php>

Nisser, M. : Our Industrial Past and Present. Challenges in Training and Education. Patrimoine de l'industrie – Industrial Patrimony. 2008, 20, 2, 27–32

Palmer, M. : Archeology or Heritage Management: The Conflict of Objectives in the Training of Industrial Archeologists. *Industrial Archeology*, 2000, 26, 2, 49–54

Seely, B. E. and Martin, P. E. : A Doctoral Program in Industrial Heritage and Archeology at Michigan. CRM: The Journal of Heritage Stewardship, 2006, 3, 1

Distance and on-line learning

Bates, A. W. : *Technology, e-Learning and Distance Education*. London: Routledge, 2012

Daly C. and Pachler, N. : Key Issues in e-Learning: Research and practice. London: Continuum, 2011

