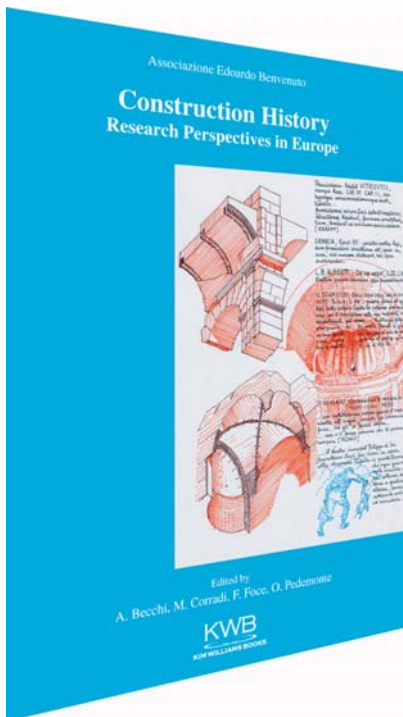


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“Report on the State of Construction History in Britain”

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Construction History Research Perspectives in Europe

A. BECCHI, M. CORRADI, F. FOCE AND O. PEDEMONTE, EDS.

This is vol. IV in the book series “Between Architecture and Mathematics”. The Associazione Benvenuto for research in the Science and Art of Building in their historical development assigned to a few international “observers” the task of styling a map of Construction History in their various countries. Obviously, we are not dealing here with an exhaustive map, but rather with a first attempt to identify some of the significant lines of research and to put into contact the individual scholars. A small step towards the constitution of an international scientific community that is interested in architecture as well as mechanics; in construction as well as its history. A community which, up to the present, has not known how to find the essential points of contact and dialogue, and which has avoided the onus of long-term initiatives. The present volume is an aid for establishing solid collaborative research projects, knowing that this can happen only if the studies are so rigorous and detailed that those emphatic recall to arms of interdisciplinarity, sure signs of problems set forth badly, are rendered superfluous.

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Contents

Antonio Becchi, Massimo Corradi, Federico Foce and Orietta Pedemonte
“Construction History: The Genoa Meridian”

Bill Addis
“Report on the State of Construction History in Britain”

Riccardo Gulli
“Margin Notes on Construction History in Italy”

Santiago Huerta
“Construction History in Spain”

Karl-Eugen Kurrer
“Construction History in Austria, Germany, Switzerland”

Patricia Radelet-de Grave
“The Meaning of “Between Mechanics and Architecture””

Anne Coste and Joël Sakarovitch
“Construction History in France”

Dirk Van de Vijver
“Construction History in Belgium”

REPORT ON THE STATE OF CONSTRUCTION HISTORY IN BRITAIN

Bill Addis

Overview

As a formal academic discipline within the higher education system, the state of Construction History in Britain is not healthy. Indeed it is now in a worse state than one or two decades ago. There are no University Departments of Construction History and hardly any formal lecture courses in the subject at undergraduate or post-graduate level. Likewise there is no formal research programme in the subject. In general terms the academic discipline is in the hands of a number of individual enthusiasts who have managed to follow their enthusiasm despite everything. Unfortunately, many of these individuals are approaching retirement and there is little evidence of new blood to take up the baton.

On the other hand, there is also good news. The core curricula published by the Joint Board of Moderators which accredits many University engineering degree courses do require them to include some input on the history of the subject, and so the doors are open for those universities that want to pursue this avenue. There is also a large body of research being undertaken in university departments of History of Science and Technology although, as a matter of fact, this does not often embrace subjects related to construction. There are also a number of individuals – often mature students – who undertake independent and sometimes part-time research leading to a Ph.D. They are usually linked to departments of architecture or history of science and technology, rather than engineering departments.

There is a large and growing ‘heritage industry’ engaged in restoring and refurbishing old buildings dating from the 1960s back to the twelfth century and beyond. One aspect of this industry is a growing number of post-graduate courses in building conservation which always contain some history of the built environment, though often dealing more with architectural issues than with engineering. Such heritage work generates considerable expertise and knowledge regarding old buildings, and this can usually be tracked down through publications on building conservation and industrial archaeology, as well as in articles the technical and architectural press that report such projects.

Conservation bodies such as English Heritage often commission reports or books on particular buildings of historical note and sometimes on generic themes such as gas holders [Tucker 2000], mills or concrete buildings.

Finally, environmental legislation in Britain (and the rest of Europe) now requires that large construction projects are subjected to an Environmental Impact Assessment. These studies, which are in the public domain, usually require a detailed assessment of archaeology and any buildings of historic importance or significance. Such assessments can constitute a valuable body of historical study.

Taken together, an enormous amount of research into the history of construction, buildings, engineering and various architectural subjects is undertaken in Britain. While some of this is undertaken in academic institutions, most is done in the professional world of building conservation and care for the historic built environment. For example, while little generic work is undertaken on the engineering behaviour of cathedrals by academic researchers, detailed studies, including physical testing and theoretical analysis are usually undertaken when a particular building is in need of attention. The situation is, then, not so different from that in 1742 when the '*Tre matematici*' and Poleni made their pioneering studies of the dome of St Peter's Cathedral in Rome.

Research into Construction History in Britain

The state of Construction History in Britain is best reviewed under a number of headings which will enable those people who are active in the field to be traced, and will help would-be researchers and historians to further their studies.

The term *Construction History* can be used differently by different people. In this paper it is taken to refer to the construction of buildings which, in principle, can relate to any aspect of building design and construction: structure, construction materials and methods, heating, ventilation, lighting, acoustics, and the building envelope or façade.

In practice, to date, more has been written about building structures and the construction of buildings than the other subjects. This paper does not consider the history of civil engineering subjects such as bridges, tunnels, dams, railways, canals and hydraulic engineering.

Universities and Research Organisations

University-based Research. There are no formal research programmes in the field of Construction History. Nevertheless, academics in a number of different fields do undertake Construction History research in universities. This work may occur

in any of a number of different departments, ranging from construction to archaeology, for example:

- JAKES HEYMAN in the Department of Engineering at Cambridge University has undertaken many studies in the history of structural analysis.
- TOM SWAILES at the University of Manchester undertakes research into the properties of nineteenth-century cast-iron beams and columns.
- HENTIE LOUW in the architecture school at the University of Newcastle studies several topics including the development of sash windows.
- BILL ADDIS, formerly of the Department of Construction Management and Engineering, has researched and written widely on the history of the engineering design of buildings.
- MARK WILSON JONES in the Department of Civil Engineering and Architecture at the University of Bath studies Roman architecture, often from a technical point of view.
- JAMES CAMPBELL in the architecture school at the University of Cambridge has made technical studies of the work of Wren and brick construction, among other subjects.
- JANET DELAINE in the archaeology department at the University of Reading has made detailed archaeological studies of Roman construction, notably the Baths of the Emperor Caracalla and buildings at the port of Ostia, involving in depth study of the engineering design and construction.
- CHRIS POWELL in the Welsh School of Architecture at Cardiff University is mainly interested in the history of building firms and the construction industry.
- ROLAND PAXTON in the civil engineering Department of Heriot-Watt University, Edinburgh concerns himself with most Scottish civil engineers. He is the Chairman of the Panel for Historic Engineering Works (PHEW).
- PETER CROSS-RUDKIN in the Department of Civil Engineering at Coventry University researches the organisation of the construction industry in the eighteenth and nineteenth centuries. He is a co-editor

of the forthcoming second volume of the Biographical Dictionary of Civil Engineers of Britain and Ireland.

- TED RUDDOCK, recently retired, now Honorary Fellow of the School of Architecture at the University of Edinburgh has wide-ranging interests, including eighteenth-century masonry bridges in particular.
- DAVID YEOMANS at the School of Architecture and Building Engineering at the University of Liverpool is interested in the history of building technology in general, and timber structures in particular.

Anyone wishing to undertake research towards a Ph.D. must be registered at a university and such individuals can be traced through likely host departments, especially where conservation courses are run.

The histories of engineering mathematics and science often overlap with the histories of physics and mathematics and some historians of the latter subjects are not fully aware of the links between their work and engineering history. Such work can be traced through the departments of History of Science and Technology, the largest of which are those at the universities of Cambridge, Oxford, Manchester and Imperial College London. One example of such work is the considerable body of knowledge collected in the mathematics department at the University of St. Andrew's, Scotland. This is made available through an excellent website which gives much attention to mathematicians and engineering scientists who contributed to the development of mechanics (<http://www-history.mcs.st-andrews.ac.uk/history/index.html>).

The British Society for the History of Science (BSHS) (<http://www.bsbs.org.uk/>) is a national umbrella organisation for all research into this field of study. Britain also has many active members of the International Committee for the History of Technology (ICOHTEC) (<http://www.icohtec.org/>).

Research institutes. The Royal Institution, has supported research into science for over two hundred years (<http://www.rigb.org/rimain/index.jsp>). The Royal Society (<http://www.royalsoc.ac.uk/>) goes back even further and counts Robert Hooke and Christopher Wren amongst its founder members in the 1660. Both organisations have excellent libraries available to non-members by appointment.

Research institutes are sometimes involved in undertaking historical research, albeit not of a purely academic nature. This can sometimes involve the testing of materials and structural elements and may be undertaken in collaboration with Universities which have suitable testing facilities. For example the Building Research Establishment (<http://www.bre.co.uk/>), the Steel Construction Institute (SCI) (<http://www.steel-sci.org/>), the Timber Research and

Development Association (TRADA) (<http://www.trada.co.uk/>), and the Brick Development Agency (BDA) (<http://www.brick.org.uk>). These organisations also produce some guidance on dealing with their respective materials in historic structures (e.g., [Bussell 1997]).

Taught courses. A survey is currently being undertaken by TOM SWAILES in the Civil Engineering Department at the University of Manchester into the extent and frequency of lectures on building and civil engineering history. The results, which at present do not look encouraging, are due for publication in late 2004.

Throughout Britain there are over 30 post-graduate courses on building conservation. These can be found through university websites and advertisements in the technical architectural and building press. Such courses rely heavily on lecturers from outside the university sector who give invited lectures in their fields of expertise. Most historians of construction in Britain are involved in giving such lectures in one or more of these courses.

By far the greatest body of historical teaching occurs in the forty departments of History of Science, many of which embrace history of technology and medicine. The history of building construction and engineering, however, does not usually feature prominently in such courses.

Professional bodies

Most British building professionals are members of one of six professional bodies, described below. Each of these organizations can be a good starting point for historical inquiry. They all have libraries and archives of varying size and richness. Some have groups of members who come together to share their interest in the histories of their professions. Each institution can provide details of professionals involved in historic building projects:

- Institution of Civil Engineers (ICE) (<http://www.ice.org.uk/homepage/index.asp>). A large and excellent library with an extensive collection of old and classic books as well as much archival material. The librarian Mike Chrimes is author and editor of many works on the history of civil engineering and construction. Proceedings of its meetings date back to 1837. The Panel for Historic Engineering Works operates regionally throughout Britain to record significant civil and structural engineering works. The ICE produces some guidance on historic construction, e.g. Marsh and Swales 1998;
- Institution of Structural Engineers (IStructE) (<http://www.istructe.org.uk/>). A good library and proceedings dating back to 1921. The Institution's History Study Group

(<http://www.istructe.org.uk/about/DB/25.asp>) has been one of the most active of its kind in the world since its inception in 1973;

- Chartered Institution of Building Services Engineers (CIBSE) (<http://www.cibse.org/>). A good library and proceedings dating back several decades. A number of members have collaborated in some historical research and maintain a presence on the Institution's website. (Formerly the Institution of Heating and Ventilating Engineers);
- Chartered Institute of Building (CIOB) (<http://www.ciob.org.uk/ciob/>). A good library, but relatively little old material;
- Royal Institute of British Architects (RIBA) (<http://www.riba.org/go/RIBA/Home.html>). An excellent library of books, periodicals and drawings;
- Royal Institution of Chartered Surveyors (RICS) (<http://rics.org.uk/>). A good library. Its members include building surveyors who undertake many condition surveys on historic buildings (but not structural and foundation work).

Historical societies

Construction history is covered in the field of interest of a number of historical societies in Britain. These are run by and for their members who are enthusiasts for the subjects.

The most obvious ones dealing with construction and buildings are these:

- The Construction History Society (<http://www.constructionhistory.co.uk/>), which is a registered charity with no professional affiliation. The society has regular meetings and organizes the publication of a refereed annual journal, *Construction History*, which contains papers and book reviews, and a thrice-yearly newsletter;
- The Georgian Group (<http://www.georgiangroup.org.uk/>), Victorian Society (<http://www.victorian-society.org.uk/>) and Twentieth Century Society (<http://www.c20society.demon.co.uk/>) focus on buildings, art and other matters respectively in Georgian (approximately 1714-1837) and Victorian (1837-1903) times, and in the twentieth century. Each has regular meetings and publishes a newsletter and journal;

- The Society for the Protection of Ancient Buildings (SPAB) (<http://www.spab.org.uk/>), the Ancient Monuments Society (AMS) (<http://www.ancientmonumentsociety.org.uk/>), and the Association for Studies in the Conservation of Historic Buildings all cover all periods of history, including the industrial age, and produce journals and other publications;
- The International Council on Monuments and Sites (ICOMOS) is a non-governmental organisation, currently with 118 national committees worldwide. In 2003 it established the International Scientific Committee for the Analysis and Restoration of Structures of Architectural Heritage (ISCARSAH). ICOMOS-UK formed its corresponding national Committee in 2004, with a membership drawn from those active in building conservation and historical studies.

In principle, buildings may be the subject of any themed historical society from aircraft to weaving. They all hold regular meetings and publish periodicals with collections of papers. In practice, the societies with the most frequent overlap with construction are these:

- The Newcomen Society (<http://www.newcomen.com/>) which deals with the history of engineering and technology;
- The Association of Industrial Archaeology (<http://www.industrial-archaeology.org.uk/>).

Throughout Britain there are many local industrial archaeology societies which often publish newsletters and can lead quickly to people interested in particular industries or sites.

Museums, libraries, and archives

The Museum of Science and Industry in London (The ‘Science Museum’, <http://www.sciencemuseum.org.uk/>) has many original artefacts related to buildings and some archival material. The Science Museum Library (<http://www.sciencemuseum.org.uk/library/>), currently located adjacent to Imperial College in London University is due to relocate to Western England soon. It contains a huge collection of books and periodicals. The National Railway Museum at York has archives relating to railways buildings as well as rolling stock. So too do the archives of Network Rail—many records of railway structures, including many original drawings, are held in four centres for England and Wales (but not Scotland): London (Waterloo Station), Birmingham, Swindon, and York.

A number of city, county, and regional museums also have collections of artefacts related to Construction History. They often also have valuable and extensive archives related to businesses and individual buildings in the local area. Of particular importance for the nineteenth century are the cities of Birmingham, Leeds, and Manchester.

Britain has a great many museums related to its industrial and cultural heritage. Many of these are housed in contemporary buildings such as mills which are themselves museum exhibits. They also usually have collections of relevant archival material. A good example is Belper North Mill (<http://www.belpernorthmill.org.uk/>) in Derbyshire which was the most advanced building of its type when built in 1806.

Particular mention must be made of Ironbridge Gorge Museum (<http://www.ironbridge.org.uk/>), not only for its unique buildings and the Iron Bridge itself, dating from 1779, but also for the large collection of archival material and the many historical studies which are undertaken there.

The National Archives (<http://www.nationalarchives.gov.uk/>), through the Public Record Office at Kew in west London, hold a huge collection of archive material including records of public construction, railway and canal companies, and much more.

Other libraries and archives have grown up where certain industries or building types prevail, such as naval dockyards at Chatham Historic Dockyard (<http://www.chdt.org.uk/>) in Kent, commercial docks at The Museum in Docklands (<http://www.museumindocklands.org.uk/>) in London, materials testing at The Kirkaldy Testing Museum in London, and hospitals at The Wellcome Trust (<http://www.wellcome.ac.uk/>) in London. The Royal Engineers Museum (<http://www.army.mod.uk/royalengineers/museum/>) at Brompton Barracks, Chatham holds records and material covering the activities of the construction 'arm' of the British army, whose military engineering—for example the use of iron in buildings—was often ahead of its civil engineering counterpart.

Some individuals or engineering firms are of sufficient historical importance that dedicated archives have been established. Examples are the archive at Bristol University devoted to Isambard Kingdom Brunel, and that at Churchill College, Cambridge, devoted to Ove Arup and the firm of consulting engineers he founded.

The building conservation industry

Britain's built heritage is generally under the guardianship of organizations such as English Heritage (<http://www.english-heritage.org.uk/>), Historic Scotland (<http://www.historic-scotland.gov.uk/>) and CADW (the Welsh

equivalent) (<http://www.cadw.wales.gov.uk/>). Many old buildings are owned and cared for by the National Trust (<http://www.nationaltrust.org.uk/main/>) or more specialised trusts, or are privately-owned. Such organizations publish well-researched guides about individual buildings (e.g., Fountains Abbey (<http://www.fountainsabbey.org.uk/>) in Yorkshire) and studies of generic building types such as cathedrals, textile mills, and dockyard and naval buildings.

In addition, extensive records including drawings, photographs, and reports on buildings and other structures are held by the National Monuments Record Centre of English Heritage, and the Royal Commissions on the Ancient and Historical Monuments of Scotland (<http://www.rcahms.gov.uk/>) and Wales (<http://www.rcahmw.org.uk/>).

These organisations compile many reports and guides which are written by professionals involved with the restoration of old buildings and are based on considerable research and life-long enthusiasm.

Unaffiliated, individual researchers

Finally, there exists a large number of knowledgeable and enthusiastic amateurs who study and write about the history of many different aspects of Construction History. Inevitably they are difficult to find except by the traces they leave, for instance in lectures to various historical societies, and the papers and books they write. Such individuals are best found in the indices to the various periodicals published by organizations mentioned above. Some of their names appear in the following list of references.

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Refereed Periodicals:

Construction History
Industrial Archaeology Review
Proceedings of the Institution of Civil Engineers
The Structural Engineer
Transactions of the Newcomen Society

Journals and Newsletters:

Most historical societies publish journals and newsletters for their members. While not refereed, these often contain valuable information and help identify people interested in particular subjects. Newsletters are published by:

The Construction History Society;
 The Georgian Group;
 The Victorian Society;

The Twentieth Century Society;
The Panel for Historic Engineering Works;
The Society for the Protection of Ancient Buildings;
The Ancient Monument Society;
The Association for Studies in the Conservation of Historic Buildings.

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