Construction History Society of America Issue No. 15 April 2011

CHSA Newsletter

By now all of you who were members in 2010 should have received your copy of the Society's journal, Construction History. If you have not, please e-mail and we will correct the omission. Our British colleagues, who produce the journal, are re-vamping their editorial board and hope to accelerate future production. In addition, Tom Leslie has volunteered to act as a guest editor with the aim of increasing the American content of the journal.

If you have not submitted an abstract for the 4th International Congress on Construction History in Paris next year, then it might be too late by the time you receive this, unless they extend the April 15th deadline. We hope to have a good American turn-out there in order to promote the 5th Congress which will be in Chicago in 2015.

The newsletter contains a Save-the-Date notice for a one-day event to be held by CHSA in New York on October 29th. This con tinues the tradition of holding regional meetings between our biennial national meetings, the next of which will be in Boston next year. There is also some movement towards setting up a mid-Atlantic interest group to explore regular meetings in the D area. If you would like to help please drop us a line.

Finally, my usual plea for all of us to find at least one new member this year and to spread the word about Construction History wherever you may go!

Brian Bowen, Chairman
College of Architecture, Georgia Tech,
Atlanta GA 404-378-3779
brian.bowen@coa.gatech.edu

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The First Steam Shovel Design

Thanks to our institutional and corporate members

* Associated General Contractors of America
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* Canadian Centre for Architecture
* ConstellationCenter
* Construction Management Association of America
* Georgia Institute of Technology
* Hoover Treated Wood Products, Inc.
* Levine Construction Company
* Minnesota State University, Mankato
* Paces Construction Co.
* Texas A&M University
* The Sullivan Company
* Turner Construction Company
* The Pepper Companies
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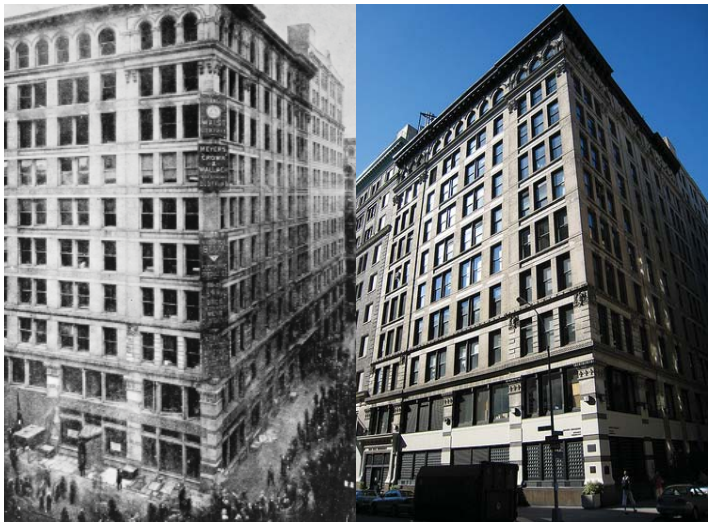
THE TRIANGLE SHIRTWAIST FIRE 1911

One of the most well-known fires in American history took place on March 25, 1911 when the shop of the Triangle Shirtwaist Company burned, killing over 140 people. The shop occupied the eighth, ninth and tenth floors of the Asch Building, facing Washington Square in New York, and was considered to be of modern design: the iron and steel frame of the building was fireproofed with terra cotta, and the building had two internal stairs and an exterior fire escape. While any fire of this magnitude would be both tragic and intensely studied for lessons about fire-protection, the prominent location of the building and the fact that many of the deaths resulted from people leaping from windows more than 100 feet above the sidewalk, ensured that this fire would be infamous.

The Triangle Shirtwaist Fire 1911

Despite rumors that the stairway doors were locked, the deaths were mostly attributable to more mundane failures: the wood doors at the fire stairs burned through, allowing heat and smoke to block the stairs' use; the fire-escape was lightly built and partially blocked by unused fire shutters, and it failed under the weight of fleeing people packed in by the bottleneck created by the blockage; and the factory floors had tables full of cloth and tissue paper (the primary fuel for the fire) and set up in long rows that prevented clear passage to the stairs.

The structure of the Asch Building was far from the most modern available when it was constructed in 1900, but it met the standards of the day for fireproofing. Those standards were not challenged by this fire: the basic structure of the building survived with little damage. The only building elements that suffered significant damage were those needed for egress: the rear fire-escape, the internal stairs, and the elevator. The resulting contrast between a structure that survived the fire with little real damage and the horrific death toll could not have been more clear.

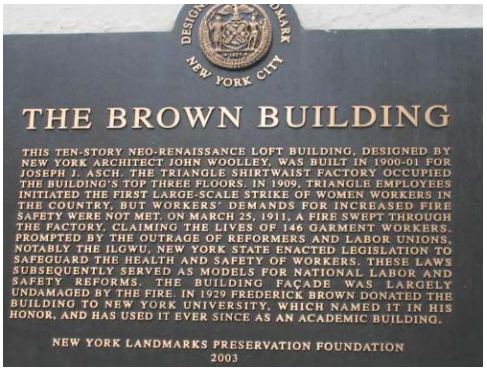


The Triangle Shirtwaist after Fire and Today

The most recent major revision of the New York City Building Code before the fire was 1906. (The building itself was constructed under the 1899 version of the 1892 code.) That code contained a handful of vague requirements for egress, such as the statement that any building where "large numbers of people are congre-

gated" including factories was to have stairs, halls, and doors "arranged as the Department of Buildings shall direct to facilitate egress in case of fire or accident." By contrast, the 1916 New York code had an entire section titled "Exit Facilities" that contained recognizably modern language defining the number of exits, their useable width, their construction, and the design loads by the number of occupants in a given building.

The Triangle fire showed shortcomings in the egress provisions of the building codes then in force, but simultaneously showed how well the general structural provisions worked to protect the structure against a fire. The fact that the building survived with only minor damage attracted little attention because it was expected in an era that promoted "fireproof" construction. Chief Croker of the Fire Department of New York was quoted the day after Triangle as saying that modern buildings were "fireproof in name only" because they lacked sufficient egress and sufficient access for firefighters. The concept of fire protection had changed, to specific protection of people rather than property.



In 1929 Frederick Brown donated the building to New York University, which named in in his honor, and has used it ever since as an academic building.

by :
Donald Friedman, President
Dfriedman@OldStructures.com
Old Structures Engineering PC, New York

INTERNATIONAL JOURNAL FOR THE HISTORY OF ENGINEERING AND TECHNOLOGY,

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This issue, formerly the Transactions of the Newcomen Society, includes two articles likely to be of interest to our members.

The first is James Brindley, American Canal Engineer, by Robert Kapsch and Yvonne Long, the latter a descendent of Brindley. He was the nephew of the pioneering British canal engineer of the same name. He arrived in the colonies in 1774 but for some reason, has often been considered an imposter, probably due to his eponymous name. The authors prove however without any doubt that he was a canal expert and was involved in the design and construction of the Potomac, Susquehanna, Conewago and Santee canals among others.

The second is Historical Development of Iron Screw-Pile Foundations: 1836-1900, by Alan Lutenegger, University of Massachusetts. The screw-pile system was originated by Alexander Mitchell, an Irish builder and brick-maker, who obtained a UK patent in 1833 and one from the US in1845. They were used extensively for moorings, lighthouse foundations, bridges and piers all over the world.

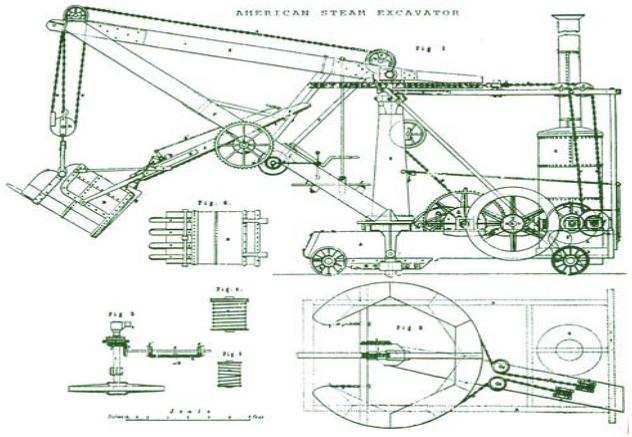
THE FIRST STEAM SHOVEL

In the early 1800s, large-scale excavation for canals and railroads required thousands of men who dug by hand and handled hundreds of teams to move spoil. The growth of railroads in particular required something better. The firm of Carmichael, Fairbanks and Otis was constructing a segment of railroad near Canton, Massachusetts, with such a force in 1835 when William S. Otis, a partner in the firm, had an idea. With the assistance of a friend, Charles Howe French, Otis developed a steam-powered "Crane Excavator."

This machine had a fixed mast and swinging boom like that of a quarry derrick, with a bucket attached to the end of a dipper stick that was mounted to the boom. The boom was lowered to enable the bucket to dig in an arc through the cut face, then raised and swung to one side or the other to dump. The swinging and dumping were accomplished manually; a man on each side of the shovel hauled to on a rope to swing the boom back and forth, and the man on the dumping side tripped the bucket. The shovel was powered by a vertical boiler that drove a double-drum chain hoist, and the machine traveled on four railroad wheels. Otis patented an improved version of this shovel in 1839; while the improved machine was working in Massachusetts on its first project, Otis died of typhus at the age of 26.

The First Steam Shovel

Other excavating machines, employing such devices as treadmill power or a chain-mounted bucket line, preceded the Otis shovel in concept if not reality, but none were as practical. The Otis shovel was the earliest known steam-powered, single-bucket excavator, and it greatly improved the efficiency of at-grade excavation by eliminating the armies of shovel-wielding laborers. It remained in production in small numbers until the early 1910s.



The First Steam Shovel- Patent Drawings

The Otis patents expired in the 1870s, and other manufacturers began expanding on Otis' design, and most continued Otis' idea of a swinging boom on a fixed chassis. These machines were known as railroad shovels because of their mounting, and because they were used extensively in railroad construction. They were produced into the 1920s, and railroad shovels saw use on construction projects as late as the early 1930s. Because railroad mounting inherently limited mobility while adding the additional expense of track-laying and shifting to operating costs, crawler bogies and steel traction wheels came into use as alternatives to railroad wheels. With their mobility improved, a few half-swing steam shovels operated into the 1950s.

The half-swing steam shovel was rendered obsolete by full-revolving shovels and the introduction of gas, diesel and electric power. The full-revolving design gave the shovel a 360 degree operating range, and the new power sources bore obvious cost savings and efficiency improvements over steam. Although full-revolving cable shovels were mostly rendered obsolete by the advent of large rubber-tired loaders and hydraulic shovels, very large cable shovels are still built today for surface mining applications. With vast improvement in size, efficiency and technology, the original Otis digging action can be seen in these massive machines.

The Historical Construction Equipment Association (HCEA) is a corresponding society with CHSA. It is dedicated to preserving the history of the construction, dredging and surface mining equipment industries. With over 4,100 members in twenty-five countries, activities include operation of National Construction Equipment Museum and archives in Bowling Green, Ohio; publication of a quarterly magazine, Equipment Echoes; and hosting an annual working exhibition of restored construction equipment.

They also offer high-quality scale models of the Otis Shovel and other historic construction machines for sale. Information is available at www.hcea.net, or by calling 419-352-5616 or e-mailing info@hcea.net.

by :
Thomas Berry, Archivist,
tberry@hcea.net
Historical Construction Equipment Association

Future CHSA Events

2011 October 29th: CHSA Regional Event, New York - see page 7 for details

2012 July 3 - 7: 4th International Construction History Congress, Paris

2012 Fall: 3rd US Biennial Meeting, MIT, Boston

2013 : Warm-up event in Chicago

2014 : 4th US Biennial Meeting, Minneapolis

2015: 5th International Construction History Congress, Chicago

Request for Information - 1950's Images

If you have any suggestions on where Andrea might search please contact her at e-mail below

I am looking for photographs of domestic/suburban construction in the US in the 1950s. I've been having trouble finding these images in the usual places (Georgia Archives, Library of Congress, etc.) and was hoping your association might have a few digitized photographs of houses under construction. The photos would be used in a documentary called Redfields to Greenfields. See www.redfieldstogreenfields.org/ for further information.
Andrea Janes - andrea.janes@gmail.com

BOOK REVIEW – BEFORE STEEL

by: Sara Wermiel

At the 2009 Construction History Congress in Cottbus, Germany, Mario Rinke, a young engineer connected with the structural design section of the ETH Department of Architecture, Zurich, talked with me about a book of essays he and a colleague at the ETH, Joseph Schwartz, were planning. The book would be about the use of iron structurally in the nineteenth century: how this material, so different in the way it performs mechanically from traditional masonry, heralded a new age of construction. He was seeking contributions to the volume and invited me to write an article. Now, a year and a half later, the book has appeared. Titled Before Steel: the Introduction of Structural Iron and Its Consequences, it contains 11 essays and an introduction. The theme of the book is how structural iron changed everything. As Rinke and Schwartz write in their introduction, the profession of structural engineer emerges, not coincidentally, when iron began to be used structurally.

My essay, "An Experiment in Skeleton-Frame Construction in the 1850s: the U.S. Marine Hospital in New Orleans," treats what I believe is the first building with a true skeleton frame erected in the United States. I discuss the history of the construction of this building, the few examples of similar buildings, and why the model of skeleton-frame construction it represented – iron frame with a cast-iron enclosure – did not catch on at the time, nor was it an influence on the form of skeleton-frame construction that developed and spread after 1890.

Other contributors to the book include several who no doubt are known to CHSA members, e.g., Tom Peters, Bill Addis, and Antoine Picon. Rinke and Schwartz allowed each writer to go her or his own way.

The book has an unusual format. Illustrations and tables are printed on separate pages (which happen to be a green-gray colored paper). Footnotes are printed in the text immediately after the superscript, in a slightly smaller, sans serif typeface. Lastly, bound in between the essays are fold-out pages with color photographs and descriptions of six iconic iron structures in England, for example, the 1814 St. George's Church in Everton, Liverpool, which has an iron interior framework. The book is in English. It was published by Niggli (Zurich) and is available at Amazon.com.

by:
Sara Wermiel
swermiel@mit.edu
Independent Architecture & Planning Professional
Massachusetts Institute of Technology

CHSA FALL MEETING, NEW YORK CITY – SAVE THE DATE!

"INVENTIONS: THE ROLES OF DISASTER AND INDUSTRIALIZATION IN CONSTRUCTION HISTORY"

WHERE: THE GENERAL SOCIETY OF MECHANICS AND TRADESMEN, 20 WEST 44TH STREET, NEW YORK, NY 10036

WHEN: SATURDAY, 29TH OCTOBER 2011, 9.00 AM – 5.00 PM

INVENTIONS OVER THE LAST TWO CENTURIES HAVE DRIVEN VAST CHANGES IN BUILDING DESIGN AND CONSTRUCTION. NEW INVENTIONS AND INNOVATION OF EXISTING IDEAS, IN TURN, HAVE BEEN DRIVEN BY RESPONSE TO DISASTERS, INVENTIONS IN TOOLS AND MATERIALS, AND A CHANGING LABOR FORCE. THE EVENT WILL GATHER TOGETHER IN PANELS REPRESENTATIVES FROM THE CONSTRUCTION, DESIGN, AND BUILDING REGULATORY COMMUNITIES TO DISCUSS THEIR VIEWS OF PAST DEVELOPMENTS AND FUTURE DIRECTIONS.

THE JULY NEWSLETTER WILL INCLUDE MORE INFORMATION ON THE PROGRAM AND HOW TO REGISTER.

The Big Buildings of Lower Manhattan, *Library of Congress, Prints and Photographs Division, Detroit Publishing Company Collection, Reproduction Number LC-D4-72999 DLC (b&w glass neg.) Created/Published [between 1900-1920]*

Who We Are

The Society is dedicated to the study of the history and evolution of all aspects of the built environment—its creation, maintenance and management. It is a forum for scholars and professionals in the field to share, meet and exchange ideas and research.

Membership is open to a wide range of construction related disciplines involved in the planning, development, design and construction of buildings and engineering infrastructure, in addition to those concerned with their operation and preservation.

Members share a passion for examining how our existing structures were planned, designed and built, with the purpose of using this knowledge to better preserve what we have and to guide us in determining future directions.

The US branch of the Construction History Society is a distinct entity catering to the historical studies and interests of its members here in America. Membership in the US branch includes full benefits in CHS at large, including receipt of the Society's Journal and newsletter and links to scholars in the field worldwide.

Corresponding Societies

Public Works Historical Society, www.pwhs.net

Historical Construction Equipment Association, www.hcea.net

Management Committee

Committee Advisors

This is your newsletter and the only vehicle we have to keep in touch with one another. So please use this to let us know:

* your interests in construction history, your current research, précis of recent lectures, etc.
* books, texts & articles that your fellow readers should know about
* names and e-addresses of colleagues and friends that we can include on our mailing list
* if you are willing to write a brief article for us.

Construction History Society of America
Post Office Box 93461
Atlanta, GA 30377–0461
Email: chs@coa.gatech.edu
www.constructionhistorysociety.org