



NEWSLETTER

Belated wishes for a successful New Year, although it already seems like an old one. And one of the first things to write is a reminder that 2014 subscriptions are due. These will remain unchanged for this year. Either, please go to the Society website where you can pay via credit card, or just send in a check to us at PO Box 93461, Atlanta, GA 30377, noting any change in addresses. With thanks to those of you who have already renewed. We will be sending out more reminders over the next few weeks.

Next is to ask each of you to make a resolution to recruit at least one new member during the year. The Society is still not well known around the country and we need to address this omission. If you need brochures to distribute contact us at chs@coa.gatech.edu One benefit of membership will be reduced registration rates at the 4th Biennial meeting in Minneapolis and the International Congress which follows in 2015, both described within.

Volume 28 No. 2 of the 2013 Construction Journal has been received and will be sent out to members in good standing soon. Do not forget that the Journal editors are always anxious to receive paper submissions – guidelines can be reached via the CHSA website. While on that subject calls for papers for the two CHSA events mentioned above will be sent out – more details inside.

Finally do not forget to send us any of your news you would like to share with the membership.

Brian Bowen
Chair, Management Committee

Don Friedman
Newsletter Editor

CONTENTS

METAL ROOFING IN NEW YORK CITY TO 1850.....	2
NEWS FROM OUR MEMBERS.....	5
2014 ANNIVERSARIES.....	6
THE 8 FT MODULE.....	7
FUTURE EVENTS	8
WHO WE ARE	9



First iron bridge in the United States, Dunlap's Creek, PA, 80ft span

THANKS TO OUR INSTITUTIONAL AND CORPORATE MEMBERS

- * A. Ottavino Corp.
- * Altusworks, Inc.
- * Associated General Contractors of America
- * Canadian Centre for Architecture
- * Consigli Construction Co.
- * ConstellationCenter
- * Construction Management Association of America
- * Georgia Institute of Technology
- * Gilbane, Inc.
- * Gleeds USA, Inc.
- * Hoover Treated Wood Products, Inc.
- * J.E.Dunn Construction
- * Joel Silverman & Associates

- * John Canning & Co. Ltd
- * Kaese & Lynch
- * Levine Construction Company
- * LimeWorks.us
- * Minnesota State University, Mankato
- * National Center for Preservation Technology and Training
- * Oak Grove Restoration Company
- * Paces Construction Co.
- * Texas A & M University
- * The Pepper Companies
- * The Whiting Turner Contracting Company
- * University of Oklahoma
- * Vertical Access LLC

METAL ROOFING IN NEW YORK CITY TO 1850

BY JØRGEN G. CLEEMANN

A recent study helped clarify the role played by metal roofing materials in early New York City buildings. A review of published sources shows that metal used as a primary roof-covering material has a pedigree that reaches far back to the early years of the republic, and that these materials were used on a wide variety of building types. While not as prevalent as slate or tile roofs, in the early nineteenth century metal roofs were nonetheless common in New York City.

In the northern European tradition from which early American architecture is derived, one of the oldest metal roofing materials is lead.¹ However, the cold climate and attendant need for pitched roofs in New York City must have proved incompatible with this fatigue- and creep-prone material, and as a result references to early lead roofs in New York are not presently forthcoming. The same cannot be said of copper roofs, which find an early example in City Hall, built from 1803-1811 to the designs of Joseph-François Mangin and John McComb, Jr. City Hall is just one of countless public and institutional buildings that were built with metal roofs, often with copper. However, the high cost of this material prior to the development of domestic copper mines in the mid-nineteenth century rendered it prohibitive for most private houses and other more modest buildings (the copper for City Hall was imported).²

For such projects builders found a ready alternative in sheet iron, the first American mill for which was established by Robert Morris in nearby Trenton, New Jersey, in the late eighteenth century.³ In order to protect them from corrosion, sheet iron plates were often dipped in molten tin to create "tinplate," or else they were dipped in a tin-lead alloy to create "terneplate." The plates were initially quite small—often only 10 inches by 14 inches—and were soldered together to create

completely flat surfaces. Upon installation, roofs covered with such materials were always painted—usually in red, reddish-brown, or green tones—in order to provide an additional level of protection.⁴ Although an early patent for the manufacture of tinplate was granted to Aaron Burk of New York City in 1815, the material was clearly available elsewhere prior to this date, as evidenced by its use on such older buildings as Virginia's Monticello (c.1800), Philadelphia's Arch Street Meetinghouse (1804), and Boston's Exchange Coffee House (1808). New York was at the forefront of the manufacture of terneplate, however; the city's own Joseph Truman began producing the nation's first supply in 1825.

Sheet metal roofs—tinplate in particular—became common in New York City in the early nineteenth century not only as a consequence of the technological advances mentioned above. Of particular importance to their proliferation were the various building codes implemented to prevent the devastating conflagrations that were shockingly commonplace in nineteenth century cities.⁵ An 1815 law states that roofs within a certain district must be constructed of "tile or slate, or other safe materials against fire, and not with boards or shingles."⁷ As noted earlier, metal roofs were never as common as tile or slate roofs; it is estimated that by 1830 approximately one half of the roofs in New York City were slate.⁸ Nonetheless, metal roofing materials could have been categorized as a "safe material against fire," and thus would have been permissible within the city's designated "fire district." The fire insurance maps that meticulously identified the construction types (and thus the insurance risk) of each building in New York City eventually picked up on this, categorizing metal roofs, along with slate roofs, as "1st Class" construction, i.e., the most fireproof.⁹

Even as metal roofs became increasingly common for private dwellings, they continued to be used on large public buildings as symbols of elegance and prestige. Trinity Church, designed by Richard Upjohn in 1839 and completed in 1846, provides a particularly interesting illustration of the perceived hierarchy that existed among metal roofing materials. An 1842 roofing contract for this building specifies that the prominent and highly visible main roof would be covered with eighteen-ounce copper, while the less visible side aisles would be covered with inexpensive tinplate.¹⁰ At approximately the same time, the dome of the recently reconstructed Merchant's Exchange was covered with galvanized sheet iron, an entirely new material that was manufactured by dipping iron plates into vats of molten zinc.¹¹ Although never as popular as tin- or terneplate, pure zinc roofs had been installed on New York City buildings in the 1820s and 30s. By the 1840s, however, pure zinc roofs had begun to go out of fashion, possibly due to the material's tendency to creep, and the element may have disappeared from roofing construction altogether had it not been for the 1837 discovery of the galvanization process, which provided excellent protection for the underlying iron.¹² By the 1850s, galvanization was combined with corrugation, in which the sheets are given parallel folds in order to increase bending strength, and corrugated galvanized iron eventually found widespread use, particularly among industrial buildings.¹³

Ongoing technological advances in the second half of the nineteenth century made metal roofs increasingly feasible and desirable for the citizens of New York City. Chief among these advances were the perfection of electroplate galvanization, the introduction of decorative stampings meant to mimic traditional shingles, and the development of industrial processes that allowed for the production of increasingly large pieces of metal.¹⁴ As the foregoing evidence makes clear, these innovations were made on the back of processes and techniques that were, by midcentury, already well en-

trenched in the city's building traditions.



Jørgen G. Cleemann is an associate at the New York City-based preservation firm of Higgins Quasebarth & Partners. He is currently working on an article on nineteenth-century brick making in coastal Maine.

¹ Margot Gayle and David W. Look, "A Historical Survey of Metals," from *Metals in America's Historic Buildings: Uses and Preservation Treatments* (Washington, D.C.: U.S. Department of the Interior, National Park Service, Preservation Assistance, 1992), 8.

² Gayle and Look, "A Historical Survey," 23.

³ Gayle and Look, "A Historical Survey," 74.

⁴ Gayle and Look, "A Historical Survey," 10-13.

⁵ William Elliot, *The Patentee's Manual; Containing a List of Patents Granted by the United States for the Encouragement of Arts & Sciences, Alphabetically Arranged, from 1790 to 1830* (Washington, D.C., S.A. Elliot, printer, 1830), 96, <http://books.google.com/books?id=4K87AQAAMAAJ&dq=the%20patentee%20manual%201830&pg=PP1#v=onepage&q=aaron%20burk&f=false> , Accessed 12 January 2014; Gayle and Look, "A Historical Survey," 12.

⁶ Donald Friedman, *Historical Building Construction: Design, Materials, and Technology* (New York: W.W. Norton & Company, Inc., 1995), 19.

⁷ *Laws of the State of New-York, Passed at the Thirty-Eighth Session of the Legislature, Begun and Held at the City of Albany, the Twenty-Sixth Day of September, 1814* (Albany: Printed by J. Buel, Printer to the State, 1815), 157, <http://books.google.com/books?id=Vn44AAAAIAAJ&dq=%22laws%20of%20the%20state%20of%20new%20york%22%201815&pg=PA157#v=onepage&q=tile,%20slate&f=false> Accessed 12 January 2014.

⁸ Robert N. Pierpont, "Slate Roofing," *APT Bulletin* 19, No. 2 (1987), 13.

⁹ *Insurance Maps of the City of New York*, Volume 1, Surveyed and Published by Sanborn-Perris Map Co., Limited, (New York: 1894).

¹⁰ Arthur Channing Downs, Jr., "Specifications for the Roofs of Trinity Church New York City, 1842," *APT Bulletin* 12, No. 2 (1980), 112.

¹¹ Gayle and Look, "A Historical Survey," 15.

¹² National Park Service, "From Asbestos to Zinc, Roofing for Historic Buildings, National Park Service," website, <http://www.cr.nps.gov/hps/tps/roofingexhibit/metals.htm> , Accessed 12 January 2014; Gayle and

Look, "A Historical Survey," 15.

¹³ Friedman, *Historical Building Construction*, 83.

¹⁴ Gayle and Look, "A Historical Survey," 12-15, 74.



In celebration of their 90th year in business, JE Dunn Construction has joined CHSA in a corporate supporting capacity. Starting out in 1924 in Kansas City, MI as a small residential contractor, the company has grown to become one of the major national general building contractors in the country with \$2.2 billion in 2012 revenues. The company is currently undertaking a number of historic restoration projects, with one of the largest being the Minnesota Capitol building designed by Cass Gilbert and opened in 1905. This project will be featured in the 2014 Minneapolis CHSA meeting.

NEWS FROM OUR MEMBERS

Benjamin Ibarra-Sevilla

Benjamin Ibarra-Sevilla (University of Texas at Austin) coordinated with Profesor Juan Ignacio del Cueto (UNAM) a Colloquium named: *Architectural Roof; Contributions of Ibero-America to Construction History*. The colloquium took place from December 9th to 12th in the School of Architecture of the National Autonomous University of Mexico (UNAM) and had 18 recognized speakers from Spain, US, and Mexico. The third day included site visits to Mexico City's Cathedral sixteenth century ribbed vaults, the Mining Palace tensile membrane, the Postal Office, the Fine Arts Palace vaults, and the church of San Antonio by Felix Candela. The content of this colloquium reviewed the history of roofing systems from pre-Columbian Mexico to contemporary solutions making emphasis in the constructive aspects of these structures as a result of an evolutive process consequence of the multiple cultures and influences. The event offered continuing education credits to professionals in the construction industry and was attended by students, professors and professionals from Mexico City.

A NEW CONSTRUCTION HISTORY SOCIETY

In June last year the Gesellschaft für Bautechnikgeschichte, which has been translated as Society for the History of Construction Technology, was formed in Berlin. Prof.Dr.-Ing.Werner Lorenz is president of the executive committee. The first annual conference was held in Aachen in November. Further information at www.bautechnikgeschichte.org

The new society joins an increasing international list. In addition to ourselves and Great Britain, similar societies exist in Spain and France.

4TH BIENNIAL CHSA MEETING, MINNEAPOLIS, MN DURING WEEK OF NOVEMBER 17, 2014

Not to be confused with the 5th International, this is the American Society's 4th meeting which is held every two years. It will be held in conjunction with the AIA Minnesota annual meeting in the Minneapolis convention center. Dates will be confirmed as soon as we have them but will probably be towards the end of the week noted above.

A Call-for-Papers for this meeting will go out in March. To encourage you to submit any presentation selected will be automatically included with the abstracts received for the 5th International.

2014 ANNIVERSARIES

175 Years (1839)

First iron bridge in the United States, Dunlap's Creek, PA, 80ft span



Trinity Church, New York City begins construction. Remained highest point in the city until 1893

150 Years (1864)

Washington Aqueduct, a 12 mile pipeline that brings water to the capital, is completed by the US Army Corps of Engineers (who still own it).

100 Years (1914)

The Panama Canal had its official opening during this year

50 Years (1964)

Two major engineering projects were completed:

- The Verrazano Narrows Bridge, New York
- The Chesapeake Bay Bridge & Tunnel, Delaware – Virginia



We are expecting an article about the Verrazano Narrows Bridge for the next newsletter. Short (400-600) pieces on any other of the above would be very welcome.

THE 8 FT MODULE

Can anyone shed light on where this module came from?

One possible candidate is indeed the Crystal Palace 1851 London. This from Robert Thorne in an article on Paxton and Prefabrication in Architectural Design Profile 70: Engineering and Architecture: "In design, the key to its modular system was its roof. The largest feasible panes of glass for use in Paxton's ridge-and-furrow roofing system were 49" by 10". Two such panes set at the correct angle constituted a roofing segment 8 feet wide; from that dimension stemmed the standard roof and gallery girders (24, 48 and 72 feet) and thus the dimensions of the building as a whole. . . .the entire building. . . obeyed a structural logic based on just one of its features."

Others have suggested, that in America at least, it was all something to do with the Balloon Frame coming into use in the early 1800's.

Let us have your own theories please!

GREAT BUILDINGS AND STRUCTURES THAT MADE A DIFFERENCE

This series was started at Georgia Tech a few years ago with a full day symposium on Santa Maria del Fiore, Florence with particular emphasis on the building of the dome. The series continues on April 5th, this time with a half-day symposium on the Crystal Palace built in London in 1851 to house the Great Exhibition. One of the features of this series is to draw upon the many talents that exist at Georgia Tech devoted to design and construction. Currently ten speakers from a variety of colleges and schools will examine many aspects of this ground-breaking project and discuss its legacy.

The proceedings will run from 8.00 am to 1.00 pm and be held in the Reinsch-Pierce Family Auditorium in the Architecture Building. Admission will be free.

For more information contact brian.bowen@coa.gatech.edu



FUTURE EVENTS CHSA

2014

April 5	Atlanta,GA	Great Buildings & Structures that made a Difference 2. Crystal Palace, London, 1851 For more information see box on page 7
November	Minneapolis, MN	4th Biennial meeting

2015

June 3-7	Chicago, IL	5th International Congress on Construction History
----------	-------------	----------------------------------------------------

2016

Austin, TX	5th Biennial meeting (date tbd)
------------	---------------------------------

FUTURE EVENTS OF INTEREST TO CHSA MEMBERS

2014

Jan 29-31	Lyon, France	2nd Congres Francophone d’Histoire de la Construction http://2cfhc.sciencesconf.org
Feb 7	Boston, MA	APTNE Annual Meeting & Symposium admin@aptne.org
April 9-13	Austin, TX	Society for Architectural History Annual meeting www.sah.org
Apr 11-13	Cambridge, UK	First Construction History Society Conference www.constructionhistory.co.uk

5TH INTERNATIONAL CONGRESS ON CONSTRUCTION HISTORY
JUNE 3 – 7, 2015 AT PALMER HOUSE HOTEL, CHICAGO. IL

Now less than 18 months away, planning and preparations are beginning to gather steam. The implementation of these is beyond the capabilities of our all-volunteer society, so we have hired a part-time administrator in Chicago, Melanie Feerst, to deal with the details. Local volunteers co-ordinated by Rachel Will, are well underway with their activities and next up will be the Call-for-Papers which is targeted to go out by mid-April.

Several people have asked how they can help. Right now the best you can do is talk the event up whenever you get the chance and please send us names and e-mails of colleagues that you think would want to be kept informed.

More information will be posted at <http://5icch.org>



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

Society of Architectural Historians, www.sah.org

MANAGEMENT COMMITTEE

Brian Bowen (Chairman), GA Tech, Atlanta, GA

Tom Leslie (Secretary), Iowa State University, Ames, IA

Jeff Beard, Drexel University, Philadelphia, PA

Jenn Cappeto: Higgins Quasebarth & Partners, New York, NY

Benjamin Ibarra-Sevilla, University of Texas, Austin, TX

Lee Gray, University of North Carolina, Charlotte, NC

Peter Hilger: University of Minnesota, Minneapolis, MN

Donald Friedman, Old Structures Engineering, New York, NY

Marvin Levine: Levine Companies, Deerfield, IL

Construction History Society Representative
James Campbell, Cambridge, UK

COMMITTEE ADVISORS

Frank Matero, University of Pennsylvania, Philadelphia, PA

John Ochsendorf, MIT, Cambridge, MA

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