It has been a long hot summer on the East coast but this did not stop Boston and New York in organizing construction history interest group meetings. Both were well attended with interesting presentations and a commitment to continue getting together with more frequent programs. While membership in CHSA is not required, we were able to sign up some new members as a result of these meetings – a welcome to you all! In the case of New York, a CHSA sponsored one day meeting is planned for some time in October 2011, with other get-togethers planned prior to this.

One of our new members from Brazil, Marco de Rezende, who attended the Philadelphia meeting in May, is keen to explore the formation of a Central & South American branch. At this stage he is trying to assemble a small organizing group of anyone interested in construction history in the area. If you know of anyone he should contact, or are interested yourself, please let him know at marco.penido.rezende@hotmail.com

On September 30th I attended a meeting of the management committee of the British Construction History Society which is in good shape. In 2012 they will be celebrating their 30th anniversary and plan a special event in recognition of this. Also in 2012 the 4th International Construction History Congress will be held in Paris – more details herein.

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THANKS TO OUR INSTITUTIONAL AND CORPORATE MEMBERS

* Associated General Contractors of America
* Auburn University
* Building Conservation Associates, Inc.
* Canadian Centre for Architecture
* Constellation Center
* Construction Management Association of America
* Georgia Institute of Technology
* Levine Construction Company
* Minnesota State University, Mankato
* Old Structures Engineering
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* The Sullivan Company
* Turner Construction Company
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* The Whiting Turner Contracting Company
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FROM 1960 – COMPUTERS – WHAT YOU SHOULD KNOW ABOUT THEM

Fifty years ago the Engineering News Record ran an article with this headline in their April 14th issue written by Frederic S. Merritt who was a senior editor at the periodical. He spent 6 months researching the special report which ran to 24 pages and was the cover story of the issue.

These of course were early days in computing applications in design and construction. By this time the second generation of computers had arrived using transistors instead of vacuum tubes. This improved reliability and data input, simplified programming and reduced power consumption and began to put computers within the range of engineering and construction firms.

In addition to explaining how the new computers worked, the article spent time on how to justify the capital investment required, concluding that a firm with 20 employees could probably support a computer of its own. There was a section on how to select the right computer and compared the characteristics of seventeen different models then on the market including those from IBM, Honeywell, Burroughs, Bendix, RCA, Control Data, Remington Rand and others. IBM ran a full page advertisement for their 1620 model billing it as “a low-cost, desk-size engineering computer”.

The author points out that “in essence a computer is a high-speed adding or subtracting machine” for use in such applications as engineering calculations of all kinds, accounting and payroll. He noted that they were in wide use by at least forty State highway departments for these purposes.

We have come a long way since then! If any of our readers would like to pick up the story, we would be delighted to publish the sequel.

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Our website at www.constructionhistorysociety.org has been updated to include a summary of the second biennial meeting in Philadelphia and a revision to the publications page. We have listed all our newsletters since the first one was published in October 2007 and any of these can be sent to you on request. We are always open to any suggestions for improvement.

Also note that we have a LinkedIn page: Construction History Society of America (what else!) – think about joining in.
Attempts to increase the fire resistance of wood are by no means new. Coatings and dipping or steeping methods originated thousand of years ago as mentioned by Aulus Gellius in Attic Nights, and there are many more archaic descriptions covering materials for this purpose. Pressure impregnation methods of “fireproofing” wood are of more recent origin, though records of early efforts in foreign countries go back nearly two centuries. Joseph Louis Gay-Lussac is credited with the development of fire retardants for wood when in 1820 he proposed treatments with ammonium phosphates and borax. This article however, explores the development, history and use of Fire-Retardant-Treated Wood in the United States.

In the United States, the commercial fire retardant treatment of wood by pressure impregnation was commercialized by Max Bachert and the Electric FireProofing Company, later known as the Protexol Corporation, in the early 1890’s, with the first commercial installation reportedly made in 1895. The first important demand for fire-retardant treated wood in this country apparently came from the U. S. Navy for use in battleship construction. A few years later, in 1898, the City of New York gave further impetus to the embryo industry by adopting a revised building code, which required that wood, used in the construction of buildings over 150 feet in height, must be treated to make it “fireproof.” From that time up until the beginning of World War II the industry was localized around the New York – New Jersey area.

The tremendous military demands for fire-retardant-treated lumber in the early 1940’s, caused the industry to expand nationwide. Its principal uses were for the construction of dirigible hangars and for shoring aboard ships. In 1943, 65 million board feet of plywood and lumber were treated. By 1946 production had dropped to less than 5 million.

Growth was stagnant during the 1950’s and 60’s until the superior fire performance of FRTW was recognized by insurance underwriting organizations on a national basis. In 1962, the Basic Building Code is the first model building code to acknowledge FRTW
as a structural alternative to steel and concrete in non-combustible types of construction and is written into Supplement 1 of the 1960 edition of the Basic Building Code promulgated by the Building Official Conference of America. Similar provisions for FRTW are published in the Uniform Building Code and the Standard Building Code in 1962 as well. In the 1970’s, exterior fire retardant treated wood was developed extending applications to cedar shakes, shingles, siding and other applications requiring moisture resistance.

With consolidation of the regional model codes into the International Building Code in 2000, fire-retardant-treated wood has become an American innovation specified for a greater range of structures than ever before (Table above). Code-mandated or owner preferred applications are varied and significant, ranging from wooden horse barns to nuclear power plants providing protection from fire to new and historic structures including the Washington Monument, Monticello, and Mount Vernon.

![Image of Hanger used to house US Navy submarine patrol blimps constructed of fire-retardant-treated lumber and plywood during World War II.](image)

Modern 1.2 million square foot warehouse that features a hybrid panelized roof system utilizing fire-retardant-treated lumber and plywood.

**USES OF FIRE-RETARDANT-TREATED WOOD**

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<td>FRTW in noncombustible spaces in unplastered buildings</td>
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<td>Shingles and shakes (Class A, B, and C)</td>
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<td>Walls and ceilings, fire and dropped more than 1/4 inch</td>
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**NOTES:**

1. R2 and R4 flammabilities in Types III, IV, V, VI construction.
2. Types I, II, V, and VI construction.
3. Except Type I and II construction of 3 or less stories.
4. Building not more than 3 stories.
5. Area can be increased to a maximum of 750 sq. ft.
6. When required fire resistance is 1 hour or 2 hours.

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SQUARE BUILDINGS AND ROUND BARS: C.A.P. TURNER AND THE MINNEAPOLIS WAREHOUSE DISTRICT

The explosive commercial growth of the Minneapolis Warehouse District, especially between 1904 and 1920, coupled with the local engineering and architectural knowledge, fostered a shift in construction type from masonry and wood-framed buildings to structures of reinforced concrete. In fact, the construction history of the district closely reflects the commercial evolution of the roughly 30-block area. The earliest recorded structures of the district (1855-1885) were typically mills of wood and heavy timber frames which served the lumber industry. As the grain industry took hold in the 1880’s, typical structures transitioned to three-story load-bearing exterior brick masonry buildings with internal timber framing. The strong growth of the railroads in the area jump-started the local building industry; the Warehouse District quickly became the farm implement capital of the nation and aptly named “Implement Row”. In close correlation, building structures transitioned from masonry and wood to reinforced concrete. Reinforced concrete was ideally suited to demands for bigger and taller fireproofed buildings capable of supporting the higher floor loads of the warehouse and wholesaling industries. Claude Allen Porter (C.A.P.) Turner found opportunity in the shifting economy and technology with his mushroom flat slab floor system.

Turner, noted as a man of broad interests and great energy, began his engineering, architecture, and building business in Minneapolis, Minnesota, in 1901. Often cited as an inventor, he demonstrated innovation early with numerous patents being granted for concrete-steel bridge systems, methods of support for steel reinforcing in concrete, and the famous (or infamous) “mushroom” flat slab system. Turner’s mushroom slab system is a girderless and notoriously thin flat slab floor system. Turner arranged the floor reinforcement in four directions in bands running perpendicular to and diagonally between the column heads. He additionally provided concentric rings around and hooks into the column heads. He conceptualized the system as a series of cantilevers over the column heads. With this arrangement, he concluded that the center of the slab panels resisted very little force and was thus able to significantly reduce the thickness of the slab. His slab designs met with skepticism from his professional colleagues and contemporary academic structural engineers.
The advantages of the mushroom system were well recognized: greater floor-to-ceiling height, easier formwork, economical use of reinforcement, and high floor capacity values. Its greatest disadvantage, however, was the vague analytical explanation. It has been conjectured that Turner deliberately withheld his analytical methods in an attempt to protect his proprietary knowledge. Today, Turner is still well-known in the structural engineering community of Minneapolis in part for his contributions to the development of reinforced concrete (see the well-written and concise article “Contributions of C.A.P. Turner to Development of Reinforced Concrete Flat Slabs 1905-1909” by D.A. Gasparini), but more for the poor long-term performance of the floor slabs. Owners of Turner’s buildings have documented floor deflections (sag) of up to 4 inches over a 16-foot floor bay.

Fortunately, much of the Minneapolis Warehouse District maintains its historic integrity. Beginning in the 1920’s, the wholesaling industry in Minneapolis began to decline as a result of changes in the transportation industry and general economic conditions. The Great Depression followed by local economic stagnation left many of the buildings generally unchanged. Now, new economic opportunities are bringing renewed attention and development to the area. Likewise, Turner’s contribution to the importance of the district was recently recognized by the merger of the local and national Minneapolis Warehouse districts in January 2010. Turner is listed as one of the key designers (engineer, builder, and architect) to make the district significant. Likewise, the earliest remaining example of Turner’s mushroom system, known today as the Western Container building, in Minneapolis was individually designated by the Minneapolis Heritage Preservation Commission specifically for its representation of Turner’s work.

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BOOK REVIEW

CONSTRUCTING PARIS IN THE AGE OF REVOLUTION,
Allan Potofsky, Palgrave Macmillan, 2009

We do not usually publish notices of European books, but this one is covered as it is quite unusual. It addresses the changes in the methods of design and construction brought about by the revolution of 1789. During the ancient regime the guild system was still in effect with its closed, reactionary and anticompetitive procedures. In 1791 the guilds were abolished and a pragmatic compromise between private enterprise and the state was brought about. This is a well-researched study of the social and political history of the workers and entrepreneurs during the revolutionary period to 1815.

Please let us know of any publications that will be of interest to our members for inclusion in the Newsletter.

4TH INTERNATIONAL CONSTRUCTION HISTORY CONGRESS, PARIS

We have news that this Congress will be held in 2012 over the period July 3rd – 7th. We cannot believe that the fact that this is the fourth Congress had anything to do with their choice of holding it over our national day! But who knows! A Call for Papers should be issued shortly and we will keep you informed. As the Fifth Congress will be in Chicago in 2015 we hope to have a good turn-out in Paris to promote this event.
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


Historical Construction Equipment Association, www.hcea.net