To All CHSA Members:

As fellow participants in the non-profit Construction History Society of America, we are still in the afterglow of a marvelous International Congress. CHSA has only about 150 members, and it is your dues and your efforts that underpinned a world-wide gathering of like-minded historians in downtown Chicago this past June. It was a wonderful few days of presentations and tours, with diverse perspectives and healthy discussions about our emerging field.

We all have our personal reasons for becoming part of an organization: sharing of ideas, gaining new friendships, offering new insights with hopes of thoughtful feedback to guide our future research, learning from those who have dug deeper to uncover new understandings. These are such worthwhile outcomes that it makes the small price of entry – payment of modest annual dues – a much-better-than-even exchange. We all need your continued involvement next year, and promise that we will husband your contributions carefully and for the right purposes.

I was motivated to try to expand the network of those interested in construction history a number of years ago as I worked in the architecture/engineering/construction industry and raised an eyebrow at Sir Nicholas Pevsner’s admonishment that “A bicycle shed is a building. Lincoln Cathedral is architecture.” Having framed custom houses, detailed steel buildings, and managed hospital and historic preservation projects, I thought that this influential author was dismissing process and scale in favor of aesthetics and monumentality. I was also captivated by Montgomery Schuyler’s statement, “It so happens that the work which is likely to be our most durable [and most worthy of posterity] is of bare utility; not a shrine, not a fortress, not a palace, but a bridge.” Architect Schuyler was describing the Brooklyn Bridge.

If you have the wherewithal, I truly hope to see you in Austin, TX in May 2016 for the CHSA Conference, which is being hosted by the University of Texas. On Thursday evening, May 26 we will have a Town Hall meeting of all members to discuss our collective future and to have a friendly debate over how we should embrace all aspects of history of construction or history of the built environment, or both. As Andy Warhol said, “They always say time changes things, but you actually have to change them yourself.” That’s what we – CHSA members – seem to be doing.

Best wishes in your endeavors, and please e-mail your thoughts to jlb488@drexel.edu,

Jeff

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Thanks to our institutional and corporate members

* Altusworks, Inc.
* Associated General Contractors of America
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New Executive Director Melanie Feerst

You might remember me as the coordinator of 5ICCH in Chicago this past June. Having just resigned a position as the Director of the Architecture, Interior Architecture, Designed Objects and Historic Preservation Programs at the School of the Art Institute of Chicago in order to devote time to my jewelry and glass studio practice, I was thrilled to begin working with CHSA and to welcome hundreds of 5ICCH delegates to my hometown.

I encourage your participation in the CHSA Newsletter survey (see link on the email you just received) and hope to see you in Austin, Texas in May 2016! Please note that the abstract submission date is coming up in mid-November!

I look forward to the challenges of growing the organization and welcome any suggestions from members as I begin this new position as your Executive Director.

Melanie
melanie@constructionhistorysociety.org
THE HOOSAC TUNNEL: BIRTHPLACE OF MODERN TUNNELING

Submitted by Clifford Schnexnayer (Cliff.s@asu.edu)
Author of "Builders of the Hoosac Tunnel"

In his report to the General Court of Massachusetts on the feasibility of a canal from Boston Harbor to the Hudson River the engineer Loammi Baldwin, the younger, in 1825 proposed a tunnel through the Hoosac Mountain. Because of cost, his proposal was not accepted. However, by 1833 canals were falling out of favor and two railroads had been charted to build what would become a continuous line from Boston to a connecting railroad in the State of New York. Therefore, these three separate railroad companies would provide a direct connection between Boston and Albany. As they advanced across southern Massachusetts these railroads spurred the economic development of towns and businesses. The towns of northern Massachusetts looked enviously and sought their own connections to Boston and Albany. The Fitchburg Railroad was charted in 1842 and in 1844 the Vermont and Massachusetts. Together they provided service from Boston to Greenfield just beyond the Connecticut River. Finally in 1848 the Troy and Greenfield Railroad (T&G) was charted to build westward up the Deerfield River to the Hoosac Mountain and pierce the mountain with a 4.75 mile tunnel.

The directors of the T&G first tried a tunnel boring machine (TBM) which was designed and patented by Charles Wilson a Springfield, Massachusetts, mechanic. This machine had a large wheel 24 feet in diameter; this matched the proposed tunnel diameter. Cutters or grinders were mounted on the edge of the large wheel so as the wheel rotated a foot-wide trench was cut in the rock. The monster machine had a center shaft or drill. This drill would bore a five-inch diameter hole at the center of the circular cut. The idea was to grind a foot or so into the rock and then back the TBM a safe distant to the rear when a charge of black powder was fired in the center hole. The machine actually advanced about 12 feet into the Hoosac rock before the mountain won the battle of strength. Metallurgy and the art of making durable bearing had simply not advanced to where this type of boring machinery could take such punishment.

TBM design and metallurgy have improved greatly with the 34.6 km Lötschberg Base Railway Tunnel in Switzerland which opened in 2007 being a good example. The TBM made a 9.6 m diameter boring and advanced at a rate of approximately 18 m per day. But bearing on TBMs are still critical to success. The 17.4 m diameter Big Bertha on the Alaskan Way project in Seattle has experienced problems. After the failure of the TBM, Herman Haupt entered into a contract with the T&G to bore the tunnel. Haupt was a West Point trained engineer and had previously been an alignment engineer, principle assistant engineer, and finally chief engineer with the Pennsylvania Railroad. Haupt gave five years of his life trying to punch a tunnel through the Hoosac Mountain. In those five years, the men hammering drill steel and loading the holes with black powder penetrated 2,394 ft. Haupt realized the almost five mile tunnel would never be completed at such a slow rate of progress so he labored mightily to develop a workable pneumatic drill. Actually, he believed the drill should be powered by steam. He was not successful and finally the Commonwealth of Massachusetts took over the work.

The Commonwealth placed Engineer Thomas Doane in charge of the tunnel work. Doane learned his engineering under Samuel M. Felton in the Charlestown, Massachusetts, office of Loammi Baldwin, the younger. Doane took over the

Patent drawing of the Wilson tunnel boring machine
office of Baldwin’s original practice when Felton became President of the Philadelphia, Wilmington and Baltimore Railroad. By the fall of 1864, Doane had almost 900 men pecking at the Hoosac Mountain with their picks, shovels, hammers, and steel drills. The speed of the advancing the bore still depended on men throwing 10 pound hammers for hours on end. Believing a pneumatic drill would soon be a reality, he built a dam across the Deerfield River and installed water driven air compressors. An inventor from New York City came and demonstrated his drill but, like Wilson’s TBM, the rock of the mountain quickly destroyed the drill. About the middle of June 1866, a batch of drills from the Putnam shops in Fitchburg, Massachusetts, were delivered to the Tunnel. Charles R. Burleigh, the designer of the drills, visited the tunnel to appraise the performance of his drill and admitted, “The drills are not a success.” The longest run for a drill before one of its eighty parts shattered was five days. But Burleigh was a man of resistance, and, by late fall, he delivered a drill following a new design. The new Burleigh drill had the drill steel attached directly to the piston rod and with each stroke the piston and drill rotated together.

The critical design feature, to keep the drills from destroying themselves, was the way Burleigh caused exhaust air to be vented to the back of the cylinder with each blow. When the piston and attached drill steel recoiled after striking the rock, this exhaust air acted as a cushion. The Burleigh drill was a dramatic success and moved tunneling into the modern era.
CALL FOR ABSTRACTS - 5TH BIENNIAL CHSA MEETING
MAY 26 - 29, 2016
SCHOOL OF ARCHITECTURE - UNIVERSITY OF TEXAS AT AUSTIN

We invite researchers and practitioners from all aspects of the history of construction to submit presentation and paper abstracts on subjects relating to the Americas for the 5th Biennial Meeting on Construction History, to be held in the city of Austin, Texas. The meeting will be hosted by the Construction History Society of America and the School of Architecture at the University of Texas at Austin from May 26-29, 2016 and follows successful meetings for the CHSA held in Minneapolis MN (2014), Cambridge MA (2012), Philadelphia PA (2010), and Atlanta GA (2008).

Submit Abstracts for Presentation (a written paper is optional)
Abstracts can be submitted for either a presentation or a paper. Abstracts will be compiled in a hard-copy catalogue to be distributed at the meeting. Abstracts for presentation imply that the author(s) intend is to do a slideshow presentation only. Abstracts for papers are also accepted implying that author(s) will do both, a presentation and a paper. The 5th CHSA Scientific Committee will be responsible for providing initial feedback to author(s) and forwarding the paper for peer review to the Journal of the Construction History Society Editorial Panel. The submission of a paper to the 5th CHSA meeting does not exempt papers from the Journal’s review process.

http://www.chsa-5thbiennial.org/chsa-austin-callforabstracts

Similarly to previous meetings of the CHSA, the meeting in Austin has a topic that will serve as the underlying discourse aiming to bring all the papers together. The conference topic is “Knowledge Exchange and Transference of Building Technology.” Nevertheless, all Construction History topics related to the Americas will be welcome.

One tour will be included in your meeting registration fee: your choice of a walking tour of Austin, Historic Bridges or San Antonio Churches.

JOIN US IN AUSTIN IN MAY!
LOOK FOR UPDATES ON THE MEETING WEBSITE

http://www.chsa-5thbiennial.org

Important Dates:
Deadline for abstracts: November 15th, 2015
Abstract decision notification: January 6th, 2016
Deadline for paper submission: February 9th, 2016
Deadline for final papers: March 31st, 2016
THE UTILITY OF BIM IN THE STUDY OF STANDING STRUCTURES

Introduction
This paper explores the application of an evolving technology, Building Information Modeling (BIM), to the study and documentation of historical building construction. The utility of 3D digital emulation as an approach to the research and documentation of an existing structure is explored through the investigation of a case study, the c.1870 Briggs House in Springfield, Oregon.

BIM
Unlike 2D CAD, in which a user describes a real-world three-dimensional object with multiple 2D drawings, with BIM the user directly constructs a 3D digital model, and produces 2D drawings from this model itself. A BIM model is far more complex and rich than the digital equivalent of cardboard—it is, rather than a simple solid, “a visual representation of an intrinsic database containing information about construction materials and assemblies, as well as spaces and areas within the building.”

BIM is an ideal tool for exploring complicated spatial or material adjacencies and engagements in three interrelated ways. First, a BIM model consolidates collected measurements in a single, unified model, rather than requiring the management of multiple, independent 2D drawings within even a single drawing file. Second, due to this fundamental feature of BIM, the user can readily monitor the completeness of an evolving digital model—omissions can be detected more readily in an otherwise coherent model than from somewhere within a set of drawings. Finally, BIM offers the user the opportunity to easily assess the accuracy of the model by comparing the rotatable, zoomable model to the building itself, rather than with a series of individual, unlinked 2D projections. Using BIM as a tool in the exploration and recording of an historic building can generate a concise, complete, and accurate model that may be subsequently used as the basis for further analysis, communication, and interpretation.

Case Study
The building selected for this project is the Reynolds and Eva Briggs House, an unoccupied residence associated with the National Register-listed Dorris Ranch Historic District in Springfield, Oregon. The Briggs House was built in several stages over time; the oldest section of the house was constructed around 1872, with subsequent additions over the following century. A previous study of the physical history of the Briggs House had partially exposed many components of the house’s structural systems. These minimally invasive subsurface explorations of the underlying building fabric had been undertaken in a number of locations throughout the house and, in conjunction with the structure visible in the crawlspace and attic, allowed for discrete structural elements to be observed from multiple, spatially separate locations in the house.

Modeling
Several days were spent at the house, hand-sketching all of the accessible structural components wherever they could be seen, measured, and touched directly. Because it was important to inflict no additional damage to the finish surfaces of the house, this work necessarily took place in discontinuous locations, and the resulting information was correspondingly incomplete (Figure 1).

Back at the studio, these known elements were modeled in BIM as digital framing, assigned a distinctive surface color, and tagged with the label Accurate. Working from this known information, adjacent but inaccessible structural

Figure 1: BIM model showing only those elements that were accessible in the actual house
elements could in many cases be confidently modeled as extensions or replications of the documented components, and were modeled in BIM as Extrapolated and assigned a contrasting surface color. Finally, there were swaths of the building fabric that were obscured or inaccessible; here, all that was possible was a best guess, and these elements were termed Probable. The final working model demonstrates the potential of crafting a complete virtual representation of the structural elements of the building, with three levels of confidence in the accuracy of the modeled elements visually differentiated (Figure 2).

Conclusion
Constructing a detailed model of any sort—be it balsa or binary—is an excellent means by which to understand the building being studied. It is a practice of visual and cognitive dissection, and constitutes a protocol for the careful examination of a building. Documented components can be then studied in the model for alignment and continuity, and constructional hypotheses generated to explain hidden unknowns. BIM is excellent tool for learning to visualize complex shapes and their interactions, to develop a deeper structural understanding of a building, and even, perhaps, to “discover some of its consequential secrets.”

2. Mary Horvat and Robert Melnick, National Register of Historic Places, Dorris Ranch, Springfield, Lane, Oregon, National Register # 88000724.
CONSTRUCTION HISTORY BOOKS

At Home with the Sapa Inca: Architecture, Space, and Legacy at Chinchero
By Stella Nair

This major architectural survey and analysis of the Inca royal estate at Chinchero significantly increases our understanding of how the Inca conceived, constructed, and gave meaning to their built environment.

STELLA NAIR Trained as an architect and architectural historian, Nair is Associate Professor in the Department of Art History and Core Faculty in the Archaeology Interdepartmental Program at UCLA. She coauthored (with Jean-Pierre Protzen) The Stones of Tiahuanaco: A Study of Architecture and Construction.
Release Date | July 2015
$45.00 | Paperback | 978-1-4773-0250-7
$125.00 | Hardcover | 978-1-4773-0249-1

Mixtec Stonecutting Artistry / El arte de la cantería mixteca wins at the Mexico City Architecture Biennale by Benjamin Ibarra Sevilla

The book “Mixtec Stonecutting Artistry/ El arte de la cantería mixteca” was awarded with the silver medal as the best publication work within the Second Architecture Biennale of Mexico City. The award was given by the College of Architects in Mexico City and the jury was formed by outstanding practitioners such as Augusto F. Álvarez Fuentes, Eliseo Arredondo González, Gerardo García del Valle y Blanco, Enrique García Formentí, José Grinberg Dameshovitzki, Luis Solís Avila. The award ceremony was celebrated on October 1st during the festivities of the Architect’s National Day. More information (in Spanish) in the Colegio de Arquitectos de la Ciudad de Mexico webpage.

**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

Society of Architectural Historians, www.sah.org

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**Management Committee**

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**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.

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