As we enter our second year of operation, I am pleased to report elsewhere in this newsletter on the very successful Inaugural meeting in November. This provided the opportunity for many of us to meet for the first time and to discuss common interests. It was good to see the range of construction history interests represented and the mix of academics and practitioners. The program itself was well received and contained fifteen excellent papers and keynotes, further detailed herein.

Critical to our success in 2009 is expanding our membership base. You should have received your renewal notices and I encourage you to renew as soon as possible. We intend to mount a membership drive early in the year, which will include asking you to help us recruit new members in all categories. This is particularly important as the financial assistance from the College of Architecture at Georgia Tech, which we have been able to rely on for organizing the Branch, will not extend into 2009, so we must stand on our own financially from this point forward.

We now have a new Management Committee (essentially the old Organizing Committee with additions) that was voted in at the Annual General Meeting held in conjunction with the Inaugural event. Names are listed on the rear page of this newsletter.

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Thanks to our Institutional and Corporate Members:
* Associated General Contractors of America
* Auburn University
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* CH2M HILL
* Clemson University
* Construction Management Association of America
* Georgia Institute of Technology
* Levine Construction Company
* Skanska USA Building, Inc.
* Texas A&M University
* Turner Construction
* University of Pennsylvania
Kintai Bridge in Iwakuni City

Kintai Bridge in Iwakuni City, Japan is set to become a test case for authorities on historical bridges. Although the existing structure was only built a few years ago, the skills used to build it, and the plans to which it was built, place it very firmly in the past. Now the city council, which owns the bridge, wants to persuade Japan’s Cultural Affairs Ministry to nominate it to the country’s indicative list for World Heritage listing and possible future inscription. To do this, however, will mean challenging the criterion of ‘authenticity’ which nominees have to meet, and will test the ‘intangible’ value of properties nominated to world heritage status, something which is still under debate by scholars and the World Heritage Convention, part of Unesco.

The crossing was first built in 1673 and was extensively replicated three times over the space of three centuries - in 1686, 1950 and 2005. Between the main rebuilds, it was constantly repaired. Its derivative reaches back to the intricate wood joinery found in Japanese temples, and translated, Kintaikyo means Brocade Sash Bridge, from the Japanese ‘kin’ (brocade), ‘tai’ (sash) and ‘kyo’ (bridge).

The structure itself is truly unique — making it difficult to give a definitive description of bridge type, which features wooden arch spans on masonry piers. The arches feature a network of interlocking wood supports and laminated beams based on the form of a reversed catenary. It is considered one of the country’s most outstanding contributions to wood-frame craftsmanship.

Beyond the topology of its construction and design, Kintaikyo is a remarkable example of the Japanese system of traditional wood construction, revolving around centuries of craft tradition and knowledge that has been passed from generation to generation. Although engineers, historians and archeologists link much of Japan’s culture and technological heritage to China, some aspects of the country’s heritage are unique, and in some ways more sophisticated than the rest of the world.

In order to have the structure nominated for inscription will mean challenging the criterion of authenticity that is required. The question of a replicated structure will be central to the debate on whether Kintaikyo merits world heritage designation, but this question has been successfully addressed by many other replicated world heritage sites. The 2005 inscription of the historic city of Mostar in Bosnia & Herzegovina, with its replicated bridge, could be significant in this debate.

The argument is that the intangible values such as craft, tradition and place mitigate the fact that there is no original fabric in the superstructure of the bridge. Kintaikyo also illustrates sustainability — one of the major themes in today’s engineering and construction industry. When a community chooses to rehabilitate rather than replace any bridge, they exercise safety and efficiency while at the same time saving the structure for posterity and maintaining its associated street or landscape. Kintaikyo is indeed an engineering superlative and aesthetic marvel that deserves wider exposure.

Creating a bridge that could be replicated rather than repaired was the decision taken by the Japanese centuries ago. The same holds true for Yakushi-ji — one of seven ancient Buddhist temples in Nara, a historic monument inscribed as Unesco World Heritage in 1998.

In fact the only wooden structures surviving from 300 years ago, much less dating back a thousand years, are either original structures protected by roofs and enclosed sides, or are replicas. Europe’s trussed-roof cathedrals, market halls and wood-framed bridges are protected by roofs and enclosed sides, but Kintaikyo is completely exposed.

With this in mind, how can a 23,000-member replica bridge meet Unesco’s standard of authenticity? The litmus test is whether the structure meets or exceeds a global view of ‘accuracy’. In 1994, upon the request of the World Heritage convention, Japan sponsored an international conference in the historic city of Nara, to examine the concepts of accuracy and authenticity.

Scholars admitted that it was difficult to clearly define authenticity, and subsequent workshops have been held in an attempt to
refine this understanding, and the concept of intangible values. Even though scholars are now beginning to embrace these concepts, there is no universal agreement of authenticity or genuineness, especially for monuments of an engineering or technological nature.

The Nara document points out that authenticity has many parameters, including form and design, material and substance, use and function, tradition and technique, location and setting, spirit and feeling, and other internal and external factors. To be included on the World Heritage list, cultural sites must be of outstanding universal value and meet at least one out of six selection criteria, which are set out in the committee’s operational guidelines. The first of these criteria refers to human creative genius, and to meet this test, the resource has to demonstrate the quality of human creativity, i.e., that it is genuine and stands on its own merits.

Criteria three, four and five refer to a testimony of representative example. The test of authenticity for these criteria consists of verification that the bridge represents a cultural tradition or is a legitimate example of the building type. Criteria two and six refer to the interchange of values or association of ideas, and the committee considers that these should be used in conjunction with other criteria. A world-heritage bridge must meet the test of authenticity in design, materials, workmanship, and setting and reconstruction is only acceptable to the committee if carried out on the basis of complete and detailed documentation of the original artifact and not conjecture. Kintaikyo meets this test.

The definition of authenticity is currently in the process of being expanded to include intangible values, which will be particularly pertinent for those bridges that embody the spirit or character of people or place. The recently replicated and world heritage-inscribed Stari Most in Mostar, Bosnia & Herzegovina would be a good example. Kintaikyo also embodies intangible values, in this case the perpetuation of craft technology, passed down over more than 300 years.

Guidelines for nominations state that each property should be compared with properties of the same type dating from the same period, both within and without the nominating state’s borders. Establishing a context for Kintaikyo, not only within Japan, but in a larger global context, is the challenge.

TAKING STOCK
The first Kintaikyo was built by a feudal lord in 1673 over the Nishiki River in Iwakuni city, connecting the peninsula on which the Samurai’s castle was built with the city. It is the easternmost city in Yamaguchi prefecture, just 40 km south of Hiroshima.

The first bridge was built through trial and error, and it lasted barely a decade before being destroyed by an earthquake. Following its reconstruction, in 1699 a detailed drawing was produced,
based on remnants of the original and replicated spans. This is the oldest extant drawing detailing measurements, joinery, types of wood and metal hardware, and along with twelve historic drawings, forms the main guidance for the carpenters and engineers today.

The second bridge lasted for 267 years although replacement of components took place during that period to maintain the bridge; apparently one of the spans was replaced every five years, so the whole bridge was rebuilt four times every century and repairs were carried out according to a fixed schedule. In the 18th century, the Japanese intended reconstruction of the superstructure to take place every ten years but in practice, financial restrictions prevented this from taking place, and deterioration or damage to wood members meant repairs were carried out ad hoc between 1673 and 1922 depending on the situation. Iwakuni city is now trying to establish a regular reconstruction programme every 20 years.

Periodic maintenance involving an almost complete rebuild is quite common in East Asia, with stone as well as wooden bridges. Many of China’s old bridges have stone stelae at the foot of the bridge, stating the dates and extent of any major reconstruction. Usable components are fitted into the new bridge alongside newly crafted components, but the bridge is always dated to its earliest construction. Stewards of Kintaikyo used a similar approach; the third Kintaikyo was reconstructed in 1953 following a flood in 1950, and the rebuild was based on the 1699 drawing and other documentation. It lasted forty-one years until 2001 when the eastern and westernmost spans were damaged by floods due to hurricane. The present bridge, completed in 2005, consists of five 5m-wide spans totalling 193m long. The three central spans are 35m long and the outermost spans are each 34m long. The cost of reconstruction in 2005 was approximately US$24 million.

Certain elements of the bridge’s joinery anticipate the possibility of damage, for example by flooding. A traditional tenon known as a ‘hozo’ is specially designed with a tapered shape, to allow members to come apart easily under certain types of loads, and minimise damage to the substructure. This might be considered as the forerunner of the seismic ‘fuse’ which is being used in design of certain at-risk bridges. Under seismic loading, however, Kintaikyo is quite flexible and has survived some quite serious quakes.

With the use of glue-laminated timber becoming commonplace in the construction industry, the reconstruction of Kintaikyo offers a rare opportunity for carpenters to learn the traditional skills of building in wood. One of the main benefits from a programme of regular rebuilding of the structure would be the chance to keep these skills alive through each generation. But this also requires a certain age of timber, which can only be found in trees of large diameter trunks, and so the city has a designated forest where timber for future rebuilding is being grown.

Eric Delony
Engineering & Industrial Heritage PC, Santa Fe, NM
Chief (Emeritus), Historic American Engineering Record (HAER), National Park Services
(Photo credit: Richard Margolis)
LEARNING FROM DESIGN AND CONSTRUCTION FAILURES

Construction History Society of America - Inaugural Meeting, November 7th – 8th 2008

The meeting was held at Georgia Institute of Technology in Atlanta with 46 in attendance. An opening reception was hosted by Skanska USA Building Inc. on the evening of the 6th. During the next two days, twelve papers were presented in three technical sessions and three keynote addresses were given. Interspersed with these was an Annual General Meeting of the Society and time was left for an open discussion session on the future of the branch.

The paper and keynote topics are listed on the next two pages. We have abstracts of all and, in a few cases, full papers, which can be made available to you at your request. For most of the presentations we have archived the powerpoint slides and individual ones can be sent to you at a small fulfillment charge, subject to the presenters agreement.

At the conclusion of the program, John Ochsendorf (above) led a discussion on what was to be learned with the following conclusions and comments:

- the subject choice was an excellent one – failure rather than success. The variety of “takes” on the subject illustrates the diversity of professional disciplines and specialities that CHSA can bring together.

PROGRAM SCHEDULE

Friday, November 7th

8.30 am - Opening session

Alan Balfour, Dean, College of Architecture, Georgia Tech
Welcome to delegates

James Campbell, Lecturer, School of Architecture, Cambridge University, Chair, Construction History Society
The International Growth of the Society & Welcome to the new American Branch

Steven Usselman, Associate Professor, Georgia Tech, President, Society for the History of Technology
The Importance of Research and Scholarship in Exploring America’s Technological Evolution

9.00 am - Keynote Speaker

John Ochsendorf, Associate Professor, Building Technology, Massachusetts Institute of Technology, Boston, MA
Construction History in the Education of Architects and Engineers: Learning from Failures and Designing for the Future

10.00 am - First Paper Session

Session Chair: Thomas Leslie, Associate Professor, Department of Architecture, Iowa State University, Ames IA

Concrete Cooling Tower Collapse at Willow Island, WV
Scott W. Kramer, Ph.D., Associate Professor, Building Science Department, College of Architecture, Design & Construction, Auburn University, AL

Deathtrap: The OTHER Ford’s Theater Disaster
Marshall C. Stewart, Association for Preservation Technology, DC Chapter, Alexandria, VA

A Monumental Challenge: Failures in Monument Design and Construction
Catherine Dewey, Architectural Conservator, National Capitol Region, National Parks Service, Washington, DC

Pavilion I Balcony Collapse, University of Virginia – Modern Lessons in Historic Preservation
Jeffrey Wouters, M.S., P.E. & Susan Lassell, M.A., Chiang, Patel & Yerby Inc., Austin, TX
- several papers identified lost or forgotten technologies relevant today in a society more attentive to sustainability.

- others focused on failures of modern technologies and designs and their lack of integration with long term maintenance.

- several comments applauded the audience mix of academics and practitioners.

- we still need to define more clearly why CHSA is distinctive from the other industry historical associations.

The general session addressed a wide range of topics relevant to CHSA’s future:

- Frequency of meetings: next national one to be scheduled in 2010. Local events to be advocated.

- Newsletter: articles needed.

- Construction History Journal: ditto.

- Interest sub-groups: to be encouraged

- Membership drive: essential to ensure survival.

- Inventory of Construction History courses: being compiled.

The session concluded with the endorsement of a proposal to host the Fourth International Construction History Congress in Chicago in 2012. This will be taken to the Third Congress in Cottbus, Germany in May 2009 and we hope to be successful. Tom Leslie (tleslie@iastate.edu) is coordinating our bid and can use any help offered.

1.30 pm Keynote Speaker
Bob Berkebile, FAIA, Principal, BNIM Architects Inc., Kansas City, MO.

FAILURE/OPPORTUNITY? Learning from Design and Construction Failures
2.30 pm - Second Paper Session
Session Chair: Anat Geva, Ph.D., Associate Professor, Department of Architecture, Texas A & M University, TX

Lean Construction: a New Paradigm in Response to the Failure of Current Construction Project Delivery Systems
Hamed Kashani, Ph.D. student, College of Architecture, Georgia Tech, Atlanta, GA.

Prefabrication is Back in Vogue, but have we Learned Anything?
Theodore H.M. Prudon, Ph.D., FAIA, Associate Professor of Historic Preservation (Adjunct), Columbia University, New York, NY and President, DOCOMOMO US

Tectonics, Tolerances and Transfiguration: Examining Eero Saarinen and Mies van der Rohe’s Building Envelope Detailing, Performance and Remediation Challenges at Drake University, Des Moines, IA
Robert Whitehead, AIA, Whitehead Design Workshop, Des Moines, IA and Lecturer, Department of Architecture Iowa State University.

Testing the Limits: Long-Term Deflection of the C.A.P Turner Flat-Slab
Meghan Elliott, P.E., Meyer, Borgman and Johnson, Structural Engineers, Minneapolis, MN

4.30 pm - General Session
Future of American Branch of the Construction History Society. Moderator: Brian Bowen, Professor of Practice, College of Architecture, Georgia Tech, Atlanta, GA.

Saturday, November 8th
8.15 am - Annual Meeting of Construction History Society of America

9.00 am - Keynote Speaker
Sara Wermiel, Visiting Scholar, Massachusetts Institute of Technology, Boston, MA
It was agreed by all that the conference had been an excellent start and that we can look forward to the third international congress in Germany in May 2009, a second CHSA event in 2010 and (hopefully) the fourth congress in Chicago in 2012.

With thanks to the Event Sponsors:
* Associated General Contractors of America
* Skanska USA Building, Inc.
* Old Structures Engineering P.C.

**Third International Congress on Construction History:**

Following the success of the congresses in Madrid (2003) and Cambridge (2006), the Brandenburg University of Technology invites scholars, practitioners and the interested public from all over the world to this Congress to be held May 20th – 24th, 2009 in Cottbus, Germany. The Congress will offer an open forum for presenting and discussing a broad field of construction history topics. Up to 200 papers are expected to be presented. The language of the event will be English.

We would encourage as many of you as possible to attend to help us have a sizable American delegation and to support our bid to bring the fourth congress to the US in 2012. Full details with information on registration, accommodations, etc. can be found at www.ch2009.de The early booking deadline to get a discount on the registration is February 8th 2009.

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**Hollow Tile or Concrete? The Debate over Fireproof Construction 1895-1907.**

10.00 am - Third Paper Session

Session Chair: Jack Pyburn, FAIA, Director, Historic Preservation Studio, Lord Aeck Sargent, Atlanta, GA

*Early Church Tower Structural Idiosyncrasies*
Marie Ennis, P.E., Old Structures Engineering, New York, NY.

*Housing and Working Space in Alabama 1890-1920*
Marietta Monaghan, Ph.D. student, College of Architecture, Georgia Tech, Atlanta, GA.

*Cladding Failures in Multi-Unit Residential Buildings in the Pacific Northwest: Diagnosis and Response*
Stéphane P. Hoffman, Building Science Specialist and Ashley Aiken McDuffee, Building Science Consultant, Morrison Hershfield Corporation, Bellevue, WA.

*The Durability Fallacy of Portland Cement Plaster*
Sue Ann Pemberton, AIA, Senior Lecturer, College of Architecture, University of Texas at San Antonio.

12.00 pm - Closing Session

What Have We Learned?
Chair: John Ochsendorf

2.00 pm - Special Session

Atlanta 1908: a Brief Design and Construction Perspective
In 1908 an Architectural program was initiated for the first time at Georgia Tech. In recognition of this event, the College of Architecture is offering this brief assessment of conditions in Atlanta at that time pertaining to its urban, architectural and construction development.

*Urban and Community Development in Atlanta to 1908*
Douglas C. Allen, Professor and Associate Dean

*Prominent Architects operating in Atlanta 1908 and their work*
Robert M. Craig, Professor

*Constructing Atlanta 1908*
Brian Bowen, Professor of Practice
**Anniversaries:**

1859: George Washington Ferris was born on February 14th. He was responsible of course for the famous Ferris Wheel at The Chicago World exhibition of 1893. This could carry 2,160 passengers in 36 glass-enclosed cars suspended from a 250 ft diameter wheel.

1909: Manhattan Bridge in New York opens on December 31st. The last (after Brooklyn and Williamsburg) of the bridges over the East River, designed by Ralph Modjeski.

1959: The St. Lawrence Seaway, 189 mile long, opens on April 25th

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**The Newcomen Society:**

The well-respected Transactions of this little-known British society are being relaunched as the International Journal for the History of Engineering and Technology. Transactions have consistently carried papers of interest to construction historians. The most recent issue (Volume 78 No.2) for example, includes an article on Stabilising the Leaning Tower of Pisa: the Evolution of Geotechnical Solutions.


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**Request for Qualifications:**

The Associated General Contractors of America, an organization representing the general contracting industry and one of our supporting Institutional members, will be celebrating the centennial of its founding in 2018. For this event, the AGC is commissioning a new history of the organization and its accomplishments.

They are seeking an author to write this book. If you are interested in receiving the RFQ for this writing project, please email Monica Cardenas at cardenasm@agc.org. A RFQ will be sent out in February. Please send this announcement to potentially interested writers or historians.

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**Canadian Corresponding Secretary:**

We have been fortunate to find a volunteer to explore the opportunities for expanding our membership in Canada. Alistair MacKenzie joined Ryerson University in Toronto in 1992 after a distinguished career with Wimpey International. He was program director of the Department of Architectural Science until his retirement in 2003, but continues to serve as a consultant and lecturer. He is active with the Canadian Society of Civil Engineers and was Chair of their National History Committee. He can be reached at amackenz@ryerson.ca
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.

THANKS TO GEORGIA TECH COLLEGE OF ARCHITECTURE

We are indebted to and grateful for the financial support we received during 2008 from the College of Architecture at Georgia Tech. Their support enabled our initial organization. Please help us now to lay our own sound financial footing by joining CHS.

MANAGEMENT COMMITTEE

Brian Bowen, Georgia Tech, Atlanta, Georgia

Dr. Anat Geva, Texas A&M University, College Station, Texas

Dr. John Ochsendorf, MacArthur Fellow, MIT, Cambridge, Massachusetts

Jeff Beard, American Council of Engineering Companies, Washington DC

Donald Friedman, Old Structures Engineering, New York, New York

Tom Leslie, Iowa State University, Ames, Iowa

Frank Matero, University of Pennsylvania, Philadelphia, Pennsylvania

Linda Ruth, Auburn University, Auburn, Alabama

Michael Ramage, Department of Architecture, Cambridge University, U.K.

We are compiling a list of any courses being taught that touch on any aspect of construction history, other than history or architectural design. If you are involved in, or are aware of, any such course, would you please bring it to the attention of Dr. Anat Geva (anatgeva@archone.tamu.edu). Thank you!

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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