Construction History Society of America Issue No. 8 July 2009

CHSA Newsletter

The big event since the last newsletter has been the gathering of construction historians from all over the world in Cottbus, Germany for the Third International Construction History Congress. This happens at three year intervals and it is therefore an important event on the calendar for us. Approximately 300 delegates were in attendance from 28 countries and nearly 200 papers were presented. Read more about it on the following pages which includes an outline of the program and abstracts of papers presented by members of CHSA. Being our first outing as a fully fledged Society, we were welcomed warmly and were chosen as the location for the 2015 Congress, which will be held in Chicago. The next will be in Paris in June 2012.

Also inside is some more information on our own plans for sessions in Boston (July 2009), Washington, DC (December 2009) and Philadelphia (May 2010).

In closing we make the usual plea for every member to get a member. We have brochures, draft letters and attachments and copies of newsletters that can be sent to you to help bring in more of your friends and colleagues.

Brian Bowen, Chairman
College of Architecture, Georgia Tech,
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Contents

Altmarkt, Cottbus

Thanks to our institutional and corporate members

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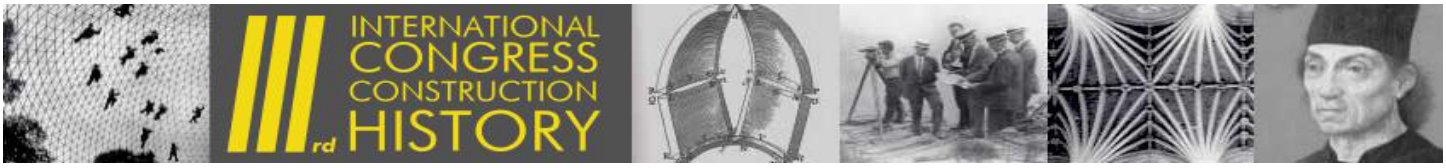
IIIrd International Congress on Construction History

Cottbus, Germany
20–24 May, 2009



Previous Congresses have been held in Madrid (2003) and Cambridge, UK (2006). This event was organized and hosted by the Brandenburg University of Technology (BTU). Werner Lorenz, Chair of Construction History and Structural Preservation, acted as Chairman and Volker Wetzk as Secretary.

Some Impressions of Cottbus, the CHC III Host City

In a speech before a concert, one of the events in the Construction History Congress program, the presenter explained that the 1908 concert hall (Staatstheater Cottbus) in which we were seated was built in a period of prosperity in Cottbus, due in large measure to the city's textile industry. What sort of textiles, I wondered, and where were the mills located? Were any still standing? No one could tell me anything about the industry, except where some of the mills were located. So one afternoon I went in search of textile mills.

Cottbus textile factory; woollen fabrics were the main product, but the town also manufactured apparel.

The area of town with "some" extant mills (my informant didn't know how many) was along the Spree river, south of Franz-Mehring Street. To my surprise, I found many old mills there: some were abandoned, some seemed occupied although probably not for textile production. Although the mills of Cottbus contributed only a small share of total textile production in the heyday of the GDR, they provided employment for a large number of people, roughly 10,000, in particular women.

The loss of jobs has exacerbated a general population exodus from the region, following reunification. We learned that thousands of housing units have been demolished, but one could see many abandoned buildings still standing. This includes the fine textile mills. These former mills seem ideal for adaptive reuse: they are of moderate size with lots of windows, are integrated in residential areas and architecturally attractive. But Cottbus is struggling to revive its economic base. Whether the mill buildings will survive until they can be rehabilitated is a question.

Most of the factories were built after the late 1870s. They were integrated into residential areas. In the early period, owners built their houses right next to their factories, and many examples of these high-style villas survive.

Sara Wermiel
Independent Architecture & Planning Professional
Massachusetts Institute of Technology

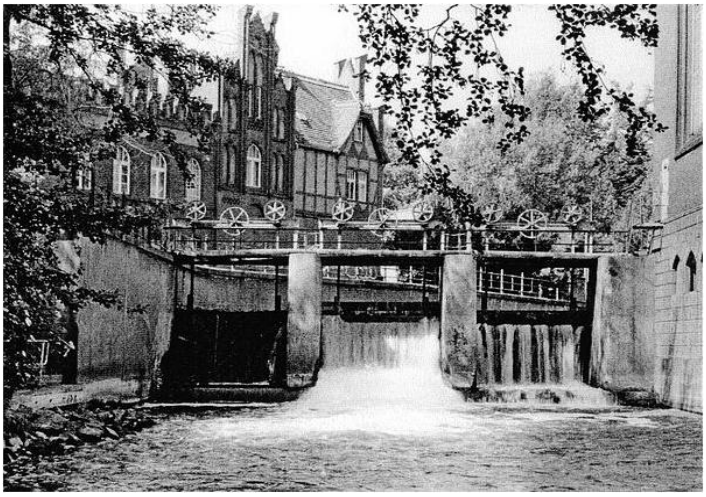
Attendance

A total of 283 delegates were listed at May 13th. Inevitably some did not show and others were added. Breakdown by country from the list is:

Country	Delegates #
Germany	95
Italy	47
Spain	38
UK	18
Belgium	17
USA	16
France	12
Sub-total	**243 (86 %)**

Countries with:
4 delegates – Netherlands, Switzerland
3 delegates – Turkey, Austria, Japan, Australia
2 delegates – Taiwan, Venezuela, Latvia, China, Mexico
1 delegate – Brazil, Columbia, Portugal, Peru, Bosnia, South Africa, Ukraine, UAE, Ireland, Slovakia

No registration data was given to be able to determine affiliation or disciplines represented, but the general consensus was about 75% were academics and the balance practitioners and others. Most papers were given by architects or engineers.



River Spree Weir, Cottbus

Program

194 papers are printed in the three volumes of the Proceedings. Of these 177 were presented in six concurrent sessions generally grouped by theme. In addition there were five films shown and two discussion periods included. All papers and presentations were given in English.

The program started on Wednesday afternoon, continued all day on Thursday and Saturday and half-day on Sunday. Friday was set aside for tours.There were six keynote addresses given.

A subjective analysis of the paper subjects reveals that a majority (75%) dealt with "objects" (i.e. buildings, bridges, structural issues, preservation and materials), with the balance addressing a very wide range of "softer" design and construction subjects.

Architectural and engineering subjects look to be quite well-balanced. Poorly covered subjects included economics, legal & construction (act of).

Papers presented by American delegates follow with abstracts. If you would like to be sent by e-mail a copy of any of the full papers, please send a request to chs@coa.gatech.edu

Copies of the Congress Proceedings in three volumes are available for €70 plus shipping.
Contact:
volker.wetzk@tu-cottbus.de

Discussion Sessions

Three of these were held. Matters arising of interest were:

- The IVth Congress will be held in Paris in 2012 and the Vth in Chicago on 2015.
- Encouragement was given to form national CHS autonomous branches and maintain a loose international consortium.
- There is still no clear consensus on a definition of Construction History, although many were offered.
- There is to be an attempt to start some kind of international research project.

Overall the Congress was a big success, well organized with a good diverse program. As usual the opportunity to interact with 300 other delegates was the biggest benefit.

Abstracts of papers presented by American delegates

Brian Bowen

Georgia Institute of Technology, Atlanta, GA

The Quantity Surveyor – MIA in the USA

This paper examines why the British quantity surveying approach to measurement and contracting for construction work did not establish itself in the United States, given the close economic and cultural ties between the countries. The evolution of measurement at both locations up to 1800 is studied and the factors leading to the establishment of a separate quantity surveying profession in Great Britain during the nineteenth century are related. Towards the end of this century, as the American industrial revolution gathered pace and as competitive single price general contracting emerged, the issue of responsibility for the measurement of construction work was hotly debated. This culminated in a joint recommendation from the general contractor's and professional associations that a system similar to the British approach of using bills of quantities, be adopted. The paper concludes with reasons as to why this edict was never accepted by the American industry.

Eric Delony

Engineering & Industrial Heritage, PC, Santa Fe, NM

State of Historic Bridges in America Compared to the World

Changing awareness and appreciation of historic bridges during the late-20th and early-21st century has made people realize the impact infrastructure has on the cultural environment. Highlighting efforts of the historic bridge world regarding regulations, codes, bridge engineering best practices, education, and how saving old bridges represent sustainability, the intent of this paper is to summarize what's happening in the US regarding public advocacy, Interstate bridges, landmarks and World Heritage, comparing America's experience with Europe and other parts of the world.

Richard A. Etlin

University of Maryland,MD

Serial Barrel Vaults, Inverted Arches, and Rings: A Neglected Family of Structural Forms

This paper explores the use of embedded arches, serial barrel vaults, inverted arches, and full rings primarily in masonry architecture of the pre-industrial age, while seeking to understand the intentions of the architects, es-pecially by gathering together rare examples of written explanations. Parallels are drawn to a comparable understanding in the writings of modern architects, engineers, and architectural historians.

Donald Friedman

Old Structures Engineering PC, New York, NY

Early Predictions of Steel Frame Deterioration: Permanency in High-Rise Construction

Steel-frame construction had critics, like all new technologies, from the time it was first used and discussed in the 1890s. Some of the criticism came from knowledgeable sources and was based on sound logic: steel framing was neither good nor bad because it was new or because it enabled high-rise construction, and architects, engineers, and contractors who worked with steel framing were capable of judging it on its expected performance. Load capacity was a straightforward matter of structural design, but long-term performance could only be addressed through speculation, since no such buildings had been constructed before. In New York and Chicago, the two cities with the largest collection of pre-1930 steel-frame buildings, facade-inspection laws introduced in the 1980s and the subsequent repair campaigns have revealed extensive corrosion damage to spandrel beams and exterior columns. Critics of steel framing had explicitly predicted this form of damage before 1900.

Dario A. Gasparini

Case Western Reserve University, Cleveland, OH

Charles C. Sunderland and the Diffusion of PrestressingTechnologies in the Americas

Charles C. Sunderland was employed by the John A. Roebling's Sons Company for over fifty years. from 1901 to 1952. He was Chief Engineer for Roebling for the construction of the George Washington Bridge. He was appointed Chief Bridge Engineer of the newly-formed Bridge Division in 1929 and served in that capacity until retirement. Sunderland advanced fabrication and processing technology for steel wire, wire rope, and wire strand. He developed new structural designs including prestressed cable truss bridges and posttensioned concrete box bridges. Research initiated by Sunderland developed core technologies for the prestressed concrete industry in the U.S. He sustained Roebling's vitality in bridge construction for the entire first half of the 20th century.

Anat Geva

Texas A&M University, College Station, TX

The Utility of Computerized Energy Simulations in the Study of Religious Identity

This paper highlights the methodological utility of computerized energy simulations in evaluating cultural and heritage influences on built form of immigrants' churches. Specifically, I compared St. Paul's Lutheran Church built by the Wends immigrants in Serbin Texas in 1871 with the Wendish original homeland church in Kotitz, Germany built 200 years earlier. A morphological analysis was conducted along accepted "design with climate" guidelines and showed that the church in Texas was built similar to the one in Kotitz. To corroborate these findings I utilized ENERWIN- a computerized energy simulation program to evaluate the comfort level and energy performance of each church in its actual location and if "transported" from one location to the other. These simulations provided controlled analyses of thermal comfort of a given church in different climates. The findings demonstrated that immigrants retain their church form in new frontiers despite changes in climate, and introduced empirical evident to the study of religious identity.

Lynne Lancaster

Ohio University, Athens, OH

Terracotta Vaulting Tubes in Roman Architecture: A Case Study of the Interrelationship between Technologies And Trade in the Mediterranean

Ms. Lancaster's paper was delivered as kynote presentation and there is no abstract available.

Cottbus

Staatstheater, Cottbus

Thomas Leslie

Iowa State University, Ames, IA

The Importance of Steel to Wind-Resistant Building Frames: Riveting and the Quest for Structural Rigidity

The rise of the tall commercial building at the end of the 19th century is often described as an outgrowth of steel's development as a building material. Rarely, however, are the mechanisms of this enabling explored. One might well ask why steel per se had very much to do with skyscraper construction, as for a good portion of the key skyscraper decades it was seen as an expensive, unreliable version of structural iron. Iron, in its cast and wrought forms, had been the structural material in most tall American buildings during the boom years of the early to mid-1880s, during which record heights of eight, ten, and eventually fourteen stories had been achieved. Why would architects, engineers, and clients change their material preference so quickly—from about 1888 until about 1895, when Engineering Record suggested that any use of cast iron in building could no longer be recommended—and what about steel made it better than iron, when the chemical differences between the two were barely detectable?

Renato Perrucchio, Philip Brune

University of Rochester, Rochester, NY

The Evolution of Structural Design of Monumental Vaulting in Opus Caementicium in Imperial Rome

We present a numerical study of the structural behavior of monumental Roman cross-vaulted halls in opus caementicium under static gravitational loads. The study is based on linear elastic FEM stress analysis and is focused on the Great Hall of Trajan's Markets and the Frigidarium of the Baths of Diocletian. Both cross vaults were designed following a similar supporting scheme based on contrasting arches, transverse shear walls, and supporting blocks. There are, however, critical differences in the two structures, which allow us to evaluate the shift in design paradigms that took place after the construction of the Great Hall. The analysis of the Great Hall reveals the inherent weakness of the support system. The contrasting arches play no significant role in the static equilibrium of the vault. The shear walls and, in particular, the supporting blocks are the critical elements on which the stability of the vault hinges. In fact, motion of the blocks might have caused a near collapse of the vault. The analysis of the Frigidarium shows a much improved structural configuration. The shear wall is extended upward, the contrasting arch is lowered and becomes an integral part of the shear wall, and, most importantly, the supporting blocks are now completely encased in the opus caementicium. This suggests that Roman engineers were able to detect and correctly interpret the structural deficiencies of the Great Hall, thus developing the knowledge necessary to build the gigantic hall of the Frigidarium.

Humberto Rodrigueux-Camilloni

Virginia Polytechnic Institute & State University, Blacksburg, VA

Rethinking Bamboo Architecture as a Sustainable Alternative for Developing Countries: Juvenal Baracco and Simon Velez

The potential of bamboo as a sustainable material of construction for developing countries is examined through the work of contemporary leading South American architects Juvenal Baracco (b.1940) and Simón Vélez (b.1949). Whereas Baracco draws inspiration from Pre-Columbian and Spanish colonial traditions of quincha architecture, Vélez takes full advantage of the structural properties of the Guadua angustifolia, creating daring monumental structures of unsurpassed beauty. Light and flexible, yet stronger than steel, this bamboo resists well the stresses buildings face during earthquakes. Both Baracco and Vélez combine tradition and modernity through the use of renewable and sustainable natural resources of rapid growth and outstanding environmental and aesthetic qualities that offer great economic possibilities for diverse regions around the world.

David A.Simmons,
Dario A. Gasparini

Ohio Historical Society, Columbus, OH

Alfred Rives and the Cabin John Bridge: Creating an Unprecedented 67m Masonry Arch at Mid-Nineteenth Century

The Cabin John Bridge is a masonry arch of 67m span, built from 1857 to 1863 to carry the Washington aqueduct over the valley of Cabin John Creek. The paper examines the role of Alfred L. Rives, an 1854 graduate of Ecole des Ponts et Chaussees, in the design and construction of the bridge. The inspiration for the long-span design of the Cabin John Bridge was the Grosvenor Bridge, completed in 1834. For structural analysis, Rives adopted the graphical statics method proposed by Mèry in 1840. Mèry's design acceptance criteria were based on a rigorous understanding of the lower bound theorem of limit state analysis. Rives designed the center for the bridge, devised the construction technology, and supervised its construction from 1857 to the keying of the arch on 4 December 1858.

Ryan E.Smith

University of Utah, Salt Lake City, UT

History of Prefabrication: A Cultural Survey

Prefabrication is a method of production in housing that has been harnessed to meet the needs and desires of different societies throughout the globe. Although the U.S. owns 26% of the prefabrication housing market, this is primarily due to the shear quantity of growth in the country. The UK, Scandinavia, and Japan control the majority of the innovations in which prefabrication constitutes a larger majority of the overall production of housing in these regions. This can be primarily attributed to the social and cultural contexts that give shape to the tradition of construction and knowledge base that make up these construction markets. This paper examines the history of prefabrication in these societies in order to identify how the U.S. might revaluate its construction ideologies, products and process in order to produce more affordable, higher quality housing.

Stephen Waite

Waite Architects, Edmunds, WA

Construction of the Seventh Century Dzong in the Kingdom of Bhutan

The Himalayan Kingdom of Bhutan, while protected by daunting geographical features, still found it necessary to develop a defensive fortress system during its feudal period. The first dzong (citadel) was built in the twelfth century and many of the finer examples we observe today are from the seventeenth century. It was during this latter period that the militaristic purpose was expanded to include district administrative functions and Buddhist monastic activities. These culturally significant examples of Bhutan's heritage still function today in the dzongs, much as they did in their original period. Simply built of stone and wood, but massive in scale, the dzong exemplifies craftsmanship and construction methods unique to this isolated country. Currently, Bhutan is transitioning to a constitutional monarchy, with a desire to join the world community. It now faces the imposing challenge of progress without sacrificing its architectural heritage and cultural values embodied in this building type.

Sara E. Wermiel

Boston Architectural College, Boston, MA

California Concrete, 1876-1906: Jackson, Percy, and the Beginnings of Reinforced Concrete Construction in the United States

This paper describes the early history of reinforced concrete construction in the United States. It traces the line of development from Thaddeus Hyatt through the engineer Peter H. Jackson and architect George W. Percy, to the constructor Ernest L. Ransome. Surprisingly, this occurred in the San Francisco Bay area, far from the places where Portland cement was produced. Jackson was probably the first American to build Hyatt's patented reinforced concrete slabs. Percy and Ransome together created two of the earliest reinforced concrete buildings, in 1890-1891. Yet, after this, no all reinforced building went up in the Bay Area until about 1906. Ransome moved his business east, and at the opening of the twentieth century, reinforced concrete buildings began to be built on the East Coast, by Ransome and others. Nevertheless, the few reinforced concrete buildings in the Bay Area, and the many buildings there with steel frames and concrete floors passed through the tremendous earthquake of 1906. The satisfactory performance of concrete in the 1906 earthquake and fire led to its widespread use in rebuilding San Francisco.

Forthcoming Meetings:

July 21, 2009 6.00 PM - 8.00 PM
Boston Area Construction History Group, Massachusetts Institute of Technology,
Room 7-431, Cambridge - Organizing Meeting and Program. More information: swermiel@mit.edu

November 2-6, 2009
The Association for Preservation Technology International Annual Conference, Los Angeles, CA www.apti.org

December 2, 2009
Construction History – A One-Day Exploration, National Building Museum, Washington, D.C.
Three panels with representatives from Federal Agencies, Professional & Trade Associations and Construction History Societies, will discuss why the study and research of construction history is important, their activities in the field and opportunities for future collaboration.
There will be a modest registration fee. More information: chs@coa.gatech.edu

May 21 & 22, 2010
Construction History Society of America
Biennial Meeting, University of Pennsylvania,
Philadelphia, PA. Call for Papers will be issued in the fall.

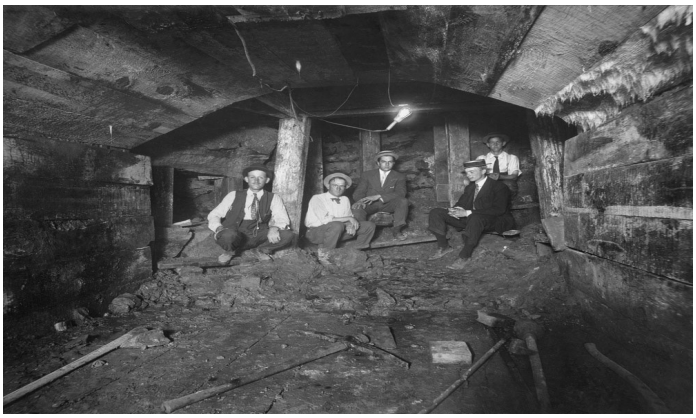
Dr. Geva Interviewed by The Rundfunk Berlin-Brandenburg TV

Dr. Anat Geva, associate professor at the department of architecture at Texas A&M University presented a paper in the Third International Congress of the Construction History Society that was held in Cottbus, Germany last May. Her presentation of the paper entitled: "The Utility of Computerized Energy Simulations in the Study of Religious Identity" was televised by The Rundfunk Berlin-Brandenburg TV. This TV broadcast also included an interview with Dr. Geva about her work on historic Wendish churches that were built in Germany, Texas, and South Australia.

Spremberg Tower
Cottbus

Whiting-Turner – A Century of Construction

The Baltimore construction company, Whiting-Turner celebrates a major milestone this year- its 100th anniversary. Many of the 2000+ employees have spent their entire career with the company giving reason for a significant sense of pride and accomplishment. The company has grown and evolved dramatically over the past century, but its core fundamentals remain relatively unchanged. Of particular interest, Mr. Willard Hackerman is only the second president in the company's history; an obvious testament to the company's stability.



Mr. Whiting Directing Tunnel Project in Baltimore

The company was founded in 1909 by George William Carlisle Whiting and LeBaron Turner. Whiting, a native of Baltimore, attended The Johns Hopkins University for his first two years of college and then completed his studies at the Massachusetts Institute of Technology (MIT), where he received a bachelor's degree in civil engineering. After working for the Baltimore Sewage Commission for four years, he decided to go into the construction business with his good friend and classmate at MIT, LeBaron Turner. Collectively, they invested $2,500 and founded a company on the belief that integrity, engineering talent, and dedication to their customers would make it the very best in the construction industry. It is interesting to note that Turner never actually worked for the company. Apparently, he had other interests and feared the loss of their friendship. In keeping the name, Whiting demonstrated one of the values upon which the company was founded – loyalty, a value retained to this day.

At the outset Whiting was experienced in heavy utility work and this focus continued in the early years.The first project was the construction of roads, curbs and sewers at Walter Reed Hospital in Washington, DC. Larger civil engineering projects followed such as the Loch Raven Dam in North Baltimore County, and bridges in the neighboring states of Pennsylvania, Virginia, and New Jersey. By the late 1920's, Whiting-Turner had become a regional contractor and was building large bridges as far away as Tennessee.

In 1938, Whiting returned to Johns Hopkins and recruited their very best civil engineering student, a 19-year old graduate by the name of Willard Hackerman. Hackerman helped set the company in a new direction by arranging to be one of the erection contractors for the Buffalo Tank Division of Bethlehem Steel Corporation. That opportunity allowed Whiting-Turner to become acquainted with industrial plants such as General Motors, Lever Brothers, Standard Acid Works, and WR Grace, who then became good customers. After World War II, Whiting-Turner continued to do industrial work and heavy civil projects, but also broke into the commercial market by building shopping centers, office buildings, and apartments. In 1955, Hackerman was made president of Whiting-Turner when Whiting retired.

The current executive vice president, Charles Irish, joined the firm shortly after graduating from the University of Maryland in 1953. His contributions include large commercial and industrial projects for both the private and public sectors. Many of Irish's projects were delivered by what is now known as construction management-at-risk contracts.

Today, more than 2000 construction professionals are employed in 30 offices across the country. What started as a $2500 investment is now a $4 billion a year construction company ranked #15 in the Engineering News Record's listing of the Top 400 Contractors in America. And yet, not much appears to have changed. The guiding principles remain those put in place a century ago by Mr. Whiting. And, like in the past 100 years, the future remains in the hands of the company's energetic and entrepreneurial engineers and managers.

Keith A. Douglas
Division Vice President
Whiting-Turner Contracting Company
Atlanta, Georgia

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 CHSA.

Management Committee

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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