After attending nearly 30 years of TICCIH conferences, I never got the impression that any country had anything quite like the HAER program. While every nation has some form of industrial heritage recording or listing usually with a central repository for information, none follow the model of hiring student architects, landscape architects, engineers, or historians during the summer months to produce drawings, photographs and histories for the national record. HAER has done this consistently for 36 years. This model evolved from employing out-of-work architects during the Depression resulting in the Historic American Buildings Survey (HABS) in 1933, HAER’s sister program. In the 1960s, when the HABS program was revived, the model changed to student internship program. HAER followed this precedent when it was established in 1969.

Following is a series of three articles on HAER documentation, discussing primarily measured and interpretive drawings. They were written by HAER architects Dana Lockett, Todd Croteau and Christopher Marston and feature examples of HAER’s approach to documenting hard-rock mining sites, maritime documentation and covered bridges. These are structure types that HAER has focused its recording efforts over the last few years. In a subsequent TICCIH Bulletin, a fourth article by former HAER historian, Tim Davis, will summarize HAER’s nearly 13-years of work documenting the roads and bridges in the national parks and parkways.

HAER is a program of the National Park Service created to compile a record of drawings, photographs and histories of America’s engineering, industrial and technological heritage. Documentation consists of measured and interpretive drawings, large-format photographs and written histories created primarily by student architects, landscape architects, engineers and historians hired to work on field projects during the summer. The documentation becomes part of the national collection at the Library of Congress. Along with the Park Service, which administers the program, and the Library of Congress, where the collection is maintained, the American Society of Civil Engineers (ASCE) participated in HAER’s creation and continues as a partner advising the program through its national membership.

For the HAER collection at the Library of Congress, see http://memory.loc.gov/ammem/collections/habs_haer/. When I first started work with HAER, I remember thinking that my generation would be the last capable of producing exquisitely executed, ink-on-Mylar, measured and interpretive drawings of industrial, engineering and technological phenomenon. This didn’t happen as subsequent generations of delineators produced drawings equal if not better than anything I created 35 years ago.

There are many wonderful stories to tell about the evolution of HAER documentation over three decades, but this is impossible in an introductory article. So let me highlight one aspect that may have relevance to TICCIH and international industrial heritage. That is what I call the “ICOMOS connection.” Beginning in the mid-1980s, US/ICOMOS, the National Park Service and other American preservation organizations came up with the idea of an international exchange of young preservation professionals among ICOMOS-member countries. HAER and HABS were perfect partners for this since we already had the infrastructure in place to employ students through our summer internship program. See www.cr.nps.gov/habshaer/ for information on the HABS/HAER program. While foreign students are employed by US/ICOMOS on a contractual basis, many are selected to work on HAER and HABS summer teams.

I was fortunate to have received a Fulbright Fellowship to study in England after graduate school. I knew the value of an international exposure and experience. To me, the “ICOMOS connection” was a tremendous benefit to HAER. Not only are we able to recruit the best talent from American universities, but we now are able to attract some of the best talent from throughout the world. I tried to place an ICOMOS intern on every HAER summer field team. Not only were project cosponsors excited about having a foreign exchange student in their community, but I thought it was important for our domestic American students to be able to compare notes and exchange experiences and information with their peers from foreign countries. In many instances, it was the first opportunity for foreign students to visit the United States. They gained hand-on
experience of American preservation. Many stayed an extra weeks at the end of the summer to explore some exotic location in the US such as Chicago, San Francisco or New York. From the feedback I received over the years, the opportunity to live and work in the US for 12 weeks was mutually rewarding.

Things have changed since initiation of the ICOMOS program in the 1980s, but the tradition continues this summer as four HAER employees will be ICOMOS interns. Cultural and educational exchanges are especially important today since the world has become even more complicated. Perhaps some TICCIH members participated or hosted an American student as part of the ICOMOS summer internship program. For information on the US/ICOMOS intern exchange program, see: http://www.icomos.org/usicomos/.

Eric Delony is a consultant on engineering and industrial heritage in Santa Fe, New Mexico.
Emerging technologies: marine documentation techniques used on the USS Monitor

Todd A. Croteau
HAER

Recent investigations have included digital laser scanning or Lydar technology, which captures three-dimensional data rapidly and accurately. In traditional surveys, a series of sections are measured along the length of a vessel and lines are fairied to these sections. Laser scanning measures the entire surface of the vessel and provides a complete record of the many imperfections along a hull’s surface. This data can be reduced to provide a fairied lines drawing also. While laser scanning is fast and accurate, the hardware is not inexpensive and there are some limitations to its capabilities. The scanners work by line of sight and if a portion of the object cannot be seen, then no measurement is taken at that area. However, scanner positions can be moved and tied together to fill in many of these gaps.

HAER has partnered with the National Oceanic and Atmospheric Administration (NOAA) to develop documentation for the American Civil War ironclad USS MONITOR, which sank during a storm off Cape Hatteras. The ship’s engine and gun turret have been recovered and are being preserved at The Mariner’s Museum in Newport News, Virginia. HAER has employed the use of laser scanning to develop existing condition documentation of these components for future study and the creation of a replica. HAER contracted with Epic Scan, Ltd. to undertake the scanning (they are also working on the CSS HUNLEY submarine project). The Monitor artifacts are being treated in water-filled tanks and must be kept wet to avoid deterioration. Laser scanning offers a relatively fast technique for gathering the data without prolonged exposure to air. What would take weeks of hand measuring was accomplished in five days. Between each setup, the artifacts could be sprayed with water and kept wet continually. The scans capture all the detail of the artifacts, but also captures the concretions that have developed while sitting on the ocean’s floor. These scans will also prove useful in evaluating the progress of the preservation treatment in the tanks. Another scan in a year could be overlaid with the present to determine changes in the conglomerations or within the structure itself.

Of particular note on the Monitor are the impact dents from enemy cannon fire. The laser scans clearly detail the size and depth of the dent and this information can be used in an analysis of the attack to determine type, size, and impact of the hit. At present, the data exists in its raw “point cloud” and a 3-D surface model was generated. HAER staff will continue to prepare measured drawings from this and other data collected to complete a set of measured drawings of the entire ship based on historic drawings, photographs, written accounts and the artifacts.
The Historic American Engineering Record often encounters large structures with inaccessible heights or complicated terrain that impede typical methods of measuring. Areas difficult to access typically involve the use of a ladder or cherry-picker to carry a person within measuring distance, but today there are sometimes more efficient means of gathering this data. Among several new measuring techniques, HAER is more commonly using electronic distance measuring (EDM) to collect data in the field quickly and with relatively less risk for damage to persons or the historic resource.

A recent project to document the Standard Gold Mill in Bodie, California presented the measuring team with soaring heights as well as steep terrain. These factors coupled with the remote location of the site made the choice of using Leica’s Total Station to measure the mill’s exterior quite obvious. While hand measurements were taken of the lower portions of the structure, several stations or positions were established for the Total Station with each allowing the reading of as many points as possible and having at least three reference points in common. Points were captured with the reflectorless laser all around the mill at intersections of planes that ultimately defined the shape of the building as well as the location of windows, doors and trestles. The reflectorless laser, requiring no prism to bounce back the beam, proved difficult in certain areas where the beam was focused on the irregular and shiny surface of corrugated iron. Many points had to be shot several times to receive a positive reading. Each Total Station position was downloaded into AutoCAD and aligned with one another using three reference points to create a cloud of points that represented the form of the structure in three-dimensional space. Three-dimensional faces and solids were drawn between the points to build the three-dimensional model and then rotated to a view that conveyed the desired information. While measuring with the Total Station can be simple and efficient and proved to be quite useful in the documentation of this industrial site, each documentation effort must initially be analyzed to determine the best approach with the tools available.
Covered bridges are treasured but vulnerable historic resources threatened by flood, arson, neglect, and modernization. In recognition of the threats and disappearance of these historic bridges Vermont Senator James Jeffords fought for the passage of the 1998 National Covered Bridges Preservation Act. This legislation authorized the Federal Highways Administration (FHWA) to assist states in preserving, rehabilitating and protecting covered bridges. The Historic American Engineering Record received a portion of this funding to manage the National Covered Bridges Research Program. This three-year program has six key components:

1. HAER documentation: identify and document some of the nation’s most significant covered bridges.
3. Update the World Guide to Covered Bridges Database by creating an interactive database, searchable maps, and website.
4. Develop a theme study to determine which covered bridges merit National Historic Landmark status.
5. Produce a handbook of Guidelines for Preserving Covered Bridges.
6. A travelling exhibit produced with the Smithsonian Institution entitled ‘Covered Bridges: Spanning the American Landscape’ will launch in the spring of 2006.

The first bridge studied by HAER was the Pine Grove Bridge, a burr arch-truss built by Elias McMellen in 1884, crossing Octararo Creek in southeast Pennsylvania. A team of architects measured the bridge in 2002 using traditional HABS/HAER field work techniques. They set a horizontal datum line with use of a theodolite. They sketched and measured one-quarter of the bridge in floor plan, reflected deck and ceiling plan, long section, cross-section, portal and side elevation, taking care to show lateral deflection and camber. Measurements were within an eighth of an inch of accuracy. The field team leader, Naomi Hernandez, communicated with team members regularly to insure accuracy and overlapping of information. An active county road crossed the bridge, which sometimes included an Amish horse and buggy.

Back in the office, the team drew the structure two-dimensionally in AutoCAD. They used photogrammetry to draw hard to measure elements like the random ashlar abutments. After completing the plans/sections/elevation, they converting these files to create a 3-D image of the structure, removing the siding to show the truss in action. The architects used 3-D to generate a cut-away view and typical Kingpost connection detail as well.

HAER also used this project to analyse covered bridges from an engineering perspective. Dylan Lamar of the University of Arkansas worked with Ben Schafer of Johns Hopkins University to perform structural analysis of the Pine Grove Bridge. While they determined there was too much retrofitted steel to get a true reading from onsite load testing, they nonetheless performed a thorough analysis by assuming approximate dead load and live loads for analysis purposes. They analyzed the arch and truss separately and then together to show how the arch and truss worked in conjunction as a combined structural system. Having shown the strengths and weaknesses of each separate system, the engineers modelled the Burr arch-truss together, where they found a noticeable change in deflection behaviour. While the arch is structurally dominant in dead load, the chords of the truss are dominant in carrying the global moment in mid-span live load. They conclude that while stresses and deflections for the arch and truss separately exceed allowable limits, in the combined system, both stresses and deflections are safely within allowable limits. The arch carries over three times the load of the truss, but depends on the truss to counteract the large bending moments and shear forces due to concentrated live loads. Thus the arch truss system is more than an addition of an arch to a truss or a truss to an arch, but a synergy of the two.

Concise qualitative engineering analysis like this can promote a general understanding of truss performance to an educated, but primarily non-technical, audience. This information, supplemented with HAER’s high quality historical and graphic information from the drawings, and photographs, show that after 70 years, HABS/HAER is still the international standard of documentation.
Zabrze, an urban and architectural monument of civilization changes in a coal-mining and heavy industries areas in the 19th and 20th century, is a town in the Upper Silesia region in South-West Poland. It was once among the largest industrial centres in Europe, and has inherited heavy industrial sites, equipment and architecture. Some of the machinery, still working, is unique in the world, and a landscape of towers, shafts and surface and subterranean tracks still remain as evidence of that rich industrial history. Support for the conference in Zabrze from the World Tourism Organisation was not accidental. Poland boasts one of the world’s oldest industrial heritage sites known worldwide as the 12th century Wieliczka Salt Mine, one of the very first to be included in the UNESCO World Heritage List.

Economic transition and transformation facing the towns and the region was requiring quick action to save valuable heritage and integrate it into modern life. The aim of the conference was to exchange experiences and to construct a programme of more intensive exploitation of post-industrial attractions in tourist promotion.

The conference bore fruit in the “Zabrze Resolution” addressed to state and local authorities, tourist branches, academics and the media. Among numerous discussions related to the qualities of the vacant mill sites and associated workers’ housing colonies, apart from developing a draft master plan for a future development of the Mills district of Mumbai, producing guidelines for the integration of the substantial existing mill buildings. They also designed guidelines for new traditional buildings within the sites and their future extensions.

According to the participants, the workshop didn’t intend to work out a fixed master plan for development, but served rather as an analysis for future possibilities that could stimulate discussion and debate in the city. INTBAU India is working with the Mumbai chapter of the Indian National Trust for Art and Cultural Heritage (INTACH). This non-governmental agency established in 1984 aims at the active participation of its members to create awareness among the public for preservation of Indian heritage. INTBAU India’s collaborators include the local municipality, the School of Planning and Architecture (SPA) in Delhi, the Raheja School of Architecture in Mumbai, and a number of governmental and non-governmental agencies.

World Tourist Organisation Conference
Zabrze - The Town of Industrial Tourism

Dr Julian Kolodziej
TICCIH Poland

postulates to be read, the creation of a “Global Industrial heritage list for tourism”, and the enhancement of actions leading towards the development, erection and consolidation of European tourist routes of industrial heritage, seem to be essential. Moreover, the resolution is to encourage other regions, especially the ones which have been involved in the process of revitalization and restructuring, to exchange experience and mutual aid in the field of exploitation of post-industrial facilities for the sake of tourism and leisure. While new industries are taking the place of the old ones, the existence of industrial heritage could have not been overlooked by creative area planners, entrepreneurs and tourism and leisure organizers. Some items of industrial heritage have had the good luck to be saved and put to new uses, to be studied, visited, exhibited, enhanced or even reused to serve a new demand; others, certainly a majority, have disappeared for ever. Tourism and leisure represent powerful options for saving industrial heritage and making their offer more attractive. Some destinations may not have beaches or other natural beauties, but they can offer a fairy-tale itinerary in an old mine or a concert or conference site in a wonderfully-arranged hall of an old factory, most destinations may not be able to display. Also new industries attract people’s attention and curiosity and visiting them helps better understand the modern world. Famous, fashionable products can gain in prestige (and sales!) if the public is allowed to watch where and how they are made. Industrial heritage conservation and the development of well-recognized brands of industrial tourism are among the present European Union priorities. TICCIH President Eusebi Casanelles, an Honorary Guest of the conference on opening ceremony, presented TICCIH’s activities on the field of industrial heritage conservation and its important role in education and leisure. The author gave a lecture on sub-regional tourist brand product strategy based on revitalization of industrial heritage.

One of the Mumbai textile mills whose future and potential was discussed at the meeting.

experts around the world, extensive public consultation programme which will include an evening public meeting with the citizens of Mumbai and a public exhibition, data collection and masterplan development, final masterplan and key proposals. Among the key speakers on the occasion were Robert Adam, Christoph Breninger, Prof. Akhtar Chavan, Andreas Duany, Dr. Matthew Hardy, Tasneem Mehta, and others.

The workshop was funded by The Prince of Wales Charitable Trust, the British Council (India) and private sponsors. (ANI)

Stuart Smith reports

I have recently been in Greece, where they are proposing that the ancient silver lead mining site at Lavarion should be proposed as a world heritage site, possibly together with the various islands in the Cyclades which supplied the site with ore. Mining in Lavarion has existed for at least 4000 years and provided the wealth for the Greek empire.

Several sites in Japan are also being proposed as world heritage sites - once again a silver lead site at Iwami which will be inspected officially by TICCIH representatives in June, and in July, following the TICCIH intermediate conference, there will be further meetings about the proposals to suggest that the sites of early European technology which was introduced into Japan in the 1860s and 1870s, centred on Kagoshima and Nagasaki, should also go forward.

The proposed world heritage site of Cornish mining was submitted recently to ICOMOS and an assessment of the site should take place during this summer and, if accepted, will lead to a number of supplementary applications from other ‘Cornish’ mining areas in the world including Mexico, USA, Canada, Australia and the British Virgin Islands.

The ICOMOS Scientific Committee’s meeting took place in Bergen, Norway, in October 2004 and was part of the conference at which TICCIH was represented. We were taken to see the outstanding and well preserved early-19th century hydro-electric power station at Tyssedal near Odda. The General Secretary of TICCIH and the Secretary of ICOMOS were both extremely impressed by the site and its possibilities as a world heritage site, particularly as there were still links with the sites in Odda itself where the electricity was consumed. These include the zinc plant and aluminium plant, a carbide factory and a fertiliser plant. As Odda reverted from being a complete tourist resort in 1900 to becoming an industrial town in the 1920s, thus destroying the tourist industry, there may be people who suggest that industrialisation has destroyed the quiet rural idyll. However, when questioned about this the Mayor of Odda said that without the coming of industry most of the inhabitants would now be living in America. The application to put Tyssedal power station on the world heritage site has been further enhanced by the fact that the town of Odda has now purchased the redundant carbide plant together with the fertiliser plant, which bisects the town of Odda and with sensitive redevelopment could revitalise Odda itself and also enhance the application for world heritage site status.

Obituary notice

Peter Neaverson sadly died from cancer aged 75 on December 22nd 2004. His passing leaves a considerable gap in British industrial archaeology, in which he was actively involved for over 25 years.

We began writing together at the time we ran the AIA Conference at Loughborough University in 1986. In 1996 we published Industry in the Landscape, 1700-1900 in the Routledge History of the British Landscape series and in 1998 Industrial Archaeology: Principles and Practice. We also edited several collections of papers including Managing the Industrial Heritage in 1995 and the proceedings of the 2000 TICCIH Millennium Congress in London, From Industrial Revolution to Consumer Revolution, in 2001. We were working together on a book on The Textile Industry of South-west England: a Social Archaeology. I am very pleased that we were able to send it to the publishers, Tempus, the week before he died and he was aware it would be published during 2005.

Peter was a member of many organisations as well as TICCIH. He was an Honorary Visiting Fellow first in the Department of History and then in the School of Archaeology and Ancient History in the University of Leicester, but he will be most remembered for his many contributions as an editor and a Council member of the British AIA.

Marilyn Palmer
Japan

New Developments in Industrial Tourism
TICCIH Intermediate conference
6-8 July, 2005
The conference will coincide with the 2005 World Exposition in Aichi Prefecture, Nagoya, at the heart of the World Expo site, has long been one of the manufacturing heartlands of Japan, but since 1996 the city has turned its industrial heritage into tourism products. The main sessions will be devoted to A. Industrial Tourism and the role of NPO/NGOs, B. Technology Transfer from the West to the East (especially Japan) and its impact on the Industrial Heritage, C. Industrial Heritage, D. The Preservation of Industrial Cultural Assets and their Use as a Tourism Resource, E. Revitalizing Communities through Industrial Tourism -- case studies in Japan, and F. Industrial Tourism in the world. Conference language: English
Contact: Akira Oita, National Representative of Japan, oita@suac.ac.jp, www.tcp-ip.or.jp/~ishida96/TICCIH2005/TICCIH2005_Programme.htm

Spain

VII International meeting on industrial heritage: Military Heritage in Peacetime
TICCIH España and INCUNA, Gijón (Asturias),
21st - 24th September, 2005
National and international papers, including those of TICCIH President Eusebi Casanoves and the US representative Prof. Patrick Martin, related to the study, analysis, interpretation and valuation of the industrial heritage generated by war and defence since the XVIII century: arms factories, housing, civil engineering (bridges, bunkers, shelters), fortifications and defence infrastructure. The conference will coincide with the 2005 World Exposition in Aichi Prefecture, Nagoya, at the heart of the World Expo site, has long been one of the manufacturing heartlands of Japan, but since 1996 the city has turned its industrial heritage into tourism products. The main sessions will be devoted to A. Industrial Tourism and the role of NPO/NGOs, B. Technology Transfer from the West to the East (especially Japan) and its impact on the Industrial Heritage, C. Industrial Heritage, D. The Preservation of Industrial Cultural Assets and their Use as a Tourism Resource, E. Revitalizing Communities through Industrial Tourism -- case studies in Japan, and F. Industrial Tourism in the world. Conference language: English
Contact: Alexander Keller agk@leicester.ac.uk

China

XXII ICOMOS International Congress of History of Science: Globalisation and Diversity: Diffusion of Science and Technology throughout History, Beijing, 24 - 30 July 2005
Registration closed 20 December 2004 but check web site: deadline for abstracts: 15 April 2005. The congress website with the first circular at http://2005b.lhms.ac.cn
Contact: Alexander Keller agk@leicester.ac.uk

Czech Republic

3rd International Biennial: Vestiges of Industry
Prague - Kladno
19-24 September 2005
The concluding event in the cycle of conferences, exhibitions, and cultural events devoted to the topic of mapping industrial heritage sites and buildings, exploring the possibilities for their conversion to new uses, and take stock of lost opportunities. The programme includes a conference reflecting on examples of European experiences and on the relationship between industrial heritage and culture, and a number of exhibitions, excursions and cultural events in Prague and in the nearby industrial town of Kladno.
Contact: Conference web page www.industrialhistory.cz

Italy

XX Symposium of CIPA, the ICOMOS & ISPRS Committee on Documentation of Cultural Heritage
Turin
27 September - 1 October, 2005
Conservators, architects and art historians, scientists and practitioners will report on the advances of inventory and monitoring in their countries, while technical experts report on up-to-date methodologies, on easy and low-cost methods for inventories, surveying and photogrammetry, new advances in photography, aerial and geophysical prospecting, and information technology for application in the heritage conservation and planning sciences.

Russia

The organisers of the international conference ‘Heritage at Risk: Preservation of 20th Century Architecture and World Heritage’ would like to inform you that the conference in Moscow has been postponed until 17 - 20th April 2006.

World Conferences

United Kingdom

III International Conference on the History of Transport, Traffic and Mobility (T2M)
National Railway Museum, York
6-9 October 2005
The social, cultural, economic, technological, ecological and political history of transport, traffic and mobility, with a special focus on the historical relationship between tourism and transport.
Contact: www.york.ac.uk/inst/irs or www.t2m.org

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