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The protracted collapse of Pennsylvania's Huber Breaker provided scope for lovers of industrial ruins. In this issue, Bode Morin chronicles industrial conservation in the United States since the 2008 downturn.

Photo John Morgan, Creative Commons

Opinion

Like postmodern Olympic games and world fairs, now as much to do with urban regeneration and place marketing as with sporting or commercial excellence, so World Heritage inscription is developing beyond conservation and celebration to embrace goals of economic renewal. This issue of the TICCIH Bulletin continues the series of World Heritage reports, presenting the Nord-Pas de Calais Coalfield, which hosted the recent TICCIH Congress, and Almadén and Idrija Heritage of Mercury, both inscribed three years ago, and the Tarnowskie Góry mines in Poland, hoping to join them on UNESCO's list next year.

'What do we get out of it?' Local benefits of the Nord-Pas de Calais Coalfield WHS inscription

Catherine Bertram, Director, Mission Basin Minier Nord-Pas de Calais

The Nord-Pas de Calais Coalfield, which was the host for the 2015 TICCIH Congress in September, was inscribed on the UNESCO World Heritage List in June 2012 as a "Continuing evolved cultural landscape", a category which was created in 1992. Mostly marked by the coal industry, this World Heritage site includes no fewer than 353 components (pits, head frames, spoil heaps, railways, housing...) showing the Outstanding Universal Value of mining landscapes.

'What do we get out of it?' is frequently asked by the inhabitants. Three years later, even if the period is too short to assess reliably the effects, this question needs to be tackled. Indeed, the issue of the concrete effects of the inscription is even more vivid in a territory such as the Coalfield, where many of the more than one million inhabitants are seriously affected by social, health, education and unemployment problems.

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In the years to come, a risk lies in a widening gap between the increasing prestige of the Coalfield in the eyes of tourists and media, and inhabitants' feeling that nothing has really changed in their lives. Worse, they could feel cut off from the process of redevelopment of the area. Another big difficulty is in different overlapping timescales: the long-term process of regional and local remediation through public policies, triggered or encouraged by the UNESCO inscription, does not fit people's immediate needs and desires for better living standards.

All these contradictions are at work, and the ambition of the UNESCO Management Plan, carried out by the public agency designated by the French State as the manager of the inscription, the Mission Bassin Minier Nord-Pas de Calais, is not to solve them by miracles but to grasp all stakes in the same framework: *how can we collectively find solutions and tools to combine the preservation of the integrity and authenticity of the Outstanding Universal Value of our cultural landscape, while making possible the evolution and redevelopment of the Coalfield?*

In this context, ownership of the inscription is still a key-issue. Between 2003 and 2012, the population was involved with the full nomination process, with memory cafés, puppet shows, collections of drawings, torch-lit processions at the foot of spoil heaps, sound and light shows, and about twenty "BMU support clubs" created by enthusiastic local organisations. Three years after the inscription, that enthusiasm is still alive and in September 2015, 200 stakeholders attended the first Conference on the UNESCO Management Plan for the conservation and development of the World Heritage Site.

In any field, there are and will be no easy answers and the economic benefits of the inscription cannot be reduced to the issue of tourism. Some studies show that betting on a "skyrocketing" UNESCO effect on the number of visitors can provoke high expectations and bitter disappointments. Tourism is an objective and "we are working on it!" but it cannot be the only pillar of our development strategy. We know the Coalfield is not and will never be the Seychelles; the 'niche' we are working on lies in visitors' yearning for authenticity, strong values and cultural identity and curiosity for original sites.

The benefits of the inscription are real. Of course, with the exception of sites under threat – thankfully not the case for the Coalfield – the World Heritage Committee's decision does not trigger any direct financial benefits. However, obtaining the label can have a great knock-on effect on communication, touristic promotion and economic attractiveness, which can be illustrated by some examples.

A long-lasting interest of media in the UNESCO inscription After the boom in June 2012 with more than 200 articles in the national and regional press, the high number of publications continues.

A new touristic destination While this was not the primary aim, the Mining Basin's inscription in 2012 has the potential to create a new tourist destination mid-way between Brussels, Paris and London, especially with the new Louvre-Lens museum.

This outstanding museum, visited by delegates at the recent TICCIH Congress, attracts half a million visitors a year, joining other places of interest in the Mining Basin such as the Historic Mining Centre in Lewarde (150,000 visitors/year) and the memorials and cemeteries commemorating soldiers from the two World Wars (500,000 visitors/year). At a time when new varieties of tourism are looking out for original products, the buzz created by the industrial heritage of the Mining Basin was perfectly timed to make it an attractive destination.

A trump card in marketing and attractiveness International recognition with the World Heritage stamp has put the Mining Basin on the global map! The UNESCO inscription makes the Coalfield different, singular and unique, all critical in global competition between territories.

Boost for financing projects The inscription enabled the purchase and financing of works to preserve decayed sites and buildings, mostly listed as Historical Monuments, and the redevelopment of the five key mining heritage sites (ERDF axe 4 measure 6c). It triggered the legal procedure of protecting 78 spoil heaps for their historic and landscape value, the financial program of the five pilot mining housing developments -32 €m to renovate 650 houses and 34,5 m€ to public spaces and facilities.

However, World Heritage listing has not only changed outsiders' views but also affected the territory.

Pride and self-esteem Recognition of industrial heritage has now made it a source of local pride. Living in a World Heritage territory has helped to free inhabitants of their inhibitions and boost their self-esteem. In an area that has often fallen victim to petty squabbling, the World Heritage 'adventure' has additionally provided proof that joining forces can bear fruit. Cooperation is essential in order to count for something when competing on the national or international scene.

Growing awareness that heritage is economic, social and cultural capital, a "seed" for economic innovation Lastly, inscription in 2012 demonstrated that the Mining Basin can fulfil requirements and lay claim to better quality in architecture and the environment to build projects for the future. These are all factors contributing to more ambition and a huge boost in confidence from an economic point of view, in particular among young people, who are encouraged to continue studying or start up a company.

As a concrete illustration of this process, key mining heritage sites, namely the five major collieries, look set to become economic and cultural centres serving as a link between yesterday's industry and the knowledge-based economy of tomorrow. The 11/19 sites in Loos-en-Gohelle (eco-industry), 9-9bis in Oignies (logistics) and the Wallers-Arenberg colliery (creative graphics) are now centres for training, innovation and research which are to help the Mining Basin to leave behind the primary economy (coal mining and auto assembly) which was its single focus for too long, and at last to master development that's 'sustainable' in every sense of the word.

Opinion



Wailers Arenberg mine site.

Photo Hubert Bouvet, Région Nord-Pas de Calais



Waste heaps in Maisnil-les-Ruitz et Ruitz.

Photo Hubert Bouvet, Région Nord-Pas de Calais

Report

The doomed struggle to save the Huber Breaker provides a compelling narrative of post-industrial conservation in America since the 2008 banking crisis. The last of Pennsylvania's anthracite coal processors dominated the local landscape for 75 years. It was finally demolished and its metal sold for scrap in the fall of 2014.

The slow death of the Huber Breaker

Bode Morin
Historic Site Administrator, Eckley Miners' Village

When completed in 1939 to replace the aging Maxwell Breaker in Ashley, Pennsylvania (USA), the Huber, named for Glen Alden Chairman Charles F. Huber, was described as "modern in both architectural design and operational details" and the plant provided "a highly marketable output." The breaker could process 7,000 tons of anthracite coal per day and over 1,000,000 tons per year. The 132' (40m) tall structure was built of steel and concrete with notable full height glass curtain walls. In addition to updated equipment, the breaker was designed to handle the output of several collieries at once. The complex was one of the largest in the region and included a power house, breaker, coal bagging house, office buildings, and ancillary buildings.

Post-industrial history While demand for anthracite coal waned over the nearly 40 year operating history of the breaker, the company made significant improvements to the site in the 1950s and 1960s to modernize operations. The Glen Alden Company continued to process coal at the Huber into the 1970s when a declining market and a series of failed financial maneuvers affected operations. It ended mining in 1973 and sold the breaker in 1975. The new owner, Lucky Strike Coal Company ran the breaker to process coal from its strip mine operations for the next year.

Louis Beltrami and the Lucky Strike Coal Company closed the breaker in 1976 but held on to the property with no activity until Beltrami's companies were forced into bankruptcy in 1991, resulting from disputes over the site and legal actions. The proceedings continued for ten years until a settlement was reached. In 2001, Al Roman of No. 1 Contracting bought the Huber site including the breaker and ran his business from the site. Immediately, local preservation hopefuls speculated that Mr. Roman, an engineer who had been a respected figure in the anthracite industry since the 1950s, would donate the structures to a preservation society or other entity for conversion into a museum.

The hope of saving the site grew further after 2001 with political support from state and local representatives. Roman, however, believed the Huber Breaker Preservation Society, formed to save the breaker in 1990, didn't have enough human and fiscal capital to transform the site, especially as liability and asbestos threats mounted.

However, he later claimed that his intention was never to donate the site, but to sell it for its scrap value or some other financial return. He eventually hired a firm to plan for the demolition but hit opposition from county officials who stalled the permit and threatened to take the site through eminent domain hoping to save it. Unfortunately, state and local governments did not have any money to support the project, especially as the local economy slowed down.

Although he supported creating a museum at the site, Roman valued the property too high for non-profit or government acquisition. He was willing, however, to swap the site for twenty one acres (8.5 ha) of nearby land controlled by the Luzerne County Redevelopment Authority. The Authority, however, was constrained by a hold on the property to ensure it was properly remediated and only offered six acres (2.5 ha). While Roman was willing to take a loss on the structure, the six acre offer and a later cash buyout option fell too short for what he considered fair.

In 2010, during the national financial crisis that began two years earlier, No. 1 Contracting, like the Lucky Strike Coal Company before it, was forced into bankruptcy owing \$10,000,000 to over 200 creditors. As part of the settlement, Paseo Logistics, a steel recycling firm from Philadelphia, Pennsylvania, bought the Huber site, and the Earth Conservancy, a non-profit land holding company, bought the office building and several acres of non-industrial land. Paseo never made any ovation of support toward the preservation of the breaker and as soon as permits were issued began site cleanup and demolition. While the structure itself couldn't be saved, the Earth Conservancy donated three acres to the Huber Breaker Preservation Society to create a miner's memorial park. Paseo donated equipment and signage to the effort. Estimators valued the breaker steel between \$600,000 and \$700,000.

Huber Breaker Preservation Society While the bankruptcy courts worked through the various proceedings over twenty years, the Huber Breaker Preservation Society was publicly trying to raise both political support and money to buy the breaker. In 1990, the Ashley Breaker Preservation Society was formed to begin preservation efforts. While its efforts were largely inconsequential in the 90s, it was reorganized with a broader mission as the Huber Breaker Preservation Society in 2001 following the National Park Service Historic American Engineering Record (HAER) report documenting the structure and a feasibility study exploring preservation and development options. While the HAER report was primarily focused on history and operations, the feasibility study outlined goals and costs to convert the site to a museum and park and included site cleanup, security, and signage with estimated costs ranging from \$500,000 to \$4,000,000. The challenge, according to Ray Clarke, chairman of the Huber Breaker Preservation Society, was the ownership issue. Without the legal right to work on the building many fundraising efforts fell short.

Report

Clarke stated that the society had several successful fundraising efforts but was not able to fully capitalize on its achievements. Ultimately the group was forced to return significant funds including a \$90,000 grant for cosmetic restoration because it didn't have access to the site and \$12,600 of a \$26,000 grant because it didn't spend the money in time. While money came in from small community grants and individual donations, Clarke said the society never made enough in any give year to formally file an Internal Revenue Service form 990, a tax form required of non-profit organizations in the US. He estimated that the society never had more than \$60-70,000 at any given time. With the 2014 demolition of the breaker, the society's primary focus became the development of the miners' memorial park on the land donated by the Earth Conservancy.

Social, cultural, and economic constraints While the primary reasons the Huber Breaker was not saved lied in its enormous size, its scrap value, and the poor economic conditions that led to two bankruptcies, these are conditions influenced and informed by larger economic and post-industrial social and cultural forces. It is true that no organization ever had enough money to buy the site and the bankruptcies hurt any long-term planning, but economic fluctuations triggered in 2008 that saw significant downturns in economic growth in 2008, 2009, and 2011 had reverberations throughout the US economy.

Unemployment rose, housing prices dropped, and people tended to curb spending. This downturn had significant affects on government tax revenues and many state, regional, and municipal governments had to cut spending. The Pennsylvania Historical and Museum Commission, for example, lost nearly half of its operating budget in 2009 leading to the closure of historic sites and museums and the loss of jobs. As economic conditions worsened, the lack of public money trickled down to county governments. Luzerne County which had been supporting some action at the Huber Breaker had to withdraw while trying to manage a \$400 million dollar debt.

Although the economic downturn that occurred in 2008 had an immediate effect on the anthracite region, coal mining had been significantly declining since the 1930s and there had not been any meaningful economic replacement for the industry. Several attempts to revitalize the region included the development of industrial parks located near major east-west and north-south interstates. Some companies relocated here because of temporary tax breaks and some warehouse facilities opened but the level and quality of jobs and economic activity did not rebound. In many post-industrial regions in the US, as economic conditions worsened people fled leaving behind an aging population with poor prospects for economic recovery. Mired in this malaise, social and cultural conditions worsened for those who remained. Several studies conducted over the last five years demonstrated that the anthracite area of Northeast Pennsylvania is among the lowest rated regions in the country in education, income, quality of life, job growth, age, health, and happiness.

The members of the Huber Breaker Preservation Society shared a common goal and worked together for twenty years to save a key part of their heritage. But the ultimate loss of the breaker occurred during one of the most significant economic downturns in the last century in a community beset by worsening living conditions and poor cooperation, trust, and expectation for a better future. While the end of the coal industry left a few significant features on the landscape, it also left poor economic and productive social legacies. Without a shared belief in common goals and government and community buy-in, it became nearly impossible to overcome the hurdles necessary to save such a large building and the loss of the breaker somehow doesn't seem as much a defeat given the social and economic conditions, as another anecdote not atypical for the region.



The memorial to the vanished Breaker which used to stand in the background.
Photo: Bode Morin

Worldwide

Russia

Industrial tourism in the Urals

Nadezhda Solonina and Olga Shipitsyna The Urals state academy of architecture and arts

During many decades the Urals was a closed strategic region with plenty of industrial enterprises. The basis of the Urals' culture is metallurgy which has been here since ancient times. In the period of the Urals' most active development – from the beginning of the 18th to the early 20th century – about 300 metallurgical production centres were founded. Many related enterprises were also built in the Urals to support metallurgy production including mines, quarries and coal burning enterprises. In the 20th century many new factories were built and a large number were developed on historically formed industrial sites.

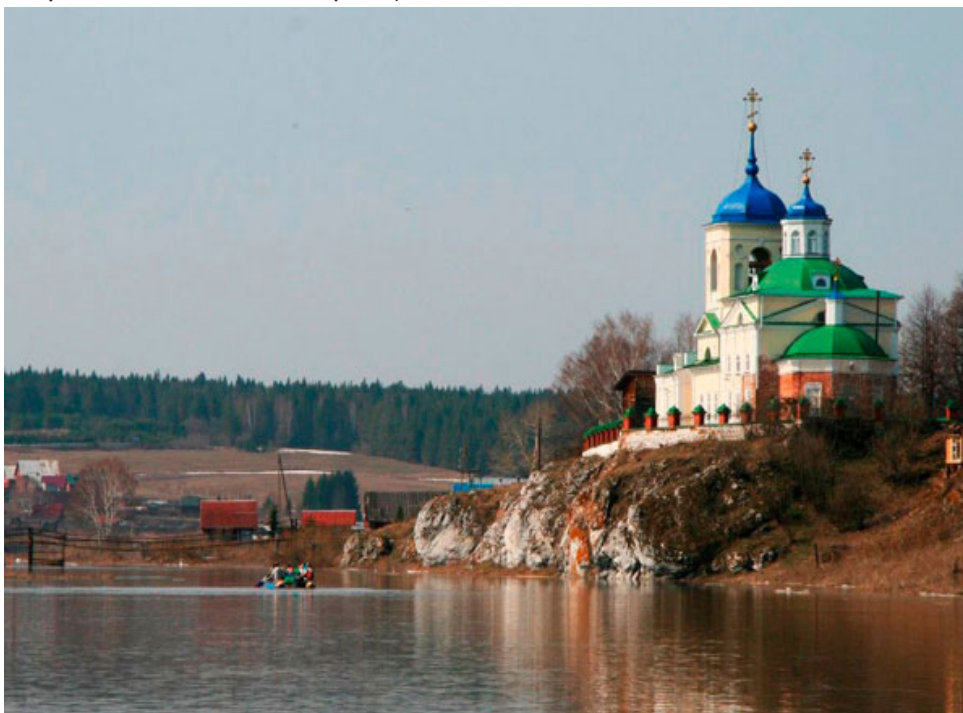
In the 18th and 19th centuries the Urals' culture was studied by Russian scientists and many explorers from different European countries. There was a permanent culture and technological exchange in the sphere of metallurgy and machinery production. But despite its unique nature, cultural and touristic potential, in the period of the USSR public access to the Urals' region was closed for many decades.

Today in the Urals there are three main directions of industrial tourism.

Organized cultural industrial tourism, focused on visits to historically formed company-towns and their museums Some industrial museums have been created in the Urals in the late 20th century. The large and valuable factory-museum in Nizhniy Tagil includes many architectural and landscape objects.

Nevyanskiy museum is smaller but very famous and attractive for tourists of different ages thanks to its extraordinary architecture and mysterious legends of Nevyanskaya slanted tower. Museum complex Severskaya Domna is unique, well preserved and presented site. The museum of the history of Alapaevskiy works possess the oldest stone building in the Urals – an abandoned hammer shop of the first Alapaevskiy works. In addition many small historical and ethnographic museums have been created in the Urals by enthusiastic local historians of historically formed industrial company-towns. These historical and culture museum centers are places of touristic attraction. In this way the centers can partially support employment in company-towns. Many local residents take part in attracting tourists by revival of crafts, production of souvenirs and making workshops. However, not all of these centers have enough funding for functioning and development.

'Wild' tourism including visits to small and remote historical company towns, surveys of factory ruins, mines, quarries, wharfs and other ancient sites During the second half of the 20th century, 'wild' tourism has become very popular among local residents, especially young people. Wild tourism in the Urals is mountain hikes and river rafting – everything with special equipment. Almost every touristic route passed through historically-formed company towns and their related small villages. At that period many historical enterprises worked according to their functions and they were not interesting for tourists. Today this wild tourism is very popular. Many historical industrial sites are abandoned now. The routes as a rule include ethnographic walks and survey. The wild tourism is the most developed direction of the Urals' touristic area. And now, besides local residents, many guests from different regions of Russia and foreign tourists take part in hikes and rafting.



A tourist group rafts on the river Chusovaya, the ancient transportation waterway of many Urals' metallurgical works production.

Worldwide

Informal industrial tourism in the scope of urban exploration movement, often very dangerous for its participants but opening many unique pictures of active and abandoned industrial sites for a general public After the collapse of USSR in the period of Perestrojka, enterprises that have worked successfully for many years began to go broke without proper management, funding and state support in the conditions of economy crises. Many of them transformed into abandoned sites, others changed their functions due to new market and economy situations. Today the abandoned sites of these factories became the basis of very popular industrial tourism direction – urban exploration. The number of urban explorers in the Urals is huge and this community permanently makes an active survey.

The Urals industrial tourism has a great potential for its development. Today the Urals industrial heritage is at the stage of awareness of its multifaceted value. Many Urals' touristic conceptions are being designed and existing touristic routes are being developed by specialists of different areas.

Correction: The article in the last issue 'Conception of the development of historical centers in the metallurgy of the Urals' should have acknowledged that it was jointly authored by Nadezda Solonina and Olga Shipitsyna



Urban explorers make a survey of discarded documents at the Staroutkinsky ironworks.



The study of the blast furnace at the abandoned Staroutkinsky ironworks.

Worldwide

Indonesia

The cultural values of traditional industrial landscape, Batik Giriloyo, Yogyakarta

Vera D Damayanti, University of Groningen, Netherlands

Batik is an art and a craft which is a paradigm of Indonesian cultural heritage. It is a traditional technique for decorating cloth passed down from one generation to another for hundreds of years. On the island of Java Batik it could formerly only be worn by royal families. Batik patterns were exquisitely designed and symbolized philosophical meanings which represented social status. Due to its significance Batik has been assigned the status of Masterpiece of Oral and Intangible Heritage of Humanity by UNESCO since 2009. Afterwards the Indonesian government designated National Batik Day and encouraged Indonesians to wear batik. The UNESCO recognition and government endorsement have given considerable encouragement to the Indonesian people to wear batik garments and have household items and handicrafts with batik designs. This enthusiasm has certainly boosted the batik industry which today has become an important sector in the Indonesian economy. Furthermore, it has stimulated the re-emergence of traditional batik production centres in the country.

On the Java archipelago, Yogyakarta is one of the primary Batik production centres. Three main hamlets (*dusun-s*) are producers in this village: Karangkulon, Giriloyo, and Cengkehan. Batik Giriloyo is manufactured by hand drawing and hand printing so the quality is different to Batik textile produced by machine. Recently the hamlets have begun to engage with tourism services alongside the batik production with the cloth and the landscape in which it is conceived and produced as attractions to bring outside visitors. It seems that batik culture has been embedded in the landscape in a special way which causes Batik Giriloyo and its production area to be distinctive.



The stairway to reach the Imogiri Royal Cemetery
(source: jogjaheritagewalk.com)

The history of batik in the area was influenced by the establishment of the Imogiri graveyard - a cemetery of the Mataram kingdom's royal families - in a hill near the hamlets in 1632. Sometime after its construction, the Mataram Yogyakarta King ordered the communities surrounding the graveyard to produce Batik for the royal families and the servants who guarded the cemetery. At that time the people assigned were only taught how to draw the pattern on the cloth. Although the palace later terminated the order they kept drawing and sold the patterns to merchants in the city.

They started to produce their own batik after several groups of batik drawers were trained in colouring batik through a disaster relief program undertaken after a 6.2 SR earthquake in 2006. The manufacture of Batik Giriloyo is a traditional industry which is currently performed by twelve groups of artisans in the three hamlets united in an organization which not only manages batik production but also tourism.

An approach to understanding the potential range of values that might be present in landscape, the Cultural Values Model, has been developed by Janet Stephenson. This concept perceives in a landscape three fundamental components: (1) Forms which are related to tangible elements: these are hills, rivers, rice fields, woodlands and forests, settlements connected by roads, workshops and showroom buildings, the kings' cemetery, religious buildings, and tourism facilities. (2) Practices and processes: The main ones in the landscape include the design and manufacture of Batik, governance of the organization, agricultural activities, religious festivals, earthquakes and landslides. (3) Relationships which include intangible elements. These consist of the history of the King's cemetery along with stories and myths, the history of Batik and sense and scenery of the rural landscape.

Human-landscape interaction. These three components which basically influence each other can be applied to interpret the interaction of landscape and inhabitants.



Pattern and colouring batik by a group in a workshop area
(source: Batik Berkah Lestari)

Worldwide

The hilly topography composed mainly of rocky soils is certainly not suitable for agriculture. Although there are farmers in the hamlets, only a small number have rice fields while the rest prefer to hire themselves out as labourers. Making batik is therefore a good alternative for making a livelihood. Instead of rice fields the landscape of the three hamlets predominantly comprised of forest and woodland which forms a buffer around the king's cemetery. This land use is suitable because vegetation minimizes run-off, reducing the risk of landslides. Unlike heavy industry which involves special structures and buildings for production which occupy a large site, the manufacture of Batik Giriloyo is a domestic industry which can be executed in a small space by engaging in un-intensive activities. Thus space limitation and fragile landscape pose no problems for the industry.

Although the manufacture of Batik commenced at the order of the King rather than beginning as a response by inhabitants to the landscape conditions, this intangible historical element has to some extent come to influence the later landscape. The Batik Giriloyo industry has indeed shaped the identity of the area.

The land use of this activity is suitable for a low carrying-capacity landscape; therefore it supports the sustainability of the landscape and subsequently the conservation of the historical landscape of the King's cemetery. Finally, this traditional industry has contributed to the preservation of Indonesian cultural heritage by giving additional economic value to a traditional sustain a traditional activity.



Tourism facilities in Javanese architectural style with hilly landscape on the background

(source: Lisa Virgiano)

UK

Animating representations of industrial heritage: the Leavers lace machine

Tom Fisher and Julie Botticello, Nottingham Trent University

While it is important and useful to preserve the architectural and material remains of industrial heritage and to integrate them into economic and social regeneration in a post-industrial setting, these efforts are often made in the absence of the human elements that animated and 'completed' these historical artefacts and environments. The work presented here is distinctive in industrial heritage research, because all the elements of the industry, human and material, are present. It included making a 3D computer model of the Leavers lace machine to animate the interpretation of the Nottingham Industrial Museum display.

The lace industry in the United Kingdom's East Midlands was a major feature of the local, and wider, economy from the invention of the 'Leavers' process in 1813 to the end of mass manufacturing of lace early in the 21st century. The industry grew out of innovations in machine knitting technology that date back to William Lee's invention of the stocking frame in 1589. In 1816 it was exported to northern France, under conditions of trade embargo, where the industry grew in the towns of Calais and Caudry. In both Nottingham and northern France it generated parallel industries in machine manufacture and textile finishing.

Three firms survive in the UK, and one of these is Cluny Lace (<http://www.clunylace.com>) in Ilkeston, near Nottingham.

Although the industry has shrunk from approximately 2,600 machines in the first decade of the twentieth century to the 16 that remain at Cluny Lace, this important part of the region's industrial heritage does survive. Working closely with the company's owners over some years, researchers at Nottingham Trent University have conducted research since 2009 to understand this heritage and effectively represent it as the important element in the region's identity that it is. Collaborators in this work have included the Victoria and Albert Museum in London, as well as Nottingham's City Museums and Galleries, which has some examples of Leavers machines in their Industrial Museum collection.

The work described here combined film, photography, computer animation and interview and was conducted in 2013. It included an ethnography [participant observation] in the Cluny Lace factory, as well as making a 3D animation of a Leavers lace machine. Both aspects of the work were represented in a short film.

Generously given access to the factory by the company's owners, the Mason family, the ethnography could trace the movement of materials through the factory through the hands of the workers. The lace is made from Egyptian cotton, twisted round nylon thread, which is prepared for the Leavers machines on site. Having emerged from the machine, the lace pieces pass through the hands of skilled menders before being transported to Calais for finishing and dying, to return to Ilkeston to be packed ready for sale. The machines require a good deal of craft skill at all stages of the production process – this was always the case, and no machines exist that are less than seventy years old.

Worldwide

The workers' skill is particularly evident when a machine is changed from one pattern to another, and when the supply of threads is renewed. Pattern changing means replacing the jacquard cards that control the movement of the threads in the machine, as well as changing the set up of the threads that run upwards from the long poles or 'beams' below the machine. This latter task requires a combination of great dexterity and the ability to interpret how the pattern being run translates into particular thread positions in the machine. So as well as connecting ends and making sure they run in the correct path, the 'twisthand' uses sheets of figures to translate the pattern and the movements it requires into the machine's set up. The nylon threads round which the cotton twists are carried in brass bobbins. Each of these fits in a steel 'carriage', which moves from front to back of the machine, between the cotton 'beam' thread. Each machine has several thousand of these, which must be individually filled prepared and re-installed in the machine to keep production going. All the steps in this process are highly skilled.



Jacquard cards that control the movement of the threads in the Leavers Machine, Cluny Lace, 2013.

(photo: Julie Botticello)

The way the machine works, and how the components move relative to each other to produce complex and beautiful patterned lace, is dependent on those skilled processes, but understanding the skills on its own does not elucidate the operation of the machine. It was for that reason that the work included constructing a 3D computer model of the machine, which could be 'exploded' and animated to show its workings. Fortunately, the company was in the process of restoring one of its machines, made by the Jardine Company, which meant that it was possible to inspect closely and measure the mechanism, to help to construct the computer model. The model will feature in the future re-display of the Nottingham Industrial Museum display, to 'animate' what is otherwise a static display of lace industry items.

A forthcoming article will present the process developed to digitise the Jardine lace machine.

Acknowledgements: This research was funded by the UK research councils, AHRC and EPSRC's 'Science and Heritage' programme, and would not have been possible without the generous and close cooperation of the Cluny Lace company, its management and employees.



Installing carriages in the machine, Cluny Lace, 2013

(photo: Julie Botticello)



Partial computer model of Jardine lace machine, 2013

(photo: James Thompson)

Worldwide

Germany

Work with Sounds: Preserving the acoustic heritage of the industrial era

Konrad Gutkowski

As a result of de-industrialization and technical progress many sounds and noise which were once commonly heard in factories, on roads, rails or waterways, or in offices, have disappeared or are rapidly disappearing from everyday life. In order to preserve the acoustic heritage of the industrial era, six European museums ran the two-year EU project “Work with Sounds” (WWS), which ended in September 2015. During that time WWS recorded and documented more than 600 sounds in Belgium, Finland, Germany, Poland, Slovenia and Sweden. The field recordings were mainly made where historical tools, machines and signal devices still can be heard during operation and where traditional working techniques are still alive: in museums, heritage-protected and traditional workplaces. The field researchers also visited modern work places and factories to capture sounds which might or will be disappearing soon. For example, WWS recorded the sound of a hoist of one of the last three operating coal mines in Germany. The German government decided to close all coal mines by 2018.

The sound spectrum of the WWS collection includes the “chuff-chuff” of the steam locomotive, the ringing of an alarm clock from the 1930s, the soundscape of a container terminal at a port and the screech of a dentist’s drill.



Recording sound of sewing machines from the 1930s

Thus the users of the collection can compare the acoustics of “historical work” with the sounds of current work and explore the differences and similarities between the soundscapes of European industrial history. The compilation of sounds, films, photos and texts are collected in the virtual sound archive www.workwithsounds.eu.

The sounds can be freely downloaded and used in new contexts: museums, the media, schools or by artists, and that is how they are already used. To name but a few: collaboration with media artists, the LWL-Industriemuseum designed a sound station where visitors can create their own soundscapes on the basis of the WWS-recordings. Together with computer programmers and elementary school students, the museum used the WWS-sounds to create an application for tablet computers with which visitors can play a sort of combination of sound memory and paper chase on one of its sites, exploring it by its sonic artifacts. The project inspired the French composer Alix Tuco to compose the piece “Technology and Bones” with WWS-sounds. The Federal Ministry of Education recommends using the WWS archive as educational and learning material. All these projects have in common that they give an understanding of industrial history by its acoustic.

In a final conference in the LWL-Industriemuseum the project team brought together representatives of museums, archives, universities, the media and the arts. 80 participants from all over Europe exchanged their experiences and views on recording, conserving, exploring and using the sounds and soundscapes of Europe.



Capturing the soundscape of a traditional tool factory. In front is an eccentric press from the 1950s.

Worldwide

Turkey

The 'Design Station' Project - adaptive reuse proposal for the Old Electricity Factory, Izmir

Sergio Taddonio and Nagne Ebru
Yasar University

Izmir, the 'Aegean Pearl', is a large metropolis at the western extremity of Anatolia and for centuries one of the principal mercantile cities of the Mediterranean. Izmir's remarkable growth began in the late 16th century when cotton and other products of the region attracted French, English and Venetian traders, and since then the city began to be one of the foremost trading centers of the Ottoman Empire.

After the Great Fire in 1922, several urban planners have been envisioning the future urban development of Izmir, such as Henri Prost and Raymond Danger in the 1930's, Le Corbusier in the 1940's and afterwards the master plan designed by Turkish architect-urbanists Aru, Canpolat and Özdes. The Daragacı district grew into the most developed industrial region of the city, closely connected with both the harbour and railway lines, with its progressive expansion positively affected by the constructed of the first electricity factory in 1928.

In 1998 the City Conservation Council registered the harbor region with its 53 buildings consisting of industrial complexes, factories, warehouses and residential buildings. Since then, except for a few cases, the consistent industrial heritage of Daragacı's district has been left underused or abandoned to its declining destiny due to the mis-recognition of its enormous potential in fulfilling a positive city regeneration agenda.



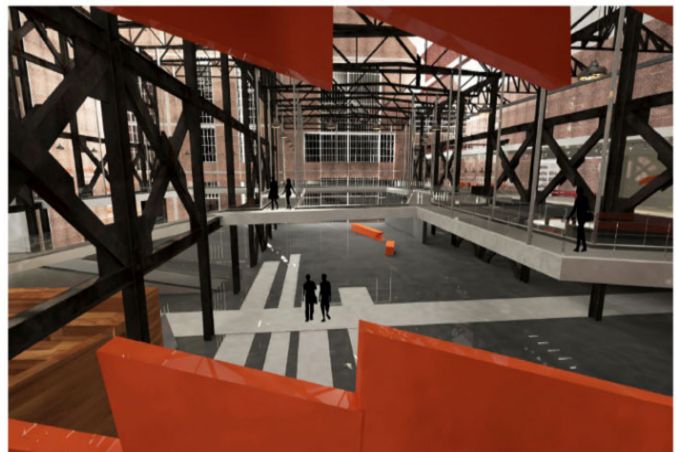
The Factory has a steel frame with pressed bricks filling the spaces between the columns. The reinforced concrete slabs are carried by steel trusses, and the roof is also made up of steel trusses.

Promoted by the Belgian firm Traction-Electricite, the construction of the Electricity Factory started in 1926 and took two years. Operations were stopped in 1989 with the justification of having fulfilled its economic life. The Factory building is striking among the industrial buildings in the region with its plasticity of mass and interior space shaped with functional considerations regarding the dimensions of machinery and mechanical equipment.

While the historic factory building is dramatically perishing due to loss of functional and economic values it is still extremely valuable because of its location in the city, its exhibition of advanced construction and production system of its time, and represents a landmark and a symbol of the collective memory of the city. Highly suitable for a 'new' creative and social programme and a potential case study for a challenging experience-based Design Studio project.

The explicit goal of the Design Studio was the identification of appropriate Re-Functionalisation Design Proposals aiming at rehabilitating the old Electricity Factory to become a vibrant centre within the city cultural network offering a variety of new opportunities.

The aim of the project was defined as the transformation of a heritage industrial building into a new place or stage for the production and consumption of experience services and goods, in this case, knowledge-based services and the whole spectrum of design products. The name of the project embraces crucial aspects of the re-functionalisation proposal. A Station, obviously reminding the former function of the building, a Power Station, which supplied for decades the fundamental 'fuel' to factories and city facilities. But also a new Station where a new journey starts, people gather, in an unrestricted manner; a place for the city and its citizens, the venue of cultural and entertainment events.



Design Station Project. Yetkin, P. & Sanaydin, S. N. (2014)

Worldwide

Sweden

Fengersfors' paper mill, industrial site of the year

In August the "industrial site of the year 2015" award was conferred upon Fengersfors' former paper mill by Svenska industriminnesföreningen -SIM (TICCIH Sweden). The prize was given for the transformation of the remains of a processing industry into an exciting arena for industrial history, artistic creation and enterprising.

Since 1995 SIM has been awarding different sites in order to pay attention and support the work with the industrial heritage in Sweden. The prize is a cast iron plaquette which is handed over in a ceremony at the site. This event often draws great attention, which this year also reached the Minister for Culture who devoted time to visit the works. More photos from Fengersfors are in the homepage of SIM at www.sim.se.

More on the mill in *TICCIH Bulletin #65 2014* and <http://www.sim.se/produkter/vastra-gotalands/fengersfors-bruk>.



Hollander beaters with their drive chain inside the mill.

Photo: Eric Julihn 2013 CC BY-SA

World Heritage experiences

Scottish Ten digital documentation project

Miles Ogglethorpe

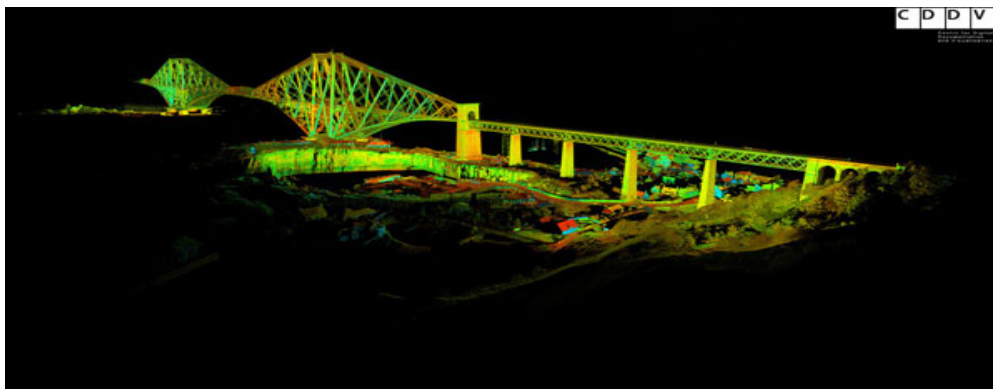
In the aftermath of the successful inscription of the 'Sites of Japan's Meiji Industrial Revolution: Iron and Steel, Shipbuilding and Coal Mining' at the World Heritage Committee in July, an exhibition was held at UNESCO HQ in Paris between 12th and 16th October demonstrating the results of digital documentation work by the *Scottish Ten* project, Cyark and Liquid Galaxy. The exhibition was organised by National Congress of Industrial Heritage, and the Japanese Government's Cabinet Secretariat, and was hosted by the Permanent Delegation of Japan to UNESCO.

The *Scottish Ten* project commenced in late 2009 to document digitally Scotland's five World Heritage sites and five international heritage sites in order to better understand how to conserve and manage them. It has been delivered as the CDDV partnership between Historic Scotland and the Digital Design Studio at the Glasgow School of Art, and by Cyark, who have also recently completed work on the Sogi Hydro-electric scheme near Kagoshima.

The project started by recording New Lanark, one of Scotland's five World Heritage sites. When moving on to the international sites, the decision was made to record a selection of industrial heritage sites in and around Nagasaki, Japan because of their strong links with Scotland, and because they were included in the Meiji World Heritage nomination. Of these sites, the most prominent are the Giant Cantilever Crane at Mitsubishi's shipyard, and the Kosuge Dock, also in Nagasaki.

The crane has operated almost continuously since it was built in 1909, and 3D laser scanning proved to be a particularly effective means of recording it, especially as it will permit virtual visits for a site which cannot be accessed by the public because of its operational status.

The exhibition also included recent survey output from the Forth Bridge in Scotland, which was inscribed onto the World Heritage list in July along with the Meiji and three other industrial heritage sites. This too is an operational structure, carrying over 200 trains a day, so the creation of a 3D model is especially valuable. Output from this project will become available in mid-2016.



World Heritage experiences

Tarnowskie Góry mine and water drainage system, Poland

Barry Gamble

This unique integrated mining and water heritage of the Tarnowskie Góry mine in Upper Silesia is one of the world's great historic producers of lead and zinc ores. It dates from the sixteenth to the twentieth centuries and is principally a below-ground heritage, connected directly in three-dimensional space with some closely associated surface sites. In addition it possesses an underground water management system that was engineered not only to intercept water inflow by an extensive and ingenious mine drainage network, but also incorporates a pioneering water supply that became the largest of its kind in the world. The mine is on Poland's Tentative List to UNESCO and in line for a World Heritage nomination in 2016.

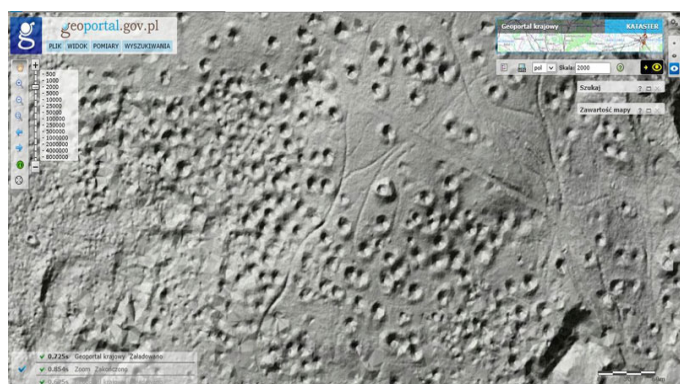
In 2005 representatives of TICCIH, Eusebi Casanelles and Julian Kolodziej, visited the property and gave encouragement to the local association who manage and care for the site to consider a nomination for World Heritage Listing. Bogdan Zdrojewski, then Minister of Culture and National Heritage in Poland, gave a further stimulus for action, together with support from the National Heritage Board of Poland and the Polish National Commission for UNESCO.

The local 'association' is the Tarnowskie Góry Land Lovers' Association, which has its origins in the early 1930s. A conservation movement was formalised but immediately stalled by the tumultuous events of the Second World War, and post-war Stalinist regime. The drainage system of the mine had reverted to a 'natural' function that left a vast mining network and its operational water supply uncommonly accessible. In 1953 a Committee for the Affairs of Monuments and the History of the Lands of Tarnowskie Góry (now the 'Association') was

formed and work began within a year upon a selected part of the underground heritage 'to set up an underground museum and demonstration mine (acting) in close cooperation with the conservation and museum authorities...' This became the focus of sustained conservation and public access for scientific, educational and tourism purposes. World Heritage nomination sees a natural progression, and a binding commitment from the State that is a further contribution to Poland's conservation of some of the world's most significant underground mining heritage.

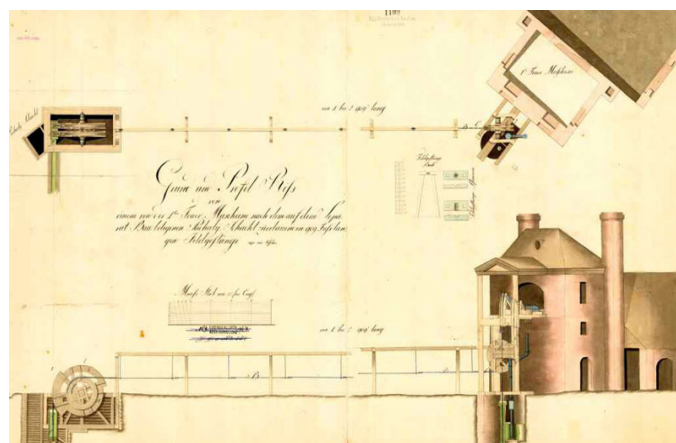
To further consider the nature of this heritage, the town of Tarnowskie Góry was founded upon the prosperity of local lead-silver deposits discovered in the late 1520s. Gory is old-Polish for 'mines'. But this is only the beginning of a period that, in World Heritage language, spans those attributes that contribute and combine to give Outstanding Universal Value, the central idea of the World Heritage Convention. This period can be broadly divided into two principal phases: 1490 to 1600, and 1750 to the early twentieth century when a 'model' lead-zinc mine was established under the Prussian State.

Silver tends to grab public attention, and numerous small mines provided rapid riches in the early years. But it was the more mundane production of lead - a massive output exploited from shallow and extensive deposits - that was of greater significance to a wider Europe at the time; although, ironically, exported and expended in the extraction of silver elsewhere. Mining of laterally extensive horizontally bedded lead ore in open excavations and thousands of shallow shafts permanently altered the landscape and hydrology in and around Tarnowskie Gory. This prolific, post-mining landscape, supported by the vast yet shallow and tortuous network of underground workings, are testimony to the scale and global impact of early Polish lead production.



The Mining Landscape of Silver Mountain: clear traces of ancient mining activity within dense and historic beech forest are strikingly revealed by hypsometric photography.

Photo: Government of Poland



Drawing of the Newcomen Atmospheric Engine, imported from Britain to Friedrich Mine in 1788, the first steam engine on Silesian soil. Samuel Homfray (1762-1822) was its English manufacturer, and subsequently new separate condenser engines pioneered by Boulton & Watt were imported from Britain, to Silesia, copied (there were no patent rights) and manufactured locally to facilitate the construction of a grand and unified adit system to drain the base of the ore-ground, for all time.

Photo: Zabrze Museum

World Heritage experiences

Mining was moribund well before the First Silesian War of 1740-42, a conflict which marked the end of Austrian control and heralded over 170 years of German rule. What Prussia implemented in the last decades of the eighteenth century fostered the first heavy industries on 'German' soil and facilitated the emergent Prussian (German) industrial revolution and the foundations of the Upper Silesian Industrial Agglomeration that was in its vanguard.

As with Tarnowskie Gory's first phase of mining, a polymetallic production was characterised by a single metal achieving significance. This time it was zinc, from the world's largest deposit of zinc carbonate ore that lay in association with abundant lead. The State-owned Friedrich Mine dominated world output of zinc ore – 65% by 1840.



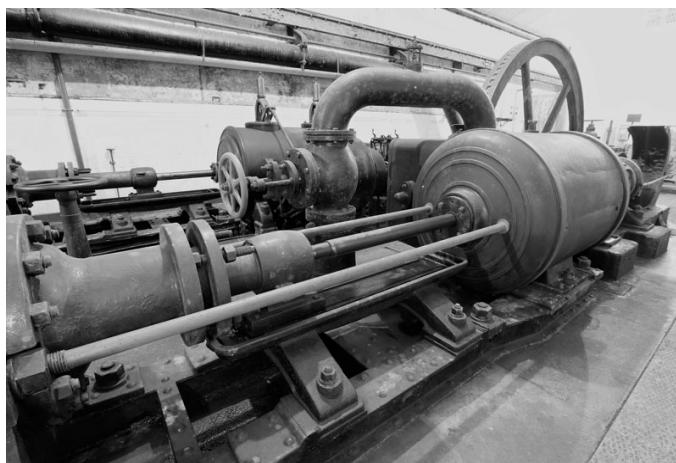
Friedrich Deep Adit, close masonry arched tunnel lining, typical of a great many kilometres that still function in the purpose for which they were constructed almost two centuries ago.

Photo: B Gamble

Steam pumping engines, installed for mining purposes, were subsequently set to work to abstract clean water from newly created underground man-made 'rivers' diverted away from the productive workings. This commenced as early as 1797, when the first Boulton & Watt engine (for mining) arrived on the continent at Friedrich Mine, a time when mining provided the technical capacity for the development of the world's first large-scale public water supply systems based on the steam pumping of groundwater. In 1884 the new Adolph Shaft Waterworks was established and incorporated the latest and most powerful horizontal compound engines placed in magnificent engine halls 50m below the surface, powered by steam generated at surface.

A monumental network of 150 km or more of accessible tunnels, shafts and galleries, many lined with fine masonry work, are testimony to Silesian pre-eminence in global zinc production; and its renewed traditional supply in lead.

Tarnowskie Gory's underground water management system is a masterpiece of hydraulic engineering that demonstrates how an exceptional inflow of groundwater, up to three times that commonly encountered in central European mines, was managed in an ingenious and sustainable manner. Water management was first engineered to intercept and remove groundwater inflow, thus enabling mine development and extraction to proceed unhindered. A consequence was a drastic lowering of the regional water table and an ensuing 'water famine' as wells ran dry.



Adolph Shaft Waterworks: Stationary horizontal compound steam pumping engines, with central flywheel, in one of three engine halls located over 50m below the surface. These were conserved in 2012.

Photo: B Gamble

Mine-sourced water supply, separated for drinking and industrial purposes, facilitated the rapid growth of industry and population in the Upper Silesian Industrial Agglomeration. Abstraction from the historic mine continues today, albeit in a much smaller way, and several million visitors have experienced, first-hand, the splendour of the Tarnowskie Gory 'underworld'. In 2014 the site became an anchor point of the European Route of Industrial Heritage.

World Heritage experiences

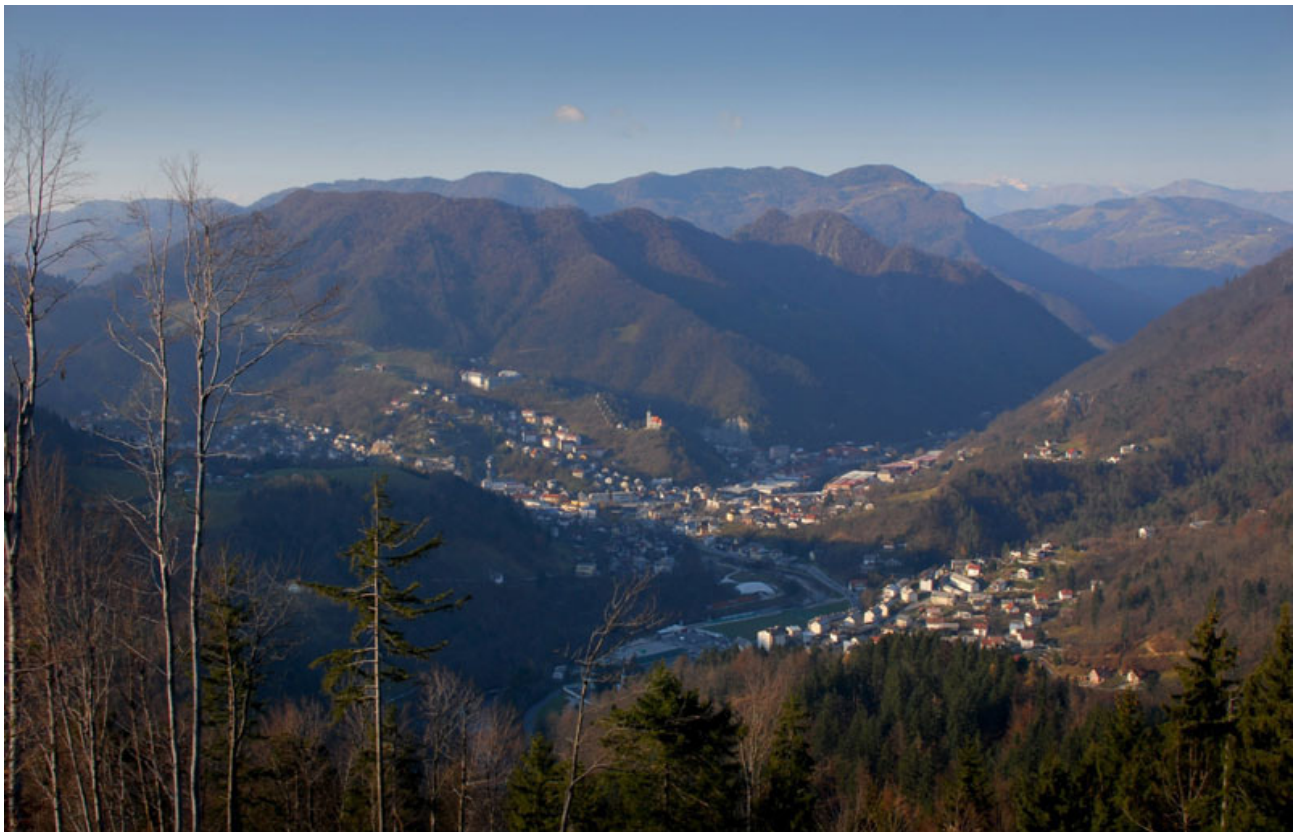
The heritage of mercury in Idrija, Slovenia

Tatjana Dizdarevič, Idrija Mercury Heritage Management Centre, and Dušan Kramberger, Slovenian National Commission for UNESCO

In June 2012 the rich evidence for mercury mining in Spain and Slovenia was inscribed on UNESCO World Heritage List as the 'Heritage of Mercury. Almadén and Idrija (Slovenia, Spain)' <http://whc.unesco.org/en/list/1313/documents/>. This heritage was created for more than two thousand years in Almadén [see TICCIH *Bulletin* #68], and in Idrija for almost half a millennium. From the mid 16th century onwards, the extracted mercury was used in the amalgamation process in Central and South American mines for the extraction of gold and silver from the ore. These precious metals were sent to Europe and considerably stimulated the development of commerce, transportation, warfare, science, art and culture in general. Through inscription, the devoted work of generations of miners, outstanding technical achievements in production of mercury and unique influence and consequences of that endeavor in society worldwide, have been globally recognized.

The World Heritage List inscription meant not only the recognition of outstanding value in both places which they might be legitimately proud of. A significant effect on life could be seen at almost every level. Following the WH Committee recommendation a thorough inventory of industrial and technical heritage in both locations is being established. The Periodic Report - Second Cycle in 2014 provided the responsible institutions and individuals with in-depth understanding of strong and weak points of conservation and management of the inscribed property as a basis and tools for further activities. Heritage is more and more understood as a driver of economic development and consequently gets a notable position in urban planning. Idrija and Almadén intensified the cooperation between communities, mines, museums, schools, handicraftsmen, artists, scientists, etc. They promote the heritage of mercury to professional and general audience, including issues of the control pollution and environmental remediation.

Idrija is the oldest mining town in Slovenia. Its beginnings are linked to the discovery of mercury deposits in the late 15th century. For centuries, the town developed just above the pit. It grew along with the development and expansion of the mine below it: local people used to say: "The town is a mine and the mine is a town." mercury production at the Idrija Mine ended in 1995. Closure activities in the pit were completed in 2009, but the mine will never be closed entirely.



The town of Idrija surrounded by hills and including core zone 1 - old town, core zone 2 - smelting plant area - and core zone 3 - kamšt, rake Kobila.

World Heritage experiences

The town of Idrija has kept a lifeline to the mine, resulting in a number of buildings in its old town closely linked to the mining being preserved to this day. The heritage of Idrija inscribed on UNESCO World Heritage List comprises the heritage of the mine and mining activities in the broadest sense of the word: the mercury ore deposit, underground shafts and pits, mine entrance buildings, administrative buildings, smelting plant, mercury and wheat storehouses, residential houses, school buildings, churches, and paths along which mercury was transported abroad.

The inscribed world heritage in Idrija includes:

- The second largest mercury ore deposit in the world, famous for its native mercury and the exceptional purity of mercury produced here, extending below the town of Idrija to a depth of 450 m
- Anthony's Main Road – the second oldest preserved entrance to the mining underground in Europe dating from 1500; a part of the pit housing the mining Chapel of the Holy Trinity from the mid 18th century has today been transformed into a museum
- Gewerkenegg Castle – mine castle dating from the early 16th century, today the home of the Idrija Municipal Museum, Best European Museum of Industrial and Technical Heritage in 1997
- Secondary School of Natural Sciences – building of the first Slovenian nonclassical secondary school built in 1903, today the Jurij Vega Secondary School in Idrija
- Church of the Holy Trinity – Idrija's oldest church dating from 1500, built on the spot where mercury was historically discovered in 1490
- Town Hall – representational secessionist administrative building dating from 1898, today the seat of the Municipality of Idrija
- Mine's Warehouse – constructed by the Mine in 1769 for storing grain
- Mine Theatre – the oldest building constructed for theatrical purposes in Slovenia, dating from 1770, today transformed into a film theatre
- »Švica« ("Switzerland") – a town house in which Joannes Antonius Scopoli, a natural scientist and the first mine phy-

sician, worked in the mid 18th century and corresponded with the famous botanist Carl von Linné

- Francis's Shaft leading into the mine underground, built in 1792, still operates today. Displayed in the entrance building is a collection of mine machines, the most prominent being Kley's steam pump dating from 1893.
- Miner's house – typical multi-storey residential house of miners' families dating from the second half of the 18th century
- Kamšt water pump – a water-driven device built in 1790 for pumping pit water, which boasts the largest preserved wooden drive wheel in Europe with a diameter of 13.6 m
- Rake water channel – 2.6 km-long water energy channel built at the end of the 16th century to supply water from the Idrija River to the mine facilities in the town
- Joseph's Shaft – the deepest mine export shaft, built in 1786, connecting all 15 mine levels up to a depth of 382 m
- Miners' street – area of preserved multi-storey buildings constructed by the Idrija Mine after 1870 for its workers
- Smelting plant – partly preserved facilities and devices for smelting ore; the area is being arranged to provide a comprehensive presentation of the mercury extraction process
- Klavže – mighty stone water barriers, dating from the late 18th and early 19th centuries, built on the Belca, Idrija and Ovcjak rivers and used to accumulate water and float wood to the mine

There are many connections between the two mining complexes in Idrija and Almadén, not least the way in which the population responded to the difficult living conditions of mercury production, and especially the amazing technical and scientific responses. They jointly form a set of assets constituting "twins" that represent a complex and complementary picture of mercury mining: engineering methods and related industrial and technical development from the Roman Empire to the beginning of the 21st century. It also offers a complete panorama of the different uses and utilities of mercury throughout history. The mining sites of Almadén and Idrija have produced a great part of the mercury existing at a world scale, the most eminent representatives of the meaning and transcendence of mercury and its extraction in the world.



Francis's Shaft leading into the mine underground, built in 1792, still operates today. Displayed in the entrance building is a collection of mine machines, the most prominent being Kley's steam pump dating from 1893.

Conference news

TICCIH Congress XIV LILLE-REGION 2015

TICCIH General Assembly

As happens each congress, the programme of TICCIH 2015 ended with the General Assembly. Approximately sixty members, Board Members and National Representatives attended this meeting which customarily reviews the previous three years and selects the members of the Board which will conduct the organisation through the next three.

Professor Patrick Martin, TICCIH President, welcomed delegates and opened the meeting reflecting on what had unfolded since the 2012 assembly in Taipei. He noted in particular the absences caused by the passing of two prominent colleagues, president Louis Bergeron and secretary Stuart Smith, both of whom have been much missed.

He went on to highlight some of the most important recent events, especially signing a Memorandum Of Understanding (MOU) with ICOMOS in November 2014 in Florence. ICOMOS regarded the old agreement as out of date, so this has been a great step forward.

Most exciting, however, was the 39th Session of UNESCO's World Heritage Committee in July this year, when five industrial nominations from Germany, Japan, Norway, UK, and Uruguay were successfully inscribed onto the World Heritage list, as well as the wine regions of Champagne and Bordeaux. This represents a significant step towards the global recognition for industrial heritage.

Perhaps the biggest change affecting TICCIH has been the digital changeover, with the Bulletin <http://ticcih.org/publications/> becoming paper-free. The enhanced flexibility, style and international reach of the digital format had already been proven, and the transformational work of its editor, was much appreciated. Just as important has been the positive financial impact, the burden of printing costs and postage having become unsustainable for us.

Similarly, this year's National Reports <http://ticcih.org/the-international-committee-conservation-for-the-industrial-heritage-ticcih-congress-2015-ticcih-national-reports/> were for the first time produced in digital format. Thanks to everyone who wrote National Reports and in particular to Genevieve Dufrense and James Douet for editing them.

TICCIH has also been able to make its mark more generally, responding to requests to help rescue threatened industrial heritage in several countries, a recent example being the Pierre Colbert Swing Bridge in Dieppe, France. Finally the President noted both individual and national TICCIH membership is on the rise, and national agreements have been refreshed. The TICCIH website is doing well and the Board intends to report on its work more frequently through it and the *Bulletin*.

Assembly business and elections The minutes of the previous meeting in Taipei in 2012 were accepted, and the accounts were adopted. These showed a marked improvement in the finances, reflecting in particular the move from printed to digital media already mentioned.

Professor Martin stood for President for a third term and was re-elected unopposed. In keeping with the requirement to refresh the Board, five members had offered to stand down, three of them - Gràcia Dorel Ferer, Belem Oviedo, and Benjamin Fagner - choosing not to present, Miles Oglethorpe and Irina Iamandescu standing for re-election.

The six new candidates who subsequently stood for the four vacancies were Boying Liu (China), Florence Hachez-Leroy (France), Moulshri Joshi (India), Miles Oglethorpe, Irina Iamandescu, and David Worth (Treasurer and previously Co-opted). In the ensuing ballot the four successful candidates elected by the National Representatives were Boying Liu, Florence Hachez-Leroy, Miles Oglethorpe and David Worth. The president thanked all the candidates for standing and welcomed those who were successful, and especially the two new faces from China and France. He noted that, in the unavoidable absence of the Secretary Stephen Hughes, who was unable to come to Lille, it had fallen to other Board members, particularly Miles Oglethorpe, Iain Stuart and Dag Avango, to manage the election process.

Future congress The President announced that the Board had been delighted to accept Jaime Migone's proposal that Chile will host the TICCIH 2018 Congress. Although travel may be a significant challenge it will be well worth it. Major efforts are under way to keep local costs down to balance out the potentially higher cost of travel.

Important conferences in 2016 include the 8th Latin American Colloquium on the Industrial Heritage in March in Havana, Cuba, and Central Europe Towards Sustainable Building (CESB) in Prague, Czech Republic, part of which focuses on the sustainable re-use of industrial heritage. An Asian Industrial Heritage Route is taking shape (modelled on ERIH, the European Route of Industrial Heritage), involving Taiwan, China and Japan, working under TICCIH's banner. An initiative promoting thematic studies is being co-ordinated by Stephen Hughes on topics including 20th century industries, highways and electricity.

Finally, the president thanked the sponsors and partners, members of local communities and organisations, mayors, local councillors, and especially Florence Hachez-Leroy's team for organising a tremendous congress. He closed the assembly, expressing the hope that as many as possible of those who attended this congress will be able to attend the next TICCIH assembly in Santiago, Chile, from 9th to 16th September 2018.

Thanks to Miles Oglethorpe for use of his notes from the meeting

Conference news

Big Stuff 2015

Alison Wain

Big Stuff 2015, a conference on the conservation of large technology, was held in September at the Centre Historique Minier (CHM) at Lewarde in northern France. This was the fifth Big Stuff conference, the first to be held close to a TICCIIH congress, which inspired an increased focus on the built heritage and landscape contexts of large industrial machinery, as well as the impact of heritage regulatory and funding environments.

The conference featured discussions of a rich array of machinery types, in a variety of situations. Aggressive marine environments were the villains in David Thickett's discussion of the management of dust and corrosion on WWII telecommunications equipment, in Paul Mardikian and colleagues' desalination and stabilization of Apollo era space engines, and in Kathleen Ribbens' discussion of the restoration of a Würzburg Riese Radar for display in a coastal location. Tim Scarlett also reported experimental work using supercritical CO₂ for extracting salts and water from archaeological iron. Damp environments were the cause of the mould and rot faced by Kaat Sneiders in some very plush train carriages, and by Stan Reed in the trip hammers in the Næs Ironworks hammer forge.

Relocation and display requirements drove the challenges experienced by Diana McCormack and Marta Leskard in conserving the Rugby Radio Station tuning coil apparatus (an electronic instrument surprisingly made mostly of wood and other organics). Also facing display challenges were Gesa Witt and Ulrich Stahn in their treatment of a Hamburg tram, Bill Jordan in his battle to maintain an 1885 rope driven crane as an operating display, and Clara Deck, whose visitors' feet tested the delicate aluminium structure of R. Buckminster Fuller's Dymaxion House almost to destruction.

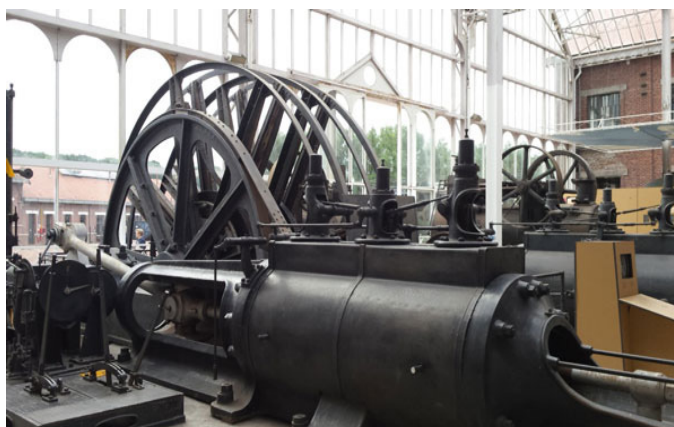
Looking at industrial heritage in Asia, Yiping Dong noted that while much interest in industrial heritage in China is focused on built heritage, excitingly attention is beginning to turn to elements of the machinery itself. Shunsyuke Nakayama discussed the protection of holistic contexts of buildings and machinery in Japan, and Sarah Jane Brazil discussed the World Heritage Listing of sites of Japan's Meiji Industrial Revolution.

Many examples of large technology are of course large enough that they are both buildings and machines. Norbert Tempel, Axel Bocker and Martin Sauder discussed the conservation of concrete structures, outlining their preference for patch repairs that integrate with the mottled appearance of aged concrete, rather than total "makeovers" for whole surfaces. Claudio Chemello and colleagues reflected on the conservation of a 'beehive' kiln in Montana, a project that was also structured as a valuable student experience. Also involving students in site based work were Romain Jeanneret and his colleagues in their project on the 14 ton underground seismograph at the Neuchâtel Observatory in Switzerland.

Community involvement is incredibly important for large technology, as it is only with the support of communities that the resources needed to conserve Big Stuff will continue to be made available. Stefan Brüggerhoff reported on the database of significant machines and networks of public and private owners being developed by the German Mining Museum in Bochum. As well as promoting a structured, collaborative approach to collecting large technology, the initiative hopes to facilitate 're-homing' of machines that are in danger of being scrapped. Different communities of owners do not, however, always share the same expectations, so ways of using the concept of values to understand and resolve conflicts were addressed by Heike Overmann in relation to developer/heritage concerns in urban environments, and by Alison Wain in relation to engineering and conservation communities of practice.

Other projects with a strong community focus were Ruth Keller's work with a community in Ethiopia to preserve electrical equipment that represented community pride in early rural development in the area, Piotr Gerber's highly successful volunteer and children's vacation projects at the Museum of Industry and Railway in Poland – which has resulted in children returning to the project as adult volunteers when they grow up – and Anna Lindgren and Peter Du Rietz's strategies for documenting the intangible heritage of skills and knowledge of workers and communities while historic machines and processes are still in operation. Kornelius Geotz and colleagues' development of an open data web app to record physical, timeline and condition data for sites, and to aid conservation prioritisation based on EU standard EN 16096:2012 should also be a useful aid to community groups and others wrestling with the management of industrial sites and machinery.

CHM Lewarde provided delegates with an excellent tour of their museum and of the mining landscapes in the surrounding area. Showering delegates with wonderful French food and wine, they also created the perfect atmosphere for discussing plans for the next Big Stuff to be held in 2018. See you there!



Machinery to swoon over - Big Stuff 2015 at CHM Lewarde

Conference news

A guide to adaptive re-use in Moulins, Lille

Mark Watson

Historic Environment Scotland

Moulins, a district once known for the windmills that ground Lille's corn, was since the mid-19th century dominated by textile mills interspersed with couronnes of housing, and some quite smart fin de siècle houses. Now it is the go-to place for exemplary adaptive re-use of industrial buildings, and many TICCIH delegates found time to investigate these, from West to East starting at the perfect conference venue:

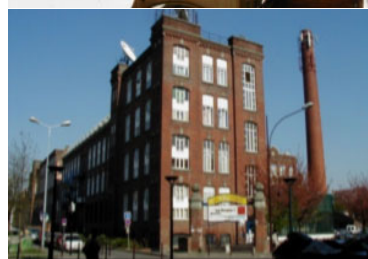
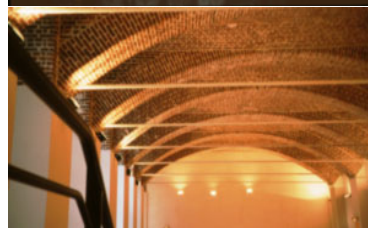
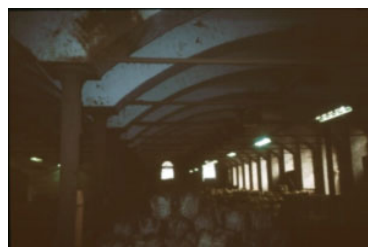
1. Le Blan flax mills produced a quarter of the linen yarn made in France until relocating in the 1990s. The Faculty of Law Political and Social Sciences in the University of Lille fits well into the courtyards formed by flax spinning mills. Some of those in the middle of the block have been taken out to allow for circulation space, partly new build. The oldest part on Rue de Fontenoy has thicker walls that form pilasters and arches, and the reason for this becomes apparent inside. Instead of columns and beams, broad arches span the width of the mill in two leaps, with smaller arches length-wise. The writer recalls seeing hackling upstairs and bales of flax in semi-darkness here. Now it's a bright exhibition space for the launch of *le Paris de l'Industrie 1750-1920* by Thomas le Roux, with striking images of boiler explosions and measures taken to reduce industrial accidents. Rectangular towers at two corners were dust flues.

2. La Filature: a secondary part of the Le Blan complex had been made redundant in 1967, and it was this building that made a name for architects Reichen & Robert. Their not overly-respectful approach taken to a mill built in one 190m long line in 1900, 1925 and 1930 has resulted in 100 flats, a church, Le Prato theatre, offices and a library. Cuts deep into the building brought light and allow residents to enjoy open terraces and small gardens. There is even room to display a gas engine and a flax drawing frame. A chimney makes it stand out. The drawings for the development at the time that it was conceived are reproduced in the influential *Les Chateaux de l'Industrie* by Lise Grenier and Hans Wieser-Benedetti (1979). Having set a bold template here, the same hands can be detected at work at the bigger Provoust Mill in Tourcoing - 162 flats, offices and shopping in a north-lit shed.

3. Rue de Douai: a cotton mill, built in 1894 is almost square in plan, unlike the narrower flax mills. Here an internal courtyard was scooped out by developer David Avital, an extra friill of post-modern arches added around the roof, and a *trompe l'oeil* mural painted on wall of a stair tower. This was at one time also a le Blan mill. Since 1981 it largely contains governmental offices.

4. Wallaerts cotton mill, LT6 or "le Fil au Louis d'Or", Rue Jean Jaures, is another project by David Avital, quoted as a champion of 'le lifting urbain' in SAVE Britain's Heritage publication *Bright Future* (1990). The very large windows and external steel frame in a mill of 1898 allowed intervening brick masonry to be removed altogether so as to introduce light to the inner recesses of the mill. It has a substantial stair tower and is linked at a high level bridge to a nearby mill of 1906.

A further mill again goes behind this, some windows masked to exclude light from a continuing industrial process. There even were clouds of steam, water towers and north-light sheds



Conference news

5. *Sciences Po Lille* was planted at 84 Rue de Trevis in 1996, to immerse future leaders of France in working class Lille. Julian and Paul le Blan Frères were established in 1872 and expanded to acquire other cotton mills, like Wallaerts, until liquidation in 1989. This was initially a spinning mill, later weaving. Converted to an elite *grand école* for political sciences, two light wells were created by removing brick floors from the wrought iron framework. Unfortunately its departure is planned in 2017. Hopefully there is a plan for future use here that will give as much dynamism to this quarter. (Another former le Blan cotton mill, biggest in France, is now Euratechnologies in Bois Blancs, to the west of the city.)

6. Rue de Valenciennes/ Rue de Trevis: beside Science Po are other cotton mills (Usine FFF?) c1855-1870, with arched windows and arcading, now apartments.

Next door to these at 48bis is a surprise. The Hotel Grand Palais has a sumptuous staircase and empire-style rooms fitted up for the headquarters of a railway company.

7/8. Finally two engineering shops form the edge of Moulins, before a railway marshalling yard: Crepelle, now part of Atlas Copco, known for compressors and, still painted on a wall, steam engines. It has an art deco door. In the block south of that are attractive curved concrete roofs over engineering shops of G D'Halluin (but perhaps formerly Crepelle). These, and a ribbed concrete chimney, may have been rebuilt after a massive explosion in German-occupied Lille in 1916. They are due to be demolished for the construction of a blood bank for the hospital. So the district continues to evolve but some considerable part of its industrial character shows through.



Photos geo-referenced to a map are found at <https://flic.kr/s/aHskkcRiiU> and anyone can add more to the TICCIH pool here: <https://www.flickr.com/groups/1246125@N23/> (Mapped with Flickr: numbers refer to the number of photos)



Conference news



A select group of TICCIH congress delegates visiting the former Oigines colliery.

Photo: Roger White"

Future conferences

Future Conferences

The tin-working landscape of Dartmoor in its European context: Tavistock, Devon UK, 6-11 May 2016

This conference marks the 25th anniversary of the Dartmoor Tinworking Research Group and the 10th anniversary of the UNESCO World Heritage Designation of the Cornwall & West Devon Mining Landscape. It will celebrate the diversity of this industrial landscape and compare its features and technologies with those of contemporary tin-working areas of continental Europe, in the Czech Republic, Germany, France and Spain. It will undoubtedly be a stimulus for future research.

The tin-working landscape of Dartmoor is perhaps the finest in the world for its extent, completeness, chronological range and accessibility. Most of it falls within Dartmoor National Park and much is on open moorland to which there is unrestricted public access. Although always closely connected historically to the Cornish tin industry, Dartmoor's tin-working landscape is quite distinct, as it lacked the deep tin deposits of its neighbour and also had an abundance of water resources. In the 18th, 19th and 20th centuries Dartmoor tin working was on a relatively small scale. Consequently, archaeological remains of these and earlier periods (especially AD 1300-1700) are still of outstanding extent and quality.

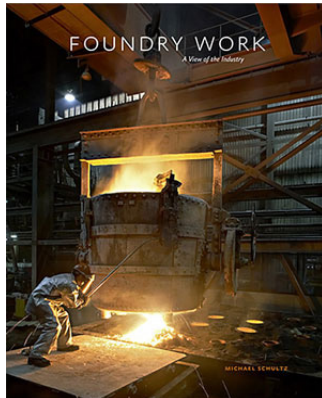
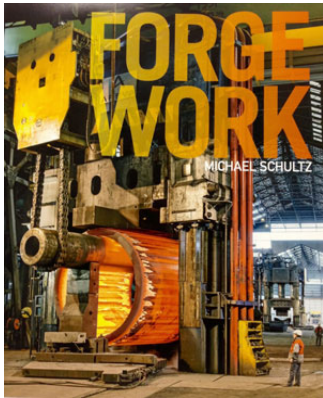
Croatia

7th International Industrial Heritage Conference PRO TORPEDO will bring specialists and enthusiasts again to Rijeka in May, 2016, to consider the 150th anniversary of the invention of the "Luppis-Whitehead" torpedo. Call for Papers

Renew your TICCIH membership for

2016 at www.ticcih.org

Book reviews



Michael Schultz, *Forge Work* (West Fork, AR: High View Publishing, 2015). ISBN: 978-0-615-21858-8. 138 pages. Paperback, \$60.00. Hardcover, \$225. 120 color illustrations.

Michael Schultz, *Foundry Work: Volume Two: A Global View of the Industry* (Privately printed, 2011). ISBN: 978-1-4675-0785-1. 288 pages, Paperback, \$80.00. 300 color illustrations.

Michael Schultz, *Foundry Work: A View of the Industry* (Privately printed, 2008). ISBN: 978-1-889937-18-2. 176 pages. Paperback, \$55.00. 150 color illustrations.

Betsy Fahlman, Arizona State University

Beginning in 2008, architectural and industrial photographer Michael Schultz has published three handsome large-format volumes of color photographs documenting the work of the international hot metal industry. His most recent book is *Forge Work*, which presents images of American sites in Illinois, Ohio, Pennsylvania, West Virginia, Wisconsin, and Texas, as well as forges in Canada, the Czech Republic, England, France, Germany, and Italy. Modern forging is a carefully coordinated and labor-intensive enterprise, requiring high levels of skill, experience, and precision. Schultz's goal is to "show the labor and faces" of modern industry, focusing on the processes that take place on the foundry floor. He conveys the scale of the immense machines of the industry, as well as the pride of those individuals and teams necessary to create a modern forging, in which "metal is pressed, pounded, or squeezed under great pressure into high strength parts." The work is noisy, hot, and dramatic, and for those unfamiliar with various forging processes, Schultz provides helpful summaries.

Schultz has divided his book into two sections: "The Work" and "The Workers." While there is no explanatory text accompanying either part, captions clearly identify site, process, and location (at the end of the book is a list of forges with information about each one). "The Work" features especially dramatic photographs with lots of steam, sparks, and red-hot ingots, the sort of visual feature that has long drawn artists to such sites.

The scale of the presses, furnaces, and hammer forges is impressive, and Schultz freely mixes locations, revealing the similarities of process that transcend national borders. His portraits of workers, shown singly and as teams, demonstrates the strength, seriousness, and pride of the men who work in the forges (there are a few images of women, but on the floor, forging remains overwhelmingly a guy profession).

Schultz's spectacular color photographs capture the power and wonder of the process, while at the same time conveying precise information about specific forges and the increasingly complex equipment operated by foundry workers. His beautiful images of the immense interiors suggest the scale and gravity of history painting, honoring the modern forge worker who performs a task with intensity and concentration. The cover pictures a 11,300-ton forge press forging a 140-ton cylinder at the AREVA, Creusot Forge in eastern France, a town known for its metallurgical companies, and whose ironworks date back to the eighteenth century. Schultz's image is a powerful example of the modern sublime.

Schultz's first two books presented similarly large scale color images (including fold-out pages), but were focused on casting metal. In *Foundry Work: A View of the Industry*, he presents dramatic photographs of a visually dynamic process, full of smoke and fire. There are sections on specific parts of the foundry process: mold, melting, casting, and finishing work. Included are complexes in Georgia, Iowa, Kansas, Louisiana, Michigan, Ohio, Oregon, Pennsylvania, Washington, and Wisconsin, as well as ones in France and Germany.

Foundry Work: Volume Two: A Global View of the Industry was supported by a 2010 Guggenheim Fellowship, which enabled him to continue to travel around the United States to sites in Indiana, Iowa, Kansas, Ohio, and Pennsylvania. More importantly, he was able to considerably expand his international scope, visiting operations in Austria, Belgium, Brazil, Canada, China, the Czech Republic, England, Germany, Hungary, Italy, Poland, and Turkey.

Collectively, these three volumes present an extraordinary visual chronicle of nearly a decade of the casting and forging industries on a national and international scale. The geographical scope is impressive, as is Schultz's ability to negotiate the many challenges of obtaining permission to work on such sites through company concerns regarding safety, and their need to protect "proprietary processes and products." Schultz's photographs celebrate one of the most visually dramatic industries, and shows their many similarities. As he noted in his Guggenheim statement, he desired "to honor the work and the workers of an industry generally hidden, difficult to access, and yet vital to the global economy." In doing so, he revealed "the commonality of a particular type of labor that is historical, often generational within families, and cuts across all geopolitical barriers." For Michael Schultz, the photographs reproduced in his three books transcend mere documentation, to create a compelling vision of a modern industry that is deeply grounded in history, work, and people.

Coming soon

Conferences and congresses

2016

US

The Past and Future of Historical Archaeology - assessing the centenary of the National Park Service (NPS) and passage of the National Historic Preservation Act (NHPA) 50 years ago. Society for Historical Archaeology
January 6-9, Washington, D.C.

Cuba

VIII Latin American Colloquium on the Industrial Heritage, organised with TICCIH
14-16 March. Havana, Cuba. 2nd Call for papers

UK

Celebrating the tinworking landscape of Dartmoor in its European context, Prehistory to 20th Century
6-11 May, Tavistock, Devon.

Croatia

7th International Industrial Heritage Conference PRO TORPEDO, 150th Anniversary of the invention of the "Luppis-Whitehead" torpedo
19-21 May, Rijeka. Call for papers

Canada

What does heritage change? Association of Critical Heritage Studies, with a session on 'Industrial Heritage: toward comparative perspectives'
6-10 June, Montreal. Call for papers

Portugal

ICOHTEC Symposium, Technology, innovation, and sustainability:
historical and contemporary narratives.
26-30 July, Porto. Call for papers

Opinions expressed in the Bulletin are the authors', and do not necessarily reflect those of TICCIH. Photographs are the authors' unless stated otherwise.

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TICCIH is the world organization for industrial archaeology promoting conservation, research, recording and education in all aspects of industrial heritage. It holds a triennial conference and organises interim conferences on particular themes. Individual membership is \$30 (USD), corporate membership \$65, and student membership. \$15

There is an online membership form on www.ticcih.org

The **TICCIH Bulletin** welcomes news, comment and (short-ish) articles from anyone who has something they want to say related to our field. The Bulletin is the only international newsletter dedicated to industrial archaeology and the conservation of the heritage of industrialisation. The TICCIH Bulletin is published online to members four times a year.

Back issues can be downloaded as a pdf file from the **TICCIH** web site, www.ticcih.org.

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