TICCIH
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Contents

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Extreme repurposing: the costly conversion of the 1951 dockyard crane over the Amsterdam docks to the Faralda Hotel marks a new threshold for the adaptation of industrial monuments. The three hotel suites - *Mystic, Secret and Free Spirit*- start 35 m up and 435 € per day.
Photo: Floris van Halm

Opinion

In appreciation of Hilla Becher

Axel Föhl

It was more than twenty years ago, in 1993, when a group of daring industrial archaeology enthusiasts ventured into the widely untouched Russian Urals to have a look at the heavy industry remains there. **Hilla Becher**, nearly sixty years old at the time, was part of our group. We were all impressed by her open-minded curiosity for the kind of things there that she and husband Bernd had already explored for nearly 40 years in other parts of the world.

Hilla, born in 1934 in Prussian Potsdam, was the one in the husband-and-wife-team that actually was a properly trained photographer, whereas Bernd had studied painting in Stuttgart and Düsseldorf. From 1959, both started their unique campaign to document in their specific way Europe's and later the world's relics of the Industrial Revolution. Not taken very seriously at first, they accumulated over the years a peerless body of serialized conceptual art showing the typified buildings industry had generated, one that serves for us today as an invaluable catalogue of objects that are rapidly disappearing - the more valuable, since not many other people had developed such an early understanding for the meaning of the industrial heritage.

Opinion

In the course of the 1970s, after their self-published book *Anonymous Sculptures – A Typology of Technical Buildings* had appeared, the **art world began to take notice**. In 1972 they took part in the Kassel "documenta 5", one year later they were shown in art galleries in New York and Paris. As early as 1967, the visionary Munich museum of Neue Sammlung had given a first glimpse of the meaning of the work of Bernd and Hilla Becher in the exhibition "Industriebauten 1830-1930". Bernd in 1976 took over a professorship in photography at the Düsseldorf Academy of Arts, where he was to become an outstanding teacher, giving his students room to breathe and allowing them (although he is credited to be the father of the "Becher School") to go their own way.

Besides Bernd, the taciturn son of the traditional Siegerland ore-mining district, Hilla, who at one time even was called "the iron lady of German photography", took over the task to interpret and communicate their joint work to the world. As the trusted 'chief advisor to the boss' as she once called herself, when Bernd died at 75 in 2007, it fell to her to curate the treasure amassed in an idyllic domicile and archive near the Romanesque church of Kaiserswerth, a northern suburb of Düsseldorf.

By means of her publications and exhibitions, the common work went on to fulfil multiple functions: document the Becher's unique body of art in a serial conceptual variant of 1920s 'New Objectivity' and at the same time preserving a singularly precious catalogue of witnesses to the industrial age, meanwhile long gone from the surface of the earth. Her vigour in doing this stayed virtually till the last days of her life.

Hilla Becher died on October 10 last year. Industrial archaeologists the world over have every reason to be thankful for the shared work of Bernd and Hilla Becher. In many places it served as an introduction to things that in consequence became easier for us to argue were worth preserving.

Report

A new approach to conservation training

Alison Wain, Course Convenor

With the ever-widening scope of objects, materials and structures in industrial museum collections, conservators continually approach new technical and intellectual frontiers. Alison Wain, who organised the first of the Big Stuff conferences on treating large industrial objects, explains how her new course responds to these challenges.

For the last three years, on the **Bachelor of Heritage, Museums and Conservation** at the University of Canberra we have delivered units designed to develop students' ability to conserve the increasingly varied range of materials found in modern collections. This means objects containing new materials, items from the world of digital art and inventions, and the increasingly varied collections now that not just elite, rare or very old objects are seen as potential collection material. This greater scope means that, while people who work in the "big four" specialisations of paper, paintings, textiles and objects are still in great demand, we also need people who have a grounding in the characteristics and needs of a wider range of materials and structures, and who expect to work across disciplines and with specialists in different areas.

So three years ago we designed a course that would introduce students to a broad spectrum of materials and conservation techniques, without compartmentalising that knowledge into specialist categories. We wanted to also embed the significance methodology into our teaching, so that our students have a basis for designing and evaluating treatments that reflects the meaning and value they carry for their stakeholders. And finally, we felt that a degree at undergraduate level should provide a solid grounding in the intellectual and ethical debates of the wider world of heritage, which ultimately form the context – and the boundaries – for the practice of conservation.

The resulting course provides core conservation knowledge through five themed units. These are Materials in Heritage Conservation – a study of the composition and structure of different materials; Preventive Conservation – a study of the interaction of materials with the environment and a risk management approach to preventive conservation; Dirt and Cleaning: Philosophy and Techniques – a discussion of what counts as "dirt" and an introduction to ways of removing unwanted material; Sustainable Repair and Restoration – a discussion of when repair is appropriate and an introduction to ways of joining and consolidating materials; and Surface, Colour and Completeness – a discussion of the importance of the surface of objects, both physically and intellectually, and an introduction to making and manipulating colour and coatings. Four of these units involve a semester long treatment project, which students may use either to acquire experience in treating different materials, or to focus on one type of material or object. This allows students who have a particular area of interest to follow it through their course. Interests that students have pursued so far include the traditional specialisations of paper, paintings and textiles, as well as natural history specimens, technology items and ceramics.

Report

Notably, students who are not aiming to become conservators can also take our conservation units, which we believe will develop a stronger understanding of how to care for collections in the wider heritage community.

The conservation units have been combined with the heritage and museums sections of the course to provide students with a broad understanding of the heritage context. The Cultural Heritage Field School teaches observation and recording techniques including photography, drawing, GPS and site mapping, while Heritage Philosophy and Ethics, Objects as Material Culture, and People, Place and the Past help students understand the different ways in which people use tangible and intangible heritage to recall, share and renew culture. Our conservation students also take a minor in science, which incorporates chemistry and a choice of forensic science, biology or environmental science units, and they have the option to take either two internships in a conservation laboratory, or one internship and one research project. They are also encouraged to take electives from other courses, such as design, which can complement and extend their skills.

Looking at the concepts and skills that are common to all areas of conservation, we have developed a course to deliver a graduate with a broad set of skills and understandings. We want our graduates to know how to work safely, both in a laboratory and on-site, how to observe carefully and document precisely what they see, and how to handle and move objects safely. They need to understand the basic formation, structure, and mechanisms of deterioration of a broad range of materials, and have a good working knowledge of how different materials respond to different interventions. And they should develop good hand-skills and be able to use the typical range of tools and equipment found in conservation laboratories competently and safely. Most important of all we expect our graduates to understand how to proceed with care when treating an object, and how to recognise the points where they need to stop and ask for advice and assistance. We anticipate that our graduates will be easily absorbed into an existing team, pre-equipped with a broad skill set, self-pacing, and ready to learn specialist knowledge as required.

Further information: Course Convenor **Alison Wain**

Worldwide

Beligum

Restoration of the Wielemans-Ceuppens brewery plant, Brussels

Joaquín de Santos

The old Wielemans-Ceuppens brewery is a symbol for Brussels and has pleased generations with delicious beers. After a period of growth and a number of enlargements, business went downhill and the company stopped operating in 1988, after more than a century of production. The Wielemans-Ceuppens machines remain as testimony of the golden age of the brewery, which used to be one of the major representatives of the beer industry in Belgium.

Restoring the Wielemans-Ceuppens machinery is thus a way of preserving the memory of the brewery as well as presenting the evolution of science applied to beer production. Such machines are far from being ordinary. Built between 1894 and 1905 they are, as far as we are aware, the last remaining in Europe and one of them, the De La Vergne compressor from New York, is unique.

The BruxellesFabriques association, which spearheads the efforts to promote and safeguard Brussels' industrial and social heritage, won a European Union Prize for Cultural Heritage / **Europa Nostra Award** in 2013 for its study for the restoration. First Guido Vanderhulst, President of BruxellesFabriques, undertook a feasibility study of their restoration.

The study went beyond a mere inventory of the machinery as well as its evolution in relation to technological progress and researching the history of the brewery, but formulated an original socio-cultural project for this historical industrial site that integrates the restoration of the machines, including setting some of them in motion for didactic purposes, with the training and involvement of the restoration workers in communicating to the wider public.

The Europa Nostra jury awarded the 2013 European Union Prize for Cultural Heritage / Europa Nostra Award with a Grand Prix in the category 'Research and Digitisation'. Restoration started at the end of December, 2015. It is progressing rapidly and has already yielded very conclusive results. Indeed, a month later the restoration team has already managed to render the bridge crane fully operational and to set the De La Vergne compressor in motion, 100 years after its last known operation.

The plant includes a horizontal Carels et Frères steam machine, The site is open for visits by appointment in French, English, Dutch and German.

Worldwide

Germany

Minerva iron works, historic place, modern technology

Judith Fait

Smelting and casting of iron has a long-standing tradition in the area of Münsterland, between the Dutch border and the Ruhr area of Germany. The region had all resources in proximity: iron ore, woods to make charcoal and water to drive machines. One of the foundries, the Minerva iron works, is still working in its original, more than 200-year-old location, now producing modern materials and automotive parts. With buildings constantly maintained and carefully enhanced, even the old city wall separating it from the medieval settlement still exists.

Between 1689 and 1794 several iron works (in German "Hütte") were founded in the region between Ijssel- and Aa River, Eltenberg heights and today's German Ruhrgebiet. Nowadays, the Dutch "Ulft Hütte" and "St- Michaelis Hütte" in German Liedern are industrial heritage sites. The "St- Antony Hütte" was the nucleus of the largest industrial complex in German Ruhrgebiet and the first archaeologically excavated industrial site in central Europe. The youngest of these companies was founded in 1794 and named after the Roman goddess Minerva, who was not only the patroness of craftsmen and trades but also the custodian of knowledge.

Minerva iron works soon provided an income for a wide region but did not became profitable until 1808. By 1817 the Minerva was a well known and respected company.

The first plan of the foundry's layout was drawn in 1797. The 17th century city walls border the foundry.

Around 1830 the regional markets for everyday goods like kettles and hearth plates decreased, and the Minerva works then began to specialize in engine building. A 1839-built 70-inch steam engine is the oldest existing German steam mining hoist. Today it can be seen at the Mining Museum in Bochum. In 1853 the periodical *Miner's Friend* noted 'three cupola smelting ovens operative at Minerva'.

In addition to small-scale items like everyday goods, special casts were also produced, some of which became almost monopolies when dealing with mailboxes and lighthouses. Their unique and precisely detailed designs for mailboxes and the technologically advanced lighthouses guarding ships along the North Sea shore made the company widely known. Its best known works include the Westheversand and Hörnum lighthouses. In 1932 ties to the Klöckner company tightened, resulting in an almost takeover situation until 1938. During the last weeks of World War II the foundry was severely damaged, but fully recovered until 1958.

Today the company is autonomous again, producing an annual volume of 28 metric tonnes in end-user casts. The modern cupola oven has a smelting capacity of 20 metric tonnes per hour and allows the company to offer cast iron parts between 20 and 520 kg in different flavours of iron from GG (grey cast iron with graphite) to GGV (recently developed vermicular graphite iron cast), plus special alloying additions on demand. The iron works offer opportunities and income for around 300 employees, providing stability and prosperity for a whole district. Moreover, they are living proof that historic awareness, modern technologies and the confidence to assert oneself in the constant technological change are not contradictory, but a chance for keeping a long standing architectural and industrial legacy alive and vibrant.

The interior of the oldest conserved part of the foundry was probably built around 1850. The lower parts of the columns are made of then-already standardized iron supports, while the upper section is a timber frame construction.

Worldwide

China

Growing industrial heritage conservation and research community

Yiping Dong
Department of Architecture, Xi'an Jiaotong-Liverpool University

Compared with my 2004 TICCIH membership, the first from China, there are now seventeen members in mainland China. The academic community of industrial heritage study is also growing and 2015 has witnessed extraordinary achievements of industrial heritage research and conservation practice.

The most important event was the agreement between TICCIH and China during the 2015 TICCIH Lille Congress. GUO Zhan (Vice President ICOMOS/China), LIU Boying and DONG Yiping, on behalf of TICCIH-China, discussed with TICCIH President Patrick Martin the agreement terms between the Industrial Heritage Committee, Cultural Relics Academy of China (IHC of CRAC) and TICCIH. This official agreement has been submitted to the State Administration of Cultural Heritage, China for approval. Six delegates participated and Professor Boying Liu was appointed national representative and elected to the TICCIH board, which will greatly promote the development of TICCIH in China and set up a close connection between China and other countries in the field. We are looking forward to the formal establishment of TICCIH-China in the near future, which will definitely improve the academic integration of Chinese IH research in the global vision.

The 6th Industrial Heritage Research Symposium-Future of Chinese Industrial Heritage was held in November, 2015 in Guangzhou. Over 250 participants and speakers joined this annual symposium, co-hosted by the Industrial Architecture Heritage Academic Committee, China, founded in 2010, of Architectural Society of China, Industrial Heritage Committee, Cultural Relics Academy of China, founded in 2014, the Industrial Heritage Section (founded in 2013) under the Historical and Cultural City Committee of Chinese Society for Urban Studies, Architecture School of Tsinghua University, and Architecture School of South China University of Technology. Although the majority participants are still from the built environment fields, this list reveals a very important expansion of research structures of Industrial Heritage studies in China. These three academic institutes for meeting the needs of different administration department are all organized and operated by Boying Liu. The annual academic conference held each November from 2010 and have published five proceedings, including members from throughout the country. Recently, IHC of CRAC has become the main industrial heritage research institute in China which involved two institutes established before, with more than 100 members, including scholars in the fields of heritage studies, architecture, technical history, urban planning and environmental and landscape science.

Before the first Industrial heritage Research Symposium in Beijing, 2010, an international symposium of Chinese Industrial Heritage was held in Fuzhou, 2008. The annual proceedings have been an important database for the research and practice in China.

Focusing on different aspects, 48 presentations have revealed the diversity of Chinese academic discourses about industrial heritage. The president of Cultural Relics Society of China, Dr. SHAN Jixiang (currently Director of the Palace Museum) delivered the keynote speech titled with "Searching and Watching – The Route of Chinese Industrial Heritage Conservation", echoing the symposium theme of "Future of Industrial Heritage" and calling for a broader interdisciplinary collaboration of research and conservation, and the urgent action to protect the industrial heritage in front of rapid urban transformation. Eusebi Casanelles, life President of TICCIH, introduced the mNACTEC territorial museum system and the former TICCIH board member, Dr. Lin Hsiao-wei presented the alternative industrial museum of industrial ruins in Hashima Island, Japan.

Besides the sessions with architectural and urban history and the conservation and regeneration perspectives, the Railway Heritage session focused on the historic Sino-Russian Railway, Yunnan-Vietnam Railway and Yunnan-Burma Railway. ; some other new topics such as the historical industrial structural research, urban transformation of the resource based cities, and education of IH were discussed during the symposium as well. After the Session of Industrial Museum, an agreement on Chinese Industrial Museums Union - Guangzhou Declaration - was signed by the curators of over 20 industrial museums in China.

This active Industrial Heritage research communities have been assisting the Chinese government produce several working documents such as "Survey Index of Chinese Industrial Heritage" (2011), "Guideline of Value Assessment of Chinese Industrial Heritage" (2014),"Inventory of Chinese Industrial Heritage in the National Key Cultural Relics Protection Units" (2014) and the ongoing "Guidelines on Conservation and Reuse of Industrial Heritage" (Request for Comment Version, 2015).

Besides the three major industrial heritage research communities, some traditional research societies or departments have started their discussions about industrial heritage as well. The Ministry of Industry and Information Technology has founded the "Industrial Culture Developing Center" (ICDC-MIIT) to promote the industrial history and quality of Chinese manufactory recently. The designation of industrial heritage, the national industrial museum, and industrial tourism have been discussed in first ICDC Summit forum in September 2015. The Chinese Society for the History of Science and Technology (CSHST) has held a seminar about the industrial heritage one week later in Beijing as well. In metropolitan Shanghai, industrial heritage and urban regeneration has been listed as a key topic in the Shanghai Urban Planning Bureau for the Shanghai 2040 new master plan.

The main exhibition of Shanghai Urban Space Art Season (SUSAS) was held in a re-used airplane shed in the former waterfront industrial site.

Last but not the least, the National Natural Science Foundation of China, the National Social Science Foundation of China, and National Key Technology R&D Program of the Ministry of Science and Technology have supported a series of industrial heritage research projects in the last few years, the research topics varying from the coal industry, modern shipyard sites, modern textile buildings, historical railways, eco-design of industrial architecture reuse, resource based city transformation and so on. Boying Liu and Yiping Dong discussed with TICCIH the possibility of translating TICCIH's Industrial Heritage Re-tooled and publishing it in China. Patrick Martin and editor James Douet were supportive and we are talking with the publishers about the Chinese version. With all the efforts from different stakeholders in the conservation and research of industrial heritage, it would definitely improve the study of industrial heritage in China.

Editor's note: The current publishers of Industrial Heritage Re-tooled, Left Coast Press, have recently been bought by Routledge, part of the Taylor and Francis Group.

Argentina

Railway architecture in private and public hands

Jorge Daniel Tartarini

In 2015, the Argentine Government re-nationalized the railway network under the name Ferrocarriles Argentinos Sociedad del Estado. Along with the modernization of equipment and infrastructure, the recovery plans contemplate new building and the recovery and rehabilitation of the system.

Argentina before the arrival of the train in 1857 was a vast territory with almost impassable geographic barriers, a largely rural population and fragmented regional economies, with little possibility of integrating into an international market avid for raw materials. With the arrival of the railroad all that was irreversibly changed. Alongside came never-before seen constructions, emerging from the industrial revolution and the needs expressed by one of the most integrated railway systems in history.

The dominant British presence is set in numerous industrial, engineering and architectural expressions that reflect the scope and quality of the transfer between those Isles and this territory until about 1930. In this process railway architecture was incorporated into the local environment as a system of elements already well-developed in the country of origin. The concept of type was applied not only to the stations - the most emblematic buildings - but to all of the constructive elements and equipment: shelters, water tanks, bridges, warehouses, directors' office, ticket counter, clocks, bells, iron columns, fireplaces, grills, gutters, carpentry, etc. A universe planned up to the last detail, but not for this nor for its nature repetitive, without design quality, craftsman's handmade rigor or nobility of materials.

The clear constructive logic of these and other parts of the network, without interference to the formal repertoire of the railway buildings, presents a magnificent combination of historical styles, predominantly picturesque, with a pragmatism in technique and construction of the building tradition and traditional quality of English domestic architecture.

This symbiosis is what allowed the stations to incorporate an amazing variety of ornamental details of high expressive quality, integrating tradition and innovation, within the universe of the standard solutions provided by railway companies.

What cannot be overlooked in this scenario the action taken by the State in favor of railway construction with public funds. By 1909 the Ferrocarriles del Estado had a 3,490 km network, an extension that in 1925 reached 6,617 km, becoming the second company in the country. Its efforts to stimulate and integrate spread to vast areas of the national territory, contrasting with the economic logic of the foreign companies that controlled the local railway businesses. In 1936 the network reached 9,690 km, with articulated branches from Patagonia in the south to international connections in the north with neighbors like Chile and Bolivia.

The variety of typologies and architectural styles designed by the technical offices of the State Railways covers a repertoire ranging from conventional examples similar to those built by British companies to solutions that draw on historicism and the picturesque with neo-colonial roots, sometimes with regional and vernacular character. So in Patagonia we find buildings of Central European style, dressed in stone, while the center and north of the country Spanish styles dominate, with decorated tiles, grates and Hispanic colonial details. At the end of this period the first expressions of rationalist architecture emerge in rail transport, not only in stations but also signal booths and workshops as well as headquarters and offices in the railway sector.

The international crisis of 1930 severely limited the economic scope of production, with the decline in commodity prices and loss of world markets. Yet despite the collapse, Argentina continued in 1939 at the head of the Latin American networks, with 46,815 km, followed by Brazil with 34,204 km and Mexico with 24,363 km.

On the other hand, competition from buses and trucks made it impossible for rail to compete on cost. In 1947, thanks to an agreement signed by the governments of Britain and Argentina, the nation acquired all the railways of British origin for 150 million pounds sterling. In that year, there was a total 2,275 railway stations of the private and public companies.

Halfway through the 1990s, the privatization process marked the collapse of the passengers and cargo system, only a portion of the goods transport and the most profitable routes and branches surviving around the capital and Greater Buenos Aires area. But under the recent return to state ownership the network will operate as "open access" with private operators able to serve freight services along the lines. It is expected that the magnificent railway heritage that our country has can join these progressive actions of rescue. It is an architecture that reflects the magnitude, richness and diversity resulting from the action of the railways over 90 years of history.

Next issue will report on railway conservation in the newly nationalized Argentine network.

Rosario central station dates from 1888 and was partly rebuilt in1921. The centre of an urban park since 2005, the new national rail company plans to spend A$ 15m restoring the building. Photo: Pablo D. Flores, Creative Commons

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Worldwide

Indonesia

New functions for redundant industry

Industrial heritage from the colonial era can still be found in many places in Indonesia. Sometimes the original function is retained but often it is lost and sites left to decay. Could preservation of industrial heritage in Indonesia have a positive impact on tourism, local economy and derelict neighborhoods?

A neat town square with whitewashed, western-style buildings, iron benches, a fountain, wide sidewalks and shady trees: that was my first impression of Sawahlunto, a mining town in West Sumatra founded after the discovery of vast coal fields in 1868. Surrounded by hills, it felt like arriving in the Dutch province of Limburg.

Rika Cherish, director of local museums at that time, took me around town and showed me the most interesting sites: the old soup kitchen, a mineshaft, the headquarters of the Ombilin Company, the club house, the house of the *assistant-resident* and the old train station. The soup kitchen is now a museum, the mayor lives in the *assistant-resident's* place, the chimney of a former power station is a minaret and the train station exhibits a locomotive that was used to transport coal to the port of Padang. Everything beautifully restored and probably the best example of preserved industrial heritage in Indonesia.

Earlier this year I visited Meru Betiri National Park in a remote corner of East Java. We had to cross a river three times to get to the village of Sukamade. Our main goal was to observe turtles on the beach at night, but to my surprise we arrived in a plantation village where time has stood still. The house of the superintendent stands on a hill, there are two rows of rickety bamboo houses for the workers, and an old factory where rubber, cacao, coffee and copra were still processed. I recognized the Dutch company name Braat on the machinery. Between 1870 and 1930 western planters founded plantation villages like this all over Java, some of which still exist today.

Both examples show that a wide range of industrial heritage can be found in Indonesia. After the Dutch Indies opened up for private investment in the 1870s, the local economy got a kick-start and industrialization took off. Most developments took place in infrastructure, processing of plantation products, mining, light machinery and public facilities. It is amazing to discover that some of this industrial heritage retains its original function today; examples are 100-year old sugar mills, irrigation systems from the start of the 20th century and an extensive national railway network on Java that was mostly developed between 1880 and 1930. The national railway company is currently busy reactivating old rail routes and historic train stations.

For foreign visitors, observing this industrial heritage creates the feeling of past times still alive and history still visible: added value for any visit to Indonesia. And Indonesians are also increasingly interested in discovering and preserving their industrial heritage. Examples are guided trips to old sugar factories in the vicinity of Surakarta, one of them recently used as a backdrop to an art performance.

Most examples of industrial heritage preservation in Indonesia are related to either retaining their original function or displaying it in a museum-like setting. However, this type of preservation has only limited possibilities, and to preserve industrial heritage on a large scale, a search for alternative functions is necessary. Standard options are usually a heritage hotel, art gallery or restaurant. However, industrial heritage is not always located in popular areas. More often it is in derelict or remote industrial neighborhoods.

During a recent trip to New York I visited the High Line, the elevated railway line in an old industrial part of the city. A residents' initiative prevented its demolition and instead it was turned into an elevated park. It not only became public space for local residents but a popular attraction for visitors to New York, and has acted as a catalyst for new developments in this former derelict area.

This shows radical new functions can create solutions and opportunities. Industrial heritage in remote and 'raw' locations can be surprisingly appealing to local initiatives, start-ups, creative industries, pop-ups or representatives of underground culture. Local government can help in facilitating the revitalization of these areas by handing over industrial heritage at minor cost to small-scale, local initiatives. These would otherwise never have access to such locations, let alone end up together with other small-scale enterprises. Facilitating its transformation into new functions will preserve the industrial heritage, develop new destinations for locals and visitors alike and eventually stimulate a local economy. It seems there is still a world of opportunities here for local governments in Indonesia.

Emile Leushuis is author of the guidebook Gids Historische Stadswandelingen Indonesie (LM Publishers, 2011). In 2014 the Indonesian translation Panduan Jelajah Kota-kota Pusaka di Indonesia was published (Penerbit Ombak, 2014).Japan

The former processing works in Sukamade plantation village, Meru Betiri National Park.

Worldwide

Japan

Tokushima, Museum of Bridges

Syuichi Takeichi, Tokushima Prefecture Land Development Public Corporation

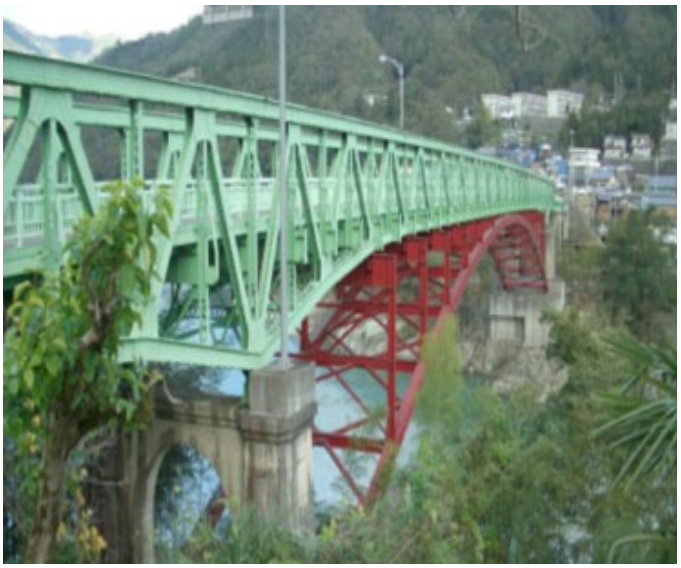
Naruto is located in the northern part of Tokushima Prefecture in Japan. It includes the Naruto Strait, among the three most dramatic ocean currents in the world and widely known for producing some of the largest whirlpools. Both Tokushima and Hyogo Prefecture have launched research on the cultural and historical values of the whirlpools, as part of their efforts to have the whirlpools registered as a World Heritage Site. Tokushima is also home to some 500 rivers and has bridges of various styles. The group of 46 bridges built across the large Yoshino River is dubbed the Museum of Bridges, as each of them reflects the construction technology of that time. Most of the bridges built from the late 1920s to the 1950s were suspension or truss bridges. As the river is very wide, the bridges had to be long enough, so the Miyoshi Bridge (suspension bridge) and the Yoshinogawa Bridge (truss bridge) were the longest in the East.

In 1963, the Nada Bridge was completed as the second bridge adopting the Dywidag method in Japan. Arch and steel girder bridges appeared between the late 1960s to the early 1970s and the box girder became common in the late 1970s to the early 1980s. A cable-stayed bridge was built for the first time in Tokushima in 1993, and an inverted Langer style PC bridge with the latest earthquake-resistant design was completed in 1999, after the Great Hanshin-Awaji earthquake. The Awa Shirasagi Ohashi Bridge was completed in 2012, and the part of the bridge built over the extensive stretch of tidal flats has no piers to preserve this natural area. The cable-egret style was adopted for the first time in the world to lower the main towers by placing horizontal cables under the girder.

The Yoshinogawa Bridge, at 1,071m in length, was the longest bridge in the East when it was completed in 1928. It survived the war and the Nankai Earthquake in 1946. In order to build this 17-span truss bridge, a travelling crane was installed on a wooden falsework.

Located in the upper Yoshino River basin, the Miyoshi Bridge was erected in 1927. It was originally built as a suspension bridge, but had to undergo serious reconstruction twice due to damage. Part of the wires in the main cable were found to be broken in 1987, which caused the bridge to be renovated into a deck-type Lohse bridge. After considering various designs, it became clear that the stiffening truss and the floor slab was firm and the basement of the main towers were covered by solid bedrock. Therefore, a two-pinned arch rib style was adopted to support the stiffening truss by using bedrock as the pivot point.

This is one of the bridges representing the "Museum of Bridges" as it shows how technological advancement enabled the bridge, which could only be built by suspension-bridge style, to be renovated into a beautiful, yet economically efficient arch-style. We would like to pass this valuable assets of important bridges for generations to come. They have a technological value and the cultural value as a civil engineering heritage.



South Africa

O'okiep Mine and the Namaqualand copper mining landscape

Barry Gamble

In 2009, the government of South Africa entered the Namaqualand Copper Mining Landscape, Northern Cape Province, on its Tentative List to UNESCO, indicating its intention to nominate the serial property for inscription on the World Heritage List. In April 2015, the property was removed from the Tentative List, together with two other key industrial heritage properties: Pilgrim's Rest Reduction Works Industrial Heritage Site, and Kimberley Mines and Associated Early Industries, both added in 2004. Work on compiling dossiers on the three sites may have become inactive, or aborted, for various reasons including mining activity (principally recoveries from 'tailings') and issues of ongoing mineral rights. But it is hoped that protection through legal and practical means, and conservation – sorely needed in certain cases – may be forthcoming given their unquestionable heritage significance to South Africa and, indeed, the global community.

The three sites provide eloquent testimony to the three major mineral discoveries (copper, diamonds and gold, in that order) that catalysed an urban-industrial society in South Africa:
Namaqualand, the oldest of all mining districts in South Africa, with its integrated copper mining-railway-port landscape that mark the beginnings of the country's industrial mining phase, its first speculative boom in stocks and shares and the establishment of its first industrial towns;
Kimberley, once the largest urban society in the interior of southern Africa, and its iconic 'Big Hole' - the world's largest surviving hand-dug hole and a symbol of Cecil Rhodes' monopolistic De Beers Consolidated Mines that dominated the global diamond market; and Pilgrim's Rest, not only the well-known gold mining settlement but also its outstanding Central Reduction Works, built in the late-1890s and powered by hydro-electricity from plants located in the spectacular Blyde River Canyon.

The South African mining industry was founded on Namaqualand copper in the 1850s in the British colony of the Cape of Good Hope. Okiep (modern spelling) is South Africa's oldest mining town and surrounds the remains of the mine at an elevation of around 3,000 feet, 75 miles south of the Namibian border.

The wide Okiep valley plain from an ultralight aircraft in the evening sun: flooded "glory hole" with smelter slag heaps behind, "Cornish Row" (centre left), Wesleyan Methodist church (1883, centre far left), and roofed engine house (lower right) that contains the 50-inch cylindered Cornish engine built by Harvey's of Hayle in 1882.

Photo: B Gamble.

By 1863 the mine was managed by John Taylor & Sons who had formed the Cape Copper Mining Company in London. O'okiep 'purple ore' (bornite), the rich copper sulphide that assayed an average of 45 per cent copper, had been found within 10 feet of the surface. Hosted in a steep dyke-like body, that proved richest between the 70 and 80-fathom levels, the Taylors advocated downright shafts with pumping and winding performed by Cornish engines. Transplanted Cornish engineering was accompanied by Taylor's characteristic formula of Cornish captains and engineers, the 'tribute and tutwork' labour system and special emphasis on the latest technology applied to all stages of mining.

Smelting was undertaken in Swansea, which possessed an unprecedented global supply chain of copper ore at the time. Carriage from O'okiep to the coast, let alone the passage to South Wales, almost equalled the overall cost of mining. Laborious ox-wagon trains (displaced by mule trains in the 1860s) followed the 'copper road' that crossed the mountains at Messelpad ('Masonry Road', built 1867-69) Pass before descending to the dry valley of the Buffelsrivier and across the Sandveld to Hondeklipbaai. Construction of a 93-mile narrow-gauge (2 feet 6 inches) railway commenced in 1869, six years after the Cape Town to Wellington line (the first railway in the Cape of Good Hope) was completed. It was operated by mule traction at first, and later by steam locomotive.

In 1874 a correspondent in the Mining Journal described O'okiep as the richest copper mine in the world. The central or mountain section (with grades up to 1 in 19, and curves as sharp as 128-feet radius) was formally opened on New Year's Day 1876. The value of copper ore transported down the railway in one year exceeded the cost of construction by around 50 per cent. Dropping 3,000 feet from the mountains to cross the monotonous Sandveld to the coast, the railway was considered one of Africa's engineering marvels.

Today, the wider mining and industrial heritage in Namaqualand is remarkable: the only extant Cornish beam pumping engine in situ in its engine house on a metal mine outside Cornwall (it survived the 'Siege of O'okiep by Boer commandos for four weeks during the last phase of the Boer War in 1902, was used until 1929, restored in 1965-68 and is now a National Monument); opencast 'glory holes' (at five different mines); mine dumps (with rare mineralogy) and smelting slag heaps (with significant remains of two smelters); the courses of the early 'Copper Road' and the mine railway with its attendant succession of water towers traversing the mountains and crossing the sandy coastal plain; the harbour with its ore jetty and original settlement at Port Nolloth; Methodist and Anglican churches with their cemeteries, company-built miners' housing and barracks. It's all there. It is a well-defined linear industrial cultural landscape worth conserving, a shared heritage that I hope one day will be considered again as spectacular as nature's show of wildflowers that visits Namaqualand each spring.

Clara, the last of the Kitson-type mountain locomotives used by the Cape Copper Company from 1893 to 1941. Mules, and steam traction, were used from the outset, steam being withdrawn in 1876, reintroduced in 1886 and taking over the whole route in 1893.

Photo: B Gamble.

Scandinavia

Resource extraction and sustainable arctic communities

Dag Avango and Peder Roberts, Div of History of Science, Technology and Environment, KTH-Royal Institute of Technology, Stockholm

Over the last two years, research funding agencies in the Nordic countries have invested substantially in initiatives which include research dealing with industrial heritage as resources for de-industrializing mining communities. Since 2014, a number of researchers at the Division of History of Science, Technology and Environment at the KTH Royal Institute of Technology in Stockholm have conducted research with this focus within two programs – the "Mistra Arctic Sustainable Development program" (funded by Mistra) and "Sustainable communities and the legacies of mining in the Nordic Arctic" (funded by Nordregio). The overarching ambition of those programs is to produce a new understanding about the conditions for creating sustainable development in the Arctic. Industrial heritage forms an important part of this work, because material and immaterial legacies of extractive industries are inescapable issues for many communities in the far north of Europe. The largest and most recent initiative in this field is REXSAC – Resource Extraction and Sustainable Arctic Communities – a Nordic center of excellence for Arctic research led by KTH, Stockholm University and Stockholm Environment Institute together with 10 partner institutions in the Nordic countries, North America and Russia. Funded with 28 million SEK by Nordforsk (Nordic Council of Ministers), REXSAC will be in operation for years 2016-2020.

The main rationale behind these initiatives is the growing global concern for the Arctic, partly due to the environmental impacts of climate change in this region, but also to the characterization of the region as a new frontier for natural resource extraction. The circumpolar Arctic was heavily affected by the global mining boom that started in the early 2000s, triggered by the high world market prices that resulted from growing demand for base metals in East Asia. This boom has affected the natural environment and the lives and future prospects of communities in the region, and therefore holds a central place in debates about sustainable development. A large component of these discussions has been the question of how to handle the legacies of large scale industry, a debate which involves industrial heritage.

Over the coming years, REXSAC will study these processes of change from a range of disciplinary perspectives. With an understanding of extractive industries as producing cultural, social, and economic, as well as ecological legacies, the center will analyze why resource extraction commences, what consequences it has for communities in the Arctic and beyond, and what opportunities exist for transitioning toward post-extractive futures.

This final problem has taken on a growing importance as the global mining boom is coming to an end and mining communities in the Arctic and beyond are being forced to deal with the consequences of past industrial operations. Researchers within REXSAC will explore under which circumstances abandoned large-scale resource extraction sites can be turned into resources for new futures in post-industrial Arctic communities, and which policies and structures can ensure that industrial heritage is considered in discussions of post-mining futures.

Researchers working at KTH and affiliated institutions have conducted several fieldwork campaigns in mining regions in northern Fennoscandia and Greenland, combining interviews with a wide variety of actors and stakeholders (such as representatives and, former employees of mining companies, municipal planners, tourism operators, and members of indigenous communities) with extensive documentation of industrial landscapes. So far our research has shown that attitudes to abandoned mining sites differ significantly across the Arctic. In some cases they have been perceived as unwanted legacies of problematic pasts, making "rewilding" the preferred strategy. In other cases abandoned mines and associated infrastructures have been re-defined as cultural heritage and have become anchor points for local identities and a resource for new economies. There are also significant differences of opinion within the mining regions. Corporate and municipal actors are often eager to brand industrial remains as heritage, as representations of success stories, while indigenous groups who have suffered negative consequences from mining are understandably less enthusiastic. It will be a challenge for policy makers in the north to recognize the controversial character of industrial remains in the region and to provide platforms where a wide range of voices and narratives may be told and gain recognition. By addressing these problems and questions, the field of industrial heritage studies can make an important contribution to the discussion of sustainable futures in the Arctic and beyond.

An abandoned coal mine at Qullissat, Greenland, a place of memory for Greenlanders who used to live there.

Modern industrial museums

Animating representations of industrial heritage Part II

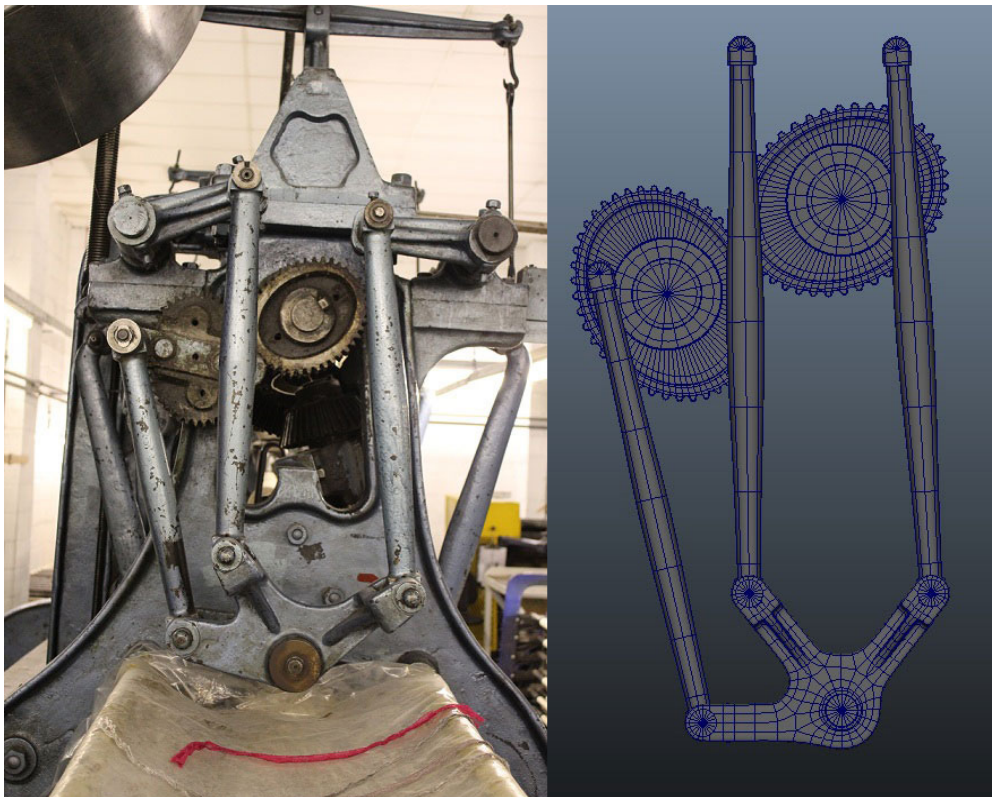
Tom Fisher and Andrew Love

This article continues from *TICCIH Bulletin* (#70, 4th Quarter, 2015) the account of 3D animation work to explore an extant piece of industrial heritage, the Cluny Lace factory in Derbyshire, England, which has remained in operation against the odds by specializing in the early 19th century Leavers lace process. The animation is part of a **short film** that demonstrates the power to explain the machine and indicates how it might be used in a museum setting. The Nottingham Industrial Museum, which has a complete, but non-functioning Leavers machine and was a partner to the project, intends to use the film as part of its future display.

The use of 3D animation in the industrial heritage field is quite new, as is the technology that makes it possible. It is a technique used to bring inert or non-existent objects, buildings, town- or landscapes to life. The power of this technology in museum settings was obvious as soon as it appeared – the use of 3D animation in museum, educational and other settings where the transmission of knowledge is important go back to the early 1990s. It was in this century, however, along with the development of CGI for film, that the technology began to produce results with levels of realism that could genuinely engage audiences and give confidence that its interpretational potential could be realised.

This 'virtual modelling' approach has been applied to a wide range of objects that 'may be too large or too small to explore in real life, or which were lost in the past, or which do not yet actually exist' (Kuksa and Childs, 2014: 14). It is part of what was identified as 'Advanced Industrial Archaeology' by **Laroche and Kerouanton** in 2010.

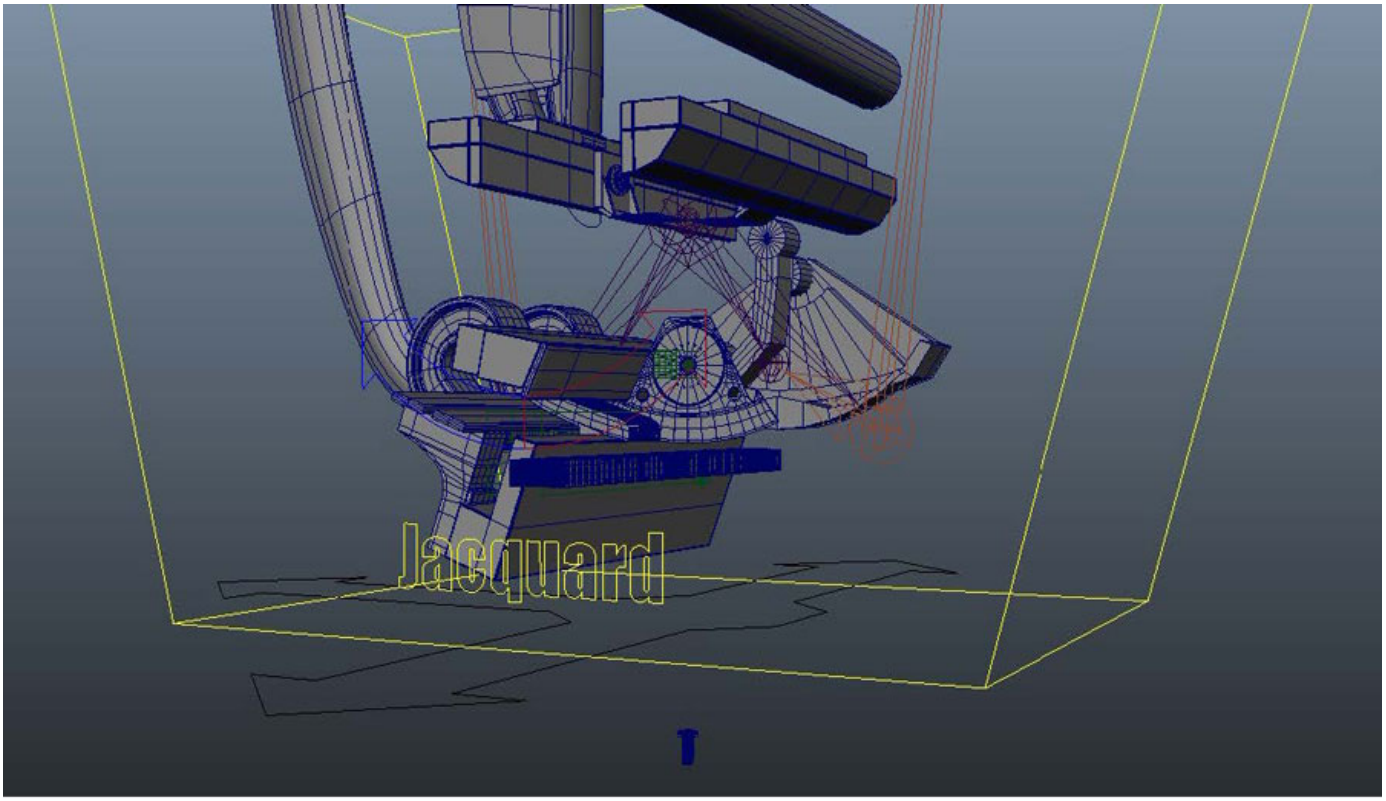
The process of making the 3D animation was dependent on the other elements of the project which gave access to the factory and its machines at Cluny Lace and, beyond that, the acceptance of the researchers by the employees of the ethnographic work. The animator, James Thompson, spent three months developing the animation, a process that began with him learning the principles of the machine's operation and studying the representations of the machine. Cluny Lace's business model involves making their 'niche' product, which means keeping their old machines running each day and completely overhauling them periodically. A machine made by the Jardine company around 1930 was in the process of being re-assembled at the time of the project. This made it possible to see in 'exploded' form the complete machine and to understand first-hand the relationship between the components, particularly between drive train and the motion of the bobbins that carry the nylon thread, and the 'points' that follow a complex path in and out of the material to consolidate the twists in the fabric. The fact that this machine was available also meant it was possible to take direct measurements of the components from which the 3D model could be constructed.



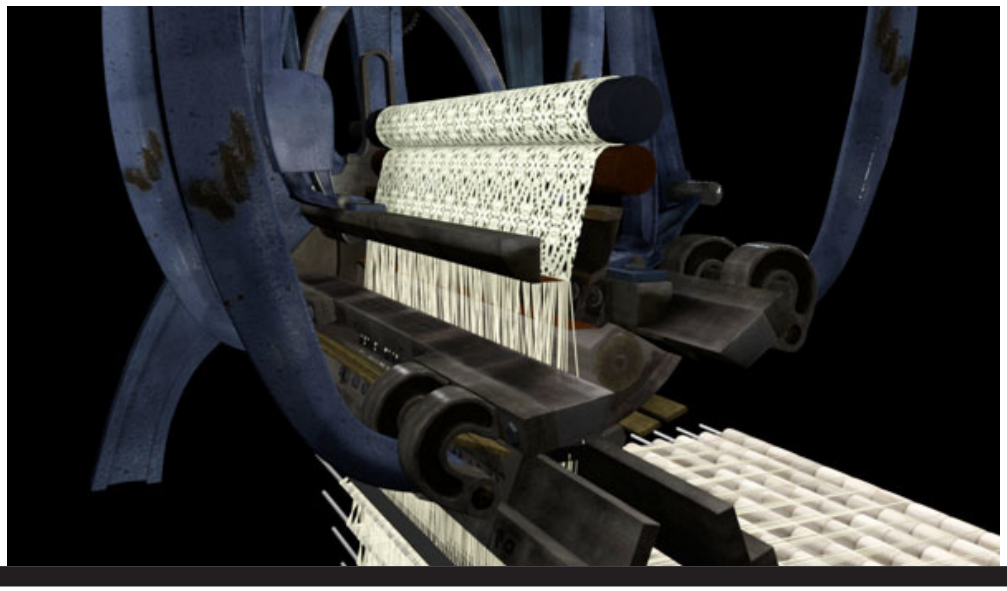
The representation of the loom drive train, on the left is one end of the machine where the drive train is visible; on the right is the 3D model of the same components.

The components were modelled using Autodesk's Maya animation software and rendered across a network of 40 Hewlett Packard work stations that were available at the university. Care was taken to ensure that the relative size, pivot points and articulation of the individual parts were replicated, along with the appearance of the components. The parts were combined into a final scene in order to replicate the general arrangement of the original machine's assemblies.

The didactic function of the animation required the representation not only the movement of the solid components of the machine, but also the motion of the threads as they twist round each other to produce the lace 'web'. Precedents for such animation exist in manufacturers' promotional material for **knitting machinery**. However, animating the threads presented a particular challenge, and it is fair to say that this aspect of the result, along with the rendering of the lace as it emerges from the machine, is rather more schematic than the animation of the machine components. The project did achieve sufficient veracity in its representation of both the soft, textile, and the hard, metal, components of the machine to achieve a result that communicates the complex dance that both undergo in the production of lace.



The components were also animated relative to each other so that they moved with their true motion. This used a technique called 'rigging' through which the static 3D model is given motion by being attached to an internal 'skeleton' and external control structure, which is invisible in the finished animation. Once complete, the animated components could be rendered with surface textures that represented the patinated steel and enamel paint on the original.



A good deal of realism can be achieved in the rendering of both the machine parts and the lace.

Modern industrial museums

Industrial museums at risk

Theodora Chatzi Rodopoulou, PhD candidate TUDelft, fellow of the Onassis Foundation

The transition to the 21st century brought a change to the risks that preserved industrial heritage sites face. In Britain, from a dilapidated industrial heritage stock that was flirting with demolition, we now have plenty of industrial sites that work as museums or visitor attractions. Nevertheless, their conversion has not guaranteed their future and many are at serious risk. Their potential failure is of great importance to the heritage field because of their high historic, technical, evidential and social value. Are there any options available for tackling this problem or will we soon need to deal with a new generation of empty buildings?

Drawing lessons from the Ironbridge Gorge Museum (IMG) and Middleport pottery in Shropshire, England, two celebrated cases of industrial visitor attractions, we highlight ways of keeping industrial museums and visitor attractions functional within the current challenging socioeconomic situation.

Select a mix of complementary uses The vast size and complexity of converted industrial sites makes them hard to maintain by single-function schemes, such as industrial museums or visitor attractions, which generate relatively small revenue. A key consideration should be ensuring long term viability. This can be achieved by creating a mixed-use program consisting of complementary uses, including a visitor attraction. The philosophy of Middleport pottery was based on this idea. Having a three-function program, it works as a production site and a visitor attraction, as well as offering spaces to rent out.

Keep it fresh and attractive The challenging socioeconomic climate in the UK makes the need for high visitor numbers crucial, especially for the survival of the existing single function industrial museums and visitor attractions. Achieving high visitor numbers can be relatively easy after the launch of a project but it becomes more and more challenging. The matter is aggravated in the cases of remote industrial museums and visitor attractions with a small catchment area.

It is therefore fundamental to convince visitors to revisit the site. The Ironbridge Gorge Museum has accomplished this by organising activities and renewing its attractions. Events based on seasonal occasions, such as Christmas, Easter and Halloween, or thematic events like workshops, exhibitions, or archaeology seminars, make Ironbridge a touristic destination for all ages, all year long. The introduction of new attractions such as *Enginuity*, a science and technology "playground" that opened in 2002, keeps the site fresh and makes it more appealing to new and old visitors.

Recruit new volunteers According to the results of the English 'Heritage at Risk' programme, "30% of all industrial heritage attractions in England are wholly or largely cared for by volunteers". The ageing of the first generation of volunteers, and the difficulty to renew this base, places them sites at risk. Sustaining the volunteer base of an industrial museum or attraction is critical for its survival. Both Middleport and IGM have recognised this and have been implementing strategies for volunteer attraction. IGM, with 500 volunteers, has a lot to teach. To recruit new volunteers it is important to address the whole spectrum of potential individuals or groups. Also, giving incentives such as training and experience for the unemployed is a powerful motive for volunteers' attraction.

The philosophy of Middleport Pottery is based on three complementary uses: the pottery production, the visitor attraction and the rent workspace. The visitors of Middleport have the unique chance to visit a working factory. Middleport production workers, depicted here, are still using traditional craftmanship for pottery making.

Modern industrial museums

Share, learn and liaise In his 2008 report "Sustaining England's Industrial heritage" Neil Cossons raised the issue of the deficiency in preservation and interpretation quality of the industrial heritage attractions in the care of volunteers and local authorities. That is still a fundamental risk, which is expected to escalate after the first generation of volunteers with high technical skills retires.

In response to this problem there are now a number of institutions that help custodians of industrial museums and heritage attractions improve their skill set and maintain high standards of preservation and interpretation. In 2012, Historic England introduced an industrial heritage support officer as part of the *Industrial Heritage at Risk* project to provide help, advice and training to preservation trusts and voluntary groups.

Collaborative regional 'self-help' networks are facilitated, encouraging sites to work together more effectively.

Careful planning, the continuous reinvention of the attraction, the maintenance and refreshment of its volunteer base as well as the use of support organisations, can reinforce significantly the viability of these sites, within the challenging economic situation.

Editor's note: Queen Street Mill Textile Museum in Burnley, Lancashire, UK, recognised as 'the last remaining operational steam powered weaving mill in the world', with a collection designated as of national importance, is under direct threat of closing under spending cuts imposed on the regional government. The campaign to drum up support is **here**.

Volunteers at Ironbridge

Conference reports

Ist international Seminar of Industrial Heritage Studies, Bogotá, Colombia, September 2015

Eusebi Casanelles

Communications about the industrial heritage of Colombia have been very scarce in the congresses of TICCIH, including the Latin American ones held every three years. Colombia is one of the few big countries of the American continent which has never had a TICCIH National representative or correspondent. But in the spring of 2015 a group of professors lead by architect Pedro Rojas set up TICCIH Colombia and before the summer they signed an agreement with TICCIH President Patrick Martin. At the same time, the Ist international Seminar of Industrial Heritage Studies was organized by four Bogotá universities. The seminar was held last September and at the opening I could welcome its incorporation into the community of TICCIH international on behalf of the President and the board.

Bogotá is a beautiful city, it has a subtropical climate but it is 2,600 m above the sea level and the average temperature is 14 C. It preserves a historic centre of great beauty, its museums are excellent and the vegetation is lush.

The history of economic production began before the arrival of the Spanish. In the Altiplano was developed the so-called "muisca culture" whose economy was self-sufficient. A settled social organization and production was based on the exploitation of salt, ceramics and the production of woven cotton fabrics. In the 16th century the introduction of sheep began the production of animal fibre. This culture optimized the resources of the territory, created terraces, exploited minerals and set up a water culture of great importance. They also began to exploit two precious elements that would have great economic importance in the colonial economy and in the following centuries: gold and emeralds.

Industrialization started in the 19th century after independence when new actors from Germany, UK, Belgium and USA started to exploit the natural mining and food resources. After the crisis of the 1920s and 1930s, production focused on tropical agro-food: tobacco, coffee, banana, sugar and mining. Communication networks were improved: river and sea ports, railways and overhead cables began to ease transport through a very hilly country.

All these activities have left an interesting heritage that needs to be studied more deeply and disseminated more widely. In the September congress, presentations on banana and coffee farming were particularly interesting. In the first case, the infrastructure and company towns of the fruit company Santa Magdalena (Lina Constanza Beltran) characterised its heritage. In the second, the cultural landscape of coffee (Juan Manuel Sarmiento) was declared world heritage. It includes eighteen urban centres in the area of Antioquia where the traditional architecture of the colonization is maintained.

Coffee is cultivated on the slopes of the mountains on small plots and farmers have adapted crops to the difficult geography of the country.

Another noteworthy sector is coal mining. Colombia has the largest reserves of this mineral in Latin America and its production is increasing annually. After oil and coffee it is the third export product of the country. Mining has left a valuable heritage and, related to it, is also a steel heritage as explained in the presentation on the Foundry of Samaca. Traditional sectors such as textiles and flour were the central topic of other papers.

The industrialization of Colombia cannot be understood without German investment and German immigrants. They are present not only in industry but also trade, education, communications infrastructure, architecture and mining. The University of Santo Tomas and the Bergakademie of Freiberg in Germany are working on a study which started three years ago (Alejandra de el Toro). In the Department of Bocayá the German contributions were basically machinery and equipment. The communication (Armando Muñoz. Mª Isabel Gómez Ayala) highlighted the Acerias Paz del Río, one of the most important industries of the country, which today is still a pole development and its existence is largely due to German contributions.

The last part of the Congress was dedicated to the railroads, which started to be dismantled from the 1960s when new roads were built. Despite this, Colombia retains approximately 2,000 km of railway lines. This huge resource is a central theme of Colombian Industrial Heritage (Pedro Pablo Rojas)

The last day was devoted to a trip on the historic Savana train which sets off from the station of la Sabana in Bogotá and continues to the village of Zipara. A railway line run by Turistern runs exclusively for tourists. On the tracks of Savana station a large number of historical materiel is kept. At the last station a bus carries visitors to the salt mines of Nemocom which have been restored with a high quality interpretation. Colombia industrial heritage is well worth visiting.

One of the four steam engines restored by Turistern, others are petrol-powered with diesel and several old wagons.

Conference reports

Industrial Heritage and the Construction of Regional Identities: A Global Perspective, Institute for Social Movements, Ruhr-University Bochum, Germany, 29-30 October, 2015

Jana Golombek

The international workshop organised by Jana Golombek, Christian Wicke and Stefan Berger was part of a research project that started in mid-February 2014 at the **Institute for Social Movements,** within the initiative "Future RUHR 2020, Universities and Region". The two-year project dealt with the question of how industrial heritage has influenced regional identities during the transition from industrial regions dominated by heavy industry to a period of post-industrial landscapes. Eleven coal and steel producing regions were selected for the historical comparison. The aim of the project, running till the end of January 2016, is to examine the role of industrial heritage sites as memory sites. In this context, it was important to analyse not only the regional spatial specificities in the manifestation of industrial heritage, but also to foreground the diverse political and social conditions under which industrial heritage has developed globally.

Experts and activists from universities and industrial heritage organisations gave presentations on coal and steel producing regions around the world. These included South Wales, Asturias, Nord-Pas de Calais, Wallonia, the Ruhr, Upper Silesia, the Moravian-Silesian Region, Northern Hungary, the Jiu Valley, Northern Kyushu, Newcastle-Hunter Valley and Greater Pittsburgh. An additional panel comprised presentations of PhD theses, dealing with industrial heritage projects in the Donets Basin, Kyushu, the Jiu Valley, Detroit and Sydney (Canada).

The aim of the workshop was to discuss the relationship between industrial heritage and the construction of regional identities in polycentric and deindustrialising regions, and to debate how, in comparison, the creation of industrial heritage has influenced and shaped the representation of these regions and their citizens during the transition from heavy industry to a post-industrial landscape. Coal and steel producing regions have often been – and still are - subject to dramatic socioeconomic changes. The participants of the workshop addressed the history of industrialisation and urbanisation, deindustrialisation and the resulting challenges, the emergence and development of regional identity and industrial heritage and the interaction between regional identity and industrial heritage in their respective region. Questions concerning the motivation and intention behind the production of industrial heritage sites, the historical agents in the making of industrial heritage or the effect on the public representation of the region were also reviewed.

The historical comparison between the selected regions demonstrated the uneven developments under conditions of deindustrialisation with their associated socioeconomic changes and cultural responses. The construction of industrial heritage and the related status of this heritage strongly varied from place to place. In the Asturian case, for example, oral traditions and more subversive representations of industrial heritage play a vital role, whereas in the British, French, Belgian and German cases industrial heritage has become a rather popular, almost mainstream phenomenon. In the Central and Eastern European countries, deindustrialisation processes occurred most strongly after the fall of the Berlin Wall in the 1990s. In these cases representations of industrial memory seem to be intertwined with the memories of the former socialist regimes and the younger generations seem to play a more important role in the industrial heritage movement than in Western Europe. The economic, political and cultural preconditions and requirements for industrial heritage construction have to be further studied at the local level. It will be important to include cases from the Global South into future comparative studies.

By bringing together experts and young researchers from different disciplines as historical science, sociology and anthropology, this first workshop served as a starting point for further cooperation with international partners in order to establish an international graduate school fostering an interdisciplinary approach. The young researchers not only had the opportunity present their projects on the second day of the workshop but could also discuss with experts in their field and establish networks for their future research. The intensive discussions were accompanied and stimulated by guided visits of the Jahrhunderthalle Bochum and the German Mining Museum which exemplified the approach to industrial heritage in the Ruhr.

The workshop marked the foundation of a new institutional network in the study of industrial heritage and the history of deindustrialization. The workshop was a great success and the most important papers will soon be published. A second workshop will follow in the autumn/ winter of 2016.

Conference reports

Protection and Reuse of Industrial Heritage, 2nd International Symposium on Cultural Heritage and Legal Issues of ICOMOS, Bled, Slovenia, 1-3 October, 2015

Sonja Ifko

ICOMOS Slovenia and the Institute for the Protection of Cultural Heritage of Slovenia organized this conference on cultural heritage and legal issues with the support of the Council of Europe, Managing Diversity Division, Directorate for the Democratic Governance.

Its aim was to promote awareness about the values of industrial heritage in contemporary society and to present challenges, dilemmas and examples related to the protection of industrial heritage, bearing in mind that industrial heritage is particularly at risk in Southern and above all Eastern Europe, and taking into account the relevance of the Parliamentary Assembly of the Council of Europe Resolution 1924 (2013) on industrial heritage in Europe and the 10th anniversary of the Faro Convention on the Value of Cultural Heritage for Society.

There were three main topics. First was Legal, Administrative and Professional Challenges, where professionals discussed topics on legislation frameworks and industrial heritage in different contexts from international to national end local ones.
Second with Authenticity and Integrity in Reuse Processes discussed the dilemmas regarding conversion of industrial buildings to new uses and the measures to guarantee respect of the character and the integrity of the sites and buildings, as well as the role of the communities with the focus on important potentials of industrial heritage /social, economic, cultural. In third topic experts discussed the issues on Management of Industrial Heritage through their experiences and examples.

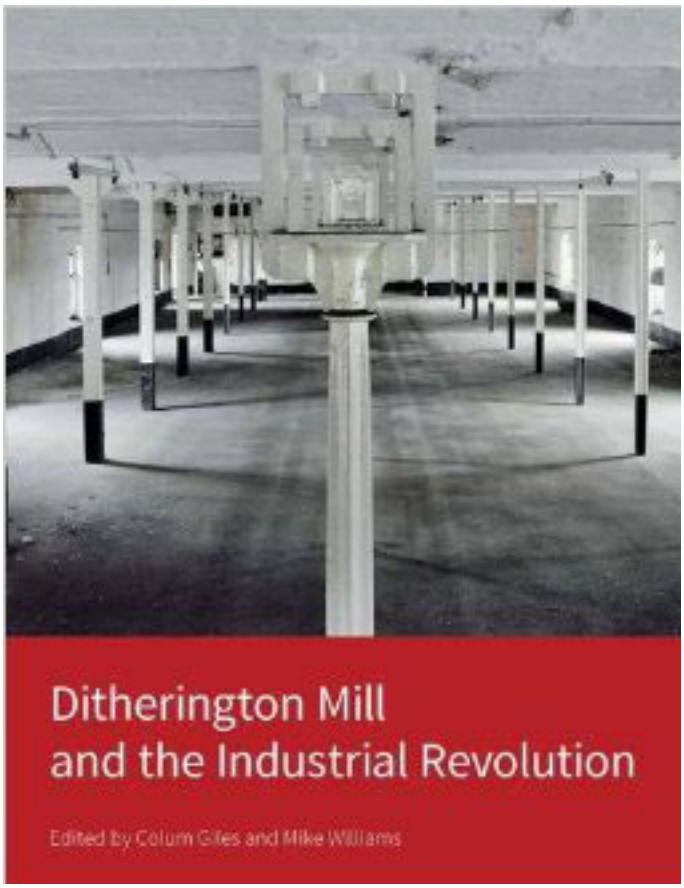
The symposium attracted 77 participants. On the excursion they visited the most important industrial heritage of Gorenjska region, among them the Gornjesavski museum in a 17th century former foundry site, where more than 400 years of ironworks tradition of the region is presented. The visit continued to the new Acroni Jesenice steelwork, where the newest production plant continues the industrial tradition, and ended in Kropa where the participants visited the Slovenian blacksmith museum and the technical monument vigenjc Vice, the only preserved nail factory for the manual forging of nails in Slovenia.

The symposium concluded with a round table, and the **conclusions** have already been summarized and published.

Participants take in the reality of 21st century metallurgical production at the Acroni Jesenice steelworks.

Photo: Sonja ifkoe

Book Reviews



***Ditherington Mill and the Industrial Revolution*, Colum Giles and Mike Williams (eds.), Swindon (Historic England) 2015, ISBN 978-1-84802-118-1**

Alexander Kierdorf, TICCIH Germany, Cologne

Never heard of Ditherington Mill? After the publication of this externally modest, clearly-structured volume, you will probably never forget it. It stands for nothing less than the oldest surviving multi-storey industrial structure with a full cast-iron inner frame - the 1796 starting point of all modern construction up to the latest skyscraper. With the mechanization of the textile industry, fire became a major threat to the new enterprises. Until then stone had been the only way to create fire-proof structures but it was expensive and inelegant. So a creative businessman and builder developed a combination of brick and cast iron to replace the wooden structures. It is not by chance that Ditherington Mill is in Shrewsbury, not far west of the Ironbridge Gorge where iron smelting and processing had been decisively improved in the 18th century. With the price of iron sharply lowered and the quality raised it could be used in larger quantities for construction purposes. Cast-iron bridges, canal aqueducts and other astonishing structures came out of this development, created more by pragmatic business- and craftsmen than on a theoretical basis.

Machine building was also a major use for cast-iron parts and frames. A number of foundries developed able to secure quality in serial, if not mass, production.

Within this atmosphere of innovation and expansion, the appropriate group of people met to create the first multi-floor buildings in a systematic combination of cast-iron columns and beams and brick walls and vaulted ceilings, first identified by American Turpin Bannister in 1950.

This book, written by collaborating experts, unfolds the background and conditions of the breakthrough which took place, astonishingly enough, not in the famous cotton industry but in one of the two more local and regional textile sectors, the often forgotten flax industry. It even seems that it needed just this combination of regional structures and the highly globalized and mechanized cotton industry to get to such an innovation.

But the book is not focused on the global context but carefully describes the economic, social and local backgrounds, and – conservation and monument documentation at its best – concentrates on the site itself with its interesting history of early reuse from flax mill to malting, where the spacious floors were used to process grain into malt, resulting in the closing of most of the windows. Even with respect for the decisive role this reuse played in the survival of the precious innovative structure, there seems to be no question that the building complex is most valuable for the way it looks and exists today. This marks a major conservational attitude which is opposed to reconstruction intentions, one observed in many similar contemporary cases and which has proven critical to a complex understanding.

The second remarkable fact is that considerable interest is also placed in the buildings around the site, not only those for industrial use but also for administration and accommodation. This avoids isolating the central mill building, showing that it was part of a working and constantly changing site. But it also helps to understand that an innovation like this did not happen out of a clear sky, but had its origins and function within a framework of connected buildings.

In the last chapters it becomes clear that the book's function is to give a broad foundation to the ongoing research and conservation work, and to finding a future use, yet to come. The last contributions dealing with documentation and conservation can only give short hints at the complex work to understand better the building and its construction. Unfortunately, cast-iron architecture and construction are still seen only as a prologue to serious construction history. The reason behind this of course is that structural theory came up and defined itself in sharp contrast and opposition to what Schwedler called the machine-building tradition of construction. A comprehensive study like this on Ditherington Mill shows that construction history is much more than the realization of a mathematic formula – and that much more was necessary to get to such results. It reveals what formed the fundament of the Industrial Revolution – a British tradition like the legendary understatement which, as this volume proofs, is beyond contemporary habits still a most vivid British characteristic.

Coming soon

Conferences and congresses

2016

Cuba
VIII Latin American Colloquium on the Industrial Heritage, organised with TICCIH
14-16 March. Havana, Cuba

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.

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

USA
SIA 45th ANNUAL CONFERENCE, KANSAS CITY, MO.
June 2-5: Info: www.sia-web.org.

UK
6th International Early Railways Conference, Newcastle-upon-Tyne, England, U.K
June 16-19: Info: www.earlyrailways.org.uk.

Singapore
Society for the History of Technology (SHOT) Annual Conference, June 22-26.
Info: www.historyoftechnology.org.

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