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A screenshot of Jugaadopolis, a social innovation initiative engaging the youth in mapping the tangible and intangible heritage of India. A virtual workshop in May 2021 included a peer group discussion with young industrial heritage professionals and a mapping exercise pinning sites, both tangible and intangible, on the map. [See page 7.](#)

TICCIH 2022, MONTREAL, CANADA

Lucie K. Morisset, Canada Research Chair in Urban Heritage

Dear TICCIH members and participants of the Montreal TICCIH Congress

A few words about our Montreal Congress, now, as you know, TICCIH 2022. After experiencing a wide range of problems of all kinds, including a few COVID attacks, the dark omens of some of our funders dealing with the global drop in tourism revenues, and the mysterious disappearance of emails that had been sent to nearly 200 authors (all of which are being redirected these days), we are now on the road that, in a little over a year, will bring us together with all of you. To tell you how much we are looking forward to welcoming you is not enough to express our joy!

Thanks to the partnerships we were able to maintain during the pandemic and those we are working to renew, we are confident that we will be able to offer a stimulating conference, rich in ideas, exchanges, discoveries, and new experiences of industrial heritage, both in the context of the papers and workshops that will be presented to you and through activities and visits in as many different formats as possible.

We intend to launch a final call for papers in a few weeks, for those of you who were still hesitating or who did not have the time to respond to the previous ones... We are currently compiling the complete texts of the papers, in view of

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the preparation of the conference proceedings, and will finalize in the next few months, thanks to the collaboration of the workshop organizers, the structuring of the workshops. You can follow our progress and start planning your stay by following [this link](#). All abstracts and preliminary papers will be published there, as well as the schedule and the information on participants. This is also where you will be able to complete registration, which we hope to open during the fall.

Do not hesitate to write to us if you have any questions! It is here: ticchih2022@uqam.ca

Lucie, Myriam and the organizing committee of Montreal TICCIH 2022 Congress

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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ISSN: 1605-6647

TICCIH is the world organization on Industrial Heritage, promoting its research, recording, conservation and dissemination and education on industrial heritage. It holds a triennial conference and organises interim conferences on particular themes. Individual membership levels range from \$10 to \$40 (USD), corporate membership is \$65, and student membership levels range from \$5 to \$10.

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

The **TICCIH Bulletin** welcomes news, comment and (shortish) 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.ticchih.org

& ON SOCIAL MEDIA:





Smoke and steam are part of the thrill of the Bo'ness & Kinneil Railway's October Steam Gala in 2015. The lead locomotive was built in 1945, the following engine in 1954 to a standard post-war austerity design. Creative Commons

REPORT

THE FUTURE OF FOSSIL FUELS IN HERITAGE

Matthew Bellhouse Moran, Chair, Scottish Transport & Industry Collections Knowledge Network (STICK)

In every country which developed an industrial society founded on coal and steam, museums and heritage groups interpret conserved industrial sites and run historic steam engines, trains and boats using coal or oil, the live experience of such machinery a thrilling way to explain their history, the reality of work, and to involve visitors in what they do. The urgent move to a zero carbon economy, however, is directly threatening this central activity of industrial heritage, as coal mining is finally ended and emis-

sions controls limit or completely prevent burning fossil fuels. The Scottish Transport & Industry Collections Knowledge Network (STICK) online event in Spring 2021 examined the future of heritage combustion engines, how to justify, offset or run engines sustainably, negotiate new climate regulations at local and national levels, and plan the future of running heritage engines.

As we navigate the climate emergency and organisations seek to minimise their carbon emissions and to reduce resource consumption, where does that leave heritage organisations that run historic engines on fossil fuels? How can we justify or offset these emissions and what does the future look like for our historic engines with increasingly sustainability-focussed funders? What is the role of industrial museums and collections in STEM subjects (Science, Technology, Engineering, Maths) and environmental education and how might learning outcomes balance emissions?



Visitors feel the heat of a stoker firing one of the Lancashire boilers in the Queen Street textile mill near Burnley, Lancashire. Creative Commons

Jim Mitchell, Director of Industrial Heritage Consulting and Director of Engineering at the historic ship the Maid of the Loch [see [TICCIH Bulletin #91](#)], noted the challenges arising from increased awareness and visibility of harmful combustion emissions. How can Maid of the Loch justify its emissions? Is her rarity and importance enough? The Maid must actively offset her emissions. Community carbon-offsetting, i.e., planting trees locally, is preferable to handing over cash to offsetting organisations. The Maid's original steam plant has been tweaked with improvements, enhancements and energy capture to improve sustainability. Heritage organisation must be ahead of the game in terms of carbon emissions to keep themselves appealing to external funders.

Another historic vessel, Paddle Steamer Waverley, converted from heavy fuel oil to marine gas oil in 2018. Paul Semple, general manager and CEO of Waverley Excursions, explaining that for Waverley, operating 110 days a season, carrying 100,000 passengers, and consuming 750 litres of fuel an hour, fuel costs were £400,000 in 2018. PS Waverley is one of the largest heritage consumers of carbon emitting fuels in Scotland and as such is subject to fluctuating fuel prices that can vary dramatically week to week, and fuel efficiency is essential to keeping operating costs manageable.

For the historic textile mills such those run by Lancashire Council, Heather Davies and Philip Butler argued that steam power is a unique selling point of their own attractions. Justifying carbon emissions to the local authority is through access and educational opportunities, as well as offsetting the fuels burned in a circular economy.

The UK [Heritage Railway Association](#) engages actively with political leadership in Britain to find ways by which new environmental legislation can coexist with heritage attractions. Chief Executive Steve Oates explained that UK heritage railways burn 26,000 tonnes of



The PS Waverley, passing under the 1864 Clifton suspension bridge in Bristol, UK, is the last seagoing passenger-carrying paddle steamer in the world. Built in 1946, she is nevertheless subject to national statutory requirements for clean fuels and emissions. Creative Commons

coal per year, but faced with the likely winding down of UK-sourced coal by 2022, heritage organisations must investigate importing coal or find alternative solid fuels. Children growing up today may not understand or care about the history of coal, and the environmentalist push against mined coal may lead to alternative solid fuels such as 100% torrefied fuel. Heritage steam organisations must work together to establish their educational and economic benefits to justify their carbon emissions.

Becky Peacock, Director of the Museum of Scottish Railways, discussed the image of heritage steam and how to have the awkward conversations around fossil fuels in heritage. For instance, [Bo'ness and Kinneil Railway](#) looks to improve efficiency and reduce emissions in their engines as well as offsetting the organisation's carbon emissions as a whole, while railways provide strips of habitat on the banks of the line which are important natural habitats and corridors.

The National Mining Museum in Scotland has embedded advocacy, energy efficiency and education in its discourses, all aligned with

climate change and environmental responsibility. Victoria Robb is Learning Manager at the Museum, whose formal education programme explores energy, climate and environment addressing the schools' curriculum through the Museum's own collections to encourage discussion and debate. The broad learning programme at the Museum uses the legacy of fossil fuels rather than shying away from it, encouraging interpretation, understanding and thereby appreciation for a history that would otherwise seem irrelevant to the next generation.

Peter Ovenstone of the European railway association Fedecrail and Europa Nostra identified the key themes drawn from the talks as education, collaboration, and mitigation. It is not enough to preserve historic engines for their own sake, their use, especially with the associated emissions, must be justified.

Historic engines were often adapted for new or modified fuels during their working lives, and the ethics of modifying historic engines to use new low emission technologies was discussed. In principle this was a sound idea, but the collections care requirements placed on accredited British museums prevents them from doing so. Moreover, modifications may not still be acceptable in 5 to 10 years' time.

An alternative is to commission and build engines that use new technologies to demonstrate the mechanical principles, to replace steam generating plant where separate from the main engine, and

plan for a worst-case future where the burning of carbon emitting fuels is banned outright, and to hope for one where allowances are made. Peter Ovenstone suggested that heritage organisations should consider themselves as custodians of that heritage as opposed to simply 'theme park attractions' to ensure that external bodies such as the UK Government make efforts to accommodate and support engine operators beyond what they would for a simple commercial venture.

As burning emission-generating fuels becomes more contentious, heritage organisations must look to balance their minimal use of coal with their economic and educational benefits. Audiences for industrial experiences are themselves also changing. The public nostalgic for heritage engines is disappearing and emerging audiences will not have the same emotional attachment to coal-burning machinery, however spectacular, and it is these audiences who are now holding heritage organisations to higher standards with regards to emissions.

The power points and some related resources from the meeting are presented here: [Burning Issues: The Future of Fossil Fuels in Heritage | STICK \(stickssn.org\)](#)



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Photo: Matthew Christopher, www.burtonandamerica.com

GERMANY

FOSTERING INTER-DISCIPLINARY TRANSFER IN CONSERVATION

Dr Roman Hillmann, Projektkoordinator Heritage Conservation Center Ruhr, Deutsches Bergbau-Museum Bochum

The Heritage Conservation Center Ruhr (hcc.ruhr) was founded in May 2020 and is a project of the Materials Science Department of the Deutsches Bergbau-Museum Bochum, the German Mining Museum. It is based in the Ruhr region, a landscape with a long experience in the reuse and preservation of industrial heritage. Between the Ruhr and Emscher mostly mines, collieries, blast furnaces are situated - industrial heritage here usually means former Industries in a mining context.

To start with our vision. Industrial heritage conservation measures require interaction between engineers, the natural sciences, and humanities scholars. For example, an owner asks for the coating of a corroded part of an industrial plant that is out of use and considered cultural heritage. The problem may be mostly technical if the coating is intended to be transparent. But the moment an owner asks for a pigmented coating that lasts longer, the impression of the part and the plant will change considerably. Engineers and conservators must make their decisions in a constant interaction: what will the part look like after it is coated, how do we avoid visually separating it from the rest? How do we integrate it? Or do we have to go back to a transparent coating? These questions can only be answered by conservators and cultural historians together.

To support this interaction, we are a team of three people. The project coordinator, Dr Roman Hillmann, is a building historian who evaluates historic importance and conservation ethics. Dr Julia Baak is a mechanical engineer with a doctorate on cavitation, that now works about corrosion analysis and coating of corroded parts. Thirdly, Katrin Liffers is a linguist who has developed the specific approaches that we need to transfer conservation knowledge not only to professionals, but also to lay people.

All our activities are about the transfer of technical and cultural history knowledge and its interaction. This is why Leibniz Association in Germany has financed hcc.ruhr for three years in a funding program called Leibniz Transfer. We create these transfers through conferences and in conservation projects. Our main outcome will be a well-structured website that will lead users to articles about coatings, corrosion, re-use and various other fields needed for preservation. It will be in English and German, bringing together international colleagues and institutions. We want to spread topics of industrial heritage conservation in an interaction between humanities and natural sciences, and in awareness of climate change and the extinction of species.



Measuring of the thickness of coatings in the laboratories of German Mining-Museum Bochum. Photo: Helene Grebe



Dr Roman Hillmann, Katrin Liffers and Dr Julia Baak. Photo: J. Baak

The hcc.ruhr interacts with continuing conservation projects. Here we take part in the development of new technologies, that are required and cannot be taken from other examples. Our main cooperation partner is the Zollverein Foundation, which is responsible for the Zollverein UNESCO World Heritage Site with its coal mine and coking plant. Here we are testing coatings of corroded metal parts on a long-term basis. Test-surfaces made more than 15 years ago on steel ovens in Hattingen in the south of Bochum are revisited, tested in our laboratories at the German Mining Museum Bochum and the experience used to make new trials on Zollverein Coking plant. We also use laboratories and graduate research from the University of Applied Sciences Georg Agricola (THGA) in Bochum, the second of our closest partners. THGA will introduce a master program Material Engineering and Industrial Heritage Conservation (MEIHC) in the winter 2021/22. This is a valuable part of



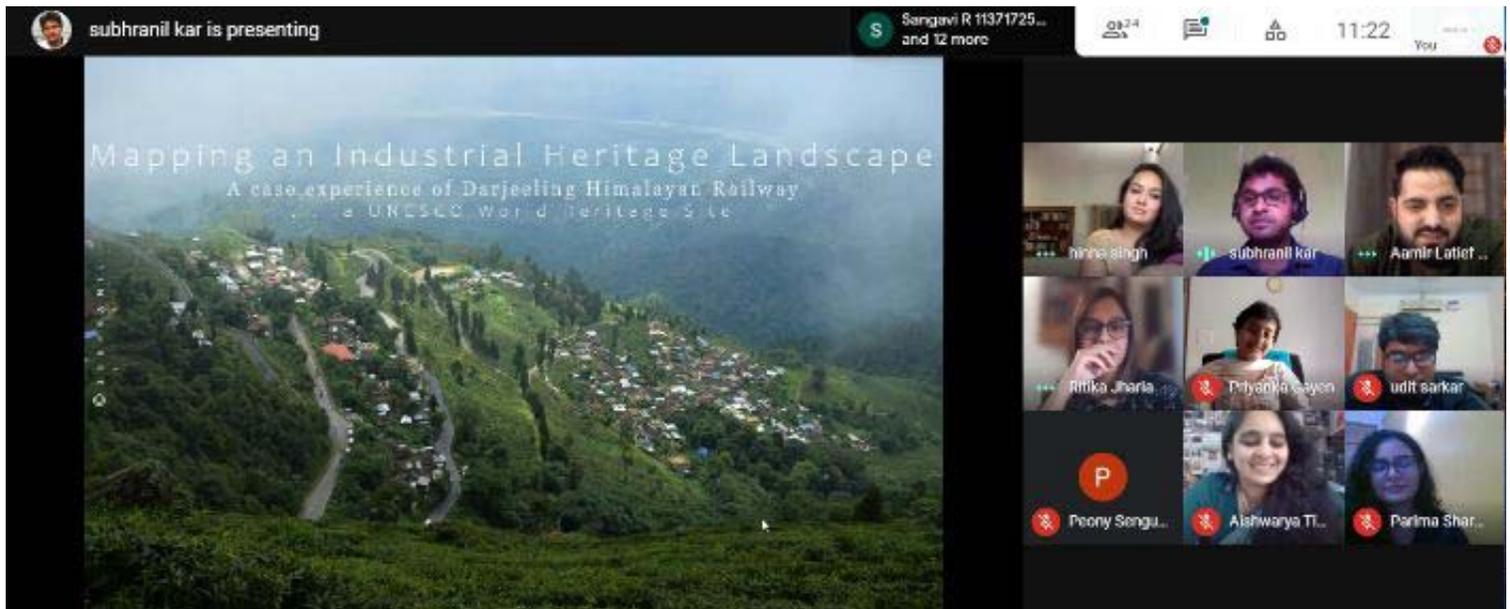
Industrial Heritage, heavily weathered: How to deal with it? Tubular coolers as part of the Ammonia-Washer in the coking plant of Zollverein. Photo: R Hillmann

our transfer strategy, because knowledge of hcc.ruhr and its partners will be taught to students in MEIHC courses.

We will take part in TICCIH 2022 in Montréal with two themes. In one section, building engineers and architects will show examples of hard conservation facts that they deal with. The section thereby fosters transfers from related disciplines into industrial heritage conservation. Our second activity at TICCIH 2022 will be a roundtable on Heritage Conservation and Climate Change (HCCC). The catastrophe of climate change is on our heads, but we still only

begin to think of actions against it! This is why the HCCC Roundtable will be a general brainstorming to collect aspects. Some we may not have thought about before. This will be a starting point to be more concrete in the future. So that a term 'sustainable' in conservation, may be more than greenwashing technologies, but to be replaced by concrete words and actual actions, and maybe also new technologies.

[Contact the author](#)



Participants in the project.

INDIA

CO-CREATING AN INDUSTRIAL HERITAGE MAP OF INDIA

Aishwarya Tipnis, Aishwarya Tipnis Architects and Jugaadopolis

The narrative of Indian industrialisation is unique in many ways; a country that is industrialising and de-industrialising simultaneously; that is struggling in the discovery of its own identity within the myriad political, ethnic, social and economic discourses. The nascent systems of protection and identification of industrial heritage sites in India, combined with the massive push given to industry in this contemporary era has a definitive impact on the urban industrial landscape. Given the fact that India is a growing economy, preservation and fossilisation of entire landscapes of industrialisation for touristic purposes is not practical. There are deep-rooted social and political issues that are intertwined in the conservation of industrial heritage sites.

In the absence of an official definition or agency for the preservation of industrial heritage, the efforts for its protection are often undertaken in silos. The objective of converging this scattered multi-disciplinary knowledge in one place, led to the idea of creating an online repository of industrial heritage sites in India. The research, largely built on my PhD thesis, was based on a thorough literature review, pilot case studies, peer and focus group discussions as well as expert interviews. A thematic framework has been developed for classification of industrial heritage sites in India based on the existing frameworks such as the Nizhny Tagil Charter for The Industrial Heritage 2003, (TICCIH, 2003), The Dublin Principles

(TICCIH, 2011) and the Taipei Declaration for Asian Industrial Heritage (TICCIH, 2012).

I have defined industrial heritage in the Indian context as an ecosystem, a combination of tangible and intangible elements set within a spatial framework. The tangible industrial heritage includes both urban and rural landscapes of extraction and production; the buildings that were built to house these processes of industrial systems of production as well as social activities such as housing, religious worship or education; engineering and transport infrastructure such as bridges, aqueducts, railway lines; machinery; corporate and company records and archives; and finally, products produced through the industrial process. The intangible industrial heritage is vested within memories and oral histories as well as identities of people who worked in the industry; systems and ways of working as well as organising labour; technical know-how and skills that worked the machinery and finally systems of management and written documentation. The most important aspect of intangible industrial heritage is the evolution of the way of life, an aesthetic that corresponds to what is considered to be industrial.

The overall timeline of industrialisation has been defined in four main periods namely Pre-Industrial (Before 1700); Proto-Industrial (1700-1800); Industrial (1800-1970) and Post-Industrial (1970-present). This global timeline is largely contextual to Western Europe and America. For developing an Indian perspective, this timeline needs to be further expanded based on India's own industrial development history. Asian scholars have argued that the industrial period in Asia needs to be expanded to include the Pre-Industrial as well as Post-Industrial periods. A chronological analysis was conducted to establish the timeline of industrial development in India to understand the intrinsic relationship between industrialisation and urbanisation. I have categorised the industrial period in India into three phases: (1) Colonial (1700-1947); (2) Post-Independence (1947-1991); (3) Post-

Liberalisation (1991-present), and excluded archaeological sites from the pre-industrial and proto-industrial periods.

Based on the literature survey a preliminary mapping of typologies of industrial heritage sites in India was carried out on an open-source Google Map. The mapping of industrial heritage sites revealed the diversity and typologies of sites that exist in the Indian context. The primary criteria adopted for the inclusion of a site in the first mapping has been

- association with a major historical or political event in the development of India
- the beginning of a new typology of industrial heritage in India, the first of many
- representative of the advancement in scale and technology of industry in India
- representative of technical innovation during the time
- designed by a famous architect as a showpiece of Indian industrialisation
- landmark quality that had a profound impact on urbanisation of the city

This was further enhanced by a peer group mapping exercise through online consultation and a two-day workshop conducted as part of Jugaadopolis (a social innovation initiative) set up with the aim of engaging the youth in the tangible and intangible heritage of India. The virtual workshop conducted over 29 and 30 May 2021 included a peer group discussion with young professionals working with industrial heritage in India and a mapping exercise where about 20 participants pinned sites (both tangible and intangible) on the map.

This map is placed in the public domain at [Indian Industrial Heritage Map – JUGAADOPOLIS](#). At present the co-created map includes nearly 900 sites of both tangible and intangible industrial heritage. They include extraction, production, transportation, communication, trade and commerce, as well as docks and maritime structures. They represent a diversity of architectural styles and expressions, ranging from Victorian, Art Deco and Indian Modernism showcasing the socio-political history of Indian industrialisation. There is a lack of appreciation of 20th century architecture in India and while efforts are being made to recognise that as a category in itself, these structures are most vulnerable to be redeveloped, leading to a rupture in the narrative of Indian industrial heritage without even recognising it as such. In the Indian context, the mechanisms to preserve intangible industrial heritage are very weak. With almost no legislative protection to preserve industrial culture, sporadic projects to document the nostalgia and oral history are largely undertaken on a case-to-case basis.

The mapping is not considered to be exhaustive, and the technology has been developed to further crowdsource an online repository of industrial heritage sites in India. The intention of the project is to make the data available to policy makers, legislators and planners in the future as well as allowing local communities and enthusiasts to add more sites to the list. We hope that the map would become a starting point for collaborations with other institutions both governmental and non-governmental for further research on shared heritage.

The author received the Chevalier des Arts et des Lettres, the highest civilian honour in the culture sector of the Government of France, in 2018 for her outstanding commitment to the preservation of heritage in West Bengal, and is also the recipient of the UNESCO Award for Heritage Conservation in the Asia-Pacific Region.

IRAN AND EGYPT

ONLINE ACADEMIC CONFERENCE ON INDUSTRIAL HERITAGE

Hellen Aziz, Martin Meyer, Mirhan Damir, Technische Universität Berlin (Germany), Mansoura University (Egypt)

On May 31 the first academic online conference on the topic of the modern industrial heritage in Iran and Egypt was held, Modern Heritage to Future Legacy (MHFL): Conservation and Conversion of Modern Industrial Heritage Sites. The project contributes to the nascent field of research on modern industrial heritage in the two countries. A neglected aspect of urban heritage, modern industrial heritage in both countries suffer from vacancy, neglect, or destruc-

tion. The project aims to document this heritage at risk, uncover its historical role and assess criteria for conservation or potential re-use scenarios. Most importantly, the project aims to shed light on the interlinkages and dependencies between the Global North and the Global South as expressed in processes of national industrialization.

The project is a cooperation between the Georg Simmel Center for Metropolitan Studies at Humboldt-University Berlin (Dr. Heike Oevermann), Technical University Berlin - Campus El Gouna (Dr. Hassan Elmouelhi, Martin Meyer, Mirhan Damir, Hellen Aziz, Mohamed Hamdy, and Muhammad Martini) and the MHFL Research Hub at Tarbiat Modares University in Tehran (Prof. Dr. Mohammadjavad Mahdavejad). The research project is funded under the framework of the excellence strategy by the German government and the States via the Berlin University Alliance and the Berlin Centre for Global Engagement.

The objective of this online conference was to get an overview of the academic discourse(s) and activities on the field of modern industrial heritage. Academics and experts were invited to share their academic, scholarly, and in some cases even practical experiences within the field in each country. Thanks to the online platform, these presenters were assembled from Iran, Egypt, Tunisia, and India.

The first part was on modern industrial heritage in Iran, starting with an overview on industrial heritage in Iran, highlighting the important role of DOCOMOMO in the country (Mohammad Fateh) and providing new insights into the process of industrialization through inputs on its socio-economic impact (Saleh Bondar), as well as the role of German architects (Abdollah Nori). The second session presented an overview on topics related on modern industries in Iran. This was first demonstrated on the railway industry (Narmin Arinnia) followed with an input on the experience with adaptive reuse in Iran (Farzaneh Gharaati). The last session demonstrated selected key sites such as the Karaj Iron Foundry (Sam Nazari), the Rey Cement Factory (Mahnaz Mahmodi), and finally the Mashhad Textile Factory (Fateme Fanaei).

The second part of the workshop presented modern industries in Egypt. The first session prepared the ground with Modern industrial architecture in Egypt 1800-1950 (Ralph Bodenstein). The second session presented scholarly published research on the documentation of selected historical sites as exemplified in the Salvago Cotton Mill in Cairo (Ralph Bodenstein) and the Phosphate Company in al-Quseir (Anandit Sachdev). The third session demonstrated academic attempts to promote the field of industrial heritage among university students with re-use projects of Qabbary Railway Station and Karmous Tram Workshop in Alexandria (Hebatalla Abouelfadl). The final session presented the attempt by academics to regenerate modern industrial sites on practical grounds. This was discussed by two contributions on the revitalization of the warehouses complex in Alexandria (Dina Nassar) and the Phosphat Company in al-Quseir (Nabeel El Hady).

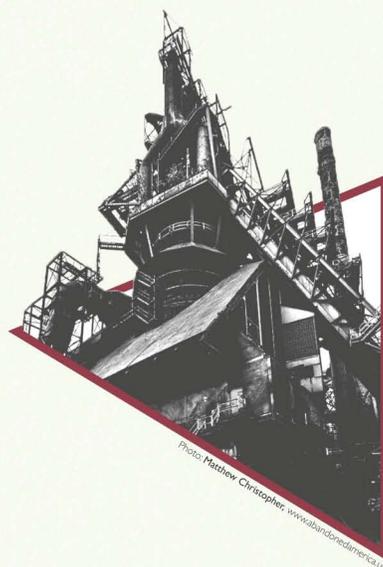
The contributions and discussions at the end of the conference highlighted the large knowledge gap that still exists when it comes to modern industrial heritage in both countries. While academic attention and public interest are growing, the fields of documentation, classification, listing, as well as methodologies and procedures for conservation and re-use are still in need of in-depth exploration and contextualization. Looking at the different academic approaches in Iran and Egypt has proven promising signs to expand the research horizons to further comprehend the challenges and potentials of modern industrial heritage in the region.

As part of the MHFL project, a follow-up stakeholders online conference will be conducted in mid-July.



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LEFT: Warsaw Power Station after reopening in 2020. Photo: wawtech.pl

BELOW: Restoration of Koneser Vodka Factory almost done in 2019. Museum of Polish Vodka is located in the high building of the former hall of rectification. Photo: wawtech.pl

POLAND

WARSAW'S INDUSTRIAL HERITAGE - ON TOO VALUABLE LAND

Bartosz Klimas, Technical Route of Warsaw - Online Archive of Industrial Heritage

Industrial monuments in the Polish capital have little chance to become museums of industry. The calculation is simple. Former power plants, chemical factories or breweries stand on too-valuable plots of land. In the last decade the revitalization process in the city has accelerated. In return for restoring historic buildings, developers got an opportunity to erect new apartments and offices. Residents gained a prospect of visiting previously inaccessible areas and ordering a glass of beer in the former brewhouse or a cup of coffee in the hall of a rolling mill. Investors' announcements about 'creating an industrial exposition' are usually a bluff - every square inch should be profitable, while industrial museum will not bring money.

However, there seems to be one exception to this rule. This is the Museum of the Norblin Factory, planned on the premises of former metalware factory, operating since the mid-19th century in the working-class district of Wola, west of the city centre. Today, the former working-class district is turning into an area of offices so many of new buildings erected here will be to accommodate top-class offices.

In addition to ten old buildings of the Norblin Factory, 50 machines have survived. After renovation, they will be arranged according to technological sequence of the factory which used to produce silver-plated tableware, but also copper pipes. These machines will form



a new museum. The venture was officially registered in March and the management agreed its regulations with the Ministry of Culture, so the institution will operate under ministerial supervision. Four sightseeing paths are planned: Buildings & Architecture, Machines & Devices, People and Products. The latter will cover 600 items of tableware bought from private collectors.

The museum associated with the factory's original activity was also established on the site of the Koneser Vodka Factory (est. 1897). The quarter was opened after the commercial transformation in 2015 - 2018. Here, too, the renovated historical buildings are intertwined with new offices and lofts. One of the entities that found its place here is Campus Warsaw, a business incubator branded by Google. It is located in the former spirit warehouse. The character of this place is remembered by the Museum of Polish Vodka (a private venture associated with today's spirits industry) located in the former hall of rectification. Its interior is designed with a flourish and the sightseeing program allows for tasting.



Interior view of the Warsaw Power Station after reopening in 2020. Photo: wawtech.pl

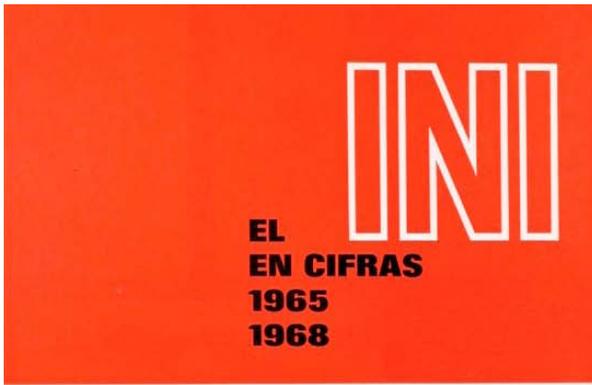
Apart from the renovation of Norblin Factory, the city is witnessing two other major transformations. First is taking place in the former Warsaw Breweries (established in the mid-19th century and known as Habermusch and Schiele from the founders' names) located close to Norblin's. The second goes on the ground of Pollena-Uroda Cosmetics Factory (previously known as Schicht-Lever), located on the other bank of the Vistula River. Both companies have become a significant part of the industrial landscape of Warsaw - the preserved buildings are over 120 years old. Once available only to employees, after renovation will become open to everyone - they are to serve as catering and shopping spots. Both investors promise that the furnishings found during the renovation will be properly displayed, but unfortunately there are not many of these left.

One can say that all this is not enough, and such activities serve as a fig leaf for investments that change the character of post-industrial quarters. However, the usual fate of the liquidated factories in the city makes you think that there was no other way. The bankruptcy of local factories mostly took place at the turn of the 1990s and 2000s, the result of difficulties in adjusting to the changing eco-

nomic conditions. And all of this was, indirectly, caused by political changes in 1989.

As an example of such a decline and rebirth we can mention Warsaw Power Station (est. 1904), standing by the Vistula River, in now-fashionable district of Powiśle. When, in the year 2000, the once state-owned company Elektrociepłowni Warszawskie (Heat and Power Plants of Warsaw) was bought by the Swedish energy producer Vattenfall, the latter decided to sell the plot on which the inactive power plant stands. When dismantling of the historic devices began, the Varsavianists started their efforts to write Warsaw Power Station in the Provincial Registry of Monuments. Finally, in 2004 the buildings were officially recognized as 'a valuable document of development of the Warsaw industry and a significant element of the contemporary landscape of Powiśle district'. The monumental buildings were saved, and the new investor, which later decided to build an multipurpose complex here, had also to restore the splendor of former power plant.

[Contact the author](#)



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SPAIN

RECONSIDERING INI, THE NATIONAL INSTITUTE OF INDUSTRY

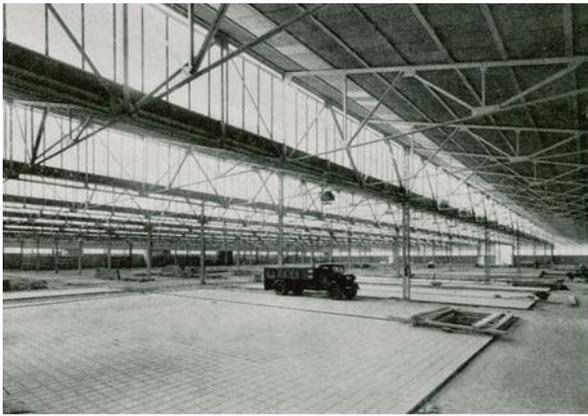
Dr Rafael García García, Assistant Professor, School of Architecture of Madrid (ETSAM), Universidad Politécnica de Madrid and Dr Ángeles Layuno Rosas, Assistant Professor, School of Architecture, Universidad de Alcalá (Madrid)

The research project *The Image of the National Institute of Industry (1941–1975): Dissemination, Territory, and Architecture* under the Franco Regime proposes a holistic approach to the representation, propaganda and heritage aspects linked to the old Spanish Instituto Nacional de Industria (INI). Coming from the disciplinary field of architecture and heritage studies, the project's main objective is to bring to the fore the institutional image conveyed by the INI which, although changing over time, was of great importance and must be rescued from oblivion as part of our industrial and cultural history. This image must not be taken as something fixed and one-dimensional, but as something multilayered, multifaceted, and multiscale.

The research becomes even more important as the studies carried out to date on the Institute have focused mainly on issues that elude approaches to its visual culture, and, in an overall view, to its heritage elements. These previous researches have been mostly focused on the Institute's foundation, organization and structure, economic, political and social issues, and on biographical aspects of the presidents. This project, in contrast, aims to study the visual

presentation and dissemination of its activities and achievements, the exhibitions and informative pavilions' projects, considering the investigation of photographic archives, annual reports, publications, etc. In this framework the study of facilities and industrial complexes also arises, their territorial dimension and the impact on landscapes, since these aspects also form part of the image provided of the Institute's activity.

The multiform reality of the Institute is compared in the project with similar achievements in nearby countries that underwent stages of strong state protectionism, specifically with the industrial works of Portugal's Estado Novo and the Italian Istituto per la Ricostruzione Industriale (IRI). The latter created in 1933, was a foundational reference for the INI. Both organisms run in parallel until late in the second half of the twentieth century. Due to its early constitution, INI was, together with IRI, the most prominent pioneering public industrial holding company in Europe. It is noteworthy that there were other important initiatives of a similar type, although quite later, such as the 1966 English Industrial Reorganization Corporation, the projects of the French Institut



Collage of images. Photographic annexes of Resúmenes de Finalidades y Actuación INI, 1956, 1961, 1954 and 1941-46 (map: research's geographic situation, exploitations and productions of the companies funded or co-funded by the INI in 1946).

de Développement Industriel or the Swedish Industrial Society of 1970, advised by the IRI. These references bring new comparative elements to our research.

The INI and the Spain's industrial growth

The Instituto Nacional de Industria was created by the Franco government in 1941 with the objective of promoting and managing the main strategic industrial sectors in Spain. Only two years after the end of the Civil War, in very difficult international circumstances, and given the supposed shortcomings of private initiatives, the INI was created in the belief that the New State had to take on a leading role in national industrial development. Although at the start special attention was paid to defence sector, since the Institute was conceived according to models of military inspiration, it soon became one of the most powerful instruments for Franco regime's task of implementing a policy of state-driven economic reconstruction.

Between its founding by Juan Antonio Suanzes, the Institute's president from 1941 to 1963, and before its dissolution in 1995, the INI went through three main stages, in parallel with the evolution of the country itself. The first period, from 1941 to about 1960, corresponds with the national policy of autarky, marked by the pursuit of self-sufficiency including industrial activities. It was INI's time of maximum vitality in carrying out own projects. The direct depen-

dence in this period on the Presidency of the Government made it practically a ministry on its own right, in parallel to the Ministry of Industry. The second period, from 1960 to around 1975, after Franco had died, was characterized by noticeable economic expansion and the entry of foreign capital. Finally, from 1975 to its dissolution, the INI had support and regulating functions for the country's industrial reconversion under democratic government.

This project focuses on the first two periods, as they are the most relevant in terms of their heritage legacy. These were decisive years in Spain's recent social and economic history, in which a very broad program of industrial construction was carried out, contributing to the formation of the country's modern industrial fabric. We can still today notice the INI's transformative effect in extensive areas of the Spanish territory through the construction of industrial sites, power plants and associated facilities including housing for employees and workers.

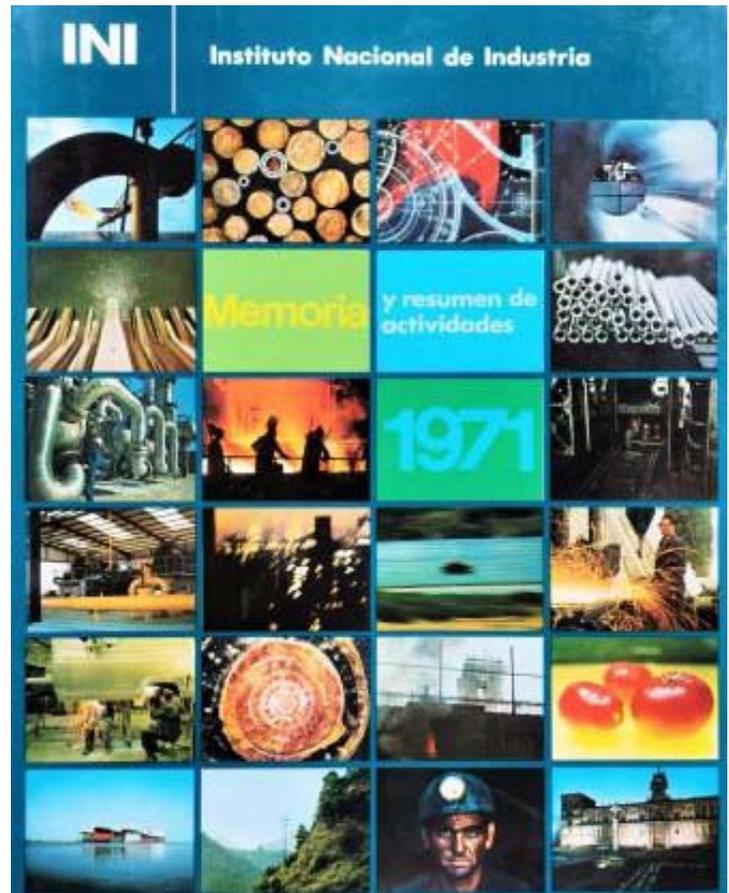
The INI's achievements in national life during its existence should be highlighted. As a holding company, it provided employment to more than 250,000 direct workers and, due to its size, it was one of the ten largest entities in western Europe. During the period of its greatest influence, the presence of its companies and the transportation of its workers were important indications of labour activity in many of our large cities. ENASA-Pegaso, Marconi, Boetticher y Navarro, Empresa Nacional de Rodamientos, Empresa Nacional de

Hélices, Iberia, Construcciones Aeronáuticas, and Empresa Nacional Calvo Sotelo, were the main state-owned companies in Madrid.

The programs and projects of the more than 120 companies founded or co-financed by the INI between 1941 and 1975 were carried out in very different sectors and they were implemented in most of the Spanish regions. Some other names of emblematic companies and their sectors were: ADARO (mining), ENSIDESA (steel industry), FOS-BUCRAA (phosphates), ENCASO (liquid fuels and lubricants), REPESA (oil refinery), ENDESA (electricity), AUXINI (construction of public works and engineering), Bazán (military naval construction), Elcano (merchant marine), ENHER (hydroelectric), ENDASA (Aluminum), ENMASA (aviation engines), ENCE (cellulose and paper), FRIGSA (industrial cold), SEAT (cars) and ENTURSA (tourism), which also shows the diversity of areas in which INI expanded its activities. Consequently, INI's industrial legacy has two features that differentiate it from any other Spanish industrial group. One is its broad transversality, as it covered a huge and ever-growing number of industrial sectors; and the other its territorial extension, with industries distributed throughout the Spanish's geography.

The documentation for the study of the National Institute of Industry activities comes from two type of repositories. The documental archives of the specific companies that are the object of the research is one, and the other the Documentation Center and Historical Archives of the Sociedad Española de Participaciones Industriales (SEPI). Here the Institute's former archives are kept, with primary documentary sources and centralized files. The Institute's own publications are also relevant, such as yearbooks, activity summaries, and especially magazines such as Nueva Empresa, and INI Revista de Information, the latter published in two periods. A long list of technicians ascribed to different sectors of activity were commissioned by the Institute. The research has also focused on a select team of architects and designers, among which we can highlight Francisco Bellosillo García, Fernando Moreno Barberá, Ramón Vázquez Molezún and José de la Mata Gorostizaga.

The research project that we are working on has been funded by the Ministry of Science, Innovation and Universities, in the frame of the State Program for Generating and Strengthening Scientific Knowledge (R+D+i, 2018 call). The project has been submitted as a coordinated Project, composed of two individual projects: The National Institute of Industry: Visual Culture and Images of its Architecture and The Image of the National Institute of Industry in the Territory: Mapping and Landscape of the Industry, directed by Rafael García and María Ángeles Layuno, respectively, the former



Instituto Nacional de Industria. Memoria y Resumen de Actividades, 1971, cover.

acting as overall coordinator. Both projects, while sharing some objectives, separately cover the two principal areas of work and research: documental media in a broad sense, including graphic and built forms; and a global view which attends to the representation of companies and facilities from landscaping and territorial cartography approaches.

The international research seminar Madrid: National Institute of Industry's capital, held on December 3, 2020, was the first public presentation of our results. The different contributions derived from it will be published soon. In addition, all the activities and other information related to the project are accessible through the [project site](#).



'Qabbār railway terminus in Alexandria, constructed in 1855 under the supervision of Robert Stephenson and his cousin George Robert. The terminus is designated as the first witness of the railway industry in Egypt, Africa, and the Middle East. The station is owned currently by the Egyptian National Railways and is officially not listed or acknowledged until today.'

TICCIH AFRICA - A NETWORK FOR INDUSTRIAL HERITAGE

Coordinated by Helen Ashby, Director, International railway heritage

The development of Africa's industry encompasses colonial history and post-colonial African development. To be truly effective, the conservation of our industrial heritage should include the techniques, production mechanisms, structures, and built environment from before, during and after European colonisation. It forms an important part of African cultural development and as such is worthy of preservation and recording.

In 2019 a collaboration between the Sierra Leone National Railway Museum and the nascent Nigerian National Railway Museum, led to a proposal for the development of a network for African Railway Heritage and a small group of interested people met online to discuss its development. Coincidentally, an approach was made by Miles Oglethorpe of TICCIH, with a view to setting up a TICCIH Africa Group offering an obvious and efficient solution to our wishes.

Since then, an expanded group of heritage specialists working in different parts of the continent have formed links and begun to hold

regular online meetings to discuss ways in which we can highlight the importance of our industrial heritage, gain the political will for its development and follow best practice in its preservation.

This is our first combined contribution to the TICCIH Bulletin, which we offer as an introduction to our work. As we develop our network, we hope to engage fully in the work of TICCIH and to meet with colleagues throughout the world to share ideas and information.

Algeria – Rim Kelouaze

Rim Kelouaze is an Algerian architect specializing in heritage, with a research focus on sustainable development, community engagement, decolonization, colonial heritage of and in Africa, including the colonial and pre-colonial industrial heritage in the region.

In terms of the history and profile of industrial heritage in Algeria,



Jaekel House Mini Museum, located in the former Colonial General Manager's house, built in 1898.

despite the presence of pre-colonial masterworks demonstrating technical innovation that can be classed as early industrial, these are rarely referenced. During the colonial period (1830-1962), the industrial map was created by a railway network of more than 5000 km long. The railway structure ensured the transportation of mining and agricultural resources. In addition to the mining and agricultural industrial sectors, all types of industry existing in Europe also existed in Algeria for the benefit of the European community residing there.

As far as conservation of the industrial heritage is concerned, little attention is paid to it. We can see on the one hand the abandonment (sometimes in ruins) of structures related to agriculture and agricultural and semi-agricultural industries, such as factories, brownfields, silos, wheat storage barns and colonial farms. On the other hand, structures that have been in use since independence have undergone a process of modernization, extension and partial replacement, including the railway infrastructure, which was reinforced during the post-colonial period, some parts of which, such as the stations, are still functional today.

In terms of tangible conservation, industrial heritage needs to be

taken control of through restoration, rehabilitation and adaptive reuse, according to the structure, its state of degradation and the re-integration perspective. In addition, in terms of the process of heritage designation, the creation of an inventory is fundamental to ensuring the monitoring and maintenance of this heritage and to identifying the sites of particular interest for listing as national / world heritage.

Egypt – Mirhan Damir

As industrial heritage is dominated by shared global narratives, I have sought to consolidate this through regional and global networking. Besides my academic and scholarly occupations - the former in Egypt and the latter in Germany - I became a TICCIH member in 2018. My involvement in TICCIH includes publishing here in the TICCIH bulletin, networking with other members and experts, and participating in the TICCIH 2022 Congress. Recently, I have been co-organizing TICCIH Africa to investigate our continental shared industrial heritage. The online Egypt/Iran meeting is presented elsewhere in this issue.

With respect to established industries/crafts during ancient times



The local primary school undertakes an educational programme amongst the exhibits at the Sierra Leone National Railway Museum.

and in the middle-age in Egypt, it is the modern industries of the 19th and 20th century that bear witness to the above-ground historical manifestation of industrialisation countrywide. The history of modern industries in Egypt was de facto not delimited within its national borders. Modern industries were part of a continental as well as global interconnectedness of both tangible and intangible facets.

In Egypt, the conservation of modern industries is still in its infancy. Listings are officially part of the other 19th and 20th century structures designated to Modern Egypt; but there is no official acknowledgment of a so-called industrial heritage. Even those listed are attributed more for their tangible significance, predominated by their architectural physiognomy. The lack of awareness of such a valuable historical asset and the continuous need for real estate expansion also led to vast demolition of the large-scale industries to serve the need for housing.

The past decade has witnessed a growing interest in documenting and sharing awareness of industrial heritage in Egypt on both scholarly and academic levels. Egypt boasts a number of museums that

showcase the history of established industries such as the railway and of dams. It is therefore important to establish a network/society to promote industrial heritage in three main directions: societal engagement and acknowledgment of (in)tangible attributes (not delimited only to architectural style). The final direction should target consolidating modern industries by their shared narratives on local, national, continental, and finally global levels.

Ethiopia – Wondwossen Amsalu Misrak

In Dire Dawa City there is an extensive collection of heritage assets, including cave paintings, ancient historic sites, railway workshops, buildings, graveyards, palaces, churches, printing presses, marketplaces and various food items and different forms of transportation and accommodation. However, although Dire Dawa has numerous historic sites, there is a lack of community awareness about heritage, documentation, and preservation. Most of the heritage sites not known by the local people or even the government, as a result of which the Dire Dawa heritage sites need urgent care and preservation from damage caused by construction works and other development activities in the city.

Synergy for Community Development (SCD) is a local registered non-government organization with an active operational presence in Dire Dawa City Administration, Ethiopia, which strives to alleviate poverty sustainably and to help the local community to generate income by working to protect and preserve urban heritage. So far, our organization has been raising the local community awareness. Synergy for Community Development is highly interested in taking part in the effort directed at improving the quality of damaged historic houses, documenting of heritage assets and enhancing community awareness and participation.

Sites should be appropriately identified and recorded as much as possible, and documentation works can be carried out in many ways depending on the nature of the heritage; effective promotion work should be an integral part of the planned heritage tourism development that draws the attention of the prospective visitors. For instance, hoteliers should work with tour guides and travel agencies; there should be proper balance of preserving heritage assets, urban development, and the use of heritage assets for tourism development.

Nigeria – Şolá Akintúndé and Mogbolahan Ajala

Mo and Şolá are architects based in Lagos, Nigeria with interest in working across West Africa due to the lingering cultural heritage links between communities within the region. For the last decade we have worked on the management and promotion of four listed properties in the Nigerian Railway Corporation compound at Ebute-Metta. Jaekel House, the first of the residential units to be restored has been repurposed into a museum and the other, Ilukwe House is to become a railway heritage research centre.

In 2018, we led a collaborative mapping project with the Africa Studies Centre at Oxford University highlighting the major railway heritage sites and artefacts in Nigeria as a whole.

In addition to these more contemporary industrial heritage assets, there is a huge resource pool for research into the traditional industrial systems that sustained the high volume of economy, trade and commerce of pre-1800s West Africa. Nigeria's first UNESCO World Heritage Site - the **Sukur Cultural Landscape**, declared in 1999, includes well-preserved extensive remains of a 16th century flourishing iron industry. There is a wide variety of historical industries dotted across Nigeria ranging from textile production, copper and bronze sculpting to clay and laterite brick making. Significant work has been done by academics and practitioners to preserve these methodologies with intermittent government support over the years. For example, the Museum of Traditional Nigerian Architecture (MOTNA) and the Centre for Earth Construction Technology are nationally funded institutions focused on promoting traditional construction methodologies.

With the new networks available to us at TICCIH, we are looking to develop mapping projects to assess the industrial heritage assets

in Nigeria and in the broader West African region. Our work aims to fill the gaps in mainstream knowledge of traditional industrial systems that were denigrated by colonisation to give way to the western industrial revolution. The education, technology and hospitality sectors are at the forefront to gain from the content generated from these future projects.

Sierra Leone – Abdul Karim Kamara and Helen Ashby

Sierra Leone is rich in mineral deposits, agriculture and fishing but until the 15th century the country's dense tropical rainforest partially isolated the land from other African cultures and the indigenous population survived through subsistence farming. The arrival of European traders in the late 15th century led to the development of the slave trade, still the industry for which Sierra Leone is best known, and which continued until the early 19th century.

In 1808 Freetown became a British Colony, then with the European 'Scramble for Africa' the British, anxious to protect their interests in the economic wealth of the region, agreed the current borders of Sierra Leone and declared the country a British Protectorate. The British Government authorised the construction of a railway across Sierra Leone, to enable the exploitation of the agricultural and mineral wealth of the land. Modern industry began to develop, including iron ore, bauxite, gold, diamonds and palm oil.

In 1946 an ordinance was passed 'to provide for the preservation of Ancient, Historical, and Natural Monuments, Relics, and other objects of Archaeological, Ethnographical, Historical or other Scientific Interest' and the Sierra Leone National Museum was opened in the centre of Freetown in December 1957. The slave trade and indigenous craft industries are represented in the National Museum, but little attention is paid to the broad range of extractive and agricultural industries.

The railway closed in 1975 and the metal was sold for scrap, but several locomotives and carriages were saved and hidden in the former carriage works on the outskirts of Freetown. Much of the built infrastructure remains but is deteriorating rapidly. In 2004, after eleven years of bloody civil war, the vehicles were rediscovered by a British soldier on duty in Sierra Leone and the National Railway Museum was born. Located in the former railway compound at Cline Town, the museum has become an important heritage asset, tourist- attraction and community hub, with a vibrant social and educational programme. A formal charitable Friends organisation with branched in Freetown and the UK offer fundraising and volunteering support to the small professional staff.

We have got the network off to a good start and our next move is to reach out to for other organisations and individuals, researchers and academics, who are interested in joining us to promote the development of TICCIH Africa.

Contact the coordinator



Some members, partners and activities of the Industrial Heritage and Archaeology group of the ICHHST (USTB)

CHINA

NEW ACADEMIC CENTER FOR INDUSTRIAL HERITAGE AND ARCHAEOLOGY

Juan M Cano Sanchiz, ICHHST (USTB, China)

Industrial heritage and archaeology have been late in being officially established as a new research direction, but they are undergoing fast development aligned with the growth that industrial heritage protection and studies are experiencing in China. Until now, such growth has been mostly, although not only, promoted by engineers interested in the history and heritage of technology, and architects and urbanists working with industrial heritage protection and reutilisation, while an archaeological approach to the study of the industrial society has been missing. In front of this gap, the Institute for Cultural Heritage and History of Science & Technology (ICHHST) aims to contribute not only to the development of industrial heritage studies and conservation in China, but also to establish industrial archaeology as a new research field.

ICHHST belongs to the University of Science and Technology Beijing (USTB, China) and houses two research centres: the Key Scientific Research Base of Archaeometallurgy (National Cultural Heritage Administration); and the Research Center for Science, Technology, and Civilisation. The ICHHST is a multidisciplinary research and teaching institution that works with the multiple intersections between heritage, science and technology. That includes five main areas of knowledge: Historical Metallurgy and Materials; Conservation of Cultural Heritage; Technology and Culture; Traditional Crafts; and Industrial Heritage and Archaeology.

Our history

USTB is a pioneer university in China in the field of history of science and technology. One of its earliest achievements in the subject

dates from 1974, when a Metallurgical History Group was settled up by Professor Jun Ke (柯俊) and *A History of Metallurgy in China* was edited. During the following years, the USTB's history of science and technology team conducted extensive research on the history of metallurgy and materials, and gradually evolved into the ICHHST, which was established in 2014. In 2007, ICHHST's discipline (major) of history of science and technology was selected as a first level National Key Discipline. Besides, the 2008 and 2012 China Discipline Rankings (CDR) ranked USTB first in the country for history of science and technology. In 2017, the discipline was included in the National Double-First Class University Plan and was granted an "A+" record in the CDR. In this context, industrial heritage and archaeology started to be developed by initiative of Professor Wei Qian (Dean of the ICHHST) in the last decade. We have a multidisciplinary team of faculty and postgraduate students that combines different chronological and disciplinary approaches to investigate, preserve and present the industrial past and its legacy.

Research lines

The industrial past and its heritage are addressed at the ICHHST from a multi-disciplinary perspective that combines history of technology, archaeology, architecture, conservation, and heritage and museum studies, among other disciplines. We focus on a wide range of topics covering both theories and methods, such as the definition of industrial heritage values, fieldwork methodologies, industrial heritage protection, conservation and reuse, industrial museums, history of modern technology, and the study of the landscapes of work.

Our research facilities include a library with more than 36,000 publications and digital resources; a laboratory fully equipped to conduct scientific analyses of artefacts, conservation treatments, computer simulations of historical technologies, and 3D modelling. We also count on all the necessary equipment to develop field recording and investigation.

Education

The ICHHST offers a PhD and a MSc programme on History of Science of Technology, and a MA programme on Cultural Heritage and Museology. The first PhD dissertation in China to include indus-

trial archaeology in its theoretical and methodological frameworks was defended by Shujing Feng in 2020 in our programme. On the other hand, both master programmes include the courses "History of Technology and Industrial Heritage" (taught in Chinese by Prof. Qian) and "Industrial Archaeology" (taught in English by Dr. Cano Sanchiz), which is by now the only university course on industrial archaeology available in China. In that sense, the ICHHST offered for the first time in the country a seminar on the archaeology of industrialisation in 2018 (by Cano Sanchiz). We also host seminars, workshops and guest lectures on industrial heritage and archaeology on a regular basis. For example, in May 2021 we organised, in collaboration with the UK Association for Industrial Archaeology and its Young Members Board, the "1st East-West Workshop on Industrial Archaeology", which had the aim to exchange ideas and knowledge among Western and Eastern colleagues to build a more international and diverse industrial archaeology.

Networks

The ICHHST holds the vice-presidency of the China Industrial Heritage Alliance and has contributed to the National Industrial Heritage list (Industrial Culture Development Centre of the Ministry of Industry and Information Technologies), and of the Chinese Industrial Heritage protection list (National Academy of Innovation Strategy and the Urban Planning Society of China). Besides, the ICHHST is a founder member of the Committee for the Conservation of the Industrial Heritage (China Association for Preservation Technology of Cultural Relics) and a partner of the Industrial Culture Development Centre, and the Huangshi Industrial Heritage Protection Centre, among other institutions. At the international level, the ICHHST is a TICCIH Institutional Member, and an Overseas Affiliated Society of the Association for Industrial Archaeology. Furthermore, we develop international cooperation and scholarly and student exchanges with several centres and groups working with industrial heritage around the world.

Welcome to join us! We welcome international students and researchers who are willing to complete their education and training in China, as well as to develop their researches and academic careers within our team. More information about us can be found at our website (<https://ihmm.ustb.edu.cn>) or requested by email (juancano@ustb.edu.cn).

PRESIDENT'S MESSAGE: TIME ... THE FINAL FRONTIER

Miles Oglethorpe, TICCIH President

Managing our time zones to be connected as necessary at all times has become an unexpected challenge in this turbo-charged digital era. Whilst we have been empowered by the new video-conferencing technologies, it means that we also have to manage our global reach much more carefully so as to ensure we do not accidentally exclude people on the opposite side of the world from us. In truth, as Iain Stuart in Australia can testify, there is no way that we can have a Board meeting without someone having to suffer loss of sleep and drink excessive quantities of strong coffee.

However, there are ways of tackling this challenge, as was brilliantly demonstrated recently by the **TICCIH Textiles section**, who organised their highly successful workshop by splitting it into three separate two-hour sessions covering different time zones. In this way, it was possible to manage interactive feedback from every part of the world during what proved to be an inspiring day that helped build a more robust international textiles inventory. Congratulations are therefore due to Heike Oevermann, Bartosz Walczak and Mark Watson for staging a successful event, the format of which can be replicated by other groups in the future.

Not surprisingly, therefore, our dependence on digital communication and meetings has not abated, and it has been further fuelled by the new CoVid19 variants, with most of us continuing to be thwarted by re-imposed lockdowns, travel restrictions and claustrophobic high-pressure working conditions. In this respect, I would like to pay a personal tribute to those of you who are still having to deliver teaching online. This has generated an often intolerable burden on top of existing issues and commitments, and the fact that it is persisting is deeply frustrating. To those of you who are enduring this and who have still managed to support the work of TICCIH, I am deeply grateful.

One of the biggest tasks being undertaken right now is the transition that has allowed the rescue of our TICCIH 2021 Congress and its move back by a year to August/September 2022. This has not been an easy process, as you can imagine, and has been further complicated by major changes to the host IT infrastructure in Montreal over which we have had no control. The good news, as Lucie Morisset explains on page 1, is that the time lost is not crucial, and there will soon be a final call for papers, once the registration systems have been fully restored by the university.

We are, nevertheless, still planning to have a TICCIH event this September, the primary purpose of which is to report on recent progress, promote our main congress next year, strengthen links with our growing membership, and keep in touch with as many people as possible. This will occur online on Friday 3 September and will comprise a series of short presentations and reports over a two hour period. Watch out for more detail in emails and on our website, and we look forward to seeing as many of you as possible on the day.



MILES OGLETHORPE

In the meantime, the digital explosion continues to provide us with opportunities to make progress in ways that were unimaginable a few years ago. In this respect, I'd like to acknowledge the continuing work of our new communications team, led by our Secretary General, Marion Steiner, with the support of a potent array of volunteers from across TICCIH and its Board. There are many issues to consider, not least how we can best harness the power of social media whilst also containing some of the risks that it brings.

At this point I should also mention the support and enthusiasm we have received from other organisations over the last few months. We are working on a memorandum of understanding with a number of related organisations, most recently FIVA (Fédération Internationale des Véhicules Anciens), and are awaiting the first opportunity to sign (in person) our agreement with ERIH. There have been other opportunities to cement relationships, including with Zenkin in Japan, and with the Heritage Commission in Saudi Arabia, and I am keen to establish other relationships with exemplar organisations like TIMS (the International Molinological Society).

Finally, despite the widespread paralysis brought about by the pandemic, threats to our industrial heritage continue to emerge, perhaps because in some countries, time has speeded up and it has been possible to accelerate rather than delay development programmes. A recent example has been the exposure of a stretch of the Takana-wa-Chikutei railway in Tokyo, Japan, which dates from 1872. Despite the excitement that this discovery generated, the railway company (JR East) decided to preserve only a fraction of the historic track. We have therefore been working with our TICCIH Japan colleagues to try to reverse this decision. Inevitably, there will be more cases like this in the months and years to come. If you think TICCIH can help, do please let us know, and send an article to the Bulletin to help further your cause.

URUGUAY

ASOCIACIÓN URUGUAYA DEL PATRIMONIO INDUSTRIAL (AURPI) - TICCIH URUGUAY

Rene Boretto Ovalle, TICCIH coordinator in URUGUAY

Through TICCIH, Uruguay has for many years made efforts through local, regional and international events to show the great heritage values generated by our industry, demonstrating that there is a fertile field of research and interest in the specialty. Therefore, I am pleased to inform everyone that we have a firm path to create AURPI, the ASOCIACIÓN URUGUAYA DEL PATRIMONIO INDUSTRIAL. Since several years very many people became involved in

its creation, carrying out a professional preparation of the Statutes, governing them by the guidelines of the Ministry of Education and Culture, which only requires a final formal technical review to approve it.

I encourage everyone to visit the form to [join AURPI](#) either in a personal or institutional capacity, to help take forward this idea.

TICCIH MEMBERSHIP DIRECTORY

James Douet, Editor, TICCIH Bulletin

Our website ticcih.org has a section that not everyone who joins TICCIH is aware of, or even many people who have been members for many years, which is the **Membership Directory**. But we should all be, not only because it is useful for each individual to explain who they are and what they are doing in relation to our field, but it is also great for all the other members who are curious to see who else is in the association and what they are currently working on.

For modern data protection reasons, the Directory is closed, so information cannot be misused. Once you log in to your TICCIH account, you can access your individual page and fill in a form with whatever information or pictures you want. Then you can browse the interests and activities of all our other members. These can be searched by countries and also by their interests and activities, according to their professional or thematic fields.

I use it to find colleagues with particular experiences which might help my own work as a consultant, to see what friends are up to, and to commission articles for this Bulletin. I am happy just now to have just found someone who uses Minecraft to develop industrial heritage outreach and will write an article for us, a professor of Medieval industrial architecture who is also curious about royal manufactories, and a colleague in Brno, where I want to find out about a disused waterworks.

The Directory gets better as it gets bigger, like all databases, so the more of us who use it the more useful it becomes.

The screenshot shows the TICCIH website interface. At the top, the TICCIH logo is visible. Below the logo, there are navigation links: Home, About Us, News, Members, Membership Contact, and Publications. The main content area is titled "TICCIH MEMBERSHIP DIRECTORY". It features a search bar and a list of member profiles. The profile for James Douet is highlighted, showing his name, a profile picture, and his role as the Editor of the TICCIH Bulletin. Below the profile, there are social media icons for Facebook, Twitter, and LinkedIn. At the bottom of the page, there is a grid of images representing various industrial heritage sites and projects.



The former Bethlehem Steel blast furnaces.

USA

SOCIETY FOR INDUSTRIAL ARCHEOLOGY (SIA) 49TH ANNUAL CONFERENCE, AUGUST 23-27, 2021, BETHLEHEM, PENNSYLVANIA USA

Dr Bode Morin, US TICCIH coordinator

The Anthracite Heritage Museum, National Museum of Industrial History (NMIH), and the National Canal Museum are hosting the Society for Industrial Archeology (SIA) rescheduled conference in Bethlehem, PA, on August 23-27, 2021. Located in the Lehigh Valley, the region holds the unique legacy as the cradle of heavy American industrialization. The 2021 SIA conference, tours, and papers engage anthracite coal; iron and steel; slate and cement; transportation networks of canals, rail roads, and bridges; a rich musical tradition; and the impact of labor and unions. All these grew big in eastern Pennsylvania and had significant impacts on American industry and its economy.

Pennsylvania was the driving force of American industry in the 19th century. The Commonwealth's industries employed more people and produced more goods with more dollar value than any other state. Pennsylvania was the center of iron production, surpassing by the 1880s even the industrial might of Britain and Germany. And Pennsylvania was the nation's powerhouse, supplying 95% of the hot-burning, high-energy anthracite coal that ignited the America's industrial revolution. The revolution began in the five counties: Bucks, Northampton, Lehigh, Carbon, and Luzerne ... the place where America was built, the cradle of the American Industrial Revolution.

— Martha Capwell Fox, *Geography, Geology, and Genius* (2019).

Bethlehem, Pennsylvania, is located in eastern Pennsylvania approximately 60 miles north of Philadelphia and 80 miles west of NYC. The city is served by Lehigh Valley International Airport, a mid-sized regional terminal 15 minutes from downtown with direct flights to many major cities like NY, Detroit, Chicago, Atlanta, Charlotte, and Philadelphia. While there is no direct rail service to the region, several bus companies operate routes to the region including Trans-Brige Lines, Greyhound, and Bieber tours.

The tours will visit four key regions that dominated their respective industries in the 19th and early 20th centuries, Anthracite, Slate, Cement, and Iron and will explore the significant bridges and canal sites that supported them. Except for iron and canals which are both conserved and engaged in a heritage context, the remaining extractive industries are still active and in production. Anthracite coal was America's first mass produced fuel. First used by blacksmiths in the mid-18th century, its purity and durability saw it replace charcoal in Pennsylvania's rapidly expanding iron furnaces in the 19th century, spawn an extensive network of canals and railroads, and become a significant home-heating fuel. The industry also saw major strikes and accidents leading to thousands of deaths and injuries. The expansive growth of the industry ultimately witnessed the formation of a vibrant heritage community supported by over 100 groups. The



Lehigh Anthracite open pit mine. 90% of the world's deposits were found in northeast Pennsylvania.

tour will visit the active Lehigh Anthracite mines, and Eckley Miners Village and the Number 9 mine heritage sites.

The cement industry blossomed in eastern Pennsylvania and saw the formation of some of the earliest large corporations that produced and distributed cement. This tour will visit the Saylor Kilns Park in Coplay, site of the first portland cement mill in the US. Eight Shoefer kilns, the last ones in the world, still stand in the park, then visit the LaFarge Holcim plant, which began as Whitehall Cement in 1899 and tour of the Atlas Memorial Cement Museum, the only such museum in the US. In Fullerton. The group will visit the Swope and Bartholomew fabricating shop and the Bridesburg Foundry and conclude with tours of the Tilghman Street and Eighth Street bridges, two large, high century-old concrete bridges in Allentown. Heading north our next tour visits the Lehigh Valley Slate Belt, long recognized as the top slate-producing region in the United States. Based on Welsh models and initially developed by Welsh industrialists, the region grew to supply most the roofing tiles for the eastern United States. This tour will visit the last remaining operating quarries, Bangor Quarry and Penn Big Bed Slate Company, as well as historical sites related to the industry including the Blue Mountain Antique Gas & Steam Engine Association in Bangor, PA.

Our other tours will include transportation corridors via the network of early canals, and the regions rich collection of historic and modern bridges. In addition, the conference will visit the historic Moravian Industrial Quarter, established in the 18th century with the largest concentration of crafts, trades, and industries in the American Colonies. The Sia will also host a day of papers exploring the Pennsyl-

vania's industrial heritage plus highlight work by American historians, engineers, heritage professionals, archaeologists, and architects.

Challenges

The SIA, like so many of you, faced challenges to conferences over the last 18 months. This event was postponed twice before we made the decision in April to reschedule to August and move forward with an in-person conference. But the pandemic is still active. Our planning committee spent considerable time at each meeting discussing the impacts to public health and the measures we needed to mitigate its effects. It has been a challenge to plan for bus tours and crowded conference rooms. In May, our group decided to pursue a hybrid model that would not only lessen concentrations of people but would permit attendance for people who could not join an in-person August event and international guests. However, as our planning continued, we faced increasing and even staggering equipment and production costs and while the SIA was willing to take a reasonable financial loss on the conference, the fees grew so large that we eventually had to return to a "normal" in-person event. We are hoping in the future to be able to follow the models successfully demonstrated by our colleagues in Spain but sadly that will not happen this year. The US is seeing a period of significant declines in COVID infections and increases in vaccinations, and we are hoping that the new variants will remain low and that we will not have to cancel the conference. I know it would be difficult for many of you to travel, but if you can, consider a visit to Eastern Pennsylvania this August. If not, I'd be happy to see you here at any time of the year. [49th Annual Conference \(sia-web.org\)](http://sia-web.org)

SWEDEN

A MINING COMMUNITY IN ARCTIC SWEDEN

Judit Malmgren, PhD Student, Luleå University of Technology

Communities highly characterized by natural resource extraction and associated industries are sensitive to expansion phases and economic downturns (booms and busts), and in the Arctic, where distances are great and access to alternative economies difficult, this becomes a particularly prominent problem. What value cultural heritage and history can have for such societies is an important question to explore. Thus, to understand the place of Svappavaara, one must understand its history of mining.

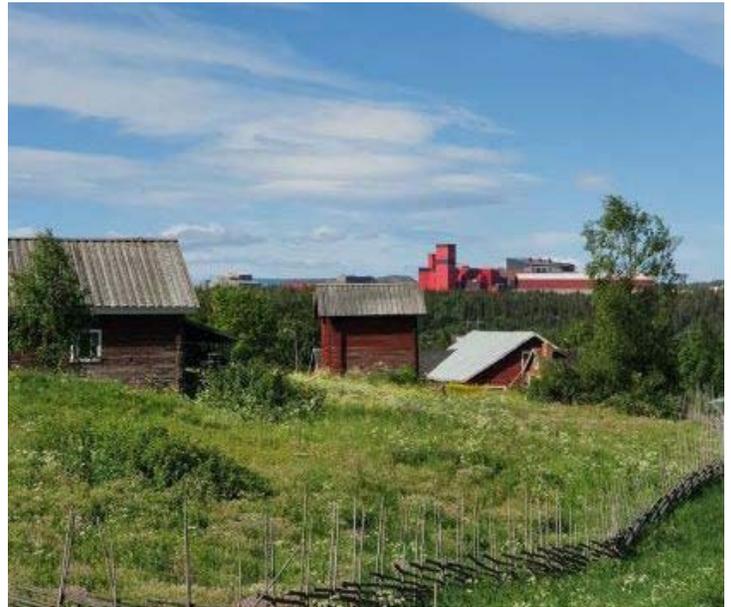
Svappavaara in Arctic Sweden is a place that historically has come to be defined as a mining community. This identity has emerged through several development phases, in which mining and its accompanying systems of infrastructure has remained a core aspect.

Driving on the E10 route, about 47 kilometers south of Kiruna, a large eye-catching mining site appears. The community of Svappavaara is located on a hillside overlooking the mining site. It consists of buildings from different eras as far back as from the 17th century to modern day, reflecting a society that has undergone several changes over time. For almost 400 years, the community of Svappavaara has been affected of the ups and downs in pre-industrial and industrial economic fluctuations. The community has undergone several phases of active mining which has affected both its physical appearance, as well as the people living in the area and their relationship to it.

History

At the beginning of the 17th century Svappavaara lacked a resident population and nomadic Sami were the main utilizers of the area. This would change as Svappavaara's ore was discovered and began to be extracted in 1656. As mining commenced, a community emerged with workers and their families moving in from different parts of Sweden and Finland. Apart from mining, work was available in ancillary activities such as smelters, forestry and other forms of supply and deliveries.

In 1684, mining in Svappavaara ceased, mainly due to economic difficulties, and most of the population left. However, some of the workers and their families remained to work with mining related tasks and ore was brought from nearby mines for processing in Svappavaara. Over time, work in small-scale mining and other related mining activities continued, but those who still lived in Svappavaara during the 18th century subsisted mainly on cattle, fishing and hunting. Many gave up working with mining, moved on or became settlers. During the 19th century, mining ceased completely and the community gradually entered a new phase, no longer revolving around mining, and people mainly lived off small-scale agriculture, hunting and fishing.



Svappavaara folk museum with the mining site in the background. Photo: Judit Malmgren



Ormen länge, designed by Ralph Erskine in 1965. Half of the building was demolished in 2010 as it had become redundant. Photo: Dag Avango

Svappavaara managed to maintain a population without mining until its mineral deposits became economically interesting again. After World War II, the demand for metals increased globally, leading to an open pit mine with associated processing plants opening in Svappavaara in 1965 by LKAB, a mining company owned by the Swedish state. Svappavaara thus became part of a giant system for ore mining that today produces 90% of all iron ore in Europe.

Svappavaara again became a mining community and gained a major population, but a new economic downturn caused the mining operations to shut down in 1983, leading to another phase of depopulation, decreasing the population by 50% in 20 years. This relatively short period of 18 years of mining was nevertheless highly influential on Svappavaara's current appearance. During the boom,



Svappavaara community with the mining site in the background. Photo: Dag Avango

the demand for housing skyrocketed and apartment blocks as well as single-family homes were built, a settlement with a unique spatial plan and architecture was created, designed by the architect Ralph Erskine, famous for his visionary designs for settlements in the Arctic. Svappavaara also got a new school, sports facilities and other types of infrastructure that made the community more comfortable and attractive to live in and the population has been quite stable since 2000. LKAB financed much of the expansion of the community's infrastructure.

During the years without active mining, after 1983, there were some mining related work as ore from a nearby mine was processed in Svappavaara, but as the population decreased many buildings were demolished, including parts of a housing complex designed by Erskine. However, when global demand for metals rose again from the early 2000's, LKAB pushed Svappavaara into yet another mining phase. The mine re-opened in 2015 and mining and its sub-industries currently employ several hundred people. After the demolition of some important buildings, today there is a demand for housing, but commuting and non-permanent housing becomes more common in mining communities such as Svappavaara.

Cultural heritage and connection to place

Svappavaara is a rather particular community, surrounded by valuable nature. Most of the buildings are from the 1960s and 1970s, but in the center of the community, parts of the old agricultural landscape are left, with barns and hayfields. There are also remains of 17th century settlements and houses, a folk museum with buildings originating from the 17th century mining community. In addition, the Swedish National Heritage Board has designated the remains from early mining operations as a national interest for cultural heritage protection. All this is accompanied by the distinguishing, red mining plant.

This article shows that ideas of what an ideal industrial society is change over time, with altering needs and preferences. What makes a place attractive also varies between individuals, through different phases of a lifetime. Basic societal functions such as schools, grocery stores, good communications and activities for children and young people are important. Connection to a place can be created in the everyday use of it, as well as by learning and living in its history and heritage. It is not only physical traces in forms of buildings and cultural landscapes that a previous mining industry leaves behind, but also immaterial cultural, historical traces, which in the long run affect the idea of, and connection to, a place. The industrial cultural heritage of Svappavaara carries histories of pioneering, business success, modernization and development, but also how a community largely dependent on extractive industries has coped with change and with competing ways of using the land.

Mining means more than the mine itself; it is always surrounded by systems of infrastructure such as roads, housing and formal and informal rules. Once a system is established, the probability of a disused mine re-opening, or new mines to be established in the area is higher. Svappavaara's history of being a mining community has provided systems of infrastructure, but seemingly also an accommodation among the population to value the mining legacies and living through booms and bust, enabling communities such as Svappavaara to survive in a depopulating part of Sweden.

This research explores land-use conflicts and synergies related to mining in the Swedish Arctic. Using system theory, it accounts for the complex relationship between the mining industry and the local communities which are affected by- and embedded within the large sociotechnical systems connected to mining.

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BRAZIL

A DIGITAL INDUSTRIAL PATH RECORD OF RIO GRANDE, BRAZIL

Dr Olivia Silva Nerya and Dr Maria Leticia Mazzucchi Ferreira, Federal University Of Pelotas

The industrialization process in Brazil began at the end of the 19th century when different factories started producing textiles aiming to substitute for imports. It was the agricultural crisis, end of slavery, and immigration that mostly helped the development of those factories. The coffee sector also enabled some families' and groups' capital accumulation, mostly in the state of São Paulo. Southern Brazil also had industrial cities and regions, which were especially important for the industrialization scenario in the whole country.

In the state of Rio Grande do Sul (RS), the industrialization process had some different characteristics: cattle raising and capital accumulation came from European immigrants. Industrialization in Rio Grande do Sul was in two different regions, one in the southern and the other in the metropolitan region, including the city of Rio Grande. It is situated in the south about 360km from Porto Alegre, the capital, and is the oldest city in the state. As the most important seaport it was naturally one of the main cities in the industrialization process. The first textile factory installed in Rio Grande was Rheingantz Factory, in 1873, founded by Carlos Guilherme Rheingantz, a German immigrant.

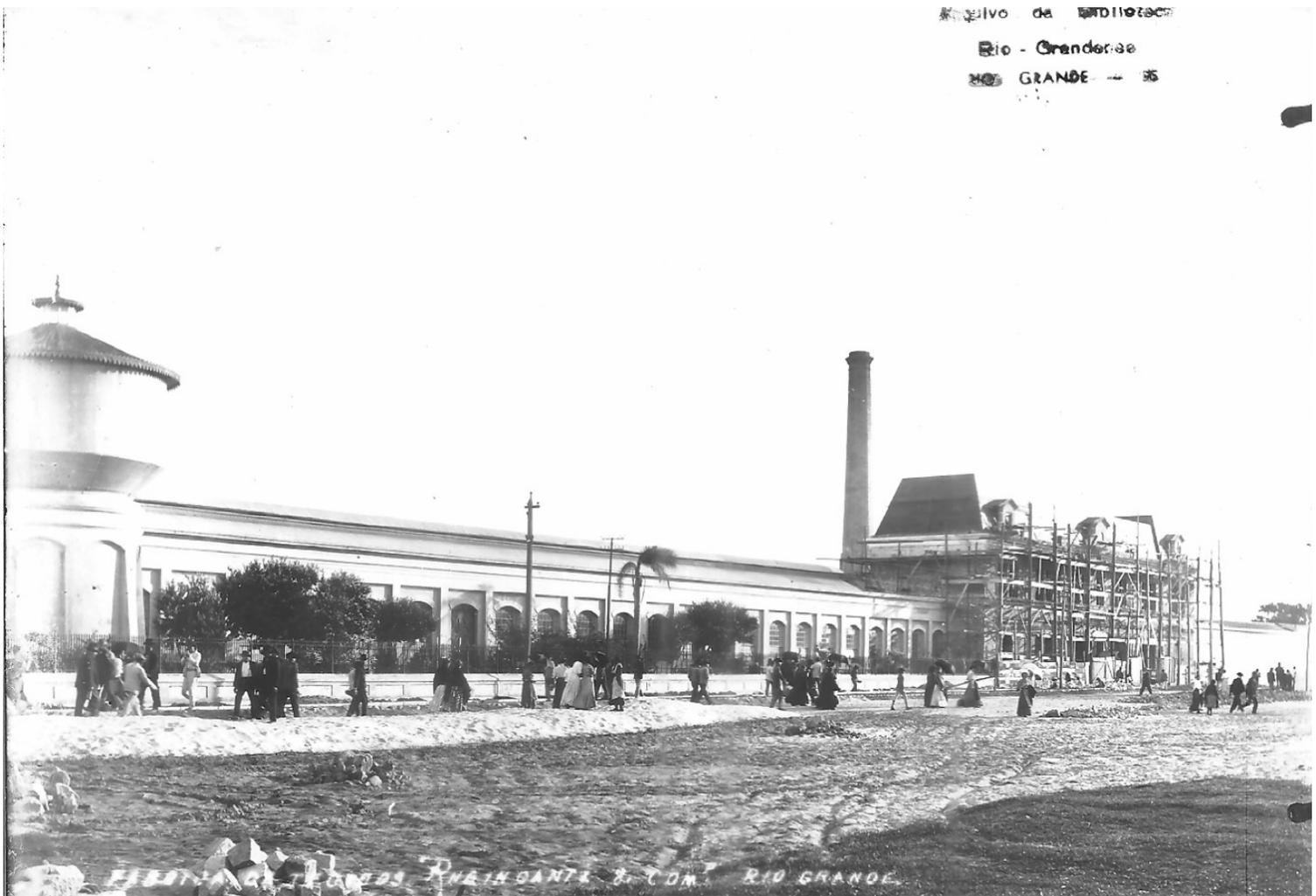
The seaport was a big attraction in Rio Grande; immigrants who wanted to invest in industry were captivated by the opportunity and possibility to readily export and import products through national and international ports. Between 1873 and 1990, we estimate that Rio Grande had about 200 factories and thousands of laborers. Some of those factories were: Rheingantz (1873), Italian-Brazilian

Textile Factory (1894), Leal, Santos & Co. (1889), Schmidt and Alse-mi Brewery (1918), Pooock Cigar Factory (1891), Riograndense Mill (1894), Swift Slaughterhouse (1918), Ipiranga Refinery (1937), Espadrilles Factory Llopart (1902), Matta & Co. (1902), Cunha Amaral Canning Factory (1876) and Túlio Martins Canning Factory (1906).

Industrial heritage of Rio Grande

Known as the City of Chimneys, Rio Grande and its industrial heritage is the object of Olivia Nery's Post-Doctoral research study. She is from the Federal University of Pelotas (RS), financed by the National Council for Scientific and Technological Development (CNPq) and one of the authors of this paper. Her project is called Factory path: industrial heritage of the city of Rio Grande.

Despite the industrial past and its importance during the de-industrialization process, which started in the 1960s, most of the factories were destroyed and abandoned. Spaces that once moved the city's day-to-day life are now abandoned, left with silence and neglect. The real estate speculation contributed for the demolition of several buildings, and those that survived are completely disconnected from the industrial past. Observing the process and the relationships that the former workers had with these spaces and factories, many researchers dedicated their investigations to understanding the history and memory of some factories. Other researchers dedicated themselves to understanding specific sectors or the industrialization process as a whole.



Rheingantz Factory, Rio Grande, in the early 20th century. Riograndense Library Collection.

A digital industrial path record

However, this investigation aims to map and study the industrial heritage of Rio Grande from an innovative approach. Including memories, documents, photos, objects and building documents, the study investigates the industrial heritage of Rio Grande between 1950 and 2000 and organizes that information in a digital industrial path record. The objective is to allow the community to visualize and know the industrial history, its importance, and the original purpose of some industrial and commercial buildings.

To create a dialogue and a form of interaction with the local population, we are using social media and a website to collect written memories about any factory or industrial heritage (transport, energy, clubs, unions). The digital connection was a strategy during the Covid-19 pandemic, when it was difficult to collect oral testimonials with safety. However, despite the losses due to the impossibility of conducting oral interviews, written statements and social networks allow us to interact with a greater number of people.

Using mostly the Facebook pages, we are able to share photos col-

lected during research in museums, archives and libraries and observe the interaction among people who lived in that time. This initiative also provides scientific divulgation and enables other public history activities, especially in terms of the local community's participation in the whole process. Our research also contributes to local industrial history and heritage by studying smaller or never-analyzed factories.

Due to its industrial past, Rio Grande is not only a City of Chimneys but also a working-class city that became known as the Red City. A lot of local families have some relation with factories or other structures and investments from the industrialization process. The testimonials show how different generations of the same family worked together in one or more factories and also give information about crafts, techniques, technology, child labor, female work, work accidents, etc.

This is one of the testimonials that we received in our form:

"I studied at Mascarenhas de Moraes School in the evening and worked at the Rheingantz factory during the day. My job

was to supply the women who worked in the weaving machines with the wool used to carry out the weaving of the garments. I was a young boy and, of course, the women teased me. It was very nice, and I made a lot of friends. There was this routine that I will never forget. When the exit whistle sounded, all workers pulled a rope and when it lit, randomly, one would enter a room with the boss and be searched. The first time it happened to me I was very nervous because I wasn't aware of the process, but then they explained it to me, and it was fine. Rheingantz produced the best clothes and blankets and jackets I've ever worn; the pattern was excellent". (Ricardo Rosa Barros, our translation).

Starting in December 2020, the research has more than 50 testimonials and thousands of Facebook comments that help us put to-

gether this industrial path record, which is still in progress, formed by memories and all sorts of documents. Working with industrial heritage and memories in Rio Grande means dealing with identity, individual and social memory, conflicts and forgetfulness, but it is a necessary and important challenge in order to preserve the local industrial heritage and its history.

This post-doctoral research study is financed by CNPq, process number 151171/2020-3. Olivia Silva Nery is the Junior Post-Doctoral Researcher, and the other author, Maria Leticia Mazzucchi Ferreira, is a researcher and supervisor.

SPAIN

THE INDUSTRIAL ARCHITECTURE OF BREAD AND OIL

Cronista Alfredo Cazabán Research Award, 2018 - Dr Sheila Palomares Alarcón, architect, CIDEHUS-IIFA-Universidad de Évora (Portugal)

It is common to think that Jaén in Andalusia in southern Spain opted for the olive grove among the crops that represent, with wheat and grapes, the Mediterranean triad. However, the agri-food industrial activity in this province dates approximately from the 19th century based on the cultivation of cereals and olives with which to produce bread and olive oil, basic foods which are the foundation of the Mediterranean diet. It has been registered as The Olive Grove Landscapes of Andalusia since 2013 on the **Representative List** of the Intangible Cultural Heritage of Humanity of UNESCO.

This research focuses on the study of industrial architecture associated with the productive cycle of cereal and olive groves from the second half of the 19th century to the end of the Franco period in the 1970s in the province of Jaén.

The choice of this period is to consider, on the one hand, the consequences of the Industrial Revolution in the province of Jaén from the second half of the 19th century, coinciding with the confiscation of monastic property and with the beginning of the change in territorial cultivation; and on the other, the end of the Franco dictatorship and the intervention policies in the flour and oil sector.

The change from polyculture, with cereal as the predominant crop, to the olive grove monoculture that developed in this phase of eco-



The old olive oil mill of the Hacienda La Laguna, Baeza, now Museo de la cultura del olivo, with the cellar at the end. 2019.



Úbeda grain silo. 2019.

conomic change, has become the cultural landscape of the olive grove and the agro-food industrial heritage linked to “bread and oil”, in the symbolic denomination chosen for this research, both in factory architecture and in that of storage.

A multidisciplinary point of view, though with architecture as the centre, the study looks at the memories and plans of the projects of the works studied, intending to understand the agro-food industrial heritage of the province without pre-established stereotypes.

This research has tried to answer this question and to recognize the elements that most enrich and represent the agri-food industrial architecture of the province, to value them, to study in what state they are currently in and to reflect on their future.

Specifically, 32 architectural sites have been selected: six flour factories built between 1909 and 1961, 5 of the 6 abandoned or lost; 17 cereal warehouses built between 1949 and 1977, of which 15 are preserved although 7 are abandoned; five oil mills between 1870 and 1952, all in operation, except one that changed its use; and four oil warehouses between 1953 and 1957, all in operation.

The study of each of the selected cases, both of bread and oil, either factories or storage units, has allowed us to know the general panorama in the province from different levels: historical context, description, architectural analysis, urban context, the heritage value of the property and of the plant or machinery, the evolution of its uses and its current condition. These typologies of architectures respond to a function, that of the flour and oil production cycle, with a formal and ornamental architectural language.

It is considered vital to know and preserve the architecture that showed the most advanced technological systems, now obsolete. In this society in which technological evolution advances at vertiginous speed, we know where we come from, especially in a province where its main economic activity has traditionally been based on the agricultural sector.

The original plans of the works have been a primary documentary source for the complete analysis of the sites. Numerous heritage inventories are focused on stylistic or historical aspects that do not include planimetry or constructive descriptions, despite them being fundamental elements to understand the architectural process, and therefore essential in the event that it is necessary to intervene on



The Olive Grove Landscape of Andalucía is considered as Intangible Cultural Heritage of Humanity by UNESCO.

the property. Furthermore, we cannot forget that in the study of this architecture time is against us. With both the oldest and most abandoned architectures, as well as in the rehabilitated cases, historical memory is not guaranteed if buildings are not preserved as a sample of the already obsolete production processes.

Palomares Alarcón, Sheila. (2020). Pan y aceite: Arquitectura industrial en la provincia de Jaén. Un patrimonio a conservar. Jaén: Diputación Provincial de Jaén. Instituto de Estudios Giennenses.

EVENTS

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BULLETIN

NUMBER 93 · 3rd Quarter 2021
ISSN 1605-6647