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Editor's Preface

— Hsiao-Wei Lin, Assistant Professor at the Department of Architecture, Chung Yuan Christian University; Board Member of the International Committee for the Conservation of Industrial Heritage (TICCIH); Convenor of the Advisory Committee, Asian Network of Industrial Heritage (ANIH)

In an analytical report on the potential World Industrial Heritage Sites by the International Commission on Cultural Monuments and Historic Sites (ICOMOS) in 2001, ICOMOS summarizes that the greatest challenges facing industrial heritage are its status as a largely overlooked heritage category, the uneven geographic distribution of sites, and the diverse needs involved in the conservation of such sites. Thanks to the publication of the report, the number of industrial heritage sites on the World Heritage List has increased from 28 in 2001 to more than 68 today, a substantial growth over a short time. In particular, the number of World Industrial Heritage Sites in Asia has also increased. To address the diverse needs involved in the conservation of industrial heritage sites, several multinational and cross-regional research organizations and promotional networks have also emerged, such as the International Committee for the Conservation of the Industrial Heritage and the European Route of Industrial Heritage. Given the diverse nature of industrial heritage, the main goal of these organizations and platforms is to promote interdisciplinary research and enhance collaboration in industrial heritage conservation. Ultimately, they hope to build a consensus among various stakeholders and create a meaningful connection between industrial heritage and contemporary life.

This bulletin focuses on the theme of "Interdisciplinary Collaboration in Industrial Heritage Conservation" and invites renowned heritage professionals to share their rich cross-domain collaboration experiences in integrated research, restoration, planning, museum exhibitions, education, business promotion, and community engagement. In this bulletin, Mr. Rainer Klenner, a co-founder of the European Route of Industrial Heritage, and Mr. Eusebi Casanelles, the founding director of The Network of Industrial Museums of Catalonia, will talk about the interdisciplinary partnerships and operational models of their organizations. In addition, Dr. James Douet, editor-in-chief of TICCIH Bulletin, will summarize the TICCIH International Oil Heritage Comparison Study that examines oil heritage sites worldwide.

Moreover, two researchers from Taiwan will share with us their interdisciplinary collaboration experience in this bulletin. In her article Research Cooperation and Exchange between Taiwan and Japan on the Conservation of Industrial Heritage, Yu-Yu Huang from the Cultural Property Preservation Center at Chung Yuan University will introduce the academic exchange programs between Taiwan and Japan for promoting the conservation of industrial modernization heritage in both countries. In his article Reinterpreting Taiwan's Modernity: The National Taiwan Museum System Plan, Yihong Lin, an assistant researcher at the National Taiwan Museum that has implemented numerous restoration and exhibition projects, will detail the museum's efforts to reuse and revitalize the industrial buildings within the Taiwan National Museum System.



In the Worldwide Trends and Events Section of this bulletin, TICCHIH President Miles Oglethorpe will speak about the COVID-19 impact and response strategies of industrial heritage sites around the world, while Ms. Hung-Yu Huang will share with us on how Germany is celebrating 500 years of industrial heritage in Saxony by staging special events and programs in 2020. In addition, Mr. Hirotaka Yamada from Japan's Rakuno Gakuen University Teacher Training Center will introduce the coal mine and iron production heritage and their preservation in Hokkaido. Finally, Fan-Lei Meng and Bo-Ying Liu from Tsinghua University, China, will report on the 10th China Industrial Heritage Academic Conference and China's efforts in promoting and conserving industrial heritage.

This bulletin presents different organizations' experiences in developing interdisciplinary partnerships for the sake of industrial heritage conservation. The cases introduced in this issue attest to the recent development in industrial heritage conservation and indicate that the conservation movement has evolved from a local phenomenon to a regional and international trend. As an organization that promotes experience exchange and collaborative cooperation, the Asian Network of Industrial Heritage (ANIH) seeks to connect with other like-minded organizations in Asia-Pacific and create more opportunities to strengthen relationships and enhance collaboration.



ERIH, the European Route of Industrial Heritage- The Tourism Information Network of Industrial Heritage in Europe

— Rainer Klenner, ERIH board member, webmaster

ERIH is a network of industrial heritage visitor attractions which tell the fascinating story of the places, the processes and the people that together make up Europe's common industrial heritage. On its website ERIH presents over 1,850 sites from all European countries. Over 100 of these sites are so-called Anchor Points, sites of exceptional historical importance in terms of industrial heritage which also offer a high-quality visitor experience. Regional Routes introduce in more detail the industrial history of landscapes, which were particularly influenced by industrialization. All locations are assigned to one or more of 14 European Theme Routes, which show the variety and - often together with the biographies - the interlinkages of European industrial history and their common roots. The network is run by an association (ERIH e.V.) established under German law, which has more than 300 members in 26 countries. In 2019 ERIH was certified as a "Cultural Route of the Council of Europe".

It was at the end of the last millennium that ERIH started. In 1999 the idea was born to establish "Industrial Heritage" as a brand of tourism and to use the potential of industrial heritage tourism for local or regional economic development. This would be realized by creating a pan-European network called "ERIH-The European Route of Industrial Heritage". ERIH would introduce sites that present the European dimensions of technology, social and cultural history of the industrial age as attractive tourist destinations that are worth a visit.

What's behind this idea? Industrial history is a crucial part of Europe's past since nothing has left its mark as clearly as the two centuries following the beginning of the Industrial Revolution. Production plants with their supply and disposal facilities, the extraction of mineral resources, transport routes and traffic facilities, workers' settlements, the rhythm of machines radically changed the landscape and working life. The Industrial Age's living and working conditions were more or less the same, assuming that a miner in the Ruhr district or in the valleys of Wales dug for same coal in a very similar way. They even migrated all

across Europe in search of the 'black gold'. The example illustrates that the peoples of Europe share the same memories of industrial history which are part of the common European identity.

For several decades now, structural and economic shifts have once again led to drastic changes to industries and their communities. Factories are closing or relocating their production facilities to other regions or continents. Mines are being closed down, production facilities demolished or converted for new industrial production, for trade and commerce or for residential purposes. Fortunately, however, a greater number of the remnants of Europe's industrial development have also been transformed into attractive tourist destinations as museums, cultural and natural spaces, becoming both places of remembrance and symbols of change. A gigantic network of sites spread all over Europe. It only has to be brought back to life – which is what ERIH is helping to bring about.

European Union supports the development of the ERIH network

Institutions from different countries (Belgium, Germany, Netherlands and United Kingdom) were convinced of the original idea. Together they applied for funds from an EU funding programme to develop a master plan - and were successful. The master plan, submitted in 2001, illustrated the economic potential of industrial heritage as a tourist brand and presented the possible structure of a pan-European network with Anchor Points (including their quality standards), regional routes and theme routes.

With further EU funding the development of ERIH was undertaken between 2003-2008, initially in the countries of North-West Europe (funding area), but towards the end of the funded development phase also a first extension to other countries.

Main activities

To promote the new brand, ERIH developed a corporate design, including a common logo, signage at the ERIH

sites, and information material. The network's most important communication tool is the website.¹ As the main promotional platform it presents the industrial heritage to the general public, thus encouraging people to visit the industrial monuments. Extensive information and a plethora of links to other websites dealing with industrial heritage, tourist offices and further organizations and initiatives help to attract visitors. With its comprehensive background information on Europe's industrial history the website can also be seen as a virtual library offering a forum to exchange experiences between experts and lay people with a strong interest in the topic. A more personal form of exchange can be experienced at annual conferences, workshops and national meetings. News concerning the network and industrial heritage in general are promoted via newsletters and the ERIH Facebook site.²

The structure of the ERIH network

ERIH's system of – virtual – routes is the signpost to Europe's industrial heritage.³

Anchor Points form the main route

ERIH presents a large number of locations, some are particularly highlighted as so-called "Anchor Points". They form the virtual main route and promote "ERIH" as a brand for industrial heritage tourism in a special way. As industrial heritage tourism has to compete with established travel destinations quality matters. Therefore, the sites highlighted as Anchor Points (currently over 100) must meet special selection and quality criteria: they are sites of exceptional historical importance in terms of industrial heritage which also offer a high-quality visitor experience. Acceptance as an Anchor Point (by the ERIH board) is a seal of quality and it offers visitors of all ages the promise of an enjoyable and interesting visit by fascinating guided tours, exciting multi-media presentations and outstanding special events. Last not least, Anchor Points are simultaneously starting points for a variety of regional routes.

Regional Routes open up the industrial history of a region

Many regions in Europe have an interesting industrial history and a sufficient number of sites which are attractive for visitors. That's why the development of regional routes is an important element of ERIH. Regional routes (or regional networks) are a marketing tool which bring together a range of sites, large and small, to present in a coordinated way the industrial heritage of a particular area.



Figure 1. Presentation of ERIH master plan in December 2001. Duisburg, D (Source: ERIH; DGfI)

Just as each region is different, so the routes which tell their stories will differ in content and presentation. However, there are features which all routes share. Based on the experience gained from the routes that have already been established, ERIH drafted a "Guidance for creating ERIH Regional Routes", which is available for download on the website.

A regional route must relate to an area that is recognizable and readily identifiable by visitors – it could be a city, a county or a region. A regional route will usually be focused on one or two Anchor Points, which provide the gateway(s) to the route and region. As well as telling their own stories, the Anchor Points will encourage visitors to explore the other sites and attractions that make up the route.

It is important that the area covered by the route has an interesting story to tell and that the cultural tradition and history of the region is reflected in the route. The theme of a regional route will 'tie together' the sites and attractions on the route and it will be reflected in its branding and promotion.

European Theme Routes illustrate the European connections

Currently ERIH presents over 1.850 sites of all branches of industry from all European countries. The database of sites is continuously being expanded. In addition to the

¹ <https://www.erih.net>

² <https://www.facebook.com/pg/ERIH.net>

³ <https://www.erih.net/i-want-to-go-there>

⁴ <https://www.erih.net/about-erih/route-system/regional-routes/>

attractive presentation of industrial history, a key selection criterion for inclusion to the database is the accessibility of the site for visitors: during the usual tourist season in summer the location should be open at least two days a week.

All ordinary sites and Anchor Points are grouped on the basis of 14 Theme Routes. The Theme Routes are organized by branches of industry; there is also a list of company museums and sites that offer factory tours and another list of industrial heritage properties on the UNESCO World Heritage List.

The Theme Routes take up specific questions of European industrial history and draw - often in connection with the biographies - possible connecting lines. They follow them throughout Europe and to a wide variety of industrial monuments. The result: a "circuit diagram" of the common roots of European industrial heritage.

Biographies introduce personalities who have influenced industrial history

However, industrial history is not only told through architectural evidence such as mines, production facilities or workers' settlements. The people are just as important: inventors, entrepreneurs, financiers, and especially the workers. This is why ERIH also presents 160 biographies of personalities who have influenced European industrial history.⁵

The ERIH website

ERIH's website is the most comprehensive portal of a cultural theme in Europe; its contents at a glance:

- more than 1,850 sites in all European countries
- among them more than 100 Anchor Points
- 20 Regional Routes with brief descriptions of their industrial history
- 14 European Theme Routes (with 42 subcategories)
- more than 160 Biographies
- brief descriptions of European industrial history and the industrial history of 42 countries
- 16 historical reviews of branches of industry presented on the European Theme Routes
- approx. 400 links to industrial heritage networks, industrial UNESCO World Heritage Sites, and industrial heritage/archaeology organisations
- more than 4,000 links to websites of sites, regions and branches of industry described

ERIH's management structure

After the end of public funding, the network established itself on a "legal footing". In 2008, 17 persons and institutions from 3 countries founded an association established under German law listed under the name of "ERIH - European Route of Industrial Heritage e.V.". Since then the number of members has risen to more than 300 from 26 European countries: industrial heritage sites and museums, organisations from tourism and business, public authorities, monument conservators, interested individuals and other actors involved in industrial heritage. The organs of the association are the board of management and the general assembly. The board has commissioned an external manager and nominated national representatives. The costs of running the network are financed by the membership fees.

Renewed EU funding enables numerous projects

Recognized as a pan-European network to promote Europe's industrial heritage ERIH was granted another funding period from October 2014, provided by the "Creative Europe" network funding programme. Thanks to this funding ERIH has been able to extend its information portal and to finance numerous further activities.

The funding is, amongst other things, invested to drive networking forward in favour of the exchange of experience on a regional, national and European level. This is particularly assured by the annual ERIH conferences, each of which focuses on a topical theme relating to industrial heritage and tourism.⁶



Figure 2. Handing over the Anchor Point Plaque to Big Pit, National Coal Museum, Blaenavon, GB (Source: Big Pit Nat Coal Museum)

⁵ <https://www.erih.net/how-it-started/stories-about-people-biographies>

⁶ <https://www.erih.net/what-is-new/erih-annual-conferences>

The project "Twinning of Sites" comprises the twinning of thematically similar ERIH sites to share experience and good practice and to develop skills and competences. ERIH covers the travel and accommodation costs of the exchange for between 1-3 persons.⁷

To create the "ERIH Industrial Heritage Barometer" the association carried out a survey of industrial heritage sites in Europe. Based on the questions ERIH is frequently asked, a questionnaire was compiled on the topic groups core data, target groups, perspectives and measures. This formed the basis of a Europe-wide online survey in 2018 and 2019.⁸

There are numerous "expert databases and best practice websites" on different topics dealing with industrial heritage. In order to get an overview of this websites at a central point, ERIH has researched them, created a linked database and placed it on its website.⁹

The annual dance event "Work it Out" for young people as well as the young at heart held at impressive industrial settings all around Europe is very successful and effective in terms of publicity.¹⁰



Figure 3. WORK it OUT 2019 at Ignacy Historic Mine. Rybnik.PL
(Source: Ignacy Historic Mine)

Challenges for the future

Since its establishment in 1999, ERIH has become established as a major player in industrial heritage tourism in Europe. It is recognised as such by the Council of Europe and the European Commission and also national heritage and tourism organisations across Europe. The network continues to expand and its profile become more widely known. However, the challenge now facing ERIH and also the industrial heritage tourism sector is how they can adapt to major issues now facing the world – including climate change and the economic and social challenges in a post-Coronavirus world. Over the coming months and years, ERIH will be keen to work with its member sites and other agencies to explore how the stories of Europe's industrial past can continue to be presented.

⁷ <https://www.erih.net/projects/exchange-program-twinning-of-sites>

⁸ <https://www.erih.net/projects/erih-industrial-heritage-barometer>

⁹ <https://www.erih.net/nc/service/experts-and-best-practice-databases>

¹⁰ <https://www.erih.net/projects/erih-dance-event-work-it-out>

The Structured Network of Industrial Museums that Explains the Industrial History of Catalonia

— Eusebi Casanelles, Ex-President and Member of TICCIIH board; Vice-President Textile Museum of Colonia Vidal

In 1981, the Government of Catalonia began the process of creating the National Museum of Science and Technology (mNACTEC). Three years later it opened its doors in the old wool textile factory "Aymerich and Amat" of art-nouveau style located in Terrassa, 30 km from Barcelona. The beginning came at a time of changes. The country was reshaping its political structure and its way of governing. It was not long since democracy was established in Spain (1980) and the Catalan government abolished by Franco's dictatorship had been re-established. At the international level there was the economic crisis started in the 1970's that definitely wiped out the "industrial era." In this period of change, the concepts of how to run the different activities of society were re-thought. New ideas and management emerged that shaped the new society affecting the cultural field. Cultural heritage policy focused on much more thoughtful heritage interventions which could be understood and enjoyed by society. Two significant concepts emerged: the Industrial Heritage as part of the cultural heritage and the territory-museum which in France evolved from what is called the Ecomuseum.

This historical context is necessary to understand the evolution of mNACTEC. It was created by the newly constituted Catalan government (1980) and in its beginning the museum model was based on collections of technical objects just as with the great existing European technical museums of science and technology.

In the same year that the mNACTEC project was started, TICCIIH organized its IV Congress in Lyon (1981) which a representative of the mNACTEC project attended. The head of the museum project immediately adhered to the objective of this institution which promoted the appreciation and study of the industrial heritage, as well as the preservation of its most outstanding elements. There was another important reason, that industrialization in Catalonia is part of the identity of its society. It began very early, in the 1830s, and was a pioneer in southern Europe along with northern Italy. For more than 150 years Catalonia was considered the "factory of Spain". Industrialization introduced a new way of life and developed new models of culture. From its beginning, the mNACTEC carried out various initiatives in the field of industrial heritage such as the in-

ventory, organizing congresses, exhibitions and publishing articles. To promote the conservation of industrial sites, the authorities were encouraged to implement conservation policies. But the most relevant decision was the promotion of industrial museums from different productive sectors in various municipalities of the country. The idea was to link them to the mNACTEC with the idea of creating a territorial museum that would encompass all of Catalonia. These industrial museums would complement the mNACTEC collections because they preserve the production-process of different industrial sectors.



Figure 1. Interior exhibition called "Energeia" (energy in old Greek) (Source: Eusebi Casanelles)

The selection of industrial sites was carried out through the study of the industrial history of Catalonia, which was divided into three periods. The first comprises mainly the second half of the 18th century. Although the sites are not fully industrial, they are considered proto-industrial because although they used pre-industrial technology, the market for their products was not only local. They worked to sell their products all over Spain and exported to the Latin American countries that at that time were part of the Spanish Empire. The market network of these proto-industrial sites was essential to understand the subsequent development of the Catalan industrialization. The second period corresponds to the first Industrial Revolution and the third period to the second Industrial Revolution which

began in the early 20th century and ended in the 1960s in Catalonia. Twenty-two industrial sites of these two periods have been converted into museums. A total of 27 museums have been created and new museums are still asking to join this network, such as the Knitting Museum and Terracotta Museum.

Four main conditions were proposed so that the chosen sites could be part of the museum organization of the mNACTEC once they had been transformed into a museum. First, they had to form part of a different industrial or technical sector than existing ones, although there two exceptions were later made. Secondly, the museum had to be a legally independent entity of mNACTEC. Currently all are municipal museums, except for two that are private and three more which belong to the mNACTEC itself, acquired through the purchase of an industrial site. The third condition was that the museum had achieved high quality, worthy of a museum linked to the National Museum. Finally, the museum had to follow the guidelines of the museology programmes promoted by the committee

of directors chaired by the director of the mNACTEC. These programmes give this network a cohesion because it implies similar lines to be followed in various activities. The most prominent are institutional image, dissemination, education and policies for the conservation of technical objects. These programs are the best tool with which to accomplish the ultimate goal of this organization, which is to create a common identity for all of the museums. This wider national identity is placed above individual identity but without being absorbed so that the museum doesn't lose its independence. On the contrary, it comes out of strengthening the thematic uniqueness of each museum at Catalonia level, so that they become a sort of “hall” of the National Museum: they acquire more cultural status than if they were only a local museum.

To organize this network a kind of confederation of museums was established. A commission composed of all the museum directors was created and coordinated by the director of mNACTEC. Its most important objectives have been to seek collaboration to organize activities and investments in the property and exhibitions, to promote concrete joint actions in the program frameworks, and to disseminate jointly the network museum.

The organization is based on the concept of a network. As Professor Manuel Castells wrote “networks can establish asymmetric relationships among its nodes and no node is able to attain the global goals without the others. Complex models emerge from simple interactions between individuals.” The mNACTEC museum network allows for asymmetries in the dimension of museums (small and large), in the property (public and private), in the typology, etc.

This organization was called the “mNACTEC Territorial System”, acronym in Catalan STmNACTEC. According to the dictionary a system is “a *whole* in which the parties are related to each other by the *laws*”, such as the solar system. In addition, biological and technical systems perform a specific *function*. The STmNACTEC function is to explain the “history of Catalan industrialization” through its heritage and the *laws* that relate them are the programs. In this context each museum, that are the nodes of this network, has the function of explaining a part of the history of the industrialization of Catalonia.

The achievement of this organization of industrial museums has been possible thanks to the great collaboration of the municipalities and private entities that own the museums. This spirit of cooperation is not easy to achieve due to the political, personal and conceptual differences of politicians and professionals at each site.



Figure 2. Students learning to produce paper artwork at Museum of Capellades (Source: Museum of Capellades)



Figure 3. Inside of the Mine Museum of “Bellmunt del Priorat” (Source: Ara.cat)

This territorial organization of museums not only reflects the large number of existing industrial sectors. It also stresses the intense relationships among the industrial sectors that give a great complexity to the industrial production that it spreads to the rest of the industrial society too. This complexity is a fundamental feature of industrialization. Production centres cannot operate in isolation. Each of them relates to other production and non-production centres: to ones of the same sector and to other sectors, to raw material centres, to energy and water production centres, to consumer centres etc. For example, in Catalonia coal mines fed the boilers of the steam engines of the textile industries and later power plants provided the power. The mechanical industries built machinery for all companies and repaired them. Those in the wood and leather sectors produced many elements of the machines of the textile industry. Many other relationships could be added. Society also interacted with industries. The accumulation of workers in the city caused the construction of flour mills and industrial wine and oil cellars to feed them. On the other hand, it was necessary to create slaughterhouses and new markets with the right hygienic conditions, facilities to provide clean water and new land and sea communications for all this interconnection.



Figure 4. Cotton Textile Colonia Vidal Museum General's view in foreground which is the worker's village and the gardens on the background close to the river is the factory above it the house of the owner. (Source: Colonia Vidal Museum)

For all this, to understand the revolutionary process of industrialisation is needed to have comprehensive approach of the extensive relationships produces in the territory.

In Catalonia many of these aforementioned industrial activities have a museum that deals with them. With this organization the museum fulfils the museum law that says "National museums" should carry out the structuring of Catalan museums that deal with specialized subjects such as art, technology and natural history.

To summarize briefly. The industrial sectors represented by museums are a) textile museums: cotton, wool, knitting, ribbons, and printed textiles, b) mining: coal, salt, and lead. c) Agricultural: flour, wine, oil and alcohol d) Other sectors: leather, metallurgy, cork, automobiles, railways, wood, hydraulic electricity and steam, cement, ceramics, e) proto-industrial museums: Iron Mill, paper mill, tannery, and salt production.

You can visit <https://sistema.mnactec.cat/es/> and click dots down the page.



Figure 5. The interior of the paper mill hammers for pulp. Paper Museum Mill. The production of paper was introduced into Europe through Spain in 12th, by the Islamic invaders who had been in contact with China culture, and some years later from Italy. (Source: Eusebi Casanelles)

Conclusion

Industrialization established an interrelated production system of great complexity that has been increasing until today and affected the whole of society. Industrial heritage through its museums could prove a good tool to know the beginning of this complex process, to better understand today's world. This requires treating the whole of museums and heritage sites of industrialization as a unit that explains the narrative of the industrial history, the territorial system of mNACTEC is an example of an organization that could be a good example if applied flexibly and related with the culture of each territory. Especially it could be useful for those small or medium sized such as Taiwan, which has a similar area to Catalonia. Because of its size all the centres of this museum-territory are easily accessible throughout by the population.

Research Cooperation and Exchange Between Taiwan and Japan on the Conservation of Industrial Heritage

— Yu-Yu Huang, Research Fellow at the Cultural Property Preservation Center, Chung Yuan Christian University

Keywords: industrial heritage, petroleum industry, heritage of industrial Modernization, international exchange, interdisciplinary collaboration

The cultural value of industrial heritage has been recognized by many countries and international organizations, including UNESCO and the European Union, both of which have in recent years designated industrial heritage as an important area worthy of research. In addition to the historical, aesthetic, social, and scientific value of industrial heritage, the potential for revitalization and reuse has also become a motivation for conservation work.

In 2002, Taiwan carried out in earnest privatization of state-owned enterprises, in the process demolishing a large number of industrial facilities and reclaiming vacant land. It resulted in the loss of many industrial heritage sites. In 2004, the Executive Yuan (the executive branch of Taiwan's central government) instructed what was then the Council for Cultural Affairs to set up a "cultural assets inventory team" to promote all cultural assets belonging to central government departments and state-owned companies. Between 2006 and 2018, the council implemented the Industrial Cultural Assets Regeneration Project and used official resources to assist industrial sites such as sugar factories, salt mines, breweries, mines, timberlands, and railways to revitalize and reuse industrial heritage. The most notable among these was the petroleum (drilling) industry.

In 1861, in the late Qing Dynasty, an oil field was discovered at Chuhuankeng in Miaoli and a primary oil well was manually excavated, only two years after the digging of the world's first oil well. In 1878, Taiwan's first machine-excavated oil well was dug at Chuhuankeng using the Pennsylvanian steam-powered cable system, and two Pennsylvanian oil technicians were brought to Taiwan to kick-start the mechanized exploitation of petroleum reserves. The unique characteristics of the Chuhuankeng reservoir's natural geological conditions mean that the petroleum industry heritage of this area forms a landscape in which the Hakka community and the oil industry are intertwined.

In 2007, the Miaoli County Government registered Chuhuankeng as a cultural landscape in order "to demonstrate the cultural importance of the relationship between the natural anticline topography and the human application of petroleum resources, possessing religious, architectural, and commemorative value, as well as the technical scientific value of the petroleum industry in an industrial mining area which has been under continuous exploitation since the Qing Dynasty, through the Japanese colonial era, and up to the present day."

In 1873, during the Meiji period, the Japanese oil industry commissioned American Benjamin Smith Lyman to look into Japanese petroleum geology. The survey was completed in 1890. In 1874, Japanese entrepreneur Kanichi Nakano started an oil business in Niitsu in Niigata Prefecture. In 1903, Nakano introduced an American cable drilling rig and successfully developed the Niitsu Oil Field in the Sea of Japan. Later on, the Niigata Prefecture—established Nippon Oil and Houden Oil would consolidate Japan's modern petroleum industry by introducing major industrial facilities with mechanized drilling and oil refineries. The facilities and the remains of the Niitsu Oil Field's Kanazu Mining Site were registered in 2007 as one of the several sites of Heritage of Industrial Modernization from Japan's modern oil industry. In 2018, the Japanese Ministry of Culture designated the area a National Historic Site.

When Japan took over control of Taiwan in 1895, Chuhuankeng was designated a Navy Reserve Oil Field by the Japanese Ministry of the Navy so as to prohibit private exploitation. Subsequently, from 1903 to 1942, both Houden Oil and Nippon Oil operated the oil field, drilling nearly a hundred wells. Seen from the historical perspective of the global oil industry, both Japan and Taiwan started with an American cable drilling and technological system. After 1895, Nippon Oil's management and technology systems were introduced into Taiwan and dominated the

oil industry here, so Japan and Taiwan's petroleum industry heritage have a shared origin.

Against this historical background, in 2017 the Miaoli County Government tasked Chung Yuan Christian University (CYCU) with organizing a campaign to push for the Chuhuankeng oil drilling site to be included in Taiwan's Potential World Heritage Sites. With an introduction by Nagaoka Institute of Design Honorary Professor Tsutomu Kimura, CYCU invited Kiyotsugu Irie, head of the Section of History and Culture of Niigata City, Takuya Miura, researcher fellow at Manu Urban Architecture Institute, and Takashi Ito, president of the Japanese Industrial Archaeology Society, to come to Taiwan to kick off the international exchange on the cultural landscape of Chuhuankeng and the Japanese petroleum industry heritage.

In May 2017, the Taiwan–Japan Petroleum Industry Heritage International Seminar was held in Taiwan. In his talk on the “Applying for World Heritage Status for the Sado Gold and Silver Mines,” Kiyotsugu Irie from Japan's Niigata City provided advice on how Chuhuankeng could be included on the list of Taiwan's potential World Heritage Sites. Takuya Miura, a research fellow responsible for a research project on Niigata's Kanazu Mining Site, presented the “Discussion of Methods of Investigation and Research into Heritage Relating to the Japanese Mining Industry”. Takahashi Ito, president of the Japan Industrial Archaeology Society (JIAS), Japan's largest industrial heritage conservation organization, gave a presentation on the conservation and reuse of Japanese industrial heritage. In addition to the seminar, the three Japanese experts and scholars were invited to visit Chufangkeng in Miaoli and oil industry facilities including CPC Corporation's Refining & Manufacturing Research Institute in Chiayi and Kaohsiung Refinery in order to deepen their understanding of the current conservation status of Taiwan's oil industry heritage.

In June 2017, CYCU Associate Professor Huang Chun-Ming led a delegation consisting of CPC Corporation and Miaoli County Government representatives and a CYCU research team on a visit to Japan to explore the country's mining heritage. The Taiwanese delegation was received by Mr. Kiyotsugu Irie, researcher Takuya Miura, and president Takahashi Ito. The itinerary included the Niitsu Oil

Field's Kanazu Mining Site in Niigata, the Sado Gold and Silver Mines World Heritage Site on Sado Island, and the Sagara Oil Field Museum in Shizuoka. The tour considered the perspectives of business, government, and academia so as to explore Taiwan's and Japan's experience of conservation of petroleum cultural assets.

A further discovery made through this exchange activity was that Taiwanese enterprises can continue to discuss conservation research and the reuse of petroleum industry facilities with local governments and to negotiate the implementation. By contrast, Japan is mostly concerned with transforming old sites into conservation sites and renewing cultural assets as the industry falls into decline. The basic conditions for these two approaches are different, and the policies of industrial conservation and cultural conservation are also oriented in very different directions.

Through these mutual visits to Taiwan's and Japan's petroleum industry heritage, we found many differences between the two countries in the promotion of the conservation and revitalization of industrial heritage, and there is much that can be learned through such exchange. Inventory taking of industrial cultural assets launched by Taiwan in recent years includes sugar factories, salt plants, breweries, tea production, agriculture, forestry, industry, mining, railways, education, and news media. Starting with the traditional publicly-owned industries that drove the modernization of Taiwan, we hope to use the process of investigating and assessing the value of industrial heritage to enable each institution to understand the importance of its own industrial heritage and implement preventive conservation of industrial heritage conservation.

Japan's conservation policy for heritage of industrial modernization has been in effect for more than twenty years and is aimed at preserving, in a systematic and context-sensitive way, modernization-related industrial sites and landscapes, building structures, civil engineering, water management and mining facilities, machinery, and cultural relics. The government agencies involved include the Ministry of Culture, which is in charge of cultural asset management, the Ministry of Economy, Trade and Industry, and the Chief Cabinet Secretary. Japan's approach led to the listing of the Sites of Japan's Meiji Industrial Revolution as World Heritage sites. Such cultural assets con-

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ervation policies and systems bring together central and local governments, as well as local cultural and historical associations, academic institutions in professional fields, professional societies and museums, volunteers, seniors retirees, and the tourism industry.

During the exchange between Taiwan and Japan on the conservation of modernization heritage, both sides have held many bilateral seminars, including the 2018 Research into the Conservation and Utilization of Japan's Modernization Heritage in Taiwan (organized by the Tokyo National Research Institute for Cultural Properties) in Japan and the Modernization Heritage Conservation Strategy Forum (organized by the Bureau of Cultural Heritage, Ministry of Culture) in Taiwan (fig1, 2).



Figure 1. Japanese scholars paid a courtesy call to Director General Gwo-long Shy, Bureau of Cultural Heritage, Ministry of Culture, Taiwan, during the 2018 Modernization Heritage Conservation Strategy Forum (Source: Yu-Yu Huang)

In 2019, Japan held the “Forefront of Taiwan’s Modernization Heritage” seminars in Tokyo and Osaka, and Taiwan also held the “Taipei Railway Workshop Steel Structure Cultural Assets Restoration Seminar.” (fig3) Through such seminars and bilateral visits, we have exchanged information on interdisciplinary research, conservation systems, and restoration science and technology. It is hoped that this mechanism of cooperation and exchange will provide our governments with advice on protection laws and regulations and provide support for academic institutions and society, as well as assisting the implementation of various aspects of industrial heritage conservation and revitalization.



Figure 3. Meeting Participants visited the Ivy Square, a hotel remodeled from the former Kuirashiki Textile Plant in Japan, after the Seminar on the Forefront of Taiwan’s Modernization Heritage concluded (Source: Yu-Yu Huang)



Figure 2. Japanese heritage experts and meeting participants joined a group photo at the 2018 Modernization Heritage Conservation Strategy Forum (Source: Yu-Yu Huang)

Reinterpreting Taiwan's Modernity: The National Taiwan Museum System Plan

— Dr. Yi-Hung Lin, Assistant Researcher, Exhibition and Planning Department, National Taiwan Museum

Keywords: industrial heritage, cultural assets, restoration and reuse of monuments, museum system

The National Taiwan Museum is the oldest extant museum in Taiwan. It was established by the Government-General of Taiwan in 1908 as a natural history museum for anthropology, geology, zoology, and botany. Its mission was to educate the public, conduct research, build collections, and mount exhibitions of Taiwan's natural resources and social customs. In 1915, the collection was relocated to the Main Building of what is now the National Taiwan Museum.

First named the Taiwan Governor Museum to commemorate Governor-General Kodama Gentarō and Chief Civil Administrator Goto Shinpei, the museum had a strongly colonial air. The British neo-classical historical building is located in Taipei, capital of Taiwan, in the 228 Park in the old city, and since its opening has become a landmark building in Taipei.



Figure 1. National Taiwan Museum (Main Building) (Source: Yi-Hung Lin)

The old city of Taipei is at the heart of the area that witnessed Taipei's development. The Taipei City Walls were inaugurated in 1884 by the Qing government in line with traditional Chinese feng shui ideas. In 1895, when the Japanese took over Taiwan, the area within the city walls of Taipei was designated as a residential area for Japanese. In 1900, plans for urban development were released, including demolishing the city walls, and building roads, parks

and offices—all to transform this traditional Han-style walled city into a modern metropolis.

Historical buildings are spatiotemporal markers in the urban development process, marking the progress of these dramatic changes to the city's appearance. Today, Taipei's old city covers about 2.4 km² and contains 48 monuments and historical buildings, including the Main Building of the National Taiwan Museum. The area is said to have the highest density of monuments and historical buildings in Taiwan.

Despite being under the control of the Japanese Empire and the Republic of China government from 1915 to the 1980s, the National Taiwan Museum not only mounted exhibitions of Taiwan's natural history, but was also used to make up for Taipei's lack of exhibition space by acting as a venue for commercial fairs and politics and art exhibitions. Since the 1980s, large commercial exhibition venues such as the World Trade Center have sprung up in Taiwan, and new large science museums have also been set up. Meanwhile, the National Taiwan Museum has been unable to shake off its image as old and outdated, belonging to Japanese colonial rule, and it has fallen into stagnation and decline.

At the same time, Taiwan's cultural asset preservation movement was caught up in the wave of nativist movements that swept the world in the 1960s. In 1982, Taiwan enacted legislation to officially protect monuments and historical buildings. At first, most of the designated monuments were traditional Han-style buildings. Then, by the 1990s, they began to include modern buildings from the late 19th to the early 20th centuries. The National Taiwan Museum was designated a national monument on June 10, 1998.

Given its lack of space for development, how can the National Taiwan Museum break out of its identity as a colo-

nial museum and become a window on Taiwan's natural and cultural history, to highlight Taiwan's cultural subjectivity? The core issue for the National Taiwan Museum in the 21st century is how to reshape its role.

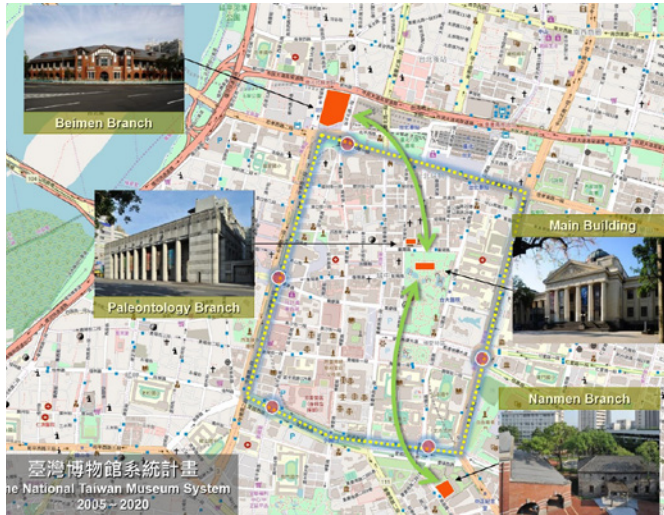


Figure 2. Schematic Diagram of the National Taiwan Museum System (Source: Yi-Hung Lin)

In 2005, the National Taiwan Museum began promoting the “National Taiwan Museum System Plan,” which focuses on restoring and reusing monuments in Taipei's old city. Various government departments worked together to take unused places of historic interest, restore them, and return them to use as museums. Each museum in the network has been allocated a theme that speaks to Taiwan's modernization process: Land, Life, Products, Modernity.

The National Taiwan Museum is located in a park in the center of the old city. In 2007, the museum worked with the Taipei City Government to transform the urban landscape of the park. Since 2014, the roof has been repaired, the interior decorated, and electrical, air-conditioning and fire-fighting equipment have all been updated. Meanwhile, the permanent exhibition has also been brought up to date. In terms of content, the collection focuses on natural history, craft industries, and historical relics, and provides an excellent way for visitors to understand Taiwan.

Opposite the National Taiwan Museum stands what was originally the Nippon Kangyo Bank. Completed in 1933, and later the former headquarters of Land Bank, the Nippon Kangyo Bank's business was mainly real estate loans and it was a funding source for colonial infrastructure construction. The building is typical of the 1930s, and the interior is the best example of Art Deco in Taiwan. Since

2007, the National Taiwan Museum and the state-owned Land Bank have been collaborating on the restoration, culminating in the February 2010 opening of the Paleontology Branch of the National Taiwan Museum, which integrates earth science, zoology, and botany, and showcases Taiwan's unique natural history.

Located outside the South Gate of Taipei's old city, the Nanmen Factory was a large camphor and opium processing factory established in 1899 and a symbol of the colonial monopoly system and industrial development. After the factory closed in 1967, the factory land was gradually sold off, leaving only one-eighth of the land remaining, which in 2007 was handed over together with the buildings to the National Taiwan Museum. Since 2009, restoration work has been carried out and a new collection storeroom has been built. The premises opened in November 2013 under the name Nanmen Park with an exhibition on Taiwan's industrial history and environmental education.

The former Railway Ministry Administration is located outside the North Gate of Taipei's old city. Built in 1885, it was the site of the first modern factory in Taiwan, the Taipei Machinery Bureau. In 1901, during the Japanese colonial era, it became the Railway Ministry Administration, and it was the center of the railway administration during the colonial era. The new hall was completed in 1920 and is the best specimen of a half-timbered modern building in Taiwan. Since 2006, the National Taiwan Museum and the Taiwan Railways Administration have been working together to plan the restoration of the site. Restoration work started in 2014, and at the end of April 2020, the museum opened under the name of the Railway Department Park with an exhibition on the history and culture of Taiwan's railways and the development of modern Taiwan.



Figure 3. National Taiwan Museum's Railway Department Park (formerly the Railway Ministry Administration) (Source: Yi-Hung Lin)

These four museums are dotted through the old city from north to south, forming a ribbon-shaped cultural path: the Ministry of Railways museum at the North Gate played a pivotal role in transport infrastructure management during the colonial era, the former site of the Nippon Kangyo Bank that now houses the Paleontology Branch showcases the colony's economic capital, the National Taiwan Museum exhibits the social, education, and colonial achievements of the colonial era, and the Nanmen Factory presents the special monopolistic industrial system in place during the colonial era. Rather than removing or eradicating all traces of colonial rule, the way to preserve and restore these industrial heritage sites is to look history squarely in the face and reflect on it.

The National Taiwan Museum has also launched the “Blast to the Past” English Walking Tour as a way to explain the city, developing a foreign language tour itinerary, reinterpreting historic architecture and urban history, and turning Taipei's old city into a unique, roofless museum. In so doing, these buildings of the city effectively become the fifth part of the National Taiwan Museum.

In general, the fields of modern industry, transportation, finance, and related industrial heritage are out of reach of ordinary people, and yet they occupy a space in people's

collective memory and daily life. Few people have ever been allowed inside the camphor factory in Taipei, for example, but they may still remember the drains outside the Nanmen Factory, constantly running with cooling water that gave off a strong smell of camphor. Members of the public were not allowed into the offices at the Ministry of Railways, but they remember how every working day morning, the roadside garage door would be wide open while drivers polished the black-topped sedans in preparation to set off and pick up a senior official and drive him to work.

The process of restoring and reusing modern industrial heritage and forming it into a museum system reflects an inclusive view of Taiwanese history. Even though people interpret history in different ways—some positive, some negative—modern industrial heritage itself is neither innocent nor guilty. These spaces witnessed the city's modernization. They testify to it and are an important part of Taiwan's history: preserved, revitalized, and developed. They connect the veins of land and history, bringing together diverse perspectives, and present the best interpretation of Taiwan's modernization process.

COVID-19 and its Impact on Industrial Heritage

— Dr. Miles Oglethorpe, President Of The International Committee for the Conservation of the Industrial Heritage (TICCIH)

Most businesses and organisations have for many years conducted annual risk assessment exercises to try to ensure they are ready to tackle and potentially avoid unforeseen dangers that might harm their operations. In hindsight, it is very unlikely that most if any would have included a pandemic in their horizon planning, so for almost all of us, COVID-19 has come as an extremely nasty surprise and one for which we have been totally unprepared.

For those of us working in industrial heritage, the impact has often been especially severe, not least because the resilience of many organisations, and of the heritage itself, has often not been great, even before the onset of the pandemic. Industrial heritage is not known in most countries for attracting huge support and resources, and we tend to have to work extra hard to win over the hearts and minds of decision makers and funders whose preferences and tastes veer naturally towards conventional arts and culture. So, life was not necessarily easy before the current crisis.

As a result, the sudden loss of revenue for many sites and organisations has been especially cruel, and in some cases, is creating precipitous situations in which permanent closure and bankruptcy is a genuine possibility, and very soon. This is happening right now even to some of our most prominent and globally recognised sites and organisations, including World Heritage Sites. Many face having to make long-serving staff redundant and the possibility of selling valuable assets as well as losing incredibly important expertise. At best, if organisations had financial reserves in the first place, these are rapidly being depleted.

In some countries and regions, there are emergency aid packages, but their effectiveness varies, and the uncomfortable truth is beginning to dawn that this situation is not going to ease quickly, and normality is unlikely to return later in 2020. Indeed, it has often been said that we will be returning to a ‘new normal’, and we now realise that we will be struggling for months, and probably well into 2021 or for even longer.

For most of us, the direct impacts relating to loss of income from activities such as tourism are obvious, but the problems are likely to run deeper. For example, the ability of national and local government organisations to provide funding assistance will be damaged because their own funding is likely to have been impaired, and by the fact that there will be a long queue of other organisations and people desperately seeking assistance. As an example, in Scotland, one of the more important national heritage organisations which gives grant funding is my own employer, Historic Environment Scotland. Unfortunately, we rely on our tourism and visitor income for more than 60% of our annual budget. Until 2020, this was seen as a major achievement, and we had been exceeding our income every year, attracting significant praise for our performance. Now however, it has become a major vulnerability and we are working with stakeholders and the Scottish Government to assess how best we can help and be helped.

It is important at this point to recognise that there have been some unexpected benefits from the crisis. First, many of us have discovered the power of digital communications and are hosting virtual meetings constantly by videoconference. In truth, I am speaking to some people for the first time, and to others more frequently than I have ever done so before. We now know that we will be able to collaborate in many ways far more than we did in the past, and the cost of doing so should be a lot less. In this respect, the power and resilience of the World Wide Web has been extraordinary, and videoconferencing seems to work far better than most of us had ever expected, even though it can be exhausting and not a little surreal.

However, perhaps more important is that our industrial heritage has a major role to play in the recovery process. There are few branches of our heritage that are so well connected to some of the most vulnerable communities, many of whom have been hit hardest by COVID-19. Their industrial history is an important part of their identities, and also carries with it many strengths such as skills and



Figure 1. The Scottish National Railway Museum, Bo'ness (Source: Miles Oglethorp)

technical knowledge, particularly in the context of teaching Science, Technology, Maths and Engineering subjects (STEM).

Taking railway heritage as an example, there are museums all over the world where buildings and collections are technical in nature, require specialist expertise to operate and be maintained, and need capable qualified people to do this work. Even before COVID-19, there was an ageing demographic, with many of the key people well beyond retirement age, so there was already a need for new blood and refreshed pools of skills. Bearing in mind a near-universal skills shortage, the demand for apprenticeships and other skills promotion programmes will continue to grow, and industrial museums have the potential to deliver.

Recent experience has also demonstrated that industrial buildings provide important historical texture that can intensify placemaking and provide the foundations of regeneration. Better still, bearing in mind the embodied energy they contain, they provide a very visible opportunity to take forward positive action in the fight against climate change. If nothing else, the fall in emissions and pollution more generally has been a revelation, so repurposing our industrial heritage to help promote a more sustainable future has to be a good thing.

In conclusion, one of the big challenges as COVID-19 retreats will be to promote the positive opportunities that our industrial heritage presents in the recovery process. At a time when there are so many distress calls bombarding the authorities and funding organisations, stressing what industrial heritage can do to help will be a major advantage.



Figure 2. Mark Ashmole, who is working on a boiler at the Scottish National Railway Museum (Source: Miles Oglethorp)

On the History of Coalmine and Iron/Steel Making, Nowadays State of Industrial Heritage and Preservation Movement in Hokkaido District in Japan as the Japan Heritage (2019)

— Hirotaka Yamada, Rakuno Gakuen University Teacher Training Center

I am living now in Hokkaido district where located at a northern part of Japan, doing research on the history of science and technology as the industrial archaeology in Hokkaido district in Japan (historic technological study for the development in Hokkaido district) for more than 40 years as the activities of the Hokkaido society of JIAS (Japan Industrial Archaeology Society)(Hokkaido Industrial Archaeology Society).

Hokkaido was newly developed only 150 years before (in 2018 since 1870) by Hokkaido Kaitakushi Branch of Meiji Government for the purpose of (1)developing natural resources and (2)making defense by the colonial military system (TondenHei) against to northern countries in northern part of Japan under the political advice of H.Capron (American technical adviser occupied by Meiji Government,1875 year report).

The features of the special technology to introduce as the industrial underlined one in Hokkaido district was “the colonial developing technology” ((1)using American big technology, (2)introducing big capital money from enterprise companies, (3)conducting colonial policy by Meiji Government). Therefore in the 15thTICCIH International Congress in Taiwan in 2012, they had many discussions for the theme “colonial technology under Government of Japan (1895~1945)” as the same case like this Hokkaido one.

In Hokkaido that have much coal resources as well as in Kyushu district, for the purpose of making a rapid progress of the industrial revolution of Japan in Meiji period, in Mikasa, Horonai (near Sapporo), the first coalmine of Hokkaido which had the first industrial production system was constructed by Hokkaido Tankou Kisen Company. And then, in Yubari, Akabira, Sunagawa, Kushiro and so on, many coalmines were opened successively. In 1943, a total amount of coal production with 20 mil. tons was fulfilled (40% share of Japan production) by the 125 large coalmine companies of all Hokkaido accordingly.

Side by side with construction sites for a coal production, as an industrial feature of coal production that is an energy industry basically, a large scale transporting network system was made as the first Horonai Railroad in 1880 and then made a continuous progress to all Hokkaido district.

Lastly constructions of harbor and gantry type coal roader facilities were fulfilled at Otaru, Muroran. And then from these transporting systems on these harbors, a coal resource was transported by sea to the iron and steel making portion in Kei-Hin Industrial region in Tokyo and Kawasaki (Keihin Kougyou Chitai) to contribute to an industrial development of modern Japan in Meiji period.

In Japan, the case of Keihin example over cited shows from the reason why a coalmine of Japan located at a mountainous site, that this coalmine and coke making site are divided mainly. To the contrary, the concept of Germany construction is that recombines a coalmine and a turning plant from coal to coke at the same place, and then transports a coke to an iron/steel making site.

As a conclusion, in Japan, they made a harbor construction firstly, and then secondly, a coke making site construction by using of coal from a far site by sea, and iron/steel making site construction were made at same place to form a complex which combined 3 process lines comprehensively.

These heritage of special system of Japan was evaluated and selected as the World Heritage in 2015 (Kyushu district and others), and are using now as the materials to develop activities under these heritage as the asset to do make newly historical towns by domestic governments.

In Hokkaido, adding a construction of harbor and coke making facilities, according to merit far from Kanto district, the special military company (the biggest company of the Asia), Nihon Seiko Sho (JSW, Japan Steel Work) was constructed in 1907 by means of an introducing capital from three English-Japanese company enterprises (Mitsui, Hokutan, and Vickers-Armstrong company).

Worldwide Trends

In the factories of JSW at Muroran, they made many war weapons of world top level ex. the battle ship Yamato's main canon, an armor plate in the war time, and after World War II, are making a large turbine rotor for a thermal power plant, atomic power plant facilities (70% of world production) by using of 14kton's Hydraulic Press Machine (the biggest one of the world).

This special conglomerate industrial system heritage of Hokkaido which was composed of coalmines, railroads, harbors, iron and steel making facilities was evaluated historically and selected in 2019 as the Japan Heritage named "Tan-Tetsu -Kou" which means coalmines, iron roads, harbor construction and iron/steel making site, with the 45 components as a heritage including the heritage of JSW, recommended by Hokkaido Government. This heritage means the strengthened one of the Hokkaido Heritage which was 1st selected (coalmine in 2001), 3rd selected (railroads in 2018) to a national level.

These heritages (Hokkaido and Japan Heritage) to re-tool will make sure to develop future town activities of the domestic governments in the many old coalmining, railroad system and iron/steel making regions in the middle Hokkaido.

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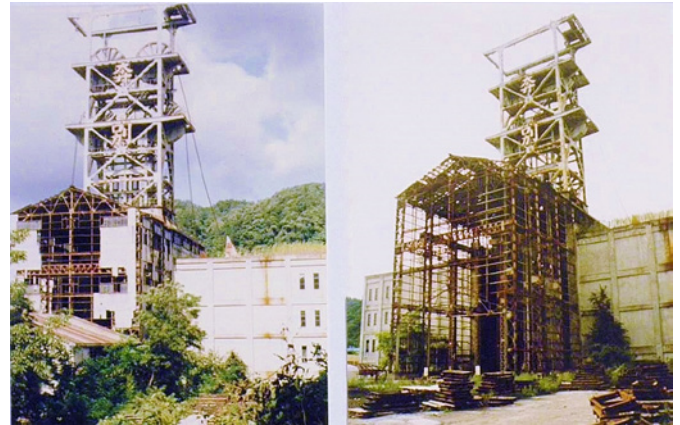


Figure 1. Main shaft of Sumitomo Ponbetsu Coalmine constructed in 1960. (height 52m, the biggest shaft of the East) (Source: Hirotaka Yamada)

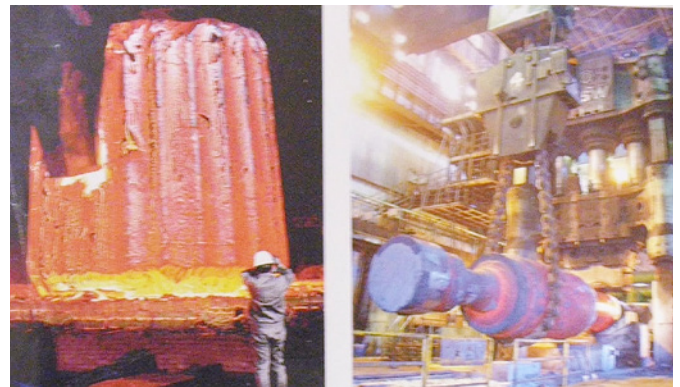


Figure 2. 14 kt Hydraulic Press Machine and 250t turbine rotor of JSW factory. (14kt press machine, the biggest press of the World) (Source: Hirotaka Yamada)

The 10th China Industrial Heritage Academic Conference Was Held in Zhengzhou, China

— Fan-Lei Meng, Bo-Ying Liu, Academic Committee of the Industrial Architectural Heritage of Architecture Society of China

On October 26-28, 2019, the 10th China industrial heritage academic conference was held in Zhengzhou, Henan Province, China, which is a famous historical and cultural city with a long history and profound industrial culture. The conference is hosted by the Industrial Heritage Committee of the China Cultural Relics Academy, the 20th Century Architectural Heritage Committee of the China Cultural Relics Academy, the Academic Committee of the Industrial Architectural Heritage of The Architecture Society of China, the Committee of Architectural Planning and Post Evaluation of The Architecture Society of China, the Historical and Cultural City Committee of the Chinese Society for Urban Studies, and the School of Architecture of Tsinghua University. The conference is arranged in the former site of Zhengzhou No. 2 Grinding Wheel Factory, which is one of the eighth batch of national key cultural heritage protection units. The theme of the conference is “Forge Ahead and Create Brilliance---The development course, great achievement, memory and heritage of new China's industrial construction”, more than 200 experts and scholars conducted a three-day discussion on this topic, they come from National Development and Reform Commission, Ministry of Industry and Information Technology, State Administration of Science, China Association for Science and Technology, and more than 40 well-known universities and research institutions.



Figure 1. Opening ceremony of the conference in the industrial heritage (Source: Fan-Lei Meng)

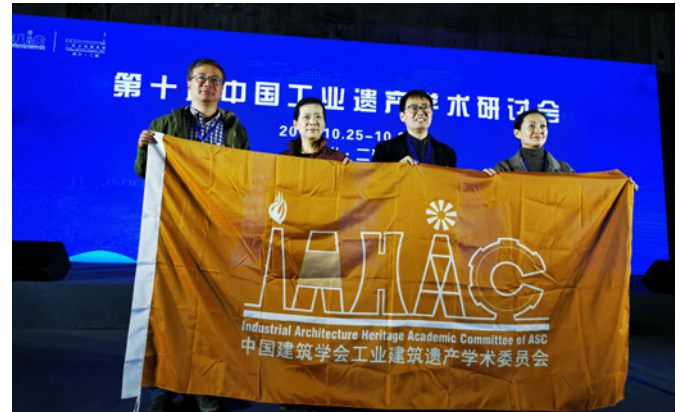


Figure 2. IAHAC flag handover during the of the conference (Source: Fan-Lei Meng)

The opening ceremony was presided over by Tsinghua University's professor Liu Boying, the board member and national representative of TICCIH and the president of the Industrial Heritage Committee of the China Cultural Relics Academy. The conference collected 97 papers, and 45 experts or scholars made academic reports, they have comprehensively demonstrated the great achievements and historical memory of the industrial development of New China from the perspective of the development history and memory of New China's industry, the development of new China's industry and urban construction, the value assessment and composition of the industrial heritage of New China, the 156 project and industrial heritage, the third-line construction and industrial heritage and so on. At the same time, the latest research results in the field of industrial heritage at home and abroad were exchanged and discussed, and fruitful results were achieved.

This is the first time to hold the conference in the national key cultural heritage protection unit, which indicates that China's industrial heritage research work is developing from survey of resources and discovery of heritage to scientific protection and activation, from pure academic research to the combination of art, humanities and society, economy and environment, to a deeper and broader dimension. During the three days, experts and scholars also visited the important industrial heritages such as Zhengzhou No.2 Grinding Wheel Factory, Luoyang Soviet-style



Figure 3. The Conference was held in the national key cultural heritage protection unit (Zhengzhou No.2 Grinding Wheel Factory, Soviet-style factory buildings) (Source: Fan-Lei Meng)



Figure 4. Historical daily supplies was displayed in the conference (Source: Fan-Lei Meng)

factory buildings, the First Tractor Factory Industrial Park, Luoyang mining machinery factory, as well as the Dongfanghong Agricultural Museum, and have a deep feel on the great achievements of new China's industrial construction and the initiating spirit of hard struggle.

The China Industry Heritage Academic Conference is held once a year and it is now ten years old. China's industrial heritage research has expanded from the field of architecture to sociology, history, science, technology, archaeology, art, environmental protection and many other fields. The research topics involved with urban development, urban renewal, regional industries, industrial city and other aspects. After ten years of accumulation, China's industrial heritage has been comprehensively, deeply and systematically studied Research and fruitful results.

Years	Research topic	Venue
2010	Investigation, Research and Protection of Industrial Building Heritage under the Background of Urban Development	Beijing, China
2011	Research and Protection of Regional Industrial Architectural Heritage	Chongqing, China
2012	Industrial City and Industrial Heritage	Harbin, China
2013	Field Investigation and Value Evaluation of Industrial Building Heritage	Wuhan, China
2014	Urban Nostalgia and Industrial Heritage	Xi'an, China
2015	The Future of China's Industrial Heritage	Guangzhou, China
2016	Scientific Protection and Innovative Use of Industrial Heritage	Shanghai, China
2017	Industrial Heritage, Cultural and Creative Industries and Innovative Urban Development	Nanjing, China
2018	The Memory, Present and Future of China's Industrial Heritage	Anshan, China
2019	The Development Course, Great Achievement, Memory and Heritage of New China's Industrial Construction	Zhengzhou, China

Table 1. Ten year's conferences of China's industrial heritage and its topics

Chinese industrial heritage has unique value of history, social, cultural and artistic, and the research of Chinese industrial heritage will never stop. The continuous and in-depth study of China's industrial heritage will help to further enrich the value system of global industrial heritage and reveal the significance of the ancient Eastern civilization in the context of modern industrialization.

The TICCIIH International Oil Heritage Comparison Study

— James Douet, Editor of The International Committee for the Conservation of the Industrial Heritage Bulletin (TICCIIH)

Petroleum has been the world's dominant source of energy since the beginning of the 20th century, yet there are a remarkably small number of historic sites conserved anywhere in the world as evidence for the industry which produces it. Historic mines and mining museums can be found in every coal-producing region in the world, but there is hardly a single authentic conserved oil well anywhere. Kerosene from petroleum made sperm whale oil obsolete for lighting by the 1870s, and yet there are more historic refineries for whale oil than for crude oil. We have an extraordinary imbalance between the historical significance of petroleum and the material evidence of its production. Why is this, and can we do anything to redress it?

Although petroleum production on an industrial scale dates back to the 1860s, a combination of short-lived materials, rapid technological turnover, ephemeral infrastructure and unconventional building types, production ensembles of enormous size and complexity, and buildings which are hard to repurpose, mean that customary processes of identifying and evaluating heritage values struggle to recognise the historic assets of this sector. Combined with corrosive and highly combustible conditions and negative associations with environmental damage, these help to explain the rarity of the oil industry heritage.

TICCIIH, the international association for conserving historic industrial sites, was asked to address this issue by coordinating a new examination of this problematic heritage in 2019. Such thematic, comparative studies - previous ones include canals, railways and the water industry (see TICCIIH thematic studies- <https://ticcih.org/ticcih-thematic-studies-and-published-reports/>) - aim to identify the most important phases for a particular sector, and then to suggest on the basis of this historical context what is most significant that should be conserved, if examples still exist. By assembling information from all over the world, a reliable understanding can be achieved. Individual or widely separated examples, which may appear at first sight to be important, can be put into their relative context and compared one with another. The results not only help ICOMOS and UNESCO to judge world heritage nominations, they can also inform national lists and regional inventories.

The scope of the study extended to sites which are integral parts of the petroleum industry production chain which produces, refines, stores and distributes the various products of petroleum, as well as the buildings, settlements and landscapes directly associated with it.

Petroleum appears naturally at the surface of the earth in 'seeps' and has been exploited on a small scale for millennia, although the full possibilities of this black, sticky slime did not begin to be realized until the mid-19th century. When a way was found of distilling petroleum to produce a lighting oil, named kerosene by its inventor, a huge market rapidly opened up, and the first 'oil rush' began either side of Lake Ontario in North America where the first important oil strikes were made. The dynamism of American capitalism then created a vast new industrial sector within a few decades. Petroleum was soon being used for lighting, mechanical lubrication, and by 1914 for transportation, as oil driven combustion engines took over travel first on the sea and then on land.

The search for new sources of petroleum quickly spread the familiar landscape of drilling rigs and nodding pumps to many parts of the world, and by the 1920s it was extending out into the sea. But while the derrick is to the era of oil what the chimney is to the age of steam, rigs very rarely survived the end of oil production, usually burned down or stripped for the materials to be reused someplace else. The few that survive, like at the historic Drake's well in Pennsylvania, in most accounts the birthplace of the industry, are commonly reconstructions.

Petroleum refineries, on the other hand, are often very long-lasting sites even if few individual structures survive from their earliest days. An example is Salzbergen refinery in Germany which is considered among the oldest in world. It was founded in 1860 to refine paraffin from oil shale, then started to distill Pennsylvania crude oil, and from the 1890s was producing heavier lubricating oils for trains with petroleum shipped from Baku, in Azerbaijan. Today petroleum products from Salzbergen include lipstick, packaging and textiles. But few of the structures in the refinery (I have not visited the site to confirm this) would meet the criteria

for authenticity or integrity that we expect of heritage sites.

These criteria may be more appropriate for buildings not so directly involved in petroleum production. Oil companies working in Isolated or unpopulated regions were often obliged to provide housing for their workforce and its families. Planned company towns were constructed in many parts of the Arabian Gulf, in Latin American from Mexico to Patagonia, and in Asia, often including social and educational facilities, and importing architectural and urban design ideas from Europe or America.

As the companies which built them became rich and powerful, their corporate headquarters came to symbolize the hegemony of oil during the 20th century. The Standard Oil building in New York stands at the beginning of a line of assertive architecture which extends forward to today's gleaming towers of the national oil companies of China, Russia or Malaysia. Finally, the counterpart to such buildings is the humble, ubiquitous filling station, most people's point of personal contact with the oil industry. Competition to sell car drivers a non-differentiable commodity encouraged distinctive brands and signature building forms, sometimes combining the two in novelty architecture, decked with symbolic language referring to the consumption of the company's product.

Based on this historical study, the TICCIIH research suggests what should be priorities for conservation, when examples in good condition survive. It examines the UNESCO tests for Outstanding Universal Value to see which of the six cultural criteria might be relevant to the oil heritage. And it includes eleven case studies of historic places, including natural seepages, oil fields, company towns and pipelines, to see how these criteria might be applied in practice.

Until the COVID-19 pandemic began, the TICCIIH report was due to be presented formally at an experts' seminar in Oil Fields, Ontario, Canada, perhaps the most authentic early oil well in the world. That meeting had to be postponed to May, 2021. Nevertheless, the report has been presented to ICOMOS so it can already be used to help assessing sites on national Tentative Lists, and can be downloaded from the TICCIIH website.

Comments or questions about the report or any sites of the oil industry are welcomed by the author.



Figure 1. The site of the original Drake well in Pennsylvania is occupied by a careful replica commissioned in 1945 and based on photographic documentation. The site is a National Historic Landmark as well as a Historic Mechanical Engineering Landmark designated by the American Society of Mechanical Engineers. (© Creative Commons)



Figure 2. The Salzbergen refinery in Lower Saxony, Germany, in 2010. (Oehlke 2010).



Figure 3. The futurist Taglieri filling station could be part of a proposed World Heritage nomination of the 20th century architecture of Asmara, Eritrea. (© David Stanley)

The Year of Industrial Heritage 2020- “Boom.” 500 Years of Industrial Heritage in Saxony, Germany

— Hung-Yu Huang, Master Graduate of Hochschule Anhalt Monumental Heritage (Denkmalpflege)

Proclaimed by the Free State of Saxony, the Year 2020 is the theme year of industrial heritage (The Jahr der Industriekultur 2020) for Saxony, Germany. The Koordinierungsstelle Sächsische Industriekultur (Saxon Industrial Heritage Liaison Office) leads managing this theme year for the Kulturstiftung des Freistaates Sachsen (KdFS). It involves numerous associations, institutions, and individuals in the “Year of Industrial Heritage”.

Like the Minister of Arts Dr. Eva-Maria Stange said at the kick-off event for the Year of Industrial Heritage 2020 in Chemnitz on November 20, 2018: “Become active! Only when everybody – Saxon Industrial Heritage buffs, experts, and organizers – contributes their ideas will it be possible to bring industrial heritage to life engagingly and vividly with the themed year 2020.” Therefore, the word logo “The Jahr der Industriekultur 2020” is opened to every field of industrial cultural projects this year, and the project types vary between contexts including model projects, networks, exchange of knowledge, exhibitions, and actions.

Why Industrial culture is so important in this region? The answer is quite obvious. As one of the birthplaces of industrialization in Europe, Saxony has formed a prosperous industrial culture and improved its business status in the past five hundred years. From 1736 to the beginning of World War II, Saxony was leading Germany's economy. Around 1900, Saxony was one of the most densely populated industrial regions in Europe. The global companies manufactured a wide range of products in Chemnitz, Zwickau, and Dresden as well as in small towns and villages. Even when specialists fled to the Federal Republic of Germany and the brands moved to other countries after losing the traditional market in 1945, Saxony was still one of the most important centres of the entire Eastern European group. Today, the new scope of the Saxon industry is successfully contributed to the cultural education and tourism again.

To illustrate Saxony's industrial revolution and heritage preservation, Saxony provides a 360-degree view through its tourist route, guides of specific issues, art and events,

and archives and museums all over the state based on their industry in regions. Along with the **Saxon Steam Railway Route and Route of Industrial Culture** in Saxony can visitors experience the golden age of this central region in Germany through amazing museums, production facilities, and outstanding architecture achievement. Not only the travelling routes provide the joyful experience of Saxon industrial culture, but the **Lively Industrial Culture in Leipzig** collects all the information of thematic events in Leipzig as well. Furthermore, many cooperative educational programmes between schools and museums allow the young generation to experience the past and future of industrial culture which is eventually close to their daily.

On the other hand, the 4th Saxon state exhibition titled “Boom. 500 years of industrial heritage in Saxony” will be held at Audi-Bau Zwickau, and further six authentic venues will present on site because of their historical background. The central exhibition at Zwickau is organized by Hygiene-Museum and a multi-dimensional exhibition landscape will be created in this authentic Auto Union AG assembly building, which can be dated back to 1938. Around 2,800 square metres area will be covered and present with interactive installations and spectacular medial or artistic scenarios. The central exhibition will highlight Saxony's history of technology, science, economy, work, politics, and culture in a historical and multimedia-based panorama.

The six special authentic venues will be exhibited in related industrial museums in regions. **CarBoom.** at the August Horch Museum Zwickau will visitors see the utopias for vehicles in the GDR, FRG, "Eastern Bloc" and "West Bloc" time. And, how will we get around in the future? Through **MachineryBoom.** at the Chemnitz Museum of Industry will invite its visitors to a journey from the filigree clockwork from Glashütte to the high-tech machining center. Besides, the **RailwayBoom.** at the Saxon Railway Museum Chemnitz-Hilbersdorf will show the vivid railway scene via historic listed buildings, technical systems, and vehicles in the former railway depot. Walking through a "coal forest" in **CoalBoom.** at the Mining Museum Oesl-

nitz/Erzgebirge, the former shaft area will present itself as a unique but real experience. Given in guided tours, **TextileBoom.** at the Textile Factory Bros. Pfau Crimmitschau will lead visitors to experience both the fabric production process with former employees and the textile workers' life in the past. Last but not least, **SilverBoom.** at the Research and Teaching Mine | Silver Mine Freiberg offers a new discovery tour into Saxon ore mining in 150 meters "depth". It will show future-oriented natural and geoscientific research of the mining academy.

Since last year some projects, such as Lichtspiele des Westens, have run as warm-up projects of the "Year of Industrial Heritage". Although the 4th Saxon State Exhibition, as the main project, was postponed due to the situation of COVID-19, it will now surely start on Junly 11 and will open to the public until November 1. And, indeed, more attractive events in Saxony are waiting for you in 2020.

For more fantastic projects, please visit the official website: <https://www.industriekultur-in-sachsen.de/>.



Figure 1. Boom. 500 years of industrial heritage in Saxony (Source: the Official Website)



Figure 2. The word logo of the "Jahr der Industriekultur 2020" (Source: the Official Website)



The Stories and Memories of Sugar Railway Culture: The Heritage Train Stamp Book

Author: National Science and Technology Museum

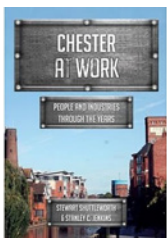
Publishing Year: 2019

Publisher: Taiwan Sugar Corp.

More at: <https://reurl.cc/QdoZY9>

The Taiwan Heritage Sugar Industry Railway Stamp Book brings into focus the history of Taiwan's sugar production industry and the island's "sugar railway" culture. In addition to providing information on Taiwan's sugar railways, the book also doubles as a travel journal, which visitors can use to document their experience of riding Taiwan's heritage railways. Visitors can take the book and get it stamped at various attractions along the sugar railways and get discounts on train tickets. The Heritage Train Stamp Book has helped to connect multiple stations along Taiwan's sugar railway route, creating a small "cultural trail" and capturing the visitors' imagination toward the future of Taiwan's sugar railways.

The Sugar Industry Railway Stamp Book invites visitors to explore the "sweet" spots along the sugar rails as they collect stamps and capture stunning images on this unique journey. Visitors can stop by the operating bases of the sugar trains, explore the locomotives and the historical buildings, reminisce about the prosperity and evolution of Taiwan's sugar industry through the black-and-white pictures, and learn about how the railway authorities are promoting heritage railways in Taiwan and abroad. Better yet, visitors can use the stamp book as a travel journal, in which they can write down their thoughts and record the fascinating moments of their sweet and memorable sugar railway journey.



Chester at Work People and Industries Through the Years

Author: Shuttleworth, Stewart, Jenkins, Stanley C.

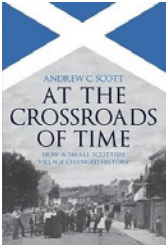
Publishing Year: 2020

Publisher: Amberley Publishing

ISBN: 978-144-56-9143-5

More at: <https://reurl.cc/R4ozGx>

Today in Chester service industries predominate such as tourism, retail, public administration, and financial services. However, this was not always the case, given the city's location on the River Dee and its strategic military position. In *Chester At Work*, Stanley Jenkins and Stewart Shuttleworth trace the changes in the city's working life from its pre-industrial beginnings, through the Industrial Revolution and right up to the present day.



At the Crossroads of Time: How a Small Scottish Village Changed History

Author: Scott C.

Publishing Year: 2020

Publisher: Amberley Publishing

ISBN: 978-144-56-9832-8

More at: <https://reurl.cc/GVYA6y>

Unlike many other small villages in the UK, Lesmahagow has many claims to fame because of its location and geological heritage and due to many of its sometime residents having taken up influential roles in the history of the nation. Andrew C. Scott's family lived in the village for more than three centuries, and in this book he explores the fascinating story of this unassuming settlement.

The coals, formed from peats when the area lay across the equator, fuelled a number of revolutions in energy supply. Important to Scott is not simply the industrial ecology, but the networks of families and people who made the local community. Inventors from Lesmahagow designed new machines such as the pedal bike, and experimented with innovative industrial developments at New Lanark, bordering Lesmahagow on the River Clyde.



Protecting Asia's Heritage: Yesterday and Tomorrow

Author: Siam Society

Publishing Year: 2020

Publisher: Silkworm Books

ISBN: 978-616-21-5156-9

More at: <https://reurl.cc/b5o9pM>

In this book, twelve principal authors, all Asians, from eleven of the region's countries, present their experience of what has been done in the past, and their ideas on what should be done in the future.

The Western experience with managing heritage needs now to be extended with concepts and practices relevant to Asia. The legal framework for protecting heritage must be brought up to date. Intangible heritage deserve more attention. Citizens and local communities are often the best guardians of their own heritage. Organizations and campaigns that draw on both public and private resources can be very effective. The heritage and environmental movements can gain from cooperation.



The Forefront of Taiwan's Industrial Heritage Revitalization

Author: Tokyo National Research Institute for Cultural Properties; Modern Cultural Heritage Section, Center for Conservation Science

Publishing Year: 2020

Publisher: Tokyo National Research Institute for Cultural Properties

More at: <http://www.tobunken.go.jp>

In March 2019, the Tokyo Research Institute for Cultural Properties and the National Association for the Promotion of Modern Industrial Heritage jointly organized a seminar under the theme: the Forefront of Taiwan's Industrial Heritage Revitalization. The event brought into focus the importance of heritage preservation and introduced case studies from Taiwan's Chiayi City and Tainan City, which are known for transforming old houses to facilitate urban regeneration.

The author of the book "The Forefront of Taiwan's Industrial Heritage Revitalization" summarizes multiple speakers' presentations at the seminar and includes an overview of the preservation and utilization of industrial heritage in Taiwan. The author hopes that organizing the seminar and publishing this book will create more opportunities for Taiwan and Japan to collaborate on preserving and regenerating industrial heritage.

- **Switzerland**

Call For Paper

Special Issue "Silk Heritage in the Knowledge Society"

Date: July 24, 2020

Place: Switzerland

Organizer: Multidisciplinary Digital Publishing Institute (MDPI)

Official Web: <https://reurl.cc/E7l6lA>

More at: <https://anlh.culture.tw/index/en-us/events/38619>

- **Taiwan**

2020 National Historic Monuments and Sites Day- Heritage Education through Action and Innovation

Date: September 19-20, 2020

Place: Tainan City, Taiwan

Organizer: Ministry of Culture, Taiwan

More at: <https://anlh.culture.tw/index/en-us/events/38626>

- **Belgium**

2020 ERIH Belgium Annual Meeting, Belgium

Date: October 7-9, 2020

Place: Museum of Industry, Ghent, Belgium

Organizer: ERIH

Official Web: <https://reurl.cc/Y1Nqa4>

More at: <https://anlh.culture.tw/index/en-us/events/38622>

- **Taiwan**

Call for Participation - The 3rd Forum on Asian Industrial Heritage Conservation

Date: October, 2020

Place: Taiwan

Organizer: Asian Network of Industrial Heritage (ANIH)

Official Web: <https://anlh.culture.tw/index/en-us>

More at: <https://anlh.culture.tw/index/en-us/news/36648>

- UK

UK Coal and Industrial Heritage Tour

Date: June 25 – July 6, 2021

Place: Scranton, UK

Organizer: Pennsylvania Anthracite Heritage Museum

Official Web: <https://www.facebook.com/events/547316502524781/>

More at: <https://anlh.culture.tw/index/en-us/events/38614>



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- 歐洲工業遺產路徑 (ERIH) 2020 年會
- 2020 第三屆亞洲產業文化資產國際線上論壇
- 英國煤炭和產業文化資產巡禮

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編者的話 —

工業遺產保存在國際文化紀念物與歷史場所委員會 (ICOMOS) 在 2001 年針對工業遺產類型世界遺產潛力名單分析的全球趨勢報告¹ 中指出幾個重點，如：工業遺產類型的未受重視、區域分佈的不均，以及工業遺產保存所涉及的多元面向需求。源此，近年來世界遺產名錄中工業遺產數量有大幅成長，已自 2001 年的 28 個增加到至今超過 68 個，特別是亞洲地區的工業遺產類型世界遺產。此外，因應工業遺產保存所涉及的多元面向需求，跨國及跨域的國際學術研究組織及行銷平台也相應而生，如：「國際工業遺產保存委員會」及「歐洲工業遺產路徑」等。這些組織及平台的目標便在因應工業遺產的多元特性，促進工業遺產保存的跨域研究及協作推廣，建立產業文化共識與當代生活的連結。

本期專刊特別以「工業遺產保存的跨域協作經驗」為主題，邀請到具豐富跨域協作經驗的專業人士分享他們在研究整合、修復、規劃、博物館展示、教育、經營推廣及社區參與等撞擊出的火花及努力成果。其中包含「歐洲工業遺產路徑」(European Route of Industrial Heritage) 創始人之一 Mr. Rainer Klenner，及「加泰隆尼亞產業博物館網絡」(The Network of Industrial Museums of Catalonia) 創始館長 Mr. Eusebi Casanelles 說明工業遺產保存的跨域整合及營運機制；此外，也邀請 TICCIH Bulletin 主編 Dr. James Douet 撰述以 TICCIH 國際組織網絡進行的全球石油文化資產研究成果 (The TICCIH International Oil Heritage Comparison Study)。對應到臺灣，中原大學文化資產保存研究中心黃玉雨研究員則從近代化遺產保存研究觀念下，策畫多場臺日學術交流活動並以《臺灣與日本產業遺產保存的研究合作及交流》為題論述；以及執行臺灣博物館諸多修復展示規劃專案的林一宏副研究員之專題《詮釋臺灣現代性的臺灣博物館系統計畫》延伸到臺灣博物館系統的工業建築再利用。

此外，在動態報導方面，特別邀請國際工業遺產保存委員會主席 Dr. Miles Oglethorpe 針對新型冠狀病毒造成全球動盪，國際工業遺產保存界的因應觀點；臺灣留德文化資產研究者黃紘彧 (Ms. Hung-Yu Huang) 報導德國薩克森州工業遺產 500 週年慶的系列活動；日本酪農學園大學教師培訓中心資深研究員 Mr. Hirotaka Yamada 報導日本北海道地區煤礦及製鐵遺產保存登錄日本遺產的過程。以及中國清華大學孟瑋磊及劉伯英博士報導 2019 年第十屆中國工業遺產學術研討會中展現的中國工業遺產推動面向。

從本期所介紹的工業遺產保存跨域協作經驗，見證推動工業遺產保存工作已從在地性的操作，走向跨區域、跨國際經驗聯結的趨勢。亞洲產業文化資產資訊平臺作為推動經驗交流與協力合作的機構，將可與亞太地區及全球相關工業遺產推動組織串聯，創造更多豐富的協作交流成果。

林曉薇

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亞洲產業文化資產資訊平臺 (ANIH) 指導委員會召集人

¹ Michael Falser, Minja Yang, 2001, Global Strategy Studies- Industrial Heritage Analysis World Heritage List and Tentative List

歐洲工業遺產路徑（ERIH）：歐洲工業遺產的旅遊資訊網絡

—— 雷納·克倫納（Rainer Klenner）ERIH 理事會成員、網站管理人

歐洲工業遺產路徑（*European Route of Industrial Heritage*，簡稱 ERIH）是歐洲工業遺產旅遊景點的網絡，敘述著歐洲工業遺產之場址、發展及人物的迷人故事。ERIH 網站上列有全歐洲超過 1850 處景點，其中有 100 多處是在工業遺產方面具特殊歷史意義且能提供高品質遊客體驗的「錨點」（Anchor Points），此外亦有「區域路徑」（Regional Routes），針對深受工業化影響的區域景觀做更詳細的介紹。

歐洲工業遺產路徑共分為 14 條「歐洲主題路線」（*European Theme Routes*），展示歐洲工業歷史的多樣性，且經常搭配歷史人物傳記，彰顯歐洲工業歷史間的聯繫及共同根源，每個景點都有一到兩條「主題路線」覆蓋。ERIH 如今由「歐洲工業遺產路徑協會」（ERIH e.V.）負責營運，該機構依德國法成立，在 26 個國家擁有 300 多名成員。ERIH 於 2019 年正式獲得歐盟認證，成為「歐洲理事會文化路徑」之一。

ERIH 的起源可以追溯到上個千禧年末。在 1999 年，歐洲誕生了一個將「工業遺產」創建為旅遊品牌、利用旅遊潛力促進地方或區域經濟的想法，方法則是透過成立一個名為「歐洲工業遺產路徑（ERIH）」的泛歐洲網絡，將能展現歐洲工業時代技術及社會文化歷史的景點，包裝成引人入勝且值得一遊的觀光勝地。

這個想法背後的概念是什麼？工業歷史對歐洲的過去至關重要，工業革命後的兩個世紀在人類歷史留下不可抹滅的印記，是其他時代無法比擬的；生產工廠的供應與處置設備、礦產資源開採設施、運輸路線及交通建設、勞動者的住所、機器所改變的生產節奏等，徹底轉變了歐洲當地景觀及工作生活。工業時代歐洲各處的工業生活及工作狀況有共通之處，德國魯爾工業區和英國威爾斯山谷的礦工以相似的方式挖掘煤炭，各地的礦工為了尋找「黑金」在歐洲各地四處遷徙，這例子說明了歐洲人民對工業歷史是擁有相同記憶的，而這些記憶則構成了歐洲共同文化認同的一部分。

過去數十年來，結構及經濟轉型再次為工業及其社區帶來天翻地覆的改變，我們看見工廠倒閉、生產設施被遷往其他地區或大陸，也看到礦山關閉、生產設施

拆除或改造，以騰出空間讓新工業進行生產、發展商業貿易，或建造更多住宅。幸運的是，許多歐洲工業發展遺跡改建成博物館、文化空間、自然空間等熱門旅遊景點，這些地點象徵著、也紀念著改變，這樣一個龐大景點網絡遍佈整個歐洲，等待重新注入新生命，而這正是 ERIH 的努力實現目標。

ERIH 網絡發展獲得歐盟支持

ERIH 最初的構想獲得了來自比利時、德國、荷蘭及英國等國的機構支持，當初為了取得資金以制定總體規劃，這些機構共同申請歐盟資助計畫且成功獲得贊助，在 2001 年提交的總體規劃中，申請機構闡述了工業遺產作為旅遊品牌的經濟潛力，並提出一個包含「錨點」（含擇選標準）、「區域路徑」、「主題路徑」在內的泛歐洲網絡架構。

獲得歐盟後續資金支持後，ERIH 在 2003 年至 2008 年間進行進一步發展，一開始，網絡僅涵蓋歐洲西北部國家（出資地區），但在資助計畫的最後階段也首度擴展到了其他國家。

主要活動

為推廣新品牌，ERIH 推出一系列企業形象設計，包括共同標誌、ERIH 網站標誌、資訊素材等，並以網站作為 ERIH 網絡最重要的交流工具及宣傳平台，向大眾展示工業遺產，進而鼓勵民眾參訪工業古蹟。網站上包含大量與工業遺產相關的訊息及外部連結，而旅遊局及其他組織的推廣倡議也有助於吸引更多遊客來訪。ERIH 網站可說是個線上圖書館，不僅蘊藏完整且全面的歐洲工業史背景資訊，也提供了一個交流平台，供專家及對此主題深感興趣的一般民眾進行經驗交流。此外，各界也可以透過參與年度大會、工作坊及國家級研討會來進行當面且直接的交流。一般而言，這些與 ERIH 網絡及工業遺產的相關消息會透過電子報及 ERIH 的臉書頁面²進行宣傳。

¹ <https://www.erih.net>

² <https://www.facebook.com/pg/ERIH.net>

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ERIH 網絡的架構

ERIH（線上）路徑系統是通往歐洲工業遺產的路標。³

「錨點」（Anchor Points）構成主要路徑

ERIH 涵蓋歐洲的大量景點，其中部分景點是重點強調區域，也就是所謂的「錨點」，這些城市不僅構成了虛擬路徑，更以獨特方式推廣 ERIH 成為工業遺產旅遊的第一品牌。由於工業遺產旅遊必須與發展完善的景點旅遊競爭，因此景點的品質很重要，作為工業遺產重要景點的錨點（目前超過 100 個）必須滿足特定篩選及品質標準，包括必須要具有獨特歷史意義，同時要能為旅客提供高品質的體驗。經 ERIH 理事會認定的「錨點」是一種品質保障，表示獲選景點能提供精彩的專門導覽、令人驚嘆的多媒體介紹，和與眾不同的特殊活動規劃，讓所有年齡層旅客都能獲得愉快有趣的參觀體驗。此外，錨點同時也是許多「區域路徑」的起點。



圖 1：歐洲工業遺產路徑總計畫於 2001 年 12 月德國杜伊斯堡正式提出。（照片來源：ERIH；DGfI）

「區域路徑」（Regional Routes）重現地方工業史樣貌

歐洲許多地區曾經歷經有趣的工業史，且有足夠數量的景點能吸引遊客，因此發展「區域路徑」便成為了 ERIH 網絡相當重要的一環。區域路徑（或區域網絡）是一種行銷工具，集結了某個特定區域的大小景點，並以統整方式將該區的工業遺產呈現在眾人眼前。

每個區域都是獨一無二的，所以每條路徑講述的故事內容及方式都不太一樣，但有些特性是所有路徑共享的，而根據發展現有路徑所獲得的經驗，ERIH 撰寫了一份「ERIH 區域路徑發展手冊」，可經網路下載。

每條「區域路徑」都必須包含一個旅客認識且能輕易辨識出的地點，可以是城市、郡縣或地方，區域路徑通常會圍繞一到兩個錨點展開，這些錨點是通往該路徑及區域的門戶，這些主要錨點除了自我行銷，也鼓勵遊客探索路徑上其他景點或名勝。

「區域路徑」的成敗取決於該地區是否能呈現一個吸引遊客的有趣故事，同時反映出當地的文化傳統及歷史；區域路徑的主題是將各景點名勝結合在一起的關鍵，也是品牌要素及宣傳重點。

「歐洲主題路線」（European Theme Routes）呈現歐洲各國關聯

ERIH 網絡目前涵蓋了超過 1850 處景點，景點分別來自歐洲各國及各工業別，網站資料庫也正持續擴大中，一個景點要收錄至 ERIH 的資料庫，除了要能精彩展示工業史，另一關鍵是該景點是否便於遊客參觀，在一般的夏季旅遊季節期間，景點每週至少應對外開放兩天。

所有一般景點及錨點都是在 14 條主題路線的架構下進行分組，「主題路線」以工業別進行劃分，主題路線也會附上一份沿線的企業博物館及觀光工廠的清單、與名列「聯合國教科文組織世界遺產名錄」的遺址清單。

「主題路線」會針對特定歐洲工業歷史議題進行探討，並描繪出可能的連接線（通常與歷史人物事蹟有關），再循著這條線走遍歐洲、走訪各式各樣的工業古蹟，最後繪製出一張歐洲工業遺產共同根源的「線路圖」。

以「人物傳記」介紹工業史的重要人物

工業歷史的故事，不能只靠礦山、生產設施、工人居所等建築證據來描述，發明家、企業家、金融家，尤其是參與其中的工人等也相當重要，這也是為什麼 ERIH 會收錄 160 篇人物傳記，介紹這些對歐洲工業史有關鍵影響的人物。⁵

³ <https://www.erih.net/i-want-to-go-there>

⁴ <https://www.erih.net/about-erih/route-system/regional-routes/>

⁵ <https://www.erih.net/how-it-started/stories-about-people-biographies>

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ERIH 網站

ERIH 的網站是全歐洲最完整全面的文化主題入口網站；其內容概覽：

- 全歐洲超過 1850 處景點
- 當中包括 100 多個「錨點」城市
- 20 條「區域路徑」及工業歷史簡介
- 14 條歐洲「主題路線」（含 42 個子類別）
- 超過 160 篇「人物傳記」
- 歐洲工業史及 42 個國家工業史簡介
- 歐洲主題路線：16 個工業分支的歷史回顧
- 約 400 個與工業遺產網絡、UNESCO 世界遺產名錄之工業遺產、工業遺產 / 考古機構相關的網站連結
- 超過 4000 個與上述景點官網、地區、工業分支有關的網站連結

ERIH 的管理架構

公家資助計畫結束之後，ERIH 網絡確立了自己的法律定位。2008 年，由 17 位來自三個國家的個人及機構根據德國法律成立一個名為「歐洲工業遺產路徑協會（ERIH e.V.）」的機構，負責 ERIH 的進一步管理，協會正式成立後，ERIH 成員數量不斷增加，如今共有來自 26 個歐洲國家的 300 位成員，包括工業遺產遺址和博物館、旅遊及商業組織、政府當局、古蹟保護人員、對工業遺產感興趣者及其他工業遺產相關參與者。協會設有董事會及會員大會，由董事會委派外部管理者及任命國家代表，網絡運營的開支則是由會員費支付。

歐盟投注新資金、支持計畫開展

ERIH 是公認的致力於促進歐洲工業產業的泛歐洲網絡，自 2014 年 10 月開始獲得「創意歐洲」（Creative Europe）的資金贊助，讓 ERIH 得以擴大資訊入口網站，並贊助更多進一步的相關活動。

這筆資金所帶來的效應中，最重的是 ERIH 網絡的擴張，讓 ERIH 能促進更多地方、國家及歐盟層級的經驗交流，每年的 ERIH 年度大會上都會選定一個特別的工業遺產及旅遊業主題以進行討論。



圖 2：英國威爾斯布萊納文市「大坑煤礦博物館」獲頒歐洲工業遺產路徑「定錨點」證書。（照片來源：「大坑煤礦博物館」）

ERIH 還推動了「景點配對」計畫，鼓勵網絡中主題類似的景點彼此配對，藉由雙方交流與互訪，彼此分享經驗及實踐案例，從中學習更多技巧並提升自身能力，參與景點可以向 ERIH 申請補助交流費，最多可支付 1 至 3 人的旅行和住宿費用。⁷

協會還建立了一套「ERIH 工業遺產線上調查表」，根據協會經常被諮詢的問題編了一份問卷並邀請工業遺產單位填寫，問卷針對核心數據、目標族群、前景及方法等面向收集了報貴資訊，這項計畫之後成為了 2018 及 2019 年在全歐洲進行的線上調查之基礎。⁸

其實網路上已經有許多不同「專業數據庫和最佳實踐網站」討論工業遺產的各項主題，為了從核心角度去整體理解這些網路資訊，ERIH 也深入研究了這些網站，並在 ERIH 網站上建立了一個「連結資料數據庫」以統整相關資料。⁹

「Work it Out」（「遺產動起來！」）是 ERIH 為年輕人及懷有赤子之心的民眾舉辦的年度舞蹈活動，地點特別選在歐洲令人驚豔的不同遺產所在地，在宣傳工業遺產上，可說十分成功也頗具成效。¹⁰

⁶ <https://www.erih.net/what-is-new/erih-annual-conferences>

⁷ <https://www.erih.net/projects/exchange-program-twinning-of-sites>

⁸ <https://www.erih.net/projects/erih-industrial-heritage-barometer>

⁹ <https://www.erih.net/nc/service/experts-and-best-practice-databases>

¹⁰ <https://www.erih.net/projects/erih-dance-event-work-it-out>

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圖 3：「Work it Out 遺產動起來！」舞蹈活動在波蘭雷布尼克市「伊格納齊歷史煤礦遺址」進行。(照片來源：「伊格納齊歷史煤礦遺址」)

未來的挑戰

ERIH 自 1999 年成立以來，已成為歐洲工業遺產旅遊的重要推手，歐洲理事會、歐洲執行委員會以及全歐洲的國家遺產及旅遊機構都高度認可 ERIH 的影響力。ERIH 網絡不斷擴大、知名度也節節高升，然而 ERIH 和工業遺產旅遊業如今面臨到許多重大全球議題，包括氣候變遷以及新冠肺炎消退後所面臨的經濟及社會問題。在未來的數月、數年中，ERIH 將持續與其成員和其他機構積極合作，探討未來如何呈現歐洲珍貴的工業歷史，期許能繼續書寫歐洲工業遺產的新篇章。

呈現加泰隆尼亞工業歷史之工業博物館網絡

—— 尤塞比·卡塞洛尼 (Eusebi Casanelles)

TICCIH 前主席及董事會成員，西班牙科洛尼亞·維達爾紡織博物館副館長

西班牙加泰隆尼亞 (Catalonia) 政府於 1981 年著手規劃「加泰隆尼亞國立科學與技術博物館」(以下簡稱 mNACTEC)，並在三年後在距離巴塞隆納 (Barcelona) 30 公里處的塔拉薩 (Terrassa)，選擇一間新藝術建築風格的舊羊毛紡織工廠為館址，命名為「Aymerich and Amat」對外開放。博物館成立初期，適逢西班牙政治結構及治理方式的重塑。西班牙在 1980 年代推行民主體制，先前被佛朗哥 (Franco) 獨裁政權廢除的加泰隆尼亞政府也才正要踏上重建之路。國際上，始於 1970 年代的經濟危機徹底摧毀了「工業時代」。在這樣的變動時期，人們開始重新思考如何推動不同的社會活動，文化界受到社會新思想及管理方式產生改變。社會重塑的同時也衝擊了文化領域，文化遺產政策開始強調文資保存的介入要更慎重周全，且要讓社會理解並喜愛，因此催生了兩個重要概念，分別是「將工業遺產視為文化遺產的一部分」及「區域博物館」(Territory-Museum)，後者是由法國的「生態博物館 (ecomuseum)」概念發展而來。

此一歷史背景意義重大，有助於我們了解 mNACTEC 的發展演變。mNACTEC 是由新建立的加泰隆尼亞政府於 1980 年所創立，最初的博物館模式跟歐洲現存舉足輕重的科學技術博物館一樣，都是以收藏科技物件的典藏品為主。

mNACTEC 成立計畫於 1981 年展開，同年出席 TICCIH 在里昂 (Lyon) 舉辦的第四屆國際大會，參加這次大會讓計畫負責人更加確定目標為致力於促進大眾對工業遺產的欣賞及研究，同時保存工業遺產最突出的元素。此目標的確立還有另一個重要原因，加泰隆尼亞的工業化是社會認同的構成要素，早在 1830 年代就展開，是歐洲南部及義大利北部的工業化先驅，在過去 150 多年來，加泰隆尼亞一直被公認是「西班牙的工廠」(Factory of Spain)，工業化不但為當地帶來嶄新的生活方式，更開展了新的文化模式。

mNACTEC 成立之初便開始在工業遺產場域推動各項措施，包括盤點工業遺產、舉辦年會、規劃展覽以及出版品等。此外也鼓勵地方政府執行保存政策來保護

工業遺址；但 mNACTEC 最重要的決策，是在國內各城市推廣來自不同產業中的工業博物館，同時與這些博物館保持聯繫、建立連結整個加泰隆尼亞區域的「區域型博物館網絡」，藉此補足藏品的不足問題，因為其他博物館涵蓋不同產業製造過程遺留的文化資產。

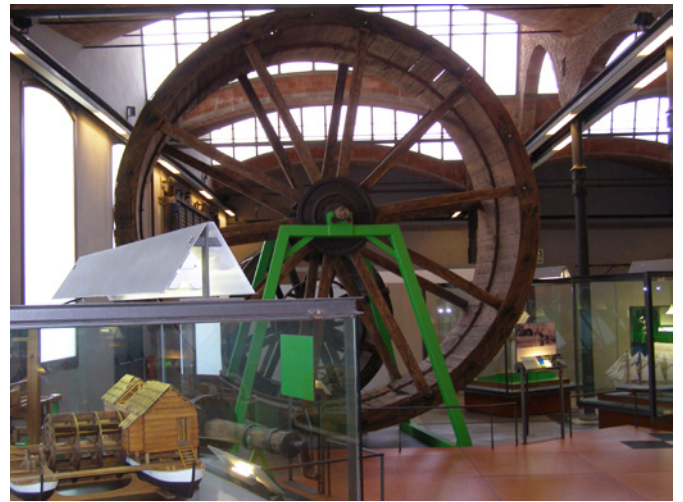


圖 1：能源產業室內展覽「Energeia」（古希臘文 Energeia 為「能源」的意思）。（照片提供：Eusebi Casanelles）

mNACTEC 在研究了加泰隆尼亞的產業歷史時，將工業遺址分為三個時期。第一時期包括回溯至 18 世紀後半葉的產業遺址，雖然不一定完全工業化，卻可視為工業化的雛型，因為當時使用的雖然是工業化前的技術，但產品市場不限於在地，也會銷往西班牙國內各地，甚至出口到當時從屬於西班牙帝國的拉丁美洲地區，這些工業化雛型的市場網絡對於認識了解加泰隆尼亞工業化的發展十分重要。至於第二、第三時期則分別對應第一次及第二次工業革命，加泰隆尼亞的第二次工業革命始於 20 世紀初並在 1960 年代結束。這兩個時期共有 22 處工業遺址被改建為博物館，總計有 27 家博物館成立，也有新的博物館正在申請加入網絡，如：編織博物館及陶瓷博物館。

想要加入 mNACTEC 網絡組織，除了選定的遺址要轉型為博物館之外，同時還需要符合四個條件。第一，必須是與現有工業博物館不同的產業或技術部門（儘管後來有兩個例外）；第二，必須是獨立於

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mNACTEC 的法定組織，目前網絡中的館舍大多為各地的市立博物館，另外有兩家私人博物館及三間直接隸屬於 mNACTEC 的博物館，後者為藉由購置產業遺址改建而來；第三，博物館必須有高水準的服務，足夠資格與國家博物館形成網絡聯繫；最後，參加的博物館必須遵守由 mNACTEC 館長擔任主席的董事會所規劃的相關博物館學活動，這些活動建構出博物館網路的關聯性，其中的關鍵包括：機構形象、訊息溝通、教育及產業科技文物的保護維護政策等。這些活動是實踐 mNACTEC 網絡目標的最佳工具，為所有參與的博物館建立認同感，也就是國家認同在個別認同之上，但又不失去各館的獨立性。此外，加入網絡的博物館在加泰隆尼亞層級上更能彰顯他們主題獨特性，更因此晉升為國家博物館之「展示館」，藉此在文化上超越僅僅作為地方博物館的地位。

為了運作網絡，mNACTEC 成立了一個類似博物館聯盟（confederation）的組織，參與的委員為各館



圖 2：學生在卡佩利亞德斯博物館（Museum of Capellades）參與手作紙張藝術課程。（圖片來源：卡佩利亞德斯博物館）



圖 3：西班牙老礦山 Bellmunt del Priorat 博物館。（圖片來源：Ara.cat）

的館長，並由 mNACTEC 館長負責總協調。該組織的首要目標是尋求合作，配合各館舍與展覽共同舉辦活動或進行投資，在此架構下推動具體的聯合行動，共同推廣與傳遞博物館網絡的訊息。

mNACTEC 的組織發展是基於「網絡」的概念。如同曼紐爾·凱斯特爾斯（Manuel Castells）教授提及「網絡可以在節點之間建立不對等關係；沒有一個節點能在沒有其他館舍幫助的情況下實現全球性的目標。複雜的模式源自於個體間的簡單互動。」mNACTEC 的博物館網絡同樣允許博物館在規模（小型或大型）、屬性（公立或私人）及類型等方面具有不對稱性。

這樣的組織稱作「加泰隆尼亞國立科學與技術博物館區域系統」（mNACTEC Territorial System，以下簡稱博物館區域系統），加泰隆尼亞語的縮寫則為 STmNACTEC。根據字典的解釋，「系統」是「各方通過『法則』去相互聯繫的『整體』」，比如太陽系；此外，生物和科技系統還會執行特定「功能」。我們可將此概念套用在 STmNACTEC 上，其「功能」是透過遺產去「詮釋加泰隆尼亞的工業化歷史」，「法則」則是透過活動連結各個博物館。在這個脈絡下，每座博物館都是一個網絡節點，也都各自詮釋一部分加泰隆尼亞的工業化歷史。

「加泰隆尼亞國立科學與技術博物館區域系統」（mNACTEC Territorial System）能有今日的成就，要歸功於各個市政府當局和許多私人博物館的大力合作。各遺址背後的政治人物及專業人士或多或少都存在政治、個人及想法上的差異，這份合作精神更顯得相當難能可貴。

加泰隆尼亞的區域型博物館組織不僅反映出現存為數眾多的工業部門，也強調各部門間具有的緊密聯繫，這些聯繫使工業生產體系變得錯綜複雜，且擴散到工業社會的其他層面。這種複雜性是工業化的基本特徵，生產中心不能孤立運作，每個中心都與其他生產及非生產中心有關，可能是同一部門或其他部門的中心，也可能是原料中心、能源和水力發電中心、消費者中心等等。以加泰隆尼亞的紡織業為例，最初由煤礦業提供紡織業的蒸汽機鍋爐動力，後來由發電廠提供電力；機械工業為紡織公司製造並維修機械；木材和皮革業提供紡織工業機器的許多要件，還有很多其他聯繫可以探究。社會也會與工業互動，例如城市裡工人聚集，促使麵粉廠、工業酒窖、油窖的興建來滿足勞動人口的需求；另一方

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面，也必須建造合乎衛生條件的屠宰場、新市場、能提供乾淨的飲水設施，以及因應這些相互聯繫而建立新式的海陸交通系統。



圖 4：棉業與紡織品 Vidal 博物館鳥瞰圖。下方為工人居住之村莊與花園、河邊為工廠所在地、工廠上方為業主之宅邸。（圖片來源：Colonia Vidal Museum）

要理解工業化的革命過程，就必須全面了解這區域中各工業生產之間的廣泛關係。在加泰隆尼亞，上述許多工業活動都有相對應的博物館，有了此博物館區域系統 (mNACTEC Territorial System)，就能實現「博物館法」所揭櫫的國家博物館任務，也就是國家博物館應該將加泰隆尼亞境內的藝術、科技和自然史等專門主題的各個博物館組織起來。

總結來說，加泰隆尼亞工業博物館代表的工業部門包羅萬象，包括：a) 紡織業：棉花、羊毛、針織、緞帶和印花等紡織品；b) 採礦業：煤炭、鹽和鉛礦；c) 農業：麵粉、酒類、油和酒精；d) 其它工業部門：皮革、冶金、軟木、汽車、鐵路、木材、水力發電和蒸汽、水泥和陶瓷；e) 原始工業：煉鐵廠、造紙廠、製革廠和製鹽廠。



圖 5：加泰隆尼亞紙漿工廠博物館展示的紙漿捶打設備。紙張製造最早於十二世紀由西班牙傳入歐洲，是由入侵歐洲的伊斯蘭教勢力從中國引入，隨後又傳入義大利與其他國家。（圖片來源：Eusebi Casanelles）

結論

工業化創造了相互連結又極其複雜的生產系統，持續擴展到了今天且影響了整體社會。工業遺產通過工業博物館化身成為一個絕佳途徑，幫助我們了解複雜生產體系的起源，更可協助我們深入了解當今世界。要做到這點，必須將所有工業化博物館及工業遺產視為一個整體，以呈現工業歷史的完整敘事。「加泰隆尼亞國立科學與技術博物館」的工業博物館網絡系統證明：一個組織若能保有彈性、使各個成員保持其文化特色，是可以發揮極大綜效的，尤其是對臺灣這樣的中小型國家而言更有幫助，因為境內有類似加泰隆尼亞的區域 - 且國土面積不大，觀眾可以輕易造訪博物館網絡中的各個樞紐中心，因此建立博物館網絡可說是實用且有效的途徑。

您可以造訪這個網站 (<https://sistema.mnactec.cat/es/>) 並點擊頁面來查看更多資訊。

臺灣與日本產業遺產保存的研究合作及交流

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關鍵字：產業遺產、石油產業、近代化遺產、國際交流、跨領域合作

產業遺產 (Industrial Heritage) 的文化價值已經被很多國家及國際組織所認同，包含聯合國教科文組織 (UNESCO) 及歐盟等近年都將產業遺產納入研究及指定的重點要項。保存產業遺產的正面意義除了歷史、美學、社會、科技等價值層次之外，產業遺產的活化再利用也成為推動保存工作的動機之一。

2002 年臺灣積極進行公營事業民營化，在過程中常將大量的產業相關設施拆除，騰空土地繳回國庫，造成許多產業遺產的流失。2004 年行政院指示當時的文化建設委員會設置「文化性資產清查小組」著手推動中央行政部門與公營事業機構文化性資產清查工作。自 2006 年至 2018 年，更推動「產業文化資產再生計畫」，以官方資源輔助糖、鹽、酒、礦、林、鐵道等產業單位進行產業遺產的活化再利用工作。當中最為特殊的是石油 (礦) 產業。

位於臺灣苗栗的出磺坑於 1861 年清末發現油脈，以人工挖掘出第一口油井，僅晚全世界第一口油井 2 年。1878 年出磺坑第一口機器開鑿的油井，使用了美國賓州蒸氣動力的頓鑽井機 (Cable system)，並且聘僱賓州的兩位油礦技師來到臺灣，開啟臺灣機械化開採石油礦脈的先河。出磺坑石油產業遺產因為自然地質條件的特殊性，形成客家族群拓墾及石油產業二種文化交互影響的景觀。2007 年苗栗縣政府將「出磺坑」登錄為「文化景觀」保存，其登錄理由為「展現背斜自然地地形質與人類應用石油資源之互動文化意涵，並具宗教、建築物、紀念碑等紀念性價值，及石油產業技術性科學價值，橫跨清代、日治、民國至今仍持續開採之產業礦區」。

日本的石油產業，於明治時期 1873 年開始委託美國人 Benjamin Smith Lyman 調查日本石油地質，1890 年完成調查工作。1874 年日本企業家中野貫一開始在新潟縣的新津地區展開石油事業，1903 年同樣引進美國的頓鑽井機，成功開發西日本海的金津油田。後來設立於新潟縣內的日本石油公司和寶田石油公司，引進機械化鑽井和石油煉製等重要產業設施而鞏固了日本近代的石油產業。金津油田的設施及遺構在 2007 年

登錄成為日本近代石油產業歷程的近代化工業遺產群之一，2018 年日本文化廳指定為日本國定史跡。

1895 年日本治理臺灣後，出磺坑被日本海軍省指定為「海軍預備油田」禁止私人開採，之後從 1903 年至 1942 年間日本寶田石油公司、日本石油公司均經營過出磺坑油田，共開鑿了近百口油井。從全球石油產業技術史的觀點，日本及臺灣均是從美國的頓鑽井系統及技術體系開始，日本石油公司的經營體系及技術系統在 1895 年之後進入主導臺灣的石油產業，因而締結了與臺灣石油產業遺產的脈絡淵源。

由於前述的歷史背景，苗栗縣政府於 2017 年委託中原大學執行「出磺坑油礦文化景觀」申請列入臺灣世界遺產潛力點推動計畫，經由日本長岡造形大學木村勉名譽教授的居中介紹，邀集日本新潟市歷史文化課入江清次課長、MANU 都市建築研究所三浦卓也研究員、日本產業考古學會伊東孝會長等三位來台，拉開出磺坑文化景觀與日本石油產業遺產進行交流的序幕。2017 年 5 月於臺灣舉辦「臺日石油產業遺產國際交流講座」，日本入江清次課長以「佐渡金銀山遺跡群申請世界遺產之經驗」，提供出磺坑油礦文化列入臺灣世界遺產潛力點執行相關意見；三浦卓也研究員為新潟金津石油礦場調查研究計畫之執行單位，提供「日本相關礦業產業遺產調查研究方法之討論」；日本產業考古學會 (JIAS) 為日本最大規模的產業遺產保存組織，伊東孝會長發表「日本地域產業保存、產業技術與產業再利用」等。除了研討會之外，並邀請日方三位專家學者參觀了苗栗出磺坑、嘉義煉製研究所、高雄煉油廠等石油產業設施群，加深其對臺灣石油產業遺產保存現況的了解。

2017 年 6 月中原大學黃俊銘副教授率領由臺灣中油公司及苗栗縣政府派出的單位代表，以及中原大學研究團隊前往參訪日本的礦業遺產。日方由入江清次課長、三浦卓也研究員、伊東孝會長等三位負責接待解說，參觀行程包括新潟新津油田金津礦場保存案例、佐渡島「佐渡金銀山遺跡群」世界遺產、靜岡相良油田資料館等石油相關設施群，從產、官、學的角度探討臺灣及日

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本的石油文化資產保存的經驗。從此次交流活動中亦發現，臺灣的企業單位能夠持續性的與縣市政府共同討論協商進行石油產業設施的保存研究及活化，而日本則大都在產業停止運作後再轉型為文化資產保存及再利用，兩者的基礎條件不同，在產業保存面向及文化保存政策上亦大相逕庭。

藉由臺、日石油產業遺產的交流互訪活動，我們發現兩國對於推動產業遺產的保存與活化工作有許多差異性，值得借鏡交流。臺灣近年所推動的產業文化性資產清查工作，綜括糖、鹽、酒、茶、農、林、工、礦、鐵道、教育、新聞媒體等等，從帶動國家社會近代化的公有傳統產業涵構出發，希望從產業遺產的清查與價值評估過程中，建立各單位對於本身歷史文化的重視，並落實文化資產預防性保存的概念。而日本的近代化遺產保存政策已有超過 20 年的經驗，其保存的對象涵蓋近代化相關的工業遺址與景觀、建築構造物、土木水利礦業等設施、機具文物等，以系統性、脈絡性的保存方式進行。同時在主管單位的層級方面，由文化財的主管單位文化廳、擴及經濟產業省、以及內閣官房長官，也使得日本近代化遺產「日本明治產業革命遺產」登錄為世界遺產。這樣的文化資產保存政策與體制，其實結合了中央政府與地方自治體，也結合了地方文史社團、專業領域的學術單位、學會與博物館、志工與銀髮族人力資源，以及觀光產業等。

基於臺灣與日本近代化遺產推動成果的交流經驗，雙方陸續舉辦了多次的交流研討會，包括 2018 年日本舉辦「關於日本於臺灣近代化遺產的保存及活用之研究會」（東京文化財研究所），臺灣也同步舉辦了「近代化遺產保存策略主題論壇」（文化部文化資產局）（圖 1、圖 2）；2019 年，日本於東京及大阪舉辦「臺灣近代化遺產活用的最前線」研討會（圖 3），臺灣也舉辦了「臺北機廠鋼鐵構造文化資產修復研討會」等，透過研討會發表及互訪方式進行跨領域研究、保存制度及修復科學技術等經驗之交流。期待此合作交流的機制，能衍伸提供官方建構保護法令制度、學術機構及社會支援的運作機制，以及協助落實產業遺產保存與活化推動的各方面。



圖 1：2018 年「近代化遺產保存策略主題論壇」日本專家學者拜會文化資產局施國隆局長。（照片來源：黃玉雨）



圖 2：2018 年「近代化遺產保存策略主題論壇」日本專家學者與參與學者合影。（照片來源：黃玉雨）



圖 3：2019 年「臺灣近代化遺產活用的最前線」研討會後參觀倉敷舊紡織工廠再利用成為 Ivy Square 飯店案例。（照片來源：黃玉雨）

詮釋臺灣現代性的臺灣博物館系統計畫：產業遺產轉型博物館的經驗

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關鍵字：產業遺產、文化資產、古蹟修復再利用、博物館系統

國立臺灣博物館是臺灣現存最悠久的博物館，1908年由臺灣總督府設立，為人類學、地學、動物學、植物學的自然史博物館，設立目的在教育人民，蒐集、研究、展示臺灣之物產、風土民情等，1915年遷入臺博本館 Main Building。這座以紀念總督兒玉源太郎 the Governor-General Kodama Gentaro 及其民政長官後藤新平 the Civil Administrator Goto Shinpei 為名的博物館，具有濃厚的殖民地色彩，建物為英國新古典式樣歷史建築，坐落於臺灣首都臺北市舊城區的二二八公園內，自啟用後即成為代表臺北的地標性建築物。



圖 1：臺博本館。(照片來源：林一宏)

臺北舊城區，本身就是見證臺北城市發展的核心地區。1884年，清朝政府依據傳統中國風水觀念建置的臺北城落成，1895年日本治臺時選定臺北城內為日本人居住區，並於1900年發布市區計畫，拆城牆、開馬路、建公園、設機關，將傳統漢式城牆都市改造為現代都市。

在城市面貌劇烈變化的過程中，歷史建物は標示城市發展歷程的時空座標，目前臺北舊城區的範圍內外大約2.4平方公里的範圍內，即有48處古蹟 monuments 或歷史建築 historic buildings，堪稱是密度最高的地區，臺博本館 Main Building 也是其中之一。

自1915年起至1980年代，雖歷經大日本帝國及中華民國政府的治理，臺灣博物館不僅展示臺灣自然史，也在缺乏展覽空間的臺北市，扮演各種政治性展覽、商業產業展覽、書畫美展的展覽場地。1980年代起，臺灣開始出現如世界貿易中心等大型商業展示場地，新的大型科學博物館等也開設立，相對地，臺灣博物館一直擺脫不了老舊、陳腐、日本殖民統治的形象，陷入了停滯與衰退。幾乎在同時，臺灣的文化資產保存運動歷經1960年代席捲全球的鄉土運動 Vernacular movement 風潮下，在1982年正式立法保護古蹟建築物，初期指定的古蹟多為漢式傳統建築，至1990年代開始能接受19世紀後期至20世紀初期的近代建築物也應指定古蹟。臺博館在1998年6月10日被指定為國定古蹟 National Monument。

臺博館受限於館舍空間不足、發展受限，如何尋求突破，從殖民地時代的博物館，轉型為臺灣自然史及文化史的櫥窗，以凸顯臺灣的文化主體性，在21世紀來臨時重新定位臺博館的角色，是核心的議題。



圖 2：臺灣博物館系統示意圖。(照片來源：林一宏)

本期專題：工業遺產保存的跨域協作經驗

2005 年起臺博館開始推動「臺灣博物館系統」計畫“National Taiwan Museum System Plan”，以臺北舊城區為空間範圍，以古蹟修復再利用為方法，經由不同公部門的合作，將閒置的古蹟修復後再利用為博物館，串聯 4 處古蹟博物館成為博物館系統，分別賦予各館「土地、生命、產物、現代性」4 個展示主題，以呈現臺灣的現代性。

臺博本館位於舊城區中心的公園內，於 2007 年與臺北市政府合作改造公園都市景觀，2014 年起進行一系列的屋頂外觀、室內裝修、機電空調消防設備更新等，並同步更新常設展內容，館藏以自然史、工藝產業與歷史文物為主軸，是認識臺灣的最佳管道。

臺博本館對面的舊土地銀行 former Land Bank Headquarter，為 1933 年落成的日本勸業銀行 the Nippon Kangyo Bank，業務以不動產放款為主，是殖民地建設經營的資金來源之一，其建物為 1930 年代歷史式樣外觀，室內裝飾為臺灣最具代表性的 Art Deco 風格。2007 年起臺博館與公營土地銀行合作修復，2010 年 2 月以古生物館 Paleontology Branch 為名開館營運，以古生物為展示主題，統合地球科學、動物學、植物學，呈現臺灣的自然史特色。

南門工場 the Nanmen Factory 位於臺北舊城南門外，是 1899 年成立的大型樟腦與鴉片加工廠，是殖民地專賣制度與產業發展的象徵，1967 年停工關廠後，廠區土地逐漸被轉賣，僅剩的 1/8 土地與建物於 2007 年交由臺博館管理。2009 年起進行修復，並新建典藏庫房 1 座，2013 年 11 月以南門園區 the Nanmen Park 為名開館營運，以臺灣產業史與環境教育為展示主題。

鐵道部 the former Railway Ministry Administration 位於臺北舊城北門外，是 1885 年臺灣第一座現代工廠：臺北機器局 the Taipei Machinery Bureau 所在地，1901 年成為日本殖民時代的鐵道部，是殖民地經營的交通軌道運輸管理核心，1920 年鐵道部新廳舍落成，為臺灣最具代表性的半木構造近代建築。2006 年起，臺博館與臺鐵局合作修復，2014 年修復工程啟動，2020 年 4 月底以鐵道部園區 the Railway Department Park 為名開館營運，以臺灣鐵道歷史文化、臺灣近現代發展為展示主題，呈現臺灣的現代性特色。



圖 3：臺博北門館，原鐵道部。(照片來源：林一宏)

這 4 處博物館，由南而北貫穿臺北舊城區，形成一個帶狀的文化路徑：南門工場南門館象徵殖民時代特殊的專賣產業體制，臺博本館為殖民時代的社會教育及殖民政績展示的場域，勸銀舊廈古生物館代表了殖民地經濟資本，而鐵道部北門館則是殖民地經營的交通建設管理核心。將這些產業遺產加以保留修復活用，而非拆除抹消殖民統治痕跡，是正視歷史並檢討反思的態度。

此外，臺博館推出了「讓歷史復活」散步導覽 the “Blast to the Past” English Walking Tour 做為一種詮釋城市的方式，發展外語導覽行程，重新詮釋古蹟建築與城市歷史，將臺北老城區建構為非典型的、無屋頂的博物館，也將建築納為國立臺灣博物館的第五類典藏。

近代工業、交通、金融等相關的產業遺產，大多為一般民眾難以涉及的產業場域，但卻為一般民眾生活中共同的記憶，例如許多市民無法進入工廠內，卻還記得南門工場外的排水溝，經常流淌著清澈卻有濃厚樟腦香氣的冷卻尾水；市民們沒有機會進入鐵道部的辦公區，卻還記得每個上班日的清晨，道路旁的汽車車庫大門敞開，司機們正在擦拭著黑頭轎車，準備出發去接送高官上班。

透過將近代產業遺產修復再利用為博物館系統的過程，反映了包容性的臺灣史觀，雖然人們對於歷史各有解讀、各有正負面評價，但近現代的產業遺產本身並沒有罪過，相反的，它們見證並敘述城市如何近代化的過程，將這些建物視為臺灣歷史重要的一部份，予以保存、活化發展，並串聯土地與歷史的脈絡，連結多元的觀點，是臺灣現代化進程的最佳詮釋。

新冠肺炎對工業遺產之衝擊

——邁爾斯·奧格索普 博士 (Dr. Miles Oglethorpe)
國際工業遺產保存委員會 (TICCIH) 會長

多年來，各大企業和機構在面臨可能損及組織運作的不可預見危機時，會透過年度風險評估使自身做好應對準備並避免危害，然而，身處疫情時代、回顧過去，我們發現多數組織並未將全球性流行病納入長期規劃範圍，因此對幾乎所有人來說，新冠肺炎來得相當突然、也很棘手，而我們對疫情可說毫無準備。

對我們這些工業遺產工作者來說，突發疫情的影響往往特別嚴重，因為早在疫情爆發之前，許多組織和遺產本身的適應力就已不是很好。許多國家的工業遺產無法吸引到大量支持和資源，決策者和贊助者比較傾向與偏好傳統藝術文化，工業遺產界只能加倍努力去贏得外界青睞，所以在疫情危機發生前，我們的日子也不見得有多好過。

因此，當近期疫情導致收入突然減少時，對許多遺址和機構是特別殘酷的衝擊，有些遺址和機構甚至面臨永久關閉或破產的嚴峻考驗，這樣的情形不但有可能發生、甚至很快就會發生，就連一些國際知名遺址或機構如世界遺產場址也難逃此命運，許多機構不得不裁掉長期服務的同仁，甚至可能得變賣寶貴資產，造成重要專業技能流失，有些狀況較好的機構雖有儲備金，但這些儲備金也正迅速耗盡中。

某些國家和地區會提供機構緊急紓困方案，但成效有好有壞，而我們也開始意識到一個令人不安的事實，也就是當前困境將不會於短期內得到緩解，2020 年尾恢復正常的可能性其實不高，事實上很多人說即使回復正常，也是回到「新常態」。我們現在意識到，要回到常態可能還要等上好幾個月，甚至可能要撐到 2021 年或更久之後。

對我們大多數人而言，疫情會直接造成一些顯而易見的損失，像旅遊等活動的收入減少，但疫情影響層面可能更深，畢竟大量機構和民眾迫切等待紓困金援助，造成許多國家和地方政府本身資金捉襟見肘，因此無法有效為遺產界挹注紓困資金。像在蘇格蘭，我所服務的機構「蘇格蘭歷史環境局」是個提供資金援助的重要國

家遺產組織，不幸的是，我們組織超過 60% 的年度預算仰賴旅遊業和遊客收入，這在 2020 年前一直被認為是個了不起的成就，因為我們收入年年增加、備受外界讚揚，但是在疫情衝擊下，仰賴觀光收入卻成為我們的致命傷，我們目前正在與利害相關團體和蘇格蘭政府合作，評估能提供及獲得協助的最佳作法。

越是非常時期，越需要掌握危機所帶來的契機。首先，我們許多人已經發現數位通信的力量，也經常會以視訊會議主持線上會議，事實上，我跟一些人因此有了首次對話的機會，與其他人的交流也比以前頻繁許多。如今我們知道未來能合作的方法將比過去多得多，要付出的成本也會低得多，在這點上，全球資訊網真的非常強大且具有韌性，視訊會議雖然可能讓人筋疲力盡、感覺有點超現實，但效果似乎比我們多數人預期的要好一些。

然而，在這個時間點，我們更要意識到工業遺產在疫情後的復原過程中將扮演至關重要的角色。有些工業遺產機構跟社會上最弱勢的群體有緊密的聯繫，且這些群體大多在這波疫情中也受到極大的衝擊，對這些群體而言，工業遺產所蘊含的工業史是構成其身份認同的重要元素，也承載許多頂尖技藝及技術知識，在教授科學、技術、數學、工程等理工學科 (STEM) 時最能體現出來。

以鐵路遺產為例，世界各地都有鐵路博物館，但鐵路建築及藏品本質上都是技術性的，操作及維護都相當仰賴專業能力，需要由有能力的專業人士來做這些工作，但早在新冠肺炎疫情爆發之前，老化現象就已經出現，許多關鍵人物早已年屆退休年齡，我們需要新血加入完成技術的世代交替。考量到技術斷層是普遍存在的問題，未來會需要越來越多學徒培訓及其他技能提升計畫，而工業博物館是有潛力滿足這項需求的。

近來經驗也顯示，工業建築能提供重要的歷史質感，不僅有助發展地方特色，更能作為地區創生的基礎。更棒的是，工業建築的轉型也蘊含內在能量，不說其他，

光是排放及污染已經因為工業轉型而減少，象徵對抗氣候變遷的積極作法，具有重要的啟發性意義，轉化工業遺產用途、建造永續未來的正面影響已廣為大眾肯定。

總之，當疫情逐漸消退之際，我們面臨的一大挑戰是如何善用工業遺產、在復原過程中創造積極的契機。目前政府當局和主管機構忙於接聽紓困詢問電話、應接不暇，在這樣的時間點，我們可以強調工業遺產如何得以在復原過程中成為一股助力，這將是我們的絕佳優勢。



圖 1：位於蘇格蘭波尼斯鎮 (Bo'ness) 的蘇格蘭國家鐵路博物館。(照片來源：邁爾斯·奧格索)



圖 2：蘇格蘭國家鐵路博物館負責修復鍋爐並培訓學徒的 Mark Ashmole。(照片來源：邁爾斯·奧格索)

論日本之煤礦及鋼鐵製造史—北海道地區的工業遺產及遺產保護運動現狀（2019）

—— 山田大隆 日本酪農學園大學師培中心

我現居日本北部北海道地區，在日本產業考古學會的北海道分會（北海道產業考古學會）從事科學史及技術史相關產業考古的研究（北海道地區的開發技術史研究）已有超過 40 年的時間。

北海道是 150 年前左右才開墾的新地（自 1870 年至 1870 年間），其開拓史可溯及到 1870 年代的明治政府，當時政府於北海道札幌設立開拓使，目的是為了 (1) 開發自然資源、(2) 依循開普倫 (H.Capron) 之政治建議在此地建立殖民軍事體系（屯田兵）以抵禦日本北方國家（根據 1875 年報告，開普倫是明治政府聘請之美國顧問）。

北海道產業技術的特別之處在於它是所謂的「殖民開發技術」，特徵為 (1) 使用美國的關鍵技術、(2) 從企業引進大筆資金、(3) 實行明治政府的殖民政策。因此，在國際工業遺產保存委員會 (TICCIH) 2012 年第 15 屆會員大會暨學術研討會上，有許多針對「日治時期殖民技術 (1895-1945)」此一主題的討論，北海道的案例的討論重點也是如此。

北海道及九州地區煤炭資源豐富，明治時期為加速日本工業革命發展，在三笠市（札幌市附近）建造了北海道第一座礦坑「幌內炭礦」(Horonai)，這是第一座採用工業化設備的礦坑，由北海道炭礦汽船株式會社 (Hokkaido Tankou Kisen Company) 所建，之後又陸續在夕張市、赤平市、砂川市等增建不少礦坑，到了 1943 年，北海道境內 125 家大型煤礦公司的煤炭總產量已達 2000 萬噸，佔日本總產量的百分之四十。

與礦坑同時設置的是一整套大規模鐵路運輸系統，也是煤炭能源產業邁向工業化的象徵。此鐵路系統最先於 1882 年鋪設「官營幌內鐵道」，隨後不斷擴建至北海道全區。

最後是室蘭小樽市的港口及高架式煤機設備建設工程，港口完工後，煤炭資源得以通過港口運輸系統，以

海運方式運送至京濱工業地帶（東京及川崎的京濱工業區）的鋼鐵製造部門，在明治時期為日本近代工業發展帶來了重要的貢獻。

在日本，京濱的案例多次被用來解釋為何日本煤礦產業會將山區礦場與煉焦場分置兩地，德國的煤礦產業建置概念是將煤礦場及煉焦場建在同一場域，待煤礦冶煉成焦炭後，再將焦炭輸送至鋼鐵製造廠。

綜上所述，日本建置煤礦產業鏈的方法有所不同，一開始會先建設港口設施，下一步會因用煤的需求在遠離港口的區域興建煉焦場，煤炭會經由海運從遠處運送至此，而鋼鐵場也是建置於煉焦場同處，形成一個複合三項流程線的產業鏈綜合體。

這些分別位於九州及其它地區具有特殊系統性的產業遺產在 2015 年被登錄為世界遺產，日本政府也正利用這些產業遺產展開相關活動，試圖藉此打造出具創新歷史意義的城鎮群。

除了港口及煉焦設施，北海道也利用與關東地區的距離優勢，在 1907 年建立日本製鋼所株式會社 (Japan Steel Work, 日本製鋼所)，這間亞洲最大的特殊軍事工業公司是由三間英日企業（三井、北海道炭礦汽船株式會社、維克斯-阿姆斯壯公司）合資興建。

位於室蘭市的日本製鋼所工廠製造了許多世界頂級的戰爭武器，例如戰爭時期大和號戰艦的大砲及裝甲板，二戰之後，則利用世界最大的 14,000 噸液壓機建造大型渦輪轉子供熱力發電廠及核能電廠使用，當時佔世界產量的百分之七十。

北海道的產業遺產自成體系，由煤礦、鐵路、港口、鋼鐵製造等設施共同構成，在 2019 年被評選為日本遺產，遺產命名為「炭鐵港」意味此遺產結合了煤礦、鐵道、港口、鋼鐵製造等產業設施，遺產涵蓋 45 個日本政府推薦的遺產，包括著名的日本製鋼所。「炭鐵港」



圖 1：住友奔別煤礦的直井，建於 1960 年（高 52 公尺，東方最大的直井）。（照片來源：山田大隆）

受到重視，強調了北海道遺產的重要性，該遺產曾在日本全國遺產評選中名列第一（2001 年，煤礦類）及第三（2018 年，鐵路類）。

這些北海道及日本的產業遺產將持續的活化再利用，位於北海道中部地帶的許多舊礦場、鐵路系統及鋼鐵製造遺跡，未來也將持續在政府規劃的地方振興活化的計畫中佔有一席之地。

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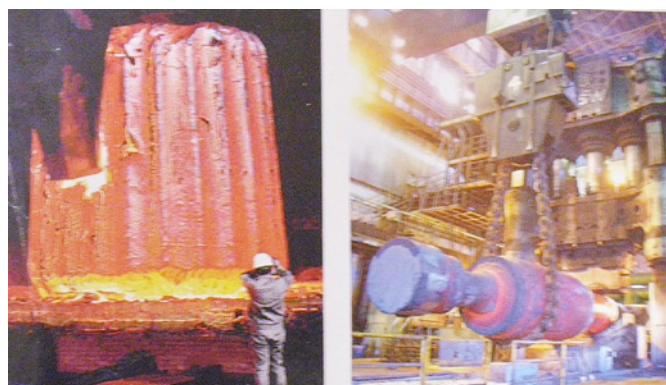


圖 2：日本製鐵所的 14000 噸液壓機及 250 噸的渦輪轉子（14000 噸為世界最大）。（照片來源：山田大隆）

第十屆中國工業遺產學術研討會在中國鄭州舉辦

—— 孟瑋磊、劉伯英 中國建築學會工業建築遺產學術委員會

第十屆中國工業遺產學術研討會於2019年10月26-28日在中國河南省歷史悠久、工業文化底蘊深厚的歷史名城鄭州舉辦，聯合主辦單位包括中國文化遺產研究院工業遺產委員會、中國文物學會20世紀建築遺產委員會、中國建築學會工業建築遺產學術委員會、中國建築學會建築策劃與後評估專業委員會、中國城市科學研究會歷史文化名城委員會及清華大學建築學院等。會議地點安排在鄭州第二砂輪廠舊址，此遺址同時也是中國第八批全國重點文物保護單位之一。在為期三天的會議中，200多名專家及學者圍繞會議主題「砥礪奮進、鑄就輝煌——新中國工業建設的發展歷程、偉大成就、記憶及遺產」進行討論，他們分別來自國家發展和改革委

員會、工業和信息化部、國家國防科技工業局、中國科學技術協會及40多所知名大學及研究機構。

開幕式由清華大學教授劉伯英主持，他同時擔任TICCIH理事及國家代表，也是中國文物學會工業遺產委員會會長。會議徵集97篇論文及45篇由專家學者撰寫之學術報告，分別從新中國工業發展歷程與記憶、新中國工業發展史及城市建設、新中國工業遺產的價值評估與構成、156個工程及工業遺產、三線建設與工業遺產等面向出發，全面展示出新中國工業發展的成就及歷史記憶，同時各方也就國內外工業遺產領域的最新研究成果進行交流討論，會議成果豐碩。



圖1：工業遺產學術研討會開幕式。(照片來源：孟瑋磊)



圖3：大會地點位於中國重點文物保護單位（鄭州第二砂輪廠的蘇聯時期風格廠房）。(照片來源：孟瑋磊)

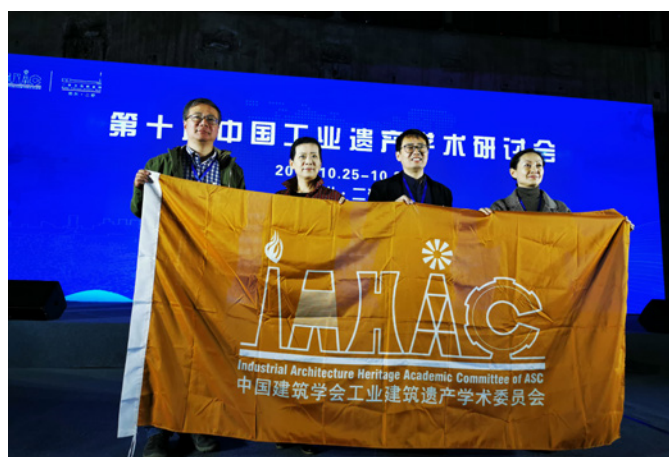


圖2：大會期間進行會旗交接儀式。(照片來源：孟瑋磊)



圖4：大會展出日常用品歷史文物。(照片來源：孟瑋磊)

選在中國重點文物保護單位舉辦會議是前所未有的嘗試，也顯示中國的工業遺產研究工作正從資源調查及遺產發現走向科學保護及活化利用，從純學術研究走向與藝術、人文、社會、經濟、環境相結合，拓展至更深更廣的層面。在為期三天的會議期間，專家學者也參觀了重要工業遺產，如鄭州第二砂輪廠、洛陽蘇式廠房建築群、第一拖拉機製造廠工業園區、洛陽礦山機器廠及東方紅農耕博物館等，深切體會中國工業建設的偉大成就及艱苦奮鬥的開創精神。

中國工業遺產學術研討會大會一年舉辦一次，至今已邁入第十屆，過程中，中國的工業遺產研究已從建築領域拓展到社會學、歷史學、科學、科技、考古學、藝術、環境保護等多個領域，研究主題也涵蓋都市發展、都市更新、區域產業、工業城市等面向。在十年的積累中，中國的工業遺產經過了全面深入且系統化的探討，取得了豐碩成果。

中國工業遺產蘊含獨特歷史、社會、文化及藝術價值，相關研究將永不停歇。持續不斷深入研究中國工業遺產不僅能進一步豐富全球工業遺產的價值體系，更能在現代工業化的背景下展現出東方古老文明的重要性。

年份	研究主題	會場
2010	都市發展背景下的中國工業建築遺產的調查、研究與保護	中國北京
2011	區性工業建築遺產的研究與保護	中國重慶
2012	工業城市與工業遺產	中國哈爾濱
2013	工業遺產的田野調查和價值評價	中國武漢
2014	都市鄉愁與工業遺產	中國西安
2015	工業遺產的未來	中國廣州
2016	工業遺產的科學保護與創新利用	中國上海
2017	工業遺產、文化創意產業與創新型城市發展	中國南京
2018	中國工業遺產的記憶、當下與未來	中國鞍山
2019	新中國工業建設的發展歷程、偉大成就、記憶及遺產	中國鄭州

表 1：中國工業遺產學術研討會——歷屆大會及十年主題

國際工業遺產保存委員會 (TICCIH) 石油遺產國際比較研究

—— James Douet TICCIH Bulletin 主編

石油自 20 世紀初以來即為世界上的主要能源來源，但卻很少有石油業遺址被保存下來，我們在每一個煤炭生產區都可找到歷史悠久的礦山遺址和採礦博物館，但走訪世界卻幾乎找不到任何一口真正保存完好的歷史油井。在 1870 年代，石油提煉出來的煤油取代了抹香鯨油作為照明燃料，但留存下來的鯨油精煉廠卻遠比原油精煉廠要多。石油工業的歷史意義與其擁有的物質證據不成比例，為什麼會這樣？我們又能為此做些什麼？

石油生產在 1860 年代達到「工業規模」，然而，石油工業具有原料壽命短、技術變化快、基礎設施使用週期短、非傳統建築類型、整體生產規模龐大而複雜、建築物難以改建等特性，很難以傳統遺產識別及價值評估流程去辨識此產業的歷史資產，加上石油易腐蝕、高度易燃，又常讓人負面聯想到環境破壞，這些都有助於解釋為何石油工業遺產如此稀少。

因此，國際工業遺產保存委員會 (TICCIH) 在 2019 年接獲任務，以全新方法重新檢視面臨困境的石油遺產，進行所謂的主題性比較研究，如同先前運河、鐵路、水力產業做過的研究（請參考 TICCIH 專題研究），目的是為了區辨出特定產業的重要階段，再參酌歷史背景，從中總結是否有存在的遺產值得保存？如是的話，又有哪些最具保存價值？藉由從世界各地蒐集而來的資料，我們可以把乍看重要或分散各地的個案，一起放到相應的歷史脈絡來相互比較，藉此做出更值得信賴的理解判斷，研究結果不僅將有助於國際文化紀念物與歷史場所委員會 (ICOMOS) 及聯合國教科文組織 (UNESCO) 評判提名的世界遺產，也能作為國家及地方建立遺產清單之參考。

本文研究範圍也延伸涵蓋到石油工業生產鏈中不可或缺的部分，包括各種石油製品的生產、提煉、貯存及分配，以及與石油直接相關的建物、聚落和景觀。

石油是以「滲漏」的方式自然而然出現在地球表面，早在 19 世紀中葉人們發現這黑色黏液的各種可能性之前，就已經被小規模開採了數千年，而當人們發現從石油提煉出油燈燃料的方法（發明者將其命名為 kerosene，中文譯為煤油），一個巨大市場隨即迅速

開啟。第一次的「石油熱」在北美安大略湖側展開，那裡同時也是北美重要的第一波石油開採地，而後，美國活躍的資本主義在數十年內間將其打造成一個巨大的新產業類別，石油被廣泛用於照明、機械潤滑，到了 1914 年也開始用於運輸，先是石油驅動的內燃機被應用於海上交通，接著路上交通也開始使用石油。

探尋新石油資源的同時，我們熟悉的鑽探平台及油泵景觀迅速拓展至世界各地，到了 1920 年代更延伸到了海裡。井架之於石油時代，就如同煙囪之於蒸汽時代，但石油結束生產後，油井設備 (oil rigs) 通常會被燒掉或拆除，以便將材料重複利用在其他地方，鮮少能倖存。少數保存下來的，如位於賓州（多數人認為的石油業發源地）頗具歷史意義的德雷克油井 (Drake's Well) 現存設備多數也是事後重建而來的。

另一方面，煉油廠通常屬於長期運作之建物，但很少煉油廠是從興建之初就保存到今日的。以德國的薩爾茨貝根煉油廠 (Salzbergen refinery) 為例，這座煉油廠建於 1860 年，是公認為世上最古老的煉油廠之一，最初是從油頁岩中提煉石蠟，後來也提煉賓州原油，1890 年代開始以亞塞拜然巴庫運來的石油生產高稠度潤滑油供火車使用，如今則生產唇膏、包裝材料、紡織品等石油產品。雖然我沒親自實地確認過，不過這座煉油廠的建物中，能達到我們對遺產真實性及完整性的預期標準者，為數應該不多。

工業遺產標準可能更適用於那些不直接與石油生產相關的建物，例如石油公司通常有義務提供前往偏遠或人煙稀少地區工作的員工及家屬住宿，這種規劃過的「企業城」在阿拉伯海灣、拉丁美洲（從墨西哥到巴塔哥尼亞）及亞洲許多地區都可以看到，「企業城」從歐洲或美洲引進建築和城市設計理念，也通常建有社會及教育機構。

在石油公司變得富有強大後，公司總部也成了 20 世紀石油霸權的象徵。自從標準石油大樓 (Standard Oil Building) 在紐約開了先例之後，隨後一系列建築紛紛興建、相互爭輝，時至今日，我們能在中國、俄羅斯、馬來西亞等地看見國家石油公司光鮮亮麗的大樓。

與之相對的，是較不起眼、無處不在的加油站，也是多數人與石油業產生交集的接觸點。在競相向駕駛人推銷石油這無差別產品之際，各家石油公司也開始將鮮明品牌形象或標誌性建築應用於加油站上，更有加油站結合前述兩者，透過新穎建築與響亮招牌口號，吸引消費者購買公司商品。

基於此歷史研究，TICCIH 針對石油工業遺產狀況良好者，提出了應該優先保護哪些項目，此外，TICCIH 也檢視了 UNESCO 的 6 項「傑出普世價值」標準 (Outstanding Universal Value)，其中有哪些項目可以運用於石油遺產，並針對 11 個案例石油遺產研究，包括自然滲漏、油田、企業城及石油管線等，分析普世價值標準如何實際應用在這些案例中。

本報告原本計畫由 TICCIH 在加拿大安大略省油田專家研討會上正式發表（該油田可能是保有世界上最真實早期油井的場址），但隨著新冠肺炎爆發，會議必須延後到 2021 年 5 月舉行，儘管如此，本報告已提交 ICOMOS，所以也已經可以作為各國建立暫時名單時參考，報告也可自 TICCIH 網站下載。

任何與報告或石油工業遺址有關的意見或問題都歡迎與作者聯絡。



圖 1：賓州德雷克油井其實是參考攝影資料後於 1945 年精心製作的複製品。此遺址是美國國家歷史名勝及美國機械工程師學會指定的國家級機械工程歷史地標（© 創用 CC）



圖 2：德國下薩克森省的薩爾茨貝爾根煉油廠，2010 年（Oehlke 2010）



圖 3：厄利垂亞阿斯瑪拉的「未來主義 Tagliero 加油站」，可能會被提名為世界遺產的「20 世紀建築遺產」。（© David Stanley）

2020 產業文化資產年—德國薩克森邦五百年產業文化資產主題特展

—— 黃紘彧 德國安哈爾特應用技術大學碩士生

德國薩克森自由邦將 2020 年訂為該邦的工業文化資產年 (The Jahr der Industriekultur 2020)，並由薩克森工業文化協調辦公室負責籌辦，吸引許多企業、機構及一般民眾共襄盛舉。

回顧歷史，就能知道為何工業文化對薩克森邦如此重要。此邦不僅是歐洲工業化的發源地之一，1736 年至二戰期間，更是德國的經濟核心。縱使二戰後及近期的全球化造成產業外移，但近年來，薩克森的工業文化已進一步地復甦於文化教育及旅遊業。

如同藝術部長 Eva-Maria Stange 於 2018 年 11 月 1 日在開姆尼茨舉行的 2020 工業文化資產年的籌備啟動儀式中強調：「動起來！只有當薩克森邦每個人——喜愛薩克森工業遺產的人們、專家、主辦者集思廣益，才可能透過 2020 的年度主題讓工業遺產更融入我們生活。」因此，所有工業文化活動蓬勃而生。

透過遍佈全邦的活動規劃，設計旅遊路線，薩克森邦的工業發展及遺產保存得以現地展演。遊客可以沿著**薩克森蒸汽鐵道路線**及**薩克森工業文化路線**飽覽薩克森邦內與工業文化相關的博物館、地景及藝術，感受中德工業的黃金年代。此外，旅客也能夠透過**萊比錫工業文化**對該市進行深度的主題遊覽。而學校和博物館也合作推出教育計畫，讓學生瞭解工業文化的過去，並成為生活的一部分。

而第四屆薩克森邦主題展—「Boom- 薩克森邦五百年工業文化」將在茲維考的工業遺產—奧迪博物館舉辦，並有六個現地特展將分別展於地方相關博物館。位於茲維考的中央展區由德國衛生博物館規劃，2800 平方公尺的展場以各種互動裝置、豐富的多媒體及全景圖像呈現薩克森邦的科技、經濟、工作、政治及文化歷史。

另外六個現地特展也不容錯過。**汽車特展**同在茲維考的奧古斯特·霍希博物館舉辦，民眾將一探德國各時期的汽車工藝及對未來的汽車技術想像。在開姆尼茨工業博物館展出的**機械特展**，邀民眾踏上從格拉蘇蒂的手錶工藝到高科技製造中心的機械工藝之旅；**鐵道特展**展於開姆尼茨希爾伯斯多夫的薩克森鐵道博物館，透過退

役鐵路機廠具文資身份的歷史建築、技術系統及陳列車輛，舊時鐵道景觀如在眼前；穿過「煤林」走入於奧埃爾斯尼茨的煤礦博物館舉辦的**煤礦特展**，能近距離看見廢棄礦井區真實的地景；在克里米喬的福奧兄弟紡織工廠的**紡織特展**，遊客跟著前員工在導覽解說中體驗布料生產的過程及過去紡織工人的生活樣貌；最後位於弗萊貝格礦區的礦產研究及教學中心的**銀礦特展**，將透過地下一百五十公尺的薩克森礦坑之旅，瞭解自然及地球科學研究的未來展望。

儘管受 2020 年新冠肺炎的影響，薩克森展覽延期至 7 月 11 日開幕，並展至 11 月 1 日。若有機會，不妨把握夏季來場別樣的深度文化之旅！

更多精彩規劃，請參閱官網：<https://www.industriekultur-in-sachsen.de/>。



圖 1：德國薩克森州五百年產業文化資產主題特展（資料來源：官網）



圖 2：「2020 產業文化資產年」圖文標誌（資料來源：官網）



《糖鐵文化足跡》

作者：國立科學工藝博物館

年代：2019

出版：台灣糖業公司

相關書訊：<https://reurl.cc/QdoZY9>

《糖鐵文化足跡手札》聚焦臺灣「糖業歷史及鐵道文化」，融合手札用途，結合集章活動，提供讀者憑手札搭五分仔車，享受折扣，藉此完成一次小型文化路徑串聯的嘗試，作為未來臺灣糖業文化旅行主題路徑的想像藍本。

這本糖鐵手札猶如探索「甜秘密」的筆記本，邀請讀者踩上自己的節奏，收藏糖業旅途的沿線風光；走訪觀光五分車的營運據點；踏勘臺灣各地的糖鐵機車頭與歷史建物，從黑白老照片遙想糖鐵的榮景與演變脈絡；從定格的影像見證糖鐵文化的在地耕耘與國際推廣，再用自己的筆觸，收存旅程裡那些甜而不膩的好時光。



《英國切斯特勞工與在地工業發展史》

作者：Shuttleworth, Stewart, Jenkins, Stanley C.

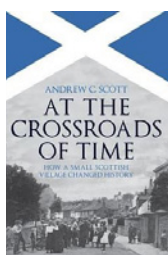
年代：2020

出版：Amberley Publishing

ISBN：978-144-56-9143-5

相關書訊：<https://reurl.cc/R4ozGx>

英國切斯特 (Chester) 地區現今主要的產業為服務業，涵蓋旅遊、零售、公共管理和金融服務等。然而，由於該城市地處迪河 (River Dee) 流域的地理位置，及其重要的戰略地理軍事位置，顯示出過往的不同樣貌。在《Chester At Work》一書中，作者史丹利·詹金斯 (Stanley Jenkins) 與史都華·沙托沃爾斯 (Stewart Shuttleworth) 共同追溯這座城市從工業化開端、工業革命、再到今日城市生活的歷史轉變。



《時代轉折點：一個蘇格蘭的小鎮如何改寫歷史》

作者：Scott C.

年代：2020

出版：Amberley Publishing

ISBN：978-144-56-9832-8

相關書訊：<https://reurl.cc/GVYA6y>

有別於英國許多其他小城鎮，萊斯馬黑戈 (Lesmahagow) 因其地理位置和歷史遺址，以及許多曾居住於此的名人而聲名遠播。本書作者安德魯·斯科特 (Andrew C. Scott) 的家人居住在這個村子裡達三個世紀，在這本書中，作者將帶領讀者探索這個位居鄉間的樸實城鎮其所蘊含的有趣故事。

煤炭來自位於赤道的泥炭生產區，其後，煤炭為多次的工業革命提供了珍貴能源。對斯科特來說，萊斯馬黑戈珍貴之處不僅在於其產業生態，也連結了當地家庭及社區的人們。出生自萊斯馬黑戈小鎮的發明家研發出腳踏車 (pedal bike) 等新型機具，並紛紛投入克萊德河岸 (River Clyde)、鄰近萊斯馬黑戈的新拉奈克地區 (New Lanark) 創新工業的研發。



《守護亞洲文化資產：過去與未來》

作者：Siam Society

年代：2020

出版：Silkworm Books

ISBN：978-616-21-5156-9

相關書訊：<https://reurl.cc/b5o9pM>

本書邀集 12 位居住於亞洲區域 11 個不同國家的作者們分享他們的經驗，以及對文化資產未來保存的想法與期許。

本書強調，當借鏡西方國家管理文化資產之概念與經驗時，我們必須推廣適合亞洲區域的做法，保護文化資產的法律架構更是必須與時俱進，無形的文化資產也應該更受到關注。公民和當地社群往往是文化資產最佳的守護者，妥善結合公私部門雙方資源，進行有效利用極為重要。透過雙方協作的過程，使文化資產及環境保護運動等相關議題向前邁進。



《臺灣近代化遺產活用的最前線》

作者：東京文化財研究所、近代文化遺產研究室

年代：2020

出版：東京文化財研究所

相關書訊：<http://www.tobunken.go.jp>

東京文化財研究所與全國近代化遺產活動聯絡協進會，於 2019 年三月共同舉辦「臺灣近代化遺產活用的最前線」研討會，研討會不僅針對產業遺產，也介紹臺灣嘉義市或臺南市如何利用閒置的老屋，以促進都市再生的事例。

本書集結研討會上講者發表所獲得的資訊，整理了關於臺灣近代化遺產保存活用的概要。藉由研討會的舉辦以及本報告書出版的契機，希望在近代化遺產方面，臺日的交流能更加的深化。

- 瑞士

徵稿訊息 | 特刊 – 知識社會中的絲綢文化資產

活動日期：2020 年 7 月 24 日

活動地點：瑞士

主辦單位：多學科數位出版研究所 (Multidisciplinary Digital Publishing Institute, MDPI)

活動官網：<https://reurl.cc/E7l6lA>

活動說明：<https://anlh.culture.tw/index/zh-tw/activities/38617>

- 臺灣

2020 全國古蹟日 – 「遺產教育行動·翻轉與創新」

活動日期：2020 年 9 月 19 至 20 日

活動地點：臺南市，臺灣

主辦單位：中華民國文化部

活動說明：<https://anlh.culture.tw/index/zh-tw/activities/38625>

- 比利時

歐洲工業遺產路徑 (ERIH) 2020 年會

活動日期：2020 年 10 月 7 日至 9 日

活動地點：產業文化博物館，根特，比利時

主辦單位：ERIH

活動官網：<https://reurl.cc/Y1Nqa4>

活動說明：<https://anlh.culture.tw/index/zh-tw/activities/38620>

- 臺灣

2020 第三屆亞洲產業文化資產國際線上論壇

活動日期：2020 年 10 月

活動地點：臺灣

主辦單位：亞洲產業文化資產資訊平臺

活動官網：<https://anlh.culture.tw/index/zh-tw>

活動說明：<https://anlh.culture.tw/index/zh-tw/news/36647>

- 英國

英國煤炭和產業文化資產巡禮

活動日期：2021 年 6 月 25 至 7 月 6 日

活動地點：斯克蘭頓，英國

主辦單位：Pennsylvania Anthracite Heritage Museum

活動官網：<https://www.facebook.com/events/547316502524781/>

活動說明：<https://anlh.culture.tw/index/zh-tw/activities/38612>