TICCIH
The International Committee for the Conservation of the Industrial Heritage
BULLETIN
NUMBER 101 · 3rd Quarter 2023

CONTENTS

Remnants of the aereal ropeway at the Aucanquilcha volcano mining camp in the Antofagasta Region of northern Chile. Considered the world's highest-altitude mine between 1913 and 1993, it is the subject of the interdisciplinary Alto Cielo Archaeological Project (see page 16; photo Rodrigo Lorca)

MESSAGE FROM YOUR PRESIDENT

INSPIRATIONAL INDUSTRIAL HERITAGE – IN PRAISE OF POLAND

Miles Oglethorpe, TICCIH President

Welcome to issue number 101 of the TICCIH Bulletin and to the latest message from your President! As I write, my brain is still pulsating with memories and images of an astonishing visit to Poland a few weeks ago. I was very honoured and fortunate to be invited to participate in an extraordinary event – an industrial heritage congress which, for three of its four days, was held hundreds of meters underground in re-purposed mineworkings. Apart from being a highly professional, hugely enjoyable event, it proved to be a brilliant networking opportunity during which I learned about amazing mining-related heritage and education projects across the world and made some incredibly useful new contacts.

The first half of the event occurred in the Wieliczka Salt Mine near Krakow. It wasn't my first visit to the mine, but this time I saw far more of it than before, met many of the amazing staff (including our hosts Jan Godłowski and Monika Dziobek-Motyka), and also took the opportunity to reflect on Wieliczka's flagship role in putting industrial heritage on the world stage. There is no better example of what mining heritage can deliver, and the fact that it was the first industrial site to be inscribed

View on the Wieliczka Salt Mine Regis Shaft (photo Miles Oglethorpe)

onto UNESCO's World Heritage List (in 1978) should not be forgotten.

The conference, which followed on from the initial International Conference of Mining and Underground Museums (ICMUM) held back in 2018, attracted some outstanding speakers, a significant proportion of whom addressed the issue of how our heritage can adapt to the evolving world around us, especially in the context of the worsening climate crisis. There was very much a feeling that our mining heritage needs to take the initiative and help act as a catalyst in the battle against climate change, not least through inspiring education projects.

Next stop at the conference: the Coal Mining Museum in Zabrze (photo Miles Oglethorpe)

TICCIH
President: Dr. Miles Oglethorpe
Historic Environment Scotland
Longmore House, Edinburgh EH9 1SH, Scotland
e: mkoglethorpe@icloud.com, t: +44 01316688611

Secretary General: Dr. Marion Steiner
ESPI Lab on Critical Industrial Heritage Studies, Valparaíso, Chile
e: secretary@ticcih.org

Editor: Articles and news of recent and future events should be sent to the Editor, Joeri Januarius, e: editor@ticcih.org

Advice for contributors: ticcih.org/ticcih-bulletin/

TICCIH Membership: Daniel Schneider, e: ticcih@mtu.edu
TICCIH Website: Daniel Schneider, e: ticcih@mtu.edu

FIND TICCIH ONLINE: WWW.TICCIH.ORG

ISSN: 1605-6647

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

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

The **TICCIH Bulletin** is the only international newsletter dedicated to the worldwide conservation of the heritage of industrialisation, and is sent direct to members four times a year. The Editor welcomes all news, critical comment and articles related to our field. Everything published in the Bulletin can be accessed in a searchable Articles Index on the TICCIH web page.

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

& ON SOCIAL MEDIA:

View on the Manufaktura Andels Hotel in Lodz (photo by Miles Oglethorpe)

The second half of the congress was hosted by the Coal Mining Museum in Zabrze near Katowice at Guido Mine and Queen Luise Adit Complex. This also proved to be an extraordinary experience (led by Ewa Wojtoń and her colleagues), and the power of taking visitors to see the mineworkings, working machinery, and real, thick coal seams in situ cannot be overstated. Those of you who know me will be aware that coal mining heritage is my personal specialism, so it was difficult not to get overexcited. I have been down a few coal mines in my time, but these experiences were outstanding. I know I am biased, but the congress and the underground (and surface) visits have reinforced my view that mining heritage is immensely important and is a vital and central pillar within the industrial heritage portfolio.

After the congress, I travelled north to Lodz to meet Professor Bartosz Walczak and see the amazing textile heritage of the city. I had been wanting to do this for many years, not only to see the mills themselves, but also to witness for myself the heritage-led transformation that has been occurring in recent years. It is no exaggeration to say that my visit far exceeded my expectations – the way in which the city's textile heritage is being used to forge a future for Lodz is remarkable. I therefore urge those of you with the means to travel to go there and witness it for yourself. You will find no better example of industrial heritage acting as a catalyst for regeneration and sustainable development.

One of the benefits of being TICCIH President is that it has given me the opportunity to see much more of the world than was previously possible, so I have seen some inspiring industrial heritage projects in many countries. However, my latest visit was exceptionally good. Furthermore, in the knowledge that there is much more happening beyond Wielicska, Zabrze, and Lodz, I can safely say that Poland is one of the most exciting countries to visit if you are seeking inspiring industrial heritage.

FAREWELL INTERVIEW WITH JAMES DOUET

Joeri Januarius, TICCIH EDITOR

—

"How retirement is from the Bulletin? Well, I miss it, of course, seeing all the authors' messages. But I have been editing 100 issues for the past 25 years, so you can imagine the editing was very intense. I am happy we met and the transfer went smoothly. Now, I want to keep researching and writing. I just finished a book on the architecture of steam and I hope more similar projects will follow."

— James Douet

What was your first contact with industrial archaeology or industrial heritage?

When living in London years ago, I worked as a stone mason in construction. I did geology at the university and trained then in masonry. That was a romantic idea back then, but it did not work out. A friend of mine lived in Cornwall. It was once full of non-ferrous mines, and the landscape is extraordinary. I had a very romantic reaction to this landscape. I found it very moving that this industry, which was finished then, left behind some striking objects and structures in the landscape. I looked around and found this course at the Ironbridge Gorge Museum on industrial archaeology. I signed in, and they accepted me. This was back in 1986. It was run by two exciting people, Barrie Trinder and Michael Stratton. I later started to work for organizations specializing in the conservation of industrial buildings. And then I was lucky. English Heritage wanted to update the inventory of historic buildings in Bristol. They thought the list was short of industrial buildings, which is when I came in. Throughout time, the focus changed from industrial buildings to different building types. I did a series on chimneys, water pumping stations, military installations, and naval dockyards, full of industrial buildings since the 17h century.

Was your first contact with TICCIH also in this period?

In 1993, I attended a specific architecture conservation course in Rome, home of a famous conservation school (Instituto Superiore per la Conservazione ed il Restauro). I met a woman from Spain who specialized in mural paintings. That is how I ended up in Barcelona. At the end of the 1990s, museum director Eusebi Casanelles became involved with TICCIH. He wanted to raise the profile of the Catalan Museum of Science and Technology and industrial heritage in general via TICCIH. As I arrived, he became president of TICCIH. He thought it could be helpful to have an English-speaking person and my background to help. He wanted to boost TICCIH, then depending on a small number of people and organizations. He started organizing meetings for national representatives. He reckoned we needed a regular Bulletin, so that was my first task.

Former editor James Douet enjoying his retirement from the *Bulletin* (photo by James Douet)

TICCIH has an essential tradition as a network, created in the 1970s. According to you, what is the importance of this type of international network?

Its principal function is to connect people who are enthusiastic about industrial heritage. There has to be such an organization in any sector. It is part of our DNA. You have to share it with others when you are involved in something.

Every network faces some challenges. What is the biggest challenge for TICCIH?

This comes from somebody who is nearly at the end of his career and who has been involved for a long time: the subject is rapidly changing. Initially, we researched and conserved buildings. New functions must be found. This was an excellent motivator for people like me. Many critical buildings have been studied, documented, and re-used in a certain way. I am worried that there will be a lack of material for the next generation.

On the other hand, I appreciate that new regions and countries are active in the field of industrial heritage. So I hope the next generation continues to explain why this industrial heritage is essential, with other materials than my generation.

You have edited a lot of articles and Bulletins. Do some unique articles come to mind?

I remember one by a French colleague on the importance of early computers, which was an unknown field of study at that time.

View on the Levant Mine and Beam Engine (photo by Tom Corser, CC BY-SA 2.0 UK)

Massimo Preite writes excellent articles. He persuaded me that the Bulletin must also publish articles longer than 1000 words (which is the current target). It is a great addition to the regular articles we publish.

Industrial architecture is more my cup of tea. An English architect called Miriam Kelly wrote a series of articles on the conservation of historic buildings. The last one was on the TWA Flight Center at JFK International Airport.

Together with Daniel Schneider, we created a small database of articles. The editor can very easily search for articles in this way. A volume with the best Bulletin articles is something TICCIH should consider.

I have some big shoes to fill! Do you have any advice left?

Feel free to change the Bulletin and the focus on themes. Throughout the years, I have tried to add some new content—book reviews, for example.

The Bulletin is also a great place to publish reviews as we have a considerable circulation and many experts reading the Bulletin. Publishers should be sending copies, but they only sometimes do so. Remember, Joeri, that it is crucial that the articles are understandable for every member of TICCIH.

Thank you again, James, for your tremendous work on the Bulletin!

COLLABORATIVE MAP OF INDUSTRIAL HERITAGE IN LATIN AMERICA AND THE CARIBBEAN & 2nd TICCIH GLOBAL MEMBERS MEETING

Wednesday, 4 October 2023
11:00 a.m. – 1:00 p.m. Central Mexico
en español / in Spanish

Marion Steiner, Secretary General TICCIH

—

We are every day closer to celebrating the X TICCIH Latin America Congress, which will take place in Monterrey, Mexico, between October 24 and 27, 2023, with the theme "Latin America and Its Industrial Heritage: Challenges and Collaboration Networks".

The scientific program will soon be published on the congress website: https://cipinl.org/. It will include a workshop called: "Mapa de patrimonio industrial latinoamericano. Cartografiar, registrar y activar." In this workshop, we will propose the collaborative elaboration of a map of industrial heritage in Latin America and the Caribbean using geographic information tools.

Prior to this, a preparatory online workshop will be held on October 4, 2023, in which the theoretical bases, the cartographic base to be used, and the access and data insertion procedure for the elaboration of this cartography will be presented. It will also provide the criteria for the selection of industrial heritage sites and the format for filling in the data. The structure and the speakers of this workshop will be announced soon. It is expected to last 2 hours and will be open to the public with prior registration.

The activity is part of the actions for the promotion of industrial heritage that we are carrying out from TICCIH for the American continent, including the organisation of the congress in Monterrey in October 2023 in conjunction with the Inter-institutional Committee for Industrial Heritage of Nuevo León, and the preparatory workshop that, at the same time, is conceived as TICCIH's 2nd Global Members Meeting, this time to be held in Spanish.

The initiative was conceived by the "TICCIH in Portuñol" committee formed last year by the Board of TICCIH International with the aim of bringing together researchers from all continents to discuss current issues and support the development of strategies necessary for the safeguarding of Latin American and Caribbean industrial heritage.

This call for the workshop is addressed to the registered participants of the Monterrey congress, and to all other members and friends of TICCIH who will not be able to travel to Mexico, but who do work from different perspectives and parts of the world on Industrial Heritage in Latin America and the Caribbean and would like to connect and contribute to the collaborative construction of the map with their experiences and the registration of heritage sites in their respective countries.

The TICCIH Global Members Meetings, of which the first was held in English on September 3, 2021 (https://ticcih.org/1st-global-members-meeting/), one year before the World Congress held in 2022 in Montréal, Canada (https://www.ticcih2022.com), aim to bring together the global community of industrial heritage on issues that are of cross-cutting interest to colleagues around the world. These online meetings are an important tool for creating networks and communities beyond national borders and contexts. We hope to hold more such events in the future, in additional other languages, to continue breaking language barriers.

You can download the workshop call here in Spanish and in English, and register to participate here (participation via Zoom). Stay tuned and check back in on our various communication channels and on our special page https://ticcih.org/taller-mapa/.

INDUSTRIAL HERITAGE, SOCIAL ISSUES AND CHALLENGES FOR NEW GOVERNANCE FROM THE SOUTHERN HEMISPHERE

Dr. María Esperanza Rock, Director of NUDISUR and the GORE Biobío Programme BIP 40049181-0 (CREASUR)

The International and Interdisciplinary Cultural Heritage Congresses have been held since 2016 as an initiative of the Southern Research Nucleus NUDISUR. This network of researchers from the Global South understands cultural heritage as an important opportunity to decolonise our discourses of the past from a critique based on the territorial realities of the southern hemisphere, including communities from below as key actors to project a pluralistic, solidarity-based and highly collaborative future. Previously the congress was organised in Chile, Mexico and Brazil, and its fourth version, focusing on "Industrial Heritage, Social Issues and Challenges for New Governance," will be held in collaboration with TICCIH International.

The congress is part of the programme "International Strategies for the Transformation of Industrial Heritage into Regional Assets, BIP 40049181-0" which was presented by the Creasur Cultural Center and the NUDISUR network and is financed by the Biobío Regional Government. This programme also includes the teaching of the diploma course "Collaborative Methodologies for Heritage Projects with a Critical Approach," supported by the Master in Architectural Heritage Intervention of the Faculty of Architecture and Urbanism of the University of Chile.

The Regional Government of Biobío is part of the "Mesa Regional Plan Lota: Towards a World Heritage Site," an initiative organised since 2019 and coordinated by the National Heritage Service in order to systematically work on the nomination of the Lota Mining Complex as a UNESCO World Heritage Site.

The collaborating institutions are the Undersecretary of Heritage, the Production Development Corporation CORFO, the Undersecretary of Public Works, the Undersecretary of Housing and Urbanism, the Undersecretary of Regional and Administrative Development, the Municipality of Lota, the Regional Government of Biobío, the Lota Heritage and Tourism Citizen Board, and other civil society organisations.

The programme seeks to generate a regional network for the governance of cultural heritage and to train those working on projects of this nature in municipalities and community organisations, with the aim of acquiring new tools with international standards to take on the challenges of a new governance of industrial heritage.

The IV International and Interdisciplinary Cultural Heritage Congress will be held in the city of Concepción, Chile, from 16 to 20 October 2023, in the premises of the governor's office, where the mural "History of Concepción" by the artist Gregorio de la Fuente is located. Experts from Chile, India, Nigeria, Nepal, Indonesia, Egypt, Argentina, Cuba, Uruguay, Brazil, Mexico, Spain, Germany and France will participate.

Alongside them, field visits will be made to the four sites in Lota inscribed on the UNESCO Tentative List, as well as to the former Bellavista Tomé textile factory and the San Rosendo railway complex. The field visits will be accompanied by artistic and cultural activities highlighting the sensitivity and regional significance of the industrial heritage.

More information: https://nudisur.org/en/gore-program

View on the station of Kortrijk (photo by author)

HERITAGE AT RISK: SAFEGUARDING THE KORTRIJK RAILWAY STATION (BELGIUM)

Adriaan Linters, Flemish Association for Industrial Archaeology VVIA

—

The site of Kortrijk railway station is historically significant. From this station, a train crossed a national border for the very first time in the world on 6 November 1842. In October 1846, the train with dignitaries, which connected two capitals (Paris and Brussels) for the first time, was given a festive welcome on Belgian soil at Kortrijk station.

A provisional station was built as early as 1840; the first full-fledged station in neoclassical style opened its doors in 1876. This 19th-century station was badly hit and largely destroyed during the heavy Allied bombing of Kortrijk in 1944, when more than 1500 homes and many public buildings were reduced to rubble, and 619 civilians were killed.

However, people did not give up and decided to build a brand new iconic station building in the same spot. To this end, in 1951, the Belgian railway company NMBS-SNCB commissioned the renowned Kortrijk architect Pierre Albert Pauwels to design a new station. It festively opened its doors in 1956.

This Kortrijk station is, therefore, a symbol of the city's reconstruction. It is one of the most important examples of a post-war reconstruction station in Flanders. And the building also has significant architectural and urban planning value.

Unfortunately, the station's maintenance has been grossly neglected for several decades, and the accessibility of the station and platforms has not been adapted to contemporary needs. For about a decade, 'renewal' has therefore been under consideration.

But 'renewal' in the railway company's eyes means demolishing the historic building and replacing it with a large tunnel under the tracks, and above this several Calatrava-like canopies. Cost: €89 million excluding VAT... According to our research, for a significantly lower sum, the existing station can be restored to its splendor and its accessibility adapted to contemporary standards. It is too large for the current station functions and can also absorb numerous other functions, such as meeting and coworking spaces.

Citizens and civic movements already questioned the future of the station and the plans made years ago, but they have yet to be heard. A Facebook group "Red ons Station" (Save our Station) was set up in November 2014. During the European Year of Rail (2021), discussions and actions intensified when it became clear that the plans did not consider the station's heritage value. A petition was started in Kortrijk, which currently has more than 3000 signatures for the station's preservation.

A dossier was introduced for The 7 Most Endangered, the European campaign organized by Europa Nostra, the European Investment Bank Institute, with the support of the European Commission.

On 13 April 2023, the reconstruction station of Kortrijk (1951-1956) was declared one of our continent's seven most endangered heritage sites by a European expert commission.

The city of Kortrijk and the SNCB/Infrabel are still planning to replace the historic station with a megalomaniacal and money-consuming project.

Detail in the station of Kortrijk (photo by author)

Meanwhile, the possible demolition was met with many protests. Recently, a manifesto was drawn up advocating the preservation and redevelopment of stations - not only from an architectural and historical point of view, but also for the sake of sustainability. This manifesto has already been spontaneously endorsed by more than 50 leading figures from the worlds of architecture, heritage, art, culture, and academia. This manifesto is available in Dutch, English and French.

Meanwhile, people and associations from all over Europe and beyond are asked to send letters pleading for preservation and against granting a demolition permit. These letters should be sent to the city council of Kortrijk, Grote Markt 54, B-8500 Kortrijk, info@kortrijk.be - and a copy to the mayor Mrs. Ruth Vandenberghe, ruth.vandenberghe@kortrijk.be.

View on the coal washing plants in Beringen (photo Bart Vanacker)

BERINGEN: TEST CASE TO HOLLOW OUT PROTECTED MONUMENTS?

Open letter signed by more than 30 heritage professionals and experts, researchers, and volunteer associations

—

Finally, after more than 30 years of deterioration and decay, people are rolling up their sleeves to breathe new life into the coal preparation plant at the Beringen mine site (Belgium). Tens of millions of euros are being poured into the reuse of the coal preparation plant. Good news, of course. But rather than starting from the existing heritage values, the monument risks being hollowed out. This sets a dangerous precedent for other protected heritage sites.

The Beringen coal preparation plant is Belgium's largest industrial monument and belongs to the heritage of the coal mining industry. The building and its technologically important machinery have been legally protected since 1994. Local and national associations have been striving to preserve the coal preparation plant and seeking appropriate reuse for years.

This year, be-MINE, the real estate developer acting as the exclusive party responsible for the conversion of the Beringen coal mine, is playing the leading role in three major applications for environmental permits. The developer aims to partially demolish coal preparation plants 1 and 3 for the be-NATURE project and add a non-accessible green zone and a stairway walking route in the vacated area. A second project concerns be-MINE PIT, a mining experience centre developed by the province of Limburg, which will be housed in the bathing hall and coal preparation plant 2. Finally, be-MINE wants to erect over three hundred residential units, a childcare centre, and a ten-storey high residential tower in the adjacent open space, the so-called *Houtpark* (Wood Park).

However, these projects all suffer from the same affliction: the heritage values seem unimportant. Take for instance the be-NATURE project. Instead of starting from the unique heritage, be-NATURE is adamant about giving nature free rein inside a protected monument. Visitors will only have to guess at the functions of the coal preparation plant's building, machines, and impressive volume. The fact that a part of the (protected) coal preparation plant 1 and the remaining machinery will forever

Simulation of the new situation

disappear seems to be a secondary matter. Whether this intervention will undermine what remains, as the structure will be exposed to the elements, thus bringing its preservation for future generations into question.

If the intention is to make space for nature (the paper-thin narrative that be-NATURE is touting), it would be better to direct that vegetation outward, for example, by greening the car parks or by planting greenery in the *Houtpark* or on the slag heaps. And there's the rub: there is no cohesion between the three projects. The *Houtpark*, where real nature has developed over the last three decades, will be taken over by a residential area. So one project appears to cannibalise another.

On the one hand, be-MINE wants to build a tourist attraction in the coal preparation plants, which requires breathing room and a wide view so that the monumental aspect of the coal preparation plant can thrive. It is not without cause that several governments, including *Toerisme Vlaanderen* (Flanders Tourism Agency), are pouring millions of euros into the project. The scale and impact of the building project are competing with the industrial heritage. If recognition as a UNESCO world heritage site was ever intended – as it was one of the resolutions in the developers' ambition notes – then filling up the *Houtpark* with constructions gives up that dream.

Likewise, the plans for the mining experience centre be-MINE PIT are held together by string and chewing gum, to the extent that several municipal advisory bodies are seriously questioning the substantive quality of the project, and the environmental permit was partially refused. While some installations in the neighbouring coal preparation plants 1 and 3 will be demolished, exactly those installations will be simulated in the mining experience centre. The best visualisation remains the reality of the industrial heritage's physical presence. Furthermore, the question arises whether it may be time for Limburg to have a certified mining museum that tells the story

of the Campine region's mining industry instead of yet another experience that already sounds outdated.

Het Verhaal van Vlaanderen[1], and the chapter about the Limburg mining industry within the *Flemish Canon*[2], prove that a wide audience is indeed receptive to this shared history. So why not integrate the coal preparation plants into be-MINE PIT instead of tearing them apart? It's not only between the three projects on the mining site itself that any form of cohesion is missing; the relationship with the six other mining sites in Limburg is equally lacking. However, the Kolenspoor, the former freight railway line connecting several mine sites, could become the common thread as long as its reconstruction turns it into more than just a cycling highway.

We endeavour to come together and cooperate on an ambitious project with the heritage value of the Beringen mine site at its core rather than rolling out isolated projects that do a disservice to the mine site. Include the main stakeholders, mainly the local community and associations within the former company housing estates, into a new adaptive reuse project instead of drowning them in utopian renderings and fake participation programmes. Commit to a substantive narrative that responds to the future challenges of the heritage and a society in transition.

Over the years, every other mine in Limburg was granted a crucial, future-oriented innovation function. Under the name Thor Park, the former Waterschei mine site is being revitalised as the hotspot for innovative manufacturing and energy companies and research centres, such as EnergyVille, where KU Leuven is conducting applied research on sustainable energy. The former main building of the Houthalen mine became an incubator for green companies (Greenville), C-Mine in Genk is synonymous with creativity and artistic development. Zwartberg is home to LABIOMISTA, the global project around biodiversity by Koen Vanmechelen. The Eisden mine is centered around Ecotron: research and simulation of the long-term effects of climate change. Zolder, meanwhile, seems destined to become a hotspot for conferences and meetings.

And what about Beringen? The Flemish government decided in 1993 to preserve a single mine as integrally as possible, namely Beringen. The starting point for any adaptive reuse must be the cohesion between the various elements of this industrial landscape to prevent further fragmentation, thereby risking the ensemble's legibility. After all, thanks to its nearly integral protection, the Beringen mine, with its coal preparation plant, provides a rare witness to the above-ground industrial production process converting raw material into fuel and residual waste. The concrete, brutalist heart of the coal mine, with its monstrous machines, appeals to the imagination and must be preserved. Part of the coal preparation plant could become the birthplace of the materials economy, offering a true response to climate change and the increasing need for sustainable production processes. Combining the seven Limburg coal mines, intertwined by the *Kolenspoor*, could offer Flanders an innovation region with global appeal, concentrated within 40 square kilometres. The main challenge is to connect, cooperate substantively with local associations, and stop parceling out the golden legacy of the miners.

---

1. "The Story of Flanders": a documentary TV series subsidised by the Flemish government about the history of the region now known as Flanders.

2. A recent government-commissioned project to establish an official canon for the Flemish region. It consists of 60 themes, called windows, listing key developments in the history of Flemish culture and society.

School of Dairy Technology butter churn, 1950s. Provided by Jan Goates

AUSTRALIA

THE RESEARCH FARM GHOST TOWN

Noel Murphy and Dr. Monika Schott, independent writers/researchers

—

Australia hosts an inordinate number of ghost towns peppered over its plains, through its mountain ranges and across its desiccated deserts. Thousands of them.

Bustling social communities full of families, workers, businesses, schools, sport and more have vanished to the inexorable march of progress, to market changes, technology and dwindling resources. What were once thriving places of enterprise and community, built on industries of farming, mining or in many cases, gold, have quietly disappeared beneath the waters of history.

Little or nothing remains of most. Yet others, such as Werribee's State Research Farm, in the southern Australia state of Victoria, have left an enduring and extraordinary legacy.

Some of the Farm's original buildings remain, although in poor condition. But its core township of 30-odd houses that grew around an agricultural research facility has vanished. Likewise, the people, the families that lived, worked, played and grew up there have vanished into the ether.

Even the State Research Farm name has gone.

The Victorian Government set up the Farm for agricultural research and experimentation as the Central Research Farm in 1912 on 1167 acres. It was to respond to ongoing social problems from the earlier 1890s economic depression and be an institution for scientific advancement rather than a commercial enterprise. It changed its name in 1915 to the State Research Farm.

Plant breeders were the first scientists recruited because of a desperate need to breed better wheat and barley varieties to replace those bred in England. After World War One, the Farm trained veterans in the newest agricultural techniques and delivered lectures and field demonstrations to convey the most contemporary farming practices. By the 1930s, the Farm's scientists regularly took their findings to farmers around the State in various ways.

These included a show-stopper Better Farming Train, with experts and numerous carriages loaded with samples, examples, images, and more. The train was a major event everywhere, with farmers and townsfolk

Hay shed, first laboratory and silos, 1960s. Provided by Andrew McPherson

descending on it like a major country fair. It influenced many farmers at hundreds of towns. At one stage, nearly every grain of wheat, barley and linseed coming out of Victoria had ancestors at the Farm.

The Farm's Dairy Institute opened in 1939 as a national dairying research centre and over the years, taught cheese-makers all over the world. It eventually grew to become Australia's research institute for food overall.

In World War Two, the Farm produced vegetable seeds for local and international needs, ergotine for shell shock and opium poppies to overcome a morphine shortage at the time. Women from the Australian Women's Land Army were trained in farming practices to fill the gap left by men going to war.

University of Melbourne agriculture students lived at the experimental station for a year, where trained staff investigated agriculture and livestock husbandry problems by testing experimental results under practical farming conditions.

The Farm quickly earned an enduring reputation for excellence. Its experiments to improve farming practices across a raft of areas delivered ongoing breakthroughs over many years in wheat, cereals, grasses, soil, crops, irrigation, fertilising, plant nutrition and natural pastures.

Researchers beavered away to transform farming and agricultural-related products in livestock, dairy technology and milk yield, poultry, pigs, stud breeding, weather observations, tractor performance and farm infrastructure. Farm breakthroughs included IVF practices via artificial insemination, heart medical science through pig research, and dairy technology such as spreadable butter, flavoured yoghurts, milks and ice creams.

All the while, its community thrived: kids were climbing trees, falling out of trees, hunting snakes and tadpoles, building cubby huts and all but running wild. Parents and children alike chopping wood, collecting milk and bread deliveries, watching animal births over the back fence.

Homes on the State Research Farm, 1961. Provided by Jan Goates

The Farm's legacy continues in new and varied research pursuits in the much-altered Farm precinct today, minus its township and community. It lives on in numerous agricultural practices and commercial products that emanated from a century of the Farm's remarkable and far-reaching efforts.

The Farm is listed on Victoria's Heritage Register for its change in agriculture from European practices to practices specific to Australia's climate and conditions. It contains fine examples of public architecture relative to its research and experimentation, including the Farm's first buildings laid out in an H-configuration, the first laboratory, fodder building, silos, dairy, stables, carpenters and painter workshops, original office, bagged grain store and storage tanks, shearing shed and former Melbourne Showgrounds pavilion. The listing gives the buildings the highest level of protection in Victoria.

The Farm is of scientific significance for its role in agricultural practices implemented and adapted around Victoria, Australia and internationally. It is significant for its association with leading scientists such as its founder Dr. Samuel Cameron, Victorian Director of Agriculture, Emeritus Professor Alan Trounson AO, renowned internationally for his work in IVF, and Professor Jock Findlay AO and his research in sheep reproduction.

Agronomists like Hugh Gordon, Alan Raw, Gwen Hotton, Leo Bartels and others bred plants to benefit farmers, making pasture breeding their life work. This was on the back of Senior Geneticist Alan Raw, with years of experience in wheat breeding and a gift for selecting the right plant to breed more than 90 percent of the wheat grown in Victoria.

Today, thanks to a powerful community effort, the Farm's history of intellectual rigour and ground-breaking research and application is being saved for posterity. Celebrated in fact.

Over the past two years, a vibrant catalogue of the State Research Farm's scientific achievements, its characters, their day-to-day lives, social ties and activities has been amassed by a dedicated group of chiefly volunteers. The research team established State Research Farm Community Facebook and Instagram social media pages to find and activate the lost community of past Farm residents and workers and their families, and rebirth it through oral history interviews, images, collection of memoirs and film, Out on the Farm.

This catalogue, this collection of spoken and written stories and images, is a personal voyage into the homes and haystacks, workshops and woodheaps, the laboratories and lifestyles, by the people who made up the Farm. It is a quintessentially Australian story about a ghost town that had a softly spoken but powerful impact across agriculture, industry and commerce.

The recollections, videos, photos, clippings and memorabilia are a treasure trove of Australiana that not only preserves and celebrates the achievements of the Farm but, importantly, the strong community behind those achievements. It assists in the conservation of the Farm's heritage and provides a legacy of learnings into the

belonging and social cohesion that exists within such communities. Learnings about the social and economic development of the past and the challenges and evolution these communities faced are vital for future sustainable urban development. The study provides immeasurable insight into how such communities thrive alongside industries they served, often isolated or segregated from mainstream populations.

We now have a repository of resources about the Farm's heritage for research, education and other uses, elevating the Farm's profile and its hub of heritage listed "H" buildings in the public arena. Enormous potential exists for the preservation and development of this central site as a creative, community, historical and tourism space.

What we have is one of the great unsung stories of a remarkable but modest Australian community that really changed the world. Our hope is as Dr Graeme Mein says in the film, Out on the Farm, that this historic site becomes a vibrant centre for science, education and community once more – a fitting way to celebrate the Farm's living heritage.

El Angulo, Aucanquilcha volcano, Chile (photo Rodrigo Lorca)

CHILE

AUCANQUILCHA'S AERIAL ROPEWAY AND THE WORLD'S HIGHEST MINING CAMP

Francisco Rivera, Instituto de Investigaciones Arqueológicas y Museo (IIAM), Universidad Católica del Norte, San Pedro de Atacama, Chile. The Archaeology Centre, University of Toronto, Canada

—

Located in Ollagüe, a municipality of the Antofagasta Region in northern Chile, the Aucanquilcha volcano (6176 meters) was considered the highest mine in the world between 1913 and 1993. Situated at 5950 meters, the remains of the camp and extraction areas of sulfur, now abandoned and scattered throughout the landscape, bear witness to the local mining activity. Since its beginnings, Quechua and other indigenous workers from the Andean highlands mainly carried out this industry.

The interdisciplinary Alto Cielo Archaeological Project studies the industrial-extractive history of sulfur mining at the Aucanquilcha volcano in Ollagüe. The research project began in 2015. Since 2022, it has been funded by the Chilean National Agency for Research and Development (Fondecyt 11220113). It focuses on two types of social spaces: traditional agropastoral and sulfur mining sites. The project's general objective is to describe, characterise and analyse the transformations in Ollagüe throughout the twentieth century and highlight their interrelationships, temporalities, and materialities.

At the beginning of the twentieth century, Juan Carrasco initiated mining operations in the Aucanquilcha volcano's famous sulfur mines, aiming to sell sulfur to the bustling saltpeter mining industry in northern Chile, which needed an essential component for its explosives requirements. In Ollagüe, Carrasco built what is known as the first autoclave in Chile, and in 1933, he founded the Sociedad Industrial Azufrera Minera (SIAM. Carrasco) with a loan from the Caja de Crédito Minero to increase the scale of sulfur deposit exploitation. This state institution promoted the extraction of all exploitable minerals in the country through loans and the creation of private initiatives and national companies. SIAM Carrasco and the sulfur mining industry, in general, produced a range of artefacts that are still present on sites today. In addition to the camps built for miners and their families, a series of technological innovations were quickly integrated into sulfur's exploitation, transport, and processing. For example, autoclaves and retorts were brought from Japan, the UK, and Germany.

Aerial ropeways, a fundamental innovation for ore transportation, helped carry sulfur from extraction sites to processing centres like Amincha. The SIAM Carrasco installed a Pohlig-type double cable aerial ropeway covering 13820m and built a transfer station called El Ángulo at 1940m from the loading terminal. Among the most visible archaeological remains in Ollagüe's industrial landscape, these ropeways have become one of its material symbols. They are one of the most distinctive artifacts of the local mining history.

With industrialisation, traditional modes of transport, such as mules and llamas, had proven incapable of carrying large quantities of ore due to weight and distance. Towards the mid-twentieth century, the new aerial ropeway technology responded to the worldwide demands of a rapidly growing mining industry and the transport requirements that expansion necessitated. In a region like Ollagüe, full of ravines and natural features, aerial ropeways offered an alternative to transportation on constantly eroding roads and costly rail tracks. The aerial ropeways avoided the obstacles imposed by the natural environment by going through straight lines. In addition, they were less affected by the difficulties of the region's high-altitude climatic conditions, such as snow and summer rains. Aerial ropeways are part of the history of technological innovations, large-scale machinery, and industrial expansion in peripheral industrial regions such as northern Chile.

The ropeway built by SIAM Carrasco reached the company's plant in Amincha, 12 km from Ollagüe. Amincha is one of the most emblematic sites of the region, mainly due to its good preservation. The famous German engineer Ernst Kausel designed its industrial facilities. In 1993, Amincha and Aucanquilcha were Chile's last active sulfur mining camps to close their operations. Today, these sites are visited by mountaineering tourists and are symbolic places in the historical heritage of the local community. Due to its isolation, high altitude, and the destruction of road access to the site, El Ángulo and its industrial facilities are preserved in the silence of the volcano's heights. Only natural agents such as snow and wind gradually destroy its last architectural remains, aerial ropeways, and sulfur loading station.

The history of the Aucanquilcha mining sites, one of the world's highest, and the importance of the local sulfur industry are shared in a small exhibit at the local museum Leandro Bravo Valdebenito, named after the archaeologist who pioneered research on the cultural history of Ollagüe. The museum, the Ollagüe community, and archaeological research projects continue to work arduously to preserve and make visible the significant industrial heritage of this Andean area of northern Chile.

CHINA

WENZHOU ALUM MINE FROM THE PERSPECTIVE OF THE ARCHAEOLOGY OF TECHNOLOGY

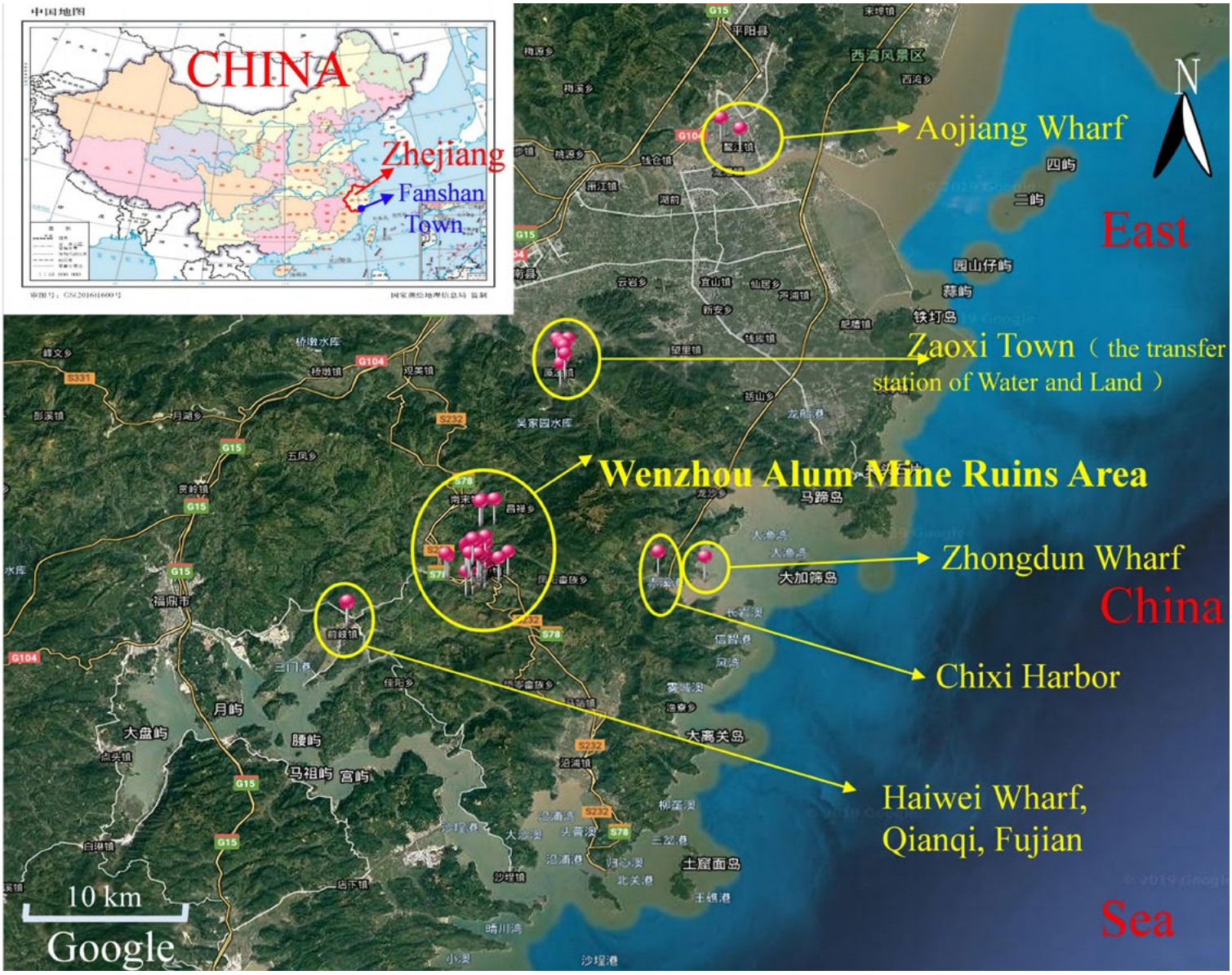
Shujing Feng, the national academy of innovation strategy, CAST and Tshinghua University

Wenzhou Alum Mine is located in Fanshan Town, Zhejiang Province, near the east coast of China. The mine has operated for over 600 years since the Ming Dynasty. Production was mainly a secondary occupation from the 14th century to the early 20th century. During the first half of the 20th century, production was carried out by small-scale private enterprises. After founding the People's Republic of China in 1949, the alum industry moved towards nationalization, gradually changing from traditional to modern modes of production. As a versatile material of great industrial value, alum has been used as a fixative for dyeing and medicine, a flocculating and clarifying agent for purifying water, and so on. With the emergence of alum substitutes and changes in the national strategic resource layouts in the 21st century, Wenzhou Alum Mine continued its decline before completely ceasing the operation of the water-immersion method in December 2017. In recent years, the area is transforming from production to industrial heritage protection due to the constraints of processing technology, resource conditions, and production costs.

Archaeological investigation of the Wenzhou Alum Mine

The alunite comes mainly from five specific mining areas (Shuiwei Mountain, Jilong Mountain, Dagang Mountain, Pengpeng Ridge, and Mabi Mountain in Cangnan County). The Geological Department has confirmed that the reserves of alunite in Fanshan Town are approximately 240 million tons, accounting for 80 percent of Chinese resources and 60 percent of the world's reserves. The area has been named World Alum City.

Since May 2017, we have investigated seven mining sites and ten



Location of Wenzhou Alum Mine in Fanshan Town. Orthophoto reproduced courtesy of OvitalMap © 2018 DigitalGlobe; insert courtesy of China Map and Google Earth via Macromedia Fireworks.

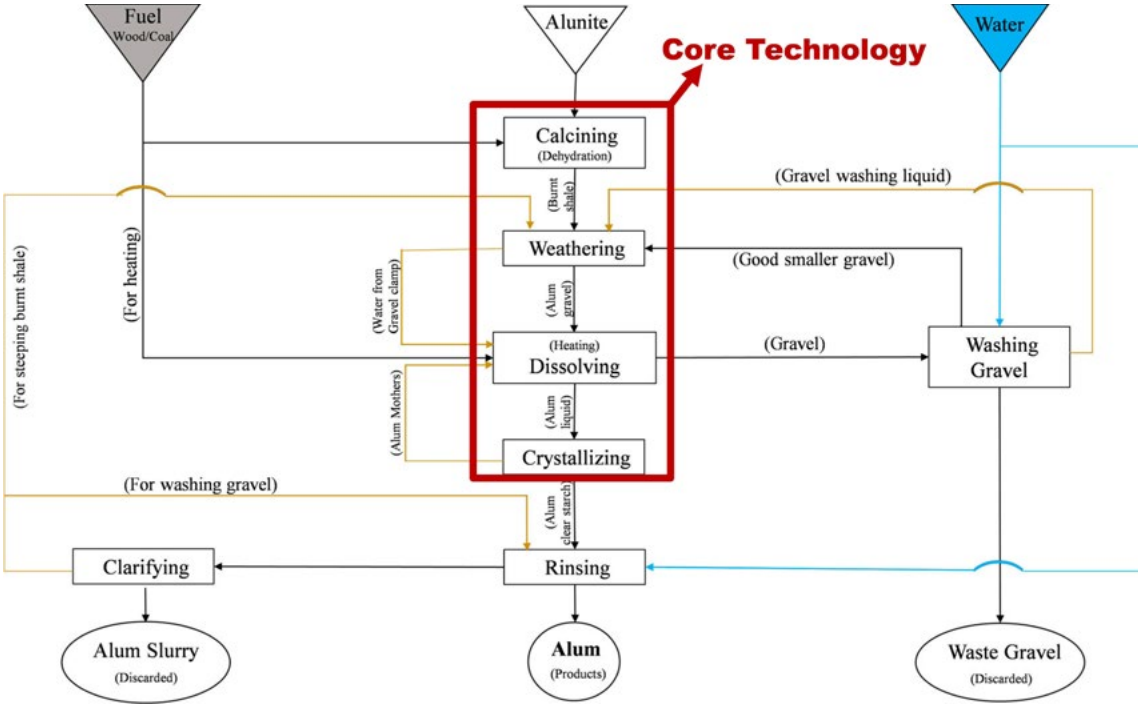
refining sites in the Wenzhou Alum Mine's area, mostly aiming to analyze the archaeology of technology. We have several research goals. First, based on the field investigation and the archaeology of technology, we want to preserve and restore the information on the mining site. The second is to reveal the industrial heritage of Wenzhou Alum Mine and to provide a comprehensive and detailed interpretation of its mining and alum refining sites. The third is to create a new explanation of the characteristics and connotations of Wenzhou Alum Mine's technological development. Finally, the main goal of this article is to present the Wenzhou Alum Mine to an international audience.

The evolution of refining technology

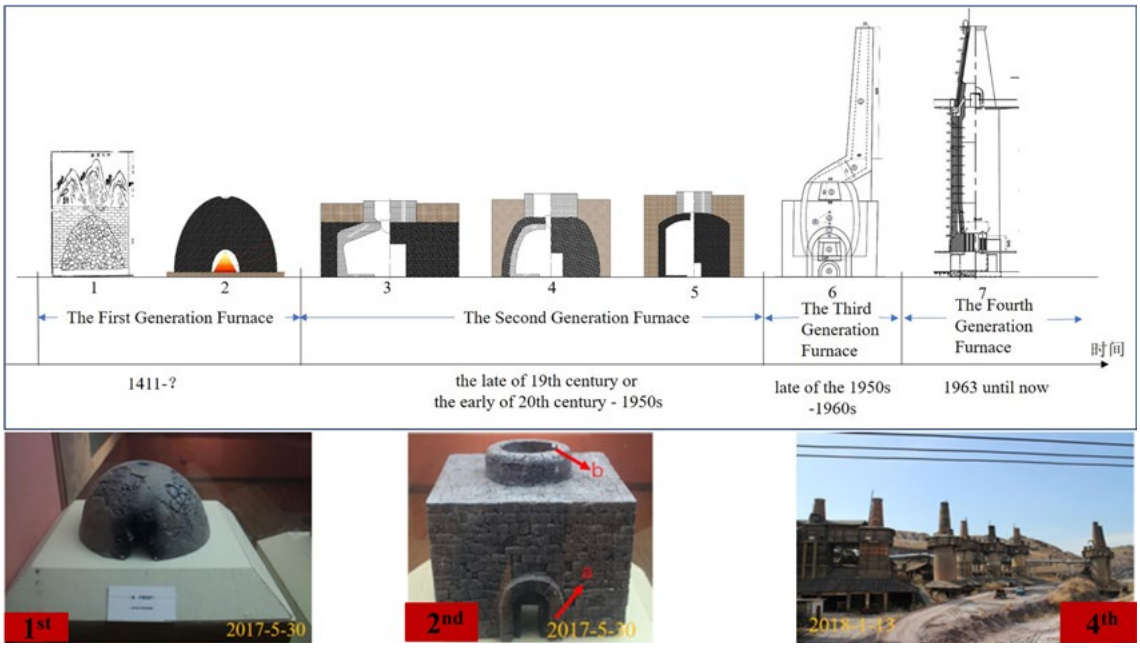
The main method used for refining alum in Wenzhou Alum Mine was the water-immersion method, described in detail in the work Tian Gong Kai Wu. This production process had three steps: calcining, dissolving, and crystallizing. The process was improved with workers' experiences. By 1949, it had evolved to a five-stage method: calcining, steeping, boiling (dissolving), crystallizing, and cutting. In the 1950s and 1960s, the five-step production process was improved by adding several additional steps, while the core technology of the process only had four stages.

The first step to extract alum is to calcinate the alunite. The furnace is the most critical facility in the calcination phase. The general layout of the alum furnace improved several times. The calcining equipment has successively applied open-air roasting, a stove-type furnace, an intermittent small kiln, and a continuous large kiln. It finally developed into a vertical continuous roasting furnace.

The first-generation furnace, shaped like a turtle's shell, was stone-



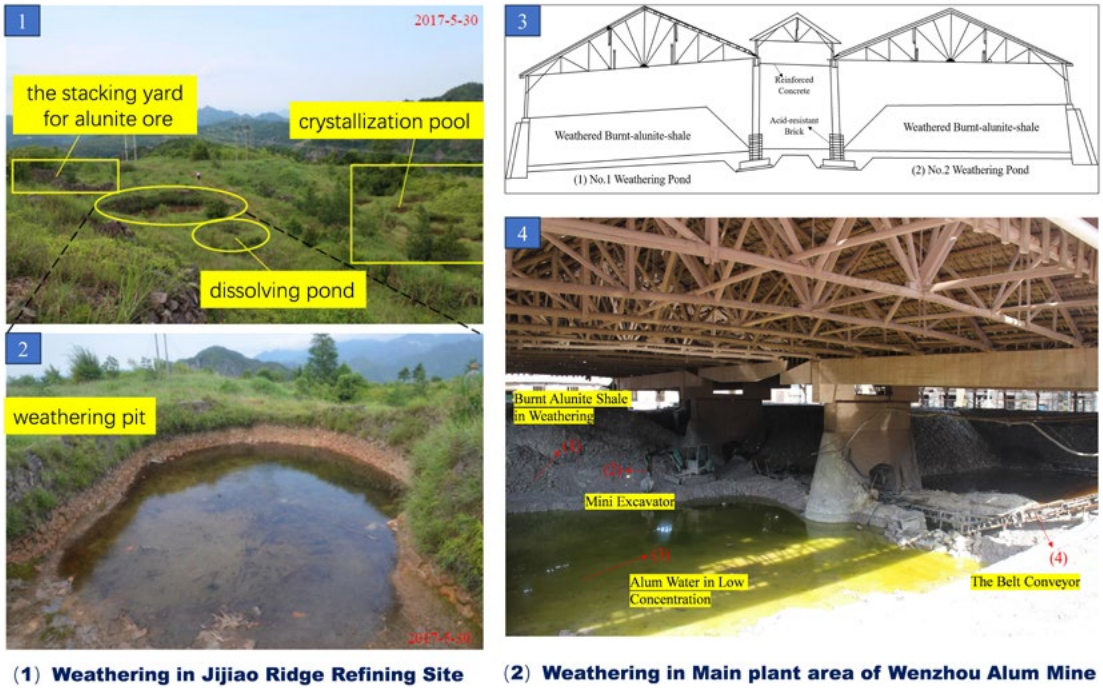
Alum producing process from the 1960s until December 2017



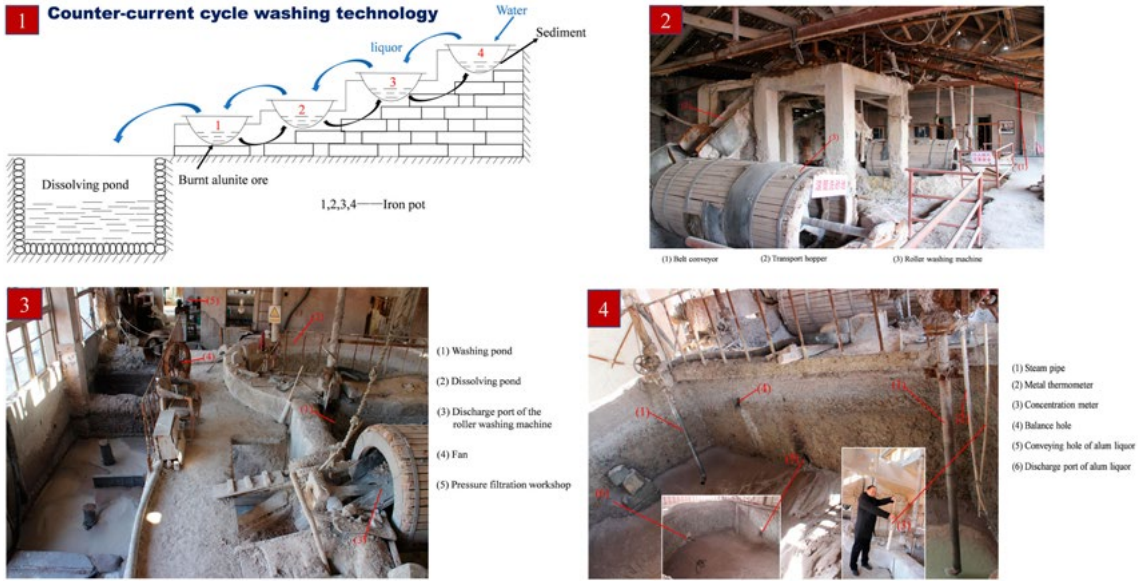
The evolution sequence of the alum furnace

made. This furnace used in the earliest production sites was tiny and suitable for family workshops. No examples of such furnaces have been found to date, so the chronologies of their introduction and use cannot be determined. Their shape and use can only be reconstructed from the accounts of previous generations of craftsmen who described or hand-painted their work.

The work Tian Gong Kai Wu describes the processes for alum using a second-generation furnace. The fuel used was coal, and the furnace was larger than the previous. However, field investigation suggested that the second-generation furnace in Wenzhou Alum Mine still used firewood (rather than charcoal) until the 1950s. Looking at the inner shape of the furnace, the second-generation furnace is divided into three parts: the urn-shaped furnace, the bell-shaped furnace, and the bunker-shaped furnace. Because of the large-scale reconstruction works carried out from the 1950s onwards, there is no surviving physical evidence of the second-generation furnace using firewood. Moreover, there is no evidence to support the start date of the second-generation furnace. Literature shows that the third-generation intermittent furnace replaced it in the late 1950s. By the end of the 1960s, the intermittent furnace was transformed into a continuous (or fourth-generation) furnace. As the third-generation furnace was used for a relatively short period, no



The evolution of the weathering facilities in Wenzhou Alum Mine



The evolution of the dissolution technology

relevant traces were left behind. At the same time, the large-scale group of the fourth-generation furnace is one of the most visible structures in the industrial landscapes of Wenzhou Alum Mine.

The weathering of alum means that the burnt alunite shale is in full contact with water. It destroys its original state by a chemical reaction to form fine alunite gravel. At the same time, impurities are separated from the burnt shale. This fine alunite gravel easily dissolves potassium sulfate and aluminum sulfate formed during calcination. It can also be separated from impurities such as silicon oxide and aluminum oxide.

Weathering facilities evolved from a leaching facility with a bottomless wooden barrel, a weathering workshop with a stone-bamboo-grass structure, and a weathering workshop with a form containing bricks, tiles, and wood. There is one stacking yard for alunite, one weathering pit, one dissolving pond, and several crystallization pools on the Jijiao Ridge Refining site, where the weathering workshop was a stone-bamboo-grass structure. The weathering and its facilities in the main plant area of Wenzhou Alum Mine are brick-tile-wood structures, with different kinds of bricks and tiles in the workshop.

After 80 days of weathering, the fine alunite gravel is transported by the belt conveyor from the weathering ponds to the next producing step.

In the counter-current cycle washing process, the first pot was filled

The evolution of the technology of crystallization

with burnt ore from the weathering pond and topped up with alum liquor from the second pot. The burnt alunite ore was rich in compound salts, such as potassium aluminum sulfate, which made it dissolve into strong liquor. Thus, when the liquor reached the required specific concentration, it was transferred into the dissolving pond, while the washed ore was transported into the second pot. This process was repeated four times. At the end of the process, the insoluble waste ore in the fourth pot was discarded. The alum liquor in the first pot was transferred to the crystallizing room, where the dissolving process ended.

The facilities in the main plant area of Wenzhou Alum Mine show that the fine alunite gravel was transported from the weathering room to the dissolving room using a belt conveyor. The gravel reached the belt's end and was transferred using a wooden herringbone hopper to the roller-washing machine in the washing pond. These rollers followed the Chinese handicrafts tradition, using wooden structures instead of entirely metallic equipment. The dissolving pond is separated from the washing pond by a wall. Both ponds are made of acid-resistant concrete and were linked by two holes whose function was transporting the alum liquor. The balance hole was used for distributing the alum liquor equally on both sides of the ponds. The conveying hole was opened after the alunite gravel was thoroughly stirred and washed, and the alum liquor reached the required concentration, measured by a concentration meter. The liquor was then transported from the washing pond to the dissolving pond to be heated by a steam pipe. When the alum liquor in

the dissolving pond reached the right temperature and concentration, the discharge port was opened, and the liquor was delivered to the next stage of the crystallization process.

The evolution of the crystallization technology has three stages: a simple crystallization pool, crystallization facilities in the mine sites, and semi-mechanized crystallization facilities. There are nineteen pools with a bottomless wooden crystal bucket. From the 1970s, the crystallization pools were built with stone materials sheltered from wind and rain with bamboo and woodsheds. The crystallization facilities of the Xiguang alum refining site are in the mining caves. There are also two crystallization rooms with 19 crystallization pools. The structure of the crystallization pool has four layers. The technology of crystallization worked with slurry. The main plant area of Wenzhou Alum Mine used semi-mechanized crystallization facilities. The crystallization rooms were structures of brick tiles and reinforced concrete; the alum mother liquor was transported by pump and rubber pipeline, and the crystallization pools were built with concrete-slate construction. There are four layers of crystallization pool walls, from the inside to the outside (slate, oyster grey-clay coating, and stone masonry with oyster ash and yellow mud).

In conclusion

First, the industrial layout and production process of Wenzhou Alum Mine followed the guiding principles of the early mining and metallurgical industry: minimum transportation costs. The site selection and layout of the alum workshop in the main plant area were built following the theory of industrial geography, reflecting the complementarity and connection among social economy, natural resources, environment, science, and technology.

Second, the alunite in Wenzhou Alum Mine allowed the adoption of the traditional water-immersion method of production process technology to produce potassium alum. This process has typical characteristics of localized or endogenous industrial technology in China. Besides, Wenzhou Alum Mine Industrial Site provides a unique historical witness for the unused traditional alum refining process technology. Especially the outstanding example of roaster construction and drum sand washing equipment technology shows the important stage of human history in refining alum from alunite using traditional technology. At the same time, it reflects the process of human understanding and utilization of chemistry.

Finally, industrial archaeology provides detailed material evidence and data for studying the history of technology. In return, the history of technology also helps explain the technical characteristics and connotations of the industrial physical remains and reveals the industrial culture and society behind them.

Acknowledgments

I want to show my gratitude to the team of my supervisors for their careful guidance: prof. Wei Qian and associate Prof. Juan Manuel Cano Sanchiz in the University of Science & Technology Beijing, prof. Zhengfeng Li at Tsinghua University, researcher Daya Zhou at China Association for Science and Technology, associate researcher Xuan Liu at National Academy of Innovation Strategy, CAST, prof. Mike Robinson and senior lecturer Roger White in the former Ironbridge International Institute for Cultural Heritage (University of Birmingham), as well as to the Government of Fanshan Town and the staff of Wenzhou Alum Mine. Warm thanks are also extended to Mr. Robert Carr, and thanks to the Institute for Cultural Heritage and History of Science & Technology (USTB, China) and the UK AIA together with its Young Members Board.

A general view of the tower clock of the Misr Spinning and Weaving Company in El-Mahalla, which goes back to 1947, with the company's steam power station facilities visible behind (photo by author)

EGYPT

THE THIRD LONGEST CLOCK IN THE WORLD IS NO LONGER WORKING

Mostafa Abo Shamia, journalist Al-Ahram Establishment

After 76 years of work and accuracy, the clock of the Misr Company for Spinning and Weaving in the city of Al-Mahalla Al-Kubrah (Egypt) has stopped running. Poor maintenance, negligence, and the indolence of the officials in training new technical specialists to deal with this historical masterpiece are at the core of the problem. The last person responsible for maintenance retired, and no one has been trained to replace him.

The most famous clock in Egypt, and by extension Africa and the Middle East, stopped working in the middle of April for the first time since 1947. It was then built by the English company Gillette and Johnston. Founded by William Gillette in 1844, the company quickly became one of the world's most famous companies specializing in the manufacture of tower clocks. The tower clock in Mahalla is 90 meters, the third longest clock in the world after Joseph Chamberlain's memorial clock in Birmingham (100 meters), and the famous Big Ben clock in London (96 meters).

The bells and mechanical components of the clock were manufactured in the company's headquarters in Croyden, a commercial district in the south of London. At the same time, the technical supervision was done by Mr. Allanby, the construction manager; Mr. Joseph Heron Knight, and Ezz El-din Abdullah, both mechanical installations engineers; Mahmoud El-Tobgy, an electrical installations engineer, and Samy Behiry, a constructions engineer at Misr's company for reinforced concrete.

Misr's company had taken over the concrete work for the clock tower, which is 90 meters high from the ground to the lightning rod and 70 meters from the bottom to the upper floor of the bells.

An inscription bearing the name of the English company on one of the mechanical parts of the historical clock of the Misr Spinning and Weaving Company in El-Mahalla (photo by author)

The clock has five attached bells that signal time with harmonious music, as four bells are distributed on the four sides of the clock. Each bell weighs half a ton, with one bell in the middle that weighs five tons. Each bell rings four times every 15 minutes, eight times every 30 minutes, and sixteen times every hour. All those bells cease to make any sound by one o'clock in the morning till five o'clock in the morning to prevent any disturbance or noise for the residents.

Each side of the four sides of the tower has one side clock that consists of two pointers (hands); the length of the smallest is 25.2 meters, and the largest is 75.2 meters, with batteries that operate automatically in the event of a power outage.

The main objective of building this clock was to alert factory workers to their work schedules and the beginnings and endings of their work shifts, especially since most of them did not have personal watches during that period.

Before the urbanization of the city, you could see the clock standing with the naked eye from a distance of three kilometers. Sometimes you could hear its voice and its famous regular ticking from a long distance with its sound being a beautiful harmony for the workers and the residents of one of the most prominent industrial cities in history.

ENGLAND

SHREWSBURY FLAXMILL MALTING

Rebecca Reeves, Shrewsbury Flaxmill Maltings Project Officer, Historic England

—

In 2022, the world's first skyscraper was reopened to the public after a five-year complex programme of restoration costing £28.4m. This building – the Grade I listed Main Mill, built in 1797 – lies in the Ditherington area of Shrewsbury. It is considered to be the grandparent of the modern skyscraper as the world's first building with a 3D internal iron frame. It brought together for the first time methods of joining together cast-iron components which allowed structures to become increasingly tall as the technique advanced. Whilst its architectural importance was known within Britain, it had also received international recognition in places such as China and America.

Shrewsbury Flaxmill Maltings is a 2.7-hectare site that houses eight listed buildings – three at Grade I, all constructed around a three-dimensional cast-iron frame, providing fire-proof buildings that housed different elements of the flax industry for almost 100 years. Following its career as a flax mill (1797 – 1886), the site was converted into a maltings for the brewing industry in 1897. This saw the introduction of the Grade II Kiln building which now sits between the three Grade I structures – Main Mill, Warehouse (1810) and Cross Mill (1812). Activity continued across the site, including a stint as a Light Infantry Barracks during the Second World War.

Several private developers were unsuccessful at restoring the site, with one at least going bankrupt as a result. It wasn't until 2005 when Historic England (then English Heritage) bought the site as owner of last resort that its future was secured - initially through a complicated scaffolding and propping system that literally held the building together for ten years. As the first known multi-storey metal framed building in the world, the Main Mill at the Flaxmill

©Historic England - Main Mill and Kiln east facade, November 2022 – following opening of the visitor exhibition and café a few months earlier.

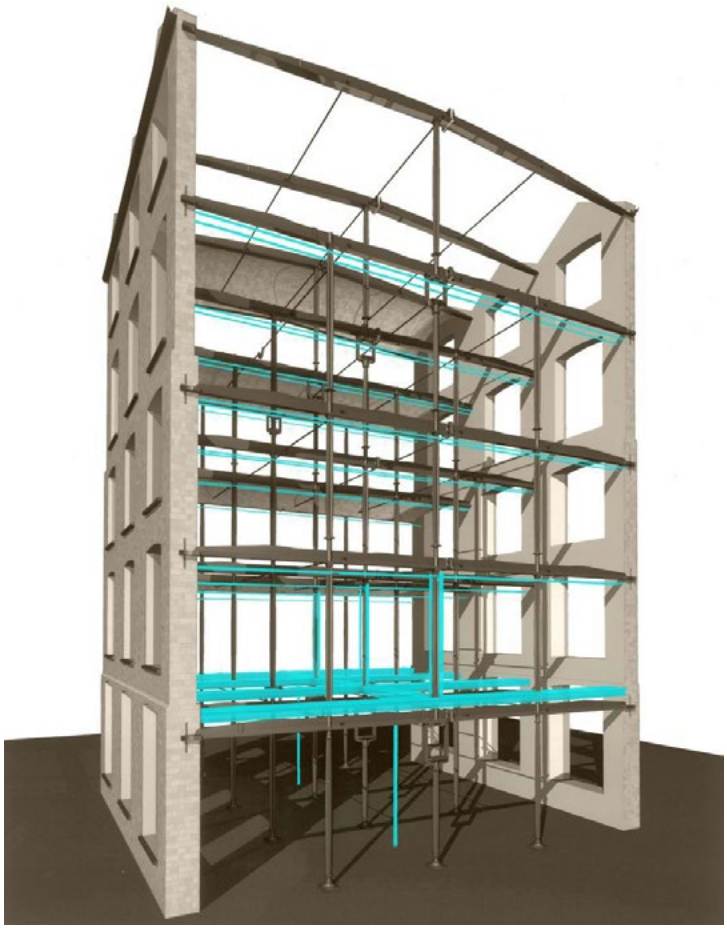
Maltings not only meets the criteria for statutory protection, it is also of outstanding global significance, and so its restoration had to reflect statutory requirements, good practice and the innovative nature of the building.

Whilst the cast iron frame was pioneering within the Main Mill's construction, the designer Charles Bage used more traditional methods within the walls – an oak ring beam at each floor level and timber lintels above windows. This proved a major issue during the malting's era when moisture was introduced and seeped into the walls causing the timber to rot, and the walls to bow outwards. The adaptation of the building to a maltings required the strengthening of the iron frame to enable reuse, with new concrete floors introduced and two-thirds of the windows were blocked up, with the rest reduced in size – the consequence of one industry reliant on light for longer working hours, and the other demanding control over light levels for the barley germination process.

Before funding was secured for the restoration, including a £20.7m grant from the National Lottery Heritage Fund, Historic England worked with the project's design team led by architects Feilden Clegg Bradley Studios and structural engineers AKT II, to investigate the building, utilising extensive historic research and investigations to understand the significance of key elements, and devise a methodology for strengthening the cast iron frame to prevent the progressive collapse of the building. It was agreed to introduce new steel – columns on the ground and first floor and a grillage on the first floor – to add additional strength without compromising the original iron work in order to preserve its historic fabric. This minimal intervention saw approximately 60 tonnes of new steel were added, compared to an alternative design which would have involved introducing 600 tonnes.

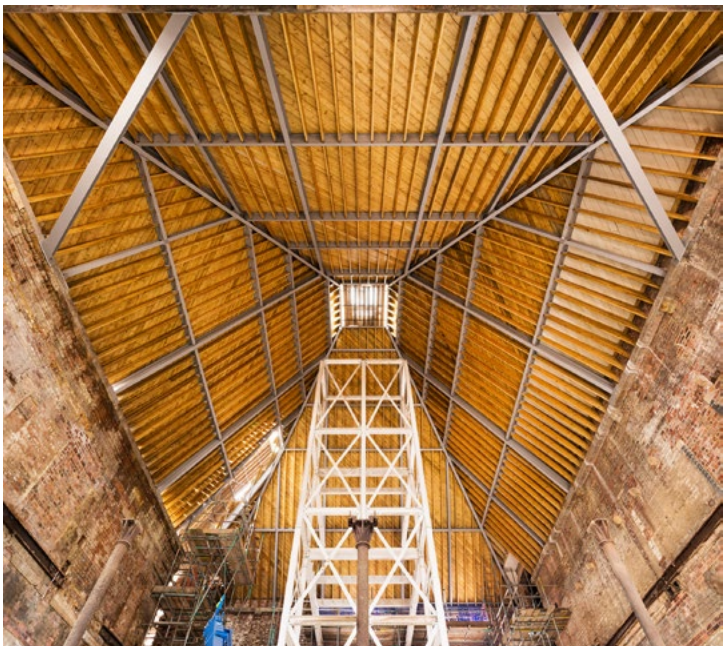
The fenestration was another major component that required thorough planning before the main construction could begin. Designs needed to marry up the two industries synonymous to the building and so it was proposed to retain the in-situ maltings era windows and restore the original large window openings of the flax era. The decision was motivated by how much light and natural ventilation would be needed to passively service the building for its next reincarnation – that of heritage and commercial uses – and consideration of the building's energy consumption. The whole process of reopening 110 windows was complex, with only two-bays on opposite sides of the building being completed at a time – in order to minimise the risk of collapse. The new windows are steel-framed with double-glazed, solar reflective glass.

The building does not have air conditioning, instead it makes use of the building's floor plan and orientation that maximises sunlight and the cross flow of air. During the course of the construction process, which commenced in June 2017, a 140kw ground source heat pump was also introduced to the scheme involving the sinking of 10 boreholes at a depth of 180 metres. This system will produce around 70% of the heating requirements of the Main Mill with the rest being provided by more traditional gas boilers.



© Feilden Clegg Bradley Studios – original cast iron structure and new steels added through restoration process.

©Steve Baker, Historic England – first floor Main Mill with new additions – new steel grillage to floor, tie rods at the ceiling and reopened flax era windows, September 2020



©Historic England – Kiln interior, November 2020 showing the replacement roof structure and the lift shaft being constructed.

Other major elements of the project saw the restoration of the Main Mill saw-tooth roof and complete replacement of the Kiln's pyramidal roof. Work to the Main Mill's roof saw the discovery of original 1797 cast-iron valley gutters – with many repaired, and those that couldn't, being replaced using traditional casting methods by Barr & Grosvenor Foundry in Wolverhampton. Installation of a lift shaft within the Kiln, providing access to all floors of not only the Main Mill, but also to the Cross Mill and Warehouse in advance of their future restoration, was also included. The Kiln - left as an unheated atrium with a raw aesthetic – creates a major 'wow' moment for both future commercial tenants and visitors to the exhibition on the ground floor of the Main Mill.

Archaeological work, historic building recording and analysis continued throughout the project, with new discoveries in the three engine houses and the Kiln. This all fed into the design of the extensive exhibition on the ground floor.

The building has also been renamed since Historic England's involvement. First known as Ditherington Mill, then locally as the Maltings, it became important not only to reflect those uses but also look forward to the next century of use – now called Shrewsbury Flaxmill Maltings, it puts not only the building but also the area on the map of key industrial buildings of the world. Further information on the project including details of visiting The Mill exhibition can be found here - https://www.shrewsburyflaxmillmaltings.org.uk/ and in 2015 Historic England also published 'Ditherington Mill and the Industrial Revolution' - https://historicengland.org.uk/images-books/publications/ditherington-mill-and-industrial-revolution/.

A view on the interior of the steam engine brewery © courtesy of the steam engine brewery

EUROPE

EUROPEAN INDUSTRIAL HERITAGE AWARDS

Joeri Januarius, TICCIH Editor, based on a press release from Europa Nostra

—

The European Commission and Europa Nostra have announced the winners of the European Heritage Awards/Europa Nostra Awards 2023. This year, 30 outstanding heritage achievements from 21 countries have been awarded Europe's top honour in the field.

The Awards, funded by the programme of the European Union, are granted in five categories: 1) Conservation & Adaptive Reuse; 2) Research; 3) Education, Training & Skills; 4) Citizens' Engagement & Awareness-raising; and 5) Heritage Champions.

Three specific award winners are of great interest for the industrial heritage community: the steam engine brewery in Czech Republic, the proto-Industrial architecture of the Veneto in the Age of Palladio, and The National Centres for Restoration of Historic Vessels in Norway.

Conservation and adaptive re-use: steam engine brewery

The brewery in Lobeč, Czechia, is a valuable monument with a rich history dating back to 1586. The brewery is located in a picturesque village of 140 inhabitants in the Kokořínsko protected landscape area. The long-term project to restore the brewery has once more enlivened the small village and has ensured that the brewery can be enjoyed for generations to come.

The brewery and malt house had been in continuous operation since the 16th century while the present-day structure has its origins in the first half of the 17th century. In the 1890s, the brewery was modernised into an industrial brewery with a steam engine. Production stopped in 1943; the site had been abandoned since the 1980s and had fallen into disrepair.

The architects Jana and Pavel Prouza discovered the forgotten brewery when they were 30-years-old. Over a 15-year period they worked to revive the monument while fulfilling their dream of living in a monument and developing cultural activities in the countryside.

The initial phase of the restoration focused on the physical preservation of the site, followed by a careful structural restoration. From 2014 onwards, the site was opened to the public with a balanced mix of cultural and business activities to ensure its future sustainability. After the restoration, the original function of beer production was re-established in the form of a small craft brewery.

Environmental responsibility has been emphasised throughout the project, for example, the site uses a system of part heat pumps and part geothermal energy for heating.

Proto-Industrial architecture of the Veneto in the Age of Palladio © Francesco Marcorin

The project has also had a wider impact on heritage conservation practice as an example of successful project management with limited financial resources.

Research: book on the proto-Industrial architecture of the Veneto in the Age of Palladio

The remarkable career of the Italian architect Andrea Palladio was intimately tied to the proto-industrial revolution taking place in the Veneto region between 1500 and 1650. This ground-breaking book uncovers the architectural wonders of early industries such as flour milling, textile production, mining, metalworking, paper manufacturing, ceramics, sawmilling and leather tanning. Through extensive fieldwork and historical research, the research sheds light on the inventive mechanical processes and hydraulic power that drove these industries. The project also investigates the transformative impact of technological innovation on the spatial environment and landscape.

The research project led by Deborah Howard was made possible through funding from the Leverhulme Trust, in collaboration with the Centro Internazionale di Studi di Architettura Andrea Palladio (CISAAP).

The three-year study (2018-2021) involved visits to 79 surviving structures. This survey of the Veneto's proto-industrial heritage is unprecedented in both Italian and European contexts and offers insights into the ecological merits of clean and renewable hydraulic power.

The principal outcome of the research is the publication of the book 'Proto-Industrial Architecture of the Veneto in the Age of Palladio'. This enlightening volume was edited by Deborah Howard and published by the CISAAP with funding from the Italian Ministry of Culture, the Regione del Veneto, the American Friends of Palladio and the Gladys Krieble Delmas Foundation. It features 27 case studies written by the team in both English and Italian, photographs of the buildings, early maps, paintings, drawings, engravings of machinery and film stills.

These sites are often overlooked and lack the protection granted to villas, palaces and churches. They face significant threats and are at risk of disappearing. While some are in precarious conditions, others have been altered over the centuries, yet many are lovingly maintained by proud local inhabitants. The sites' owners, curators and artisans generously supported the fieldwork, cooperating throughout the project.

Education, training and skills: the National Centres for Restoration of Historic Vessels in Norway

The National Centres for Restoration of Historic Vessels undertake significant work to preserve the skills related to the construction and repair of historic ships, an important element of Norway's rich maritime heritage. The Norwegian Association for the Safeguarding of Vessels, an NGO representing owners of traditional vessels, has collaborated closely with the Norwegian Directorate for Cultural Heritage to develop a plan to safeguard knowledge in these areas.

During the 1960s and 1970s, a growing interest in the preservation of historic vessels coincided with significant changes in fishing activities, sea transport and the use of traditional vessels. Many vessels disappeared from ports and the decommissioning of fishing boats

National Centers for Restoration of Historic Vessels, Norway © Nordnorsk Fartovernsenter 2023

was widespread. The skills related to repairing boats were gradually fading away, however, the desire to preserve a representative selection of vessels was growing.

Three vessel restoration centres were established: Bredalsholmen Dokk og fartøyvernsenter in Southern Norway practices traditional craftmanship in the restoration-process of iron and steel vessels and steam boilers, such as riveting and other techniques; Hardanger fartøyvernsenter in Western Norway restores wooden vessels and has expertise in rope making, rigging, blacksmithing, and clinker-built boats and; Nordnorsk Fartøyvernsenter in Northern Norway restores vessels built of wooden boats and Sami vessels and has extensive knowledge of engines and older electronic devices.

The objective of the three centres was to restore a representative selection of vessels. Additionally, the centres offer advisory services to owners of historic ships and engage in documentation and research. As traditional seamanship and associated knowledge of vessels and materials were being lost, the training of craftspeople in traditional crafts and the establishment of apprenticeship schemes became crucial. The restoration projects served as valuable learning platforms to pass on traditional maritime craftsmanship to new generations.

The establishment of the three centres, supported by national and regional grants for their buildings, has yielded significant benefits for local communities and the entire country. Consequently, there has been substantial international interest, attracting craftspeople from across Europe and the world who have been employed for varying durations over the years. The centres hold a unique position within the European context, combining government initiatives, volunteer efforts, private and corporate funding, and long-term public support for a well-defined fleet of more than 270 historic vessels. Owners of historic vessels receive grants and can choose restoration yards with professional expertise

General view of La Cantera fish canning factory (photo by author)

SPAIN

HISTORICAL FISH CANNING FACTORIES IN THE CANARY ISLANDS (SPAIN): THE EXAMPLE OF LA GOMERA

Amara Florido Castro, PhD in Art History from the University of Las Palmas de Gran Canaria

La Gomera is the second smallest island in the Canary Islands, with an approximate area of 370 square kilometers. It is divided into six municipalities: San Sebastián de la Gomera (the island's capital), Agulo, Alajeró, Hermigua, Vallehermoso, and Valle Gran Rey. Throughout history, it has faced a series of persistent difficulties which have hampered its socioeconomic development: remoteness, insularity, limited area, complex orography, and economic dependence on a small number of products.

Despite this, the favorable conditions for tuna fishing in the southern coastal strip of the territory led to the arrival of foreign capital investment, which installed several factories dedicated to preparing fish in brine. Throughout the first half of the 19th century, we witnessed the development of an outstanding fishing industry. The first factory was established in La Cantera, followed by those in Erese, Playa de la Negra, Argaga, La Rajita, Playa de las Cañitas and Playa de Santiago. In the first quarter of the last century, near the Torre del Conde, another establishment is added in San Sebastián.

We begin the cannery tour on the Alajeró coast, at La Cantera Beach, at the end of the Charco Hondo ravine. Originally, it was an industry dedicated to salting and pickling tuna, conditioned in 1831 by the Genoese Francisco Grasso. In 1860 it was acquired by Angelo Parodi, who already owned another facility with similar characteristics in Gran Canaria.

In 1890, one of the owner's nephews, the naval engineer Mario Novaro took over the company, giving it a new impetus by installing the

General view of La Cantera fish canning factory (photo by author)

first oil cannery on this site. In addition to canned tuna, mackerel, and squid, the production - in the thirties of the last century - of what will be its star product: La Gomera caviar is added—an exquisite delicacy made from mackerel roe, which was sold throughout the Archipelago with great success.

La Cantera products opened up to a growing market, especially national and European (Italy, mainly). Mario Novaro is replaced by one of the founder's grandsons, creating the company Novamor, now settled in Tenerife. Its decline occurred in 1976 as catches decreased with the arrival of Asian trawlers and due to labor disputes with employees.

The visit to the industrial complex does nothing more than reaffirm the unfortunate degree of destruction and abandonment that it has suffered since its closure. The enclosure comprises several structures connected by interior spaces.

The machine room, open on one side and roofed with zinc sheets, stands out for its special significance.

We are in front of a spacious and bright space, where the mechanical equipment used to manufacture cans is distributed: shears, moulder, sealer, and former, driven by a Lister motor. As seen in the preserved remains, this device transfers power to each machine through a transmission shaft with pulleys, connected with ropes.

The so-called glass room is a very rudimentary construction in the same room made from metal plates. Opposite the main room are the stove and boilers and the fireplace, with a truncated pyramidal section made of brick and lined with lime mortar. Next is the owners' home and office. The building has a rectangular floor plan with two levels and a four-sided roof, and is in relatively good condition. The rest of the buildings fulfilled various functions: school, machinery repair shop, quarters for the workers, etc.

La Cantera attracted a good part of the working population of Alajeró and its surroundings (Imada, Quise, Las Negrinas...), reaching up to 200 employees in its heyday. More than a factory, Novaro came to create an authentic community whose memories have survived in the collective memory of several generations of region residents. One of them, Carmen García, described to me the process and organization of work in this industry. A valuable testimony, of undoubted interest, that she recollects in the following lines.

First, the tuna is unloaded at the small dock using a crane. The catch is brought to the facility on large wooden wheeled carts pulled along a dirt road. Next, they are weighed and placed on the ground, where male personnel cut up the fish, extract the different usable parts, and slice them into large pieces. Next, they are stewed in the boilers, with plenty of water, for a prudential period. Once cooked, they drain it into large mesh baskets to cool it down, placing the pieces on boards.

Each slice was cut into several pieces. The bones and skin and the inedible dark parts were removed. The waste was piled up in the patio del guano, where it was dried outdoors and ground to make fishmeal, which was sold as compost.

The fish, already cleaned and cut, was packaged in cans and arranged on the tables in the glass room, where olive oil was added.

The cleaning and filling operations of the preserves were reserved for women since they were manual tasks that required special care. The metal containers, of different sizes depending on the content, were previously assembled in the machine room. In this way, they are distinguished: cans of mackerel and tuna (250 and 500 grams) and cans of caviar from La Gomera (180 grams). Once closed, they are distributed in the wood stove for sterilization. Subsequently, the labeling with the company logo was fixed to the surface with a pulley (adhesive made from a mixture of water and flour). Finally, the merchandise was kept in boxes destined for the sales markets.

General panorama of La Rajita factory (photo by author)

Unfortunately, little or almost nothing remains of the company started by the Italian industrialist. The inexorable passage of time, added to the effects of adverse weather conditions and environmental salinity, has given way to rusty machinery and structures that have been demolished or badly affected (including the pier and chimney).

The second most important factory is located at the mouth of the Barranco de Erque, in La Rajita (Vallehermoso), in the same place where Francisco Mora's banana plantation was. As in La Cantera, the initial activity was preparing fish in brine after the land acquisition by the Alicante firm Lloret y Llinares in 1904. Five years later, they converted the farm into a canning factory. The place chosen for the installation of the industry obeys strategic reasons, not only because of its proximity to the coast, but also because a community of fishermen was settled in this same location. They were the ideal workforce for this type of work. The conditions were precarious in very rudimentary constructions with wooden modules covered with zinc sheets. Starting in 1910, the process began to be mechanized, the start of great development and prosperity. The perimeter is extended with several warehouses, an ice factory, and a jetty. The dock had rails facilitating the transport of the merchandise to the pier, which was loaded onto steamers that landed on the beach. One of the most important aspects was, without a doubt, the life created around this industrial enclave, just as it happened in La Cantera. Its implementation led to numerous families settling in this location, working in the landing of tuna and repairing small boats. Likewise, it was a place of education for the children and a meeting and coexistence point for people from La Gomera who found their livelihood in this enclave.

It closed its doors in the seventies due to several factors, mainly the depletion of fishing grounds, an outdated fleet of boats, etc.

The different buildings of the cannery have been dismantled in recent decades. Only one of the first warehouses that served as a material deposit, the power station, the building used to house the workers, and the school remains. In the jetty and small attached dock, some devices related to loading and unloading work can still be distinguished, as well as the base of the primitive wooden davit.

Finally, in Playa de Santiago (Alajeró): Santa Rosalía Salazones y Conservas de La Gomera was promoted in 1931 by the businessman Álvaro Rodríguez López. Although he stood out as one of the most important shipping companies of his time, his role within the canning sector was no less important. It specializes in salting and canning tuna, bonito, squid, and other fish. His fleet comprised twenty fishing vessels, six small boats, and two merchant ships to transfer the final product.

The one in Playa de Santiago was the last cannery to cease manufacturing activity. The factory complex was demolished, raising an apartment block in the same place.

View of the ruins of the village of Bragno (Cairo Montenotte): in the background the chimneys of Italiana Coke, a company that processes imported coal in Bormida Valley, Italy. Credits: Land-In-Pro, F. Pompejano (2023), CC BY-NC 4.0

ITALY

LAND-IN-PRO, A RESEARCH PROJECT ON (POST)INDUSTRIAL LANDSCAPES

Dr. Federica Pompejano, RTD-a Researcher ICAR/19 and Principal Investigator of Land-In-Pro, Department of Architecture and Design (DAD), University of Genoa (UniGe), Italy

Land-In-Pro is the acronym of 'Landscapes of Industrial Production: Documenting and Assessing (post)Industrial Landscapes as Resources', a research project funded by the Italian Ministry of University and Research.

Land-In-Pro focuses on the tangible and intangible legacy left by the 20th-century (de)industrialization processes in the landscape of the Liguria region in Italy, envisioning it as a living testimony of the past and a potential resource for a sustainable and resilient future.

The conservation and management of modern architectural heritage and landscape dilemma have been a pivotal discourse since the last decades of the 20th century. It increased its importance to the present while embracing urban planning and socio-economic sustainable development perspectives in an integrated strategy towards a conscious conservation/transformation approach. The (post)industrial heritage and landscapes are part of this discourse. They should be addressed not as relics of the past but as local resources for the future able to trigger conscious transformation that creates liveable and sustainable places for their communities.

The Land-In-Pro research project considers the territory of Liguria as a case study that exemplifies the high pace of 20th-century (de)industrialization processes causing a profound transformation of the pre-existing landscape characteristics and dynamics. All over Europe, 20th-century modernization processes shaped diverse industrial landscapes that became direct protagonists in the active and incessant production processes linked to the extraction and

View of the ruins of the village of Bragno (Cairo Montenotte): in the background the chimneys of Italiana Coke, a company that processes imported coal in Bormida Valley, Italy. Credits: Land-In-Pro, F. Pompejano (2023), CC BY-NC 4.0

refining of raw materials, and to an ever-evolving technological renewal, but also to the social dynamics, manifesto of the socio-economic policies of the time. From the mid-19th century and up to the mid-20th century, the Ligurian coastal areas, as well as the rural hinterland, became the sites for the building of modern factories, placing the region at the competitive international level in the raw materials processing sector, in the metallurgical and mechanical, but also in the chemical, naval, textile and food industries. Industrial development was significant, coinciding with the development of roads and rail networks in support of industries. The decline of the Italian economic expansion phase in the 1970s and the new competitive economic global scenarios heavily impacted the Ligurian industrial structure, gradually leaving behind former productive landscapes of relevant size and complexity.

Beyond its tangible manifestation as cultural heritage, industrial heritage, and landscapes are contested issues in land management, architectural and urban planning, and cultural heritage and socio-economic policies. In fact, most European countries face the challenge of protecting their architectural and historical values while adapting/transforming industrial heritage sites and buildings abandoned in the territory. Despite encompassing architectural, historical, and technological values, most of them are not considered heritage. The question of assessing and what to do with them is highly relevant to the present, especially considering the EU Green European Deal. The current global approach advocates moving beyond existing regulatory/management frameworks, suggesting a revision of local urban planning governance practices and safeguarding policies to adapt to the new European challenges in terms of reconciling heritage conservation and development initiatives. In this sense, the (post)industrial heritage potential value in terms of sustainable transformation and adaptive re-use is strongly connected to their regional and local ecological, economic, and socio-cultural key challenges, such as the promotion of local identity, the integration of cultural heritage conservation and adaptive re-use policies and strategies into urban planning and landscape governance tools, the regeneration and improvement of blue and green infrastructures, the upgrade or boosting of sustainable regional economies. To address its overall questions, Land-In-Pro draws its methodology from the preservation of landscape and heritage studies, ethnographic methods, and spatial analysis, intending to generate significant knowledge through an interdisciplinary approach. Land-In-Pro will explore, document, and assess the legacy of the (de)industrialization processes in the peculiar Ligurian landscape as a representative case study. The research project aims:

- to identify and investigate the diversity of buildings and sites that witnessed the impact of major 20th-century (de)industrialization processes in the landscape.
- record and analyze narratives embedded in the memories and social life of local communities in selected sites and local government stakeholders' challenges.
- interpret, evaluate, and assess industrial heritage as a resource for local sustainable development policies.
- unfold new perspectives and pose further questions on conservation and adaptive re-use strategies of (post)industrial heritage for local communities' sustainable development given Europe's green transformation.

To this end, Land-In-Pro will share the research data openly and will attempt to develop a flexible and adaptable assessment tool based

on the comparative analysis of multi-level and multi-sectoral urban and landscape planning and conservation policies and practices to support the evaluation of the (post)industrial landscapes/sites actual conditions and inform and regulate the implementation of future transformation strategies and policies. The project is developed by Dr Federica Pompejano at the University of Genoa (UniGe) in collaboration with the research group of the Laboratory of Analytical Methods for Restoration and History of the Built Environment, Department of Architecture and Design (DAD) and the Geomatics Laboratory, Department of Civil, Chemical and Environmental Engineering (DICCA).

More information

Website: https://landinpro.unige.it/

Instagram: https://www.instagram.com/landinpro_project/

e-mail: federica.pompejano@unige.it - landinpro@unige.it

Titan at Gatun Lake, Unidad de Memoria Histórica del Canal de Panamá. 2010.

PANAMA

PANAMA TITAN CRANE. KEY MOMENT FOR ITS SAFEGUARDING

Carlos Mateo Caballos, researcher CIHAC-AIP and Silosy Graneros.es, Architect at We Restauro S.A.

In Panama, we have the unprecedented opportunity to revalue a colossal crane as industrial heritage. The crane can still be operated, and the authentic state allows us to understand the specific technology. Moreover, during the 82 years of existence of the Titan Crane, it left numerous pieces of documentation that help retrace its use. The Titan Crane Rehab Project aims to transmit both the technological and human history associated with the crane.

Manufactured in Germany in 1941 by renowned century-old companies such as Demag, Siemens, and Krupp,[1] it was considered the most advanced floating crane[2] in the world for decades. It resulted from years of improvements on the double jib crane system. Initially, this crane was installed at the Germaniawerft shipyard (Kiel, Germany), where it supported the construction of U-boat

1. Tigler, Hasso y Günther, Lehmann, "größte Schwimmkran Anlage Welt neuer 350 Schwimmkran", Revista "Werft - Reederei - Hafen", 24. Jahrgang 1943, Heft 1/2, S. 2-30, Springer-Verlag Berlin, Editor J. Springer, 1943

2. Description and regulations for attendance and maintenance of 350-ton floating crane. Demag fabrication n° 209620/49. (1941)

Titan at Long Beach Naval Shipyard. Circa 1955.

submarines with its 350-ton load. The construction of the crane itself and its subsequent use are full of testimonies of forced labor by the Kriegsmarine's suppliers. This crane has three twin sisters, two of which disappeared underwater in the war or post-war conflict; a third was seized by the Soviets and is now documented in the Admiralty Shipyard, St. Petersburg (Russia).

The indemnities established after the war's end involved sharing this advanced technology. The US Navy transferred the crane to the Long Beach Naval Shipyard (California), where it was used until 1994 under the name of YD-171 or Herman the German, when it was symbolically sold to the Panama Canal Commission for maintenance work on its locks.

The research work carried out over the last year under the auspices of the *Centro de Investigaciones Históricas Antropológicas y Culturales AIP-Panamá* aimed to revalue this equipment under three main premises: documenting its technological value, opening the door to the oral memory of its workers and linking this equipment to the global recognition of the victims of slave labor and the Holocaust.

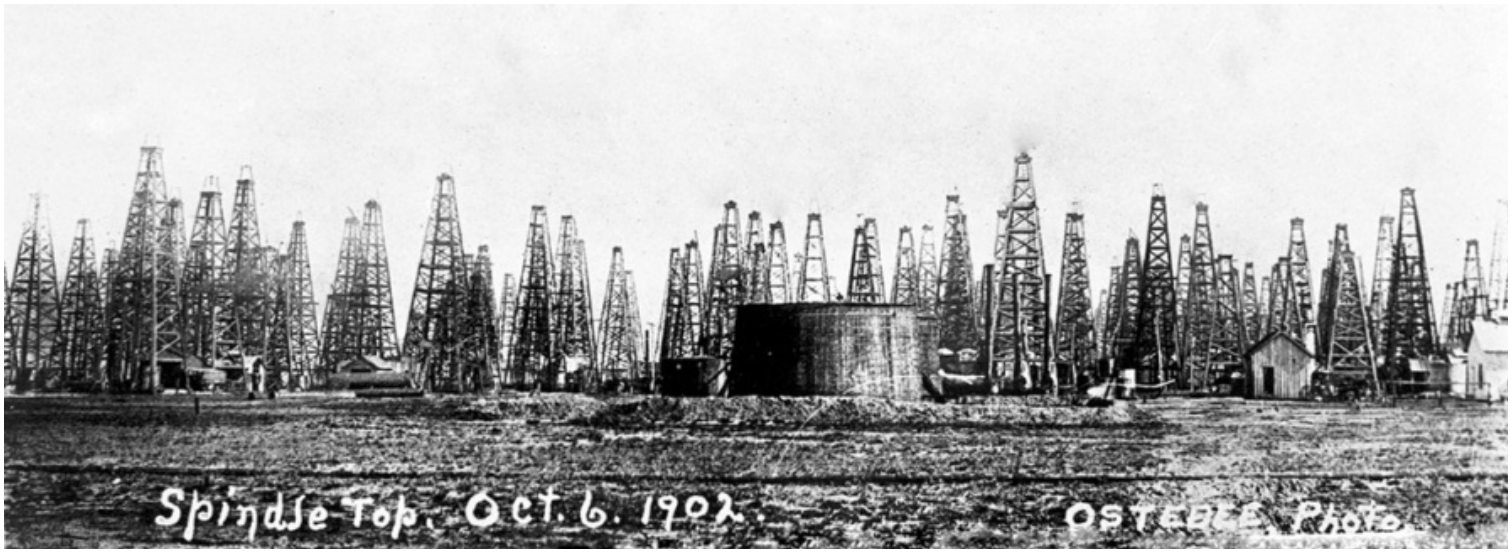
From an engineering point of view, the main designers Hasso Tigler (Demag, Duisburg) and Günther Lehmann (Deutsche Werft Hamburg) were already portraying in 1943 the technological importance of this creation. Numerous international publications (Popular Mechanic Magazine, The International Engineering Congress, Scientific American, among others) echoed the virtue of the product developed by Demag in relation to cranes, and especially with Titan. Its 62.50 m long and 33 m wide barge supports the tower, whose maximum height reaches 114 meters, giving it a weight of approximately 5000 tonnes. It can rotate 360 degrees with enormous precision thanks to the power supplied by its three Motoren-Werke Mannheim 800 kVA.

Titan during locks maintenance work. 2000. Unidad de Memoria Histórica del Canal de Panamá.

In relation to the workers' culture, the oral history of the Panama Canal workers can provide additional information on the importance of the workforce of the Dredging Division in charge of the maintenance tasks of the century-old lock gates. This crew of 23 persons is responsible for the maintenance, precisely operating the crane's hoists. This arduous work of compiling the oral memory in the Californian shipyard and in Panama needs to be further developed. It contributes to the interpretation of the crane from a social perspective. The family created around the Division itself is already a source of national pride and a symbol.

Regarding the victims of forced labor during the manufacture and use of the cranes, the weight of Nazi oligarchs and their power within the oppressive apparatus is worth noting. Studies consulted speak of thousands of workers held in hundreds of concentration camps built and run by these companies, often in conjunction with the Gestapo, the Schutzstaffel (SS), and the Armed Forces. Taking a universally inclusive view, we cannot miss this opportunity to frame the equipment within its historical context and take it one step further in its interpretation.

The feasibility of a revaluation project requires an adjustment of the available funds to the public impact of a new destination. In the proposal, we aim to maintain the crane in the context of the Panama Canal with initial public accessibility and heritage interpretation. The news of its abandonment generated great expectations among engineers. Still, we must direct its future towards resignification and discard the administrative negligence of the local authorities, who earlier already let go of crucial pieces such as the Centenary Miraflores Bridge. The Panama Canal Authority is in a position to transform this equipment into an engine of social regeneration linked to one of the most fascinating industrial landscapes ever created by mankind: the Panama Canal. The support that TICCIH has recently shown for the crane revaluation project that we will present to the local authorities is really encouraging.



Spindletop Oil Fields, Jefferson County, Texas. 1902. Lamar University Archives.

USA

OIL HERITAGE IN THE GOLDEN TRIANGLE. SPINDLETOP-GLADYS CITY BOOMTOWN

By Zachary S. Casey and Asma Mehan, Huckabee College of Architecture, Texas Tech University, Lubbock, Texas, U.S.

Spindletop Oil Fields

In the heart of Southeast Texas, an industrial powerhouse often termed the 'Golden Triangle', the oil refineries and petrochemical plants stand as stalwart testaments to the region's economic evolution. Interestingly, before the discovery of oil at Spindletop, the lumber and cattle industries powered this region's economy. A profound shift occurred when the Lucas Gusher, a fountain of oil spurting hundreds of feet into the air, struck the lands of Spindletop Hill on January 10, 1901.

This remarkable discovery of the Spindletop oilfield on a salt dome formation south of Beaumont, Texas marked the birth of the modern petroleum industry and fundamentally transformed the region's geo-political, economic, and cultural landscapes. People from all over the country relocated to Gladys City and Beaumont in search of work and new opportunities, creating a boomtown as the town's population swelled from 10,000 to 50,000. The newfound urbanization brought by the oil industry transformed the town and the surrounding areas, creating a ripple effect across the region that would be felt for generations to come.

The surge in oil-driven economic activity transmuted the region into a vibrant nexus of commerce, with the oil industry emerging as a critical architect of growth and advancement. This newfound affluence incited by the petroleum sector ushered in an era of economic diversification, laying the groundwork for industrialization's further evolution.

The Spindletop Oil Fields not only underscored the United States' ascent as the foremost petroleum-producing nation but also signaled the nation's initiation into the Petroleum Age. It was Spindletop that solidified its position as America's first significant oil field, becoming an enduring symbol of its industrial might. By 1985, over 153,000,000 barrels of oil had been produced had been extracted from the Spindletop oil fields, underscoring the magnitude of this extraordinary resource

Spindletop-Gladys City Boomtown Museum

Emerging south of Beaumont, Texas, in 1892, Gladys City conceived with the ambition of becoming an exemplar of industrial excellence. The city was to feature factories, schools, churches, homes, parks, and business for industry workers of the nearby Spindletop Hill. The city was meticulously designed, with provisions for factories, schools, churches, homes, parks, and businesses tailored to cater to the industry workers of the nearby Spindletop Hill. This industrious vision, however, underwent an unprecedented transformation with the eruption of the Lucas Gusher in 1901, leading to Gladys City's metamorphosis into a booming epicenter of oil production.

With the sudden onset of the oil boom, Gladys City expanded at an astonishing rate, with new clapboard buildings mushrooming across the landscape to accommodate the influx of oilfield workers and their families. Unfortunately, by the early 1970s, much of the original Gladys City had been razed, succumbing to the march of progress and the passage of time.

Gladys City Boomtown. 1902. Lamar University Archives.

Recognizing the need to preserve the region's rich industrial heritage and the historical significance of Spindletop, Lucas Gusher, and Gladys City, a meticulous reconstruction of the city was undertaken. Visitors to this reimagined cityscape are transported back to the heady boomtown days. They can witness the awe-inspiring spectacle of Lucas Gusher's discovery on January 10, 1901, re-enacted with a functioning replica that shoots water skyward at the same pace as the original oil gusher.

The Spindletop-Gladys City Boomtown Museum serves as an immersive historical tableau, allowing visitors to engage with artifacts and memorabilia that echo the hopes and aspirations of the early prospectors. The museum provides a window into the complex process of drilling for oil during the dawn of the 20th century, commemorating the gusher that forever altered the trajectory of Texas. Vestiges of this dynamic industrial past are scattered throughout Southeast Texas, from the meticulously reconstructed Spindletop-Gladys City Boomtown Museum to the insightful Texas Energy Museum and the countless oil derricks punctuating the landscape. These landmarks are enduring reminders of the transformative power of the Spindletop oil discovery and its pivotal role in shaping the state's — and indeed, the nation's — economic and industrial landscapes.

The Golden Triangle

The Spindletop revelation charted a transformative course in American history and reshaped the country's landscape. It ushered in a rush of investment as stakeholders staked billions of dollars, hoping to unearth the next significant petroleum reserve. Spindletop became the breeding ground for major American oil companies and catalyzed their significant corporate stature. These corporations include The Texas Company (later Texaco), Gulf Oil Corporation, Sun Oil Company, Magnolia Petroleum Company, and Humble (later Exxon Company, U.S.A.).

These corporations' relentless pursuits yielded enormous volumes of inexpensive fuel, revolutionizing the American transportation sector, and reshaping the economic contours of the time. Spindletop's discovery's ripple effect permeated beyond Gladys City and Beaumont. It catalyzed transformative changes across neighboring counties, inducing regional economic and demographic shifts and bolstering growth and urban development.

This monumental industrial activity drastically redefined these cities, leaving a lasting imprint on their urban identities. The cities of Beaumont, Port Arthur, and Orange have become known as the industrial "Golden Triangle," an area of intense economic activity centered around the oil, petroleum, and petrochemical industries.

This industrial cornucopia houses a chain of significant refineries, most notably in Beaumont and Port Arthur. Among these stands Motiva, the United States' most significant oil and petroleum refinery. Beaumont, Port Arthur, Sabine Pass, and Orange, all nestled around Spindletop, became hosts to expansive storage facilities, pipeline networks, and critical refining units, further solidifying the Golden Triangle's stature as a focal point in the nation's industrial landscape.

In conclusion, the transformation catalyzed by Spindletop—from a regional economy based on lumber and cattle to a globally significant petroleum hub—signifies its substantial impact on America's development. Nevertheless, one must not overlook the environmental toll this industrial revolution took, as increased factories, refineries, and storage units also led to pollution spikes.

Spindletop-Gladys City Boomtown Museum. 10 Jan. 2023. Lamar University Archives.

Today, amidst growing concerns about climate change, it is critical to reassess the long-term viability of petroleum-dependent economies. Spindletop's legacy underscores our historical reliance on fossil fuels, necessitating a reflection on our shift toward renewable energy sources.

Ultimately, the history of the Golden Triangle is a testament to the interplay between human ambition, technological innovation, economic development, and environmental consequences. It underscores the urgent need for a more sustainable and balanced approach in our ongoing energy transition and in the way we consume energy.

BOOK REVIEW

RIO GRANDE STEAM FINALE: NARROW GAUGE RAILROAD PHOTOGRAPHY IN COLORADO AND NEW MEXICO

Scott Lothes and Elrond Lawrence, editors, with essays by Don L. Hofsommer and Karl Zimmerman. Madison, WI: Center for Railroad Photography & Art, 2023. 228 pages, Hardcover, 200 color and b&w illustrations. (ISBN 978-1-734 5635-2-8) $60.00.

Reviewed by Betsy Fahlman, professor of Art History, Arizona State University

The Denver & Rio Grande Western Railroad's San Juan Extension operated in the remote and rugged country along the Colorado-New Mexico border. As Scott Lothes observes in his "Foreword," in the rich annals of American railroad history, "perhaps no other lines have received attention in such great disproportion to their size than the narrow-gauge railways of southern Colorado." (6) The collections of the Center for Railroad Photography & Art comprise the work of nearly 100 artists and nearly a million images and the narrow-gauge is amply represented in most of the CRP&A collections. The D&RGW's San Juan Extension, which began operations in 1881, is a fascinating chronicle of mountain railroading. Its end began in the 1950's, during which it kept running, but without new investment its days were numbered.

Railroad photographers have long been fascinated by the narrow-gauge trains whose rails were set thirty-six inches apart (standard gauge is 52 ½"), and *Rio Grande Steam Finale* takes readers on a splendid voyage through the 290-mile route of the D&RGW. Don L. Hofsommer's essay attests to the attraction of these trains these have for railroad photographers: "There is No Cure: Early Exposures to the Narrow Gauge." Karl Zimmerman had a similar epiphany, as he details in "How I Learned to Love (and Lose) the Narrow Gauge." The popularity of these trains has resulted in ample documentation.

The 200 high-quality color and black-and-white images from the fifties and sixties document not just images of the locomotives, but the entire operational ecosystem of the railroad, including the many skilled men who kept the trains running, and the communities where they and their families lived. The photographers found much more to engage them, finding "railroading practices and traditions that spanned generations." (7) They photographed in all seasons, during the day and at night, and in good weather and bad. The result is a rich visual chronicle of a significant chapter of railroad history in the last decades of its existence.

The book is organized as a journey from Alamosa to Farmington and back, and features the work of Tom Gildersleeve, John Gruber, Victor Hand, Jim Shaughnessy, Fred Springer, and Richard Steinheimer. The editors have divided their chapters into ten sections, each devoted to the most significant parts of the route: Alamosa, West to Chama, Chama to Durango, Durango, the Farmington Turn, Durango to Chama, Chama, the Cumbres Turn, the Return to Alamosa, and The Silverton. Each of these divisions is amply illustrated, with helpful introductions and captions.

Alamosa, situated at 7,545 feet above sea level in the San Luis Valley was the busy center of the D&RGW. Among the photographs is one of the roundhouse where a "fleet of ancient rolling stock was maintained." (22) The run from Alamosa to Chama could take twelve hours due to slow speeds and frequent stops for water, with fifty miles of a punishing grade to climb to the Cumbres Pass, elevation 10,015 feet. When the silver and gold booms ended, Silverton faded but then experienced a rejuvenation in passenger traffic due to Hollywood and tourism. The routes feature spectacular landscape vistas, with signs identifing each town and station. There are tunnels and bridges, water tanks and coaling towers, and horseshoe curves where the entire train was visible. Views inside the cab with its array of pressure gauges, control pipes, and valves convey the complexity of operating the heavy engines. Master mechanics kept the narrow-gauge trains running until freight operations ceased in 1968.

The future looked grim for the narrow gauges, and within several years, much was scrapped and salvaged, but efforts to save the two most scenic routes were successful. In 1970, the states of Colorado and New Mexico jointly purchased the sixty-four miles between Chama and Antonito, establishing the Cumbres & Toltec Scenic Railroad. The last D&RGW narrow-gauge line, from Durango to Silverton, was sold in 1981 to become the Durango and Silverton Narrow Gauge Railroad.

Rio Grande Steam Finale, ends with the recent work of several younger photographers: Justin Franz, Rick Malo, Nicholas D'Amato, Karl Zimmermann, Anthony D'Amato, Elrond Lawrence, William E. Botkin, and William Diehl.

A detailed and very clear map of the Rio Grande Narrow Gauge presents the entire route from major nodes from Alamosa to Antonito, on to Cumbres, connecting at Durango south to Farmington and north to Silverton. There were many stops in between, with altitude noted for each. Also documented are several historical milestones: D&RGW Narrow Gauge Lines circa 1950-1970, D&RGW Dual Gauge Lines circa 1950-1970, Rio Grande and Southern Line circa 1950, D&RGW Narrow Gauge Lines abandoned before 1950, and Connecting Standard Gauge Lines.

In his "Afterward", Richard Tower, observes that it has been fifty-five years since the Denver & Rio Grande Western Railroad freight trains made their last runs. Many of the descendants of those who settled in the area when it was still Spanish and Mexican territory continue to live in those communities. They also continue to work for the railroad, which now carries passengers not freight. Both railroads have faced financial and operational challenges, including the weather, but have continued to survive and modernize.

Railroad photographers have long been fascinated by the narrow-gauge trains whose rails were set thirty-six inches apart (standard gauge is 52 ½"), and *Rio Grande Steam Finale* takes readers

LINKS TO ONLINE EVENTS CALENDARS:

- TICCIH Conference Calender
- ICOMOS Conference Calender
- UNESCO Events

To add events to the TICCIH Calender please send details and a link to ticcih@mtu.edu

TICCIH

The International Committee for the Conservation of the Industrial Heritage

BULLETIN

NUMBER 101 · 3rd Quarter 2023
ISSN 1605-6647