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Archeologia industriale: ancora una disciplina di frontiera?

Industrial Archaeology: still a frontier discipline?

A cura di
Aldo Castellano
e Luca Mocarelli

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Industrial archaeology: what future does it have in France?

L'Archeologia industriale: quale futuro in Francia?

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ABSTRACT

Industrial archaeology, which emerged in the 1960s, has established itself as an autonomous discipline, influencing innovative heritage initiatives and contributing to the development of industrial heritage. This discipline has a tangible cultural impact and addresses controversial issues related to capitalism and business, particularly regarding social and cultural implications.

In France, industrial archaeology emerged in the 1970s, primarily within associations and museums, but also in higher education and research. Maurice Daumas initiated thought on this subject, followed by Bertrand Gilles and Denis Woronoff, who defined industrial archaeology as the study of the link between production and the place of production. This discipline deals with buildings, infrastructures, and their material, human, and abstract elements, requiring observation, excavation, and the analysis of written, iconographic, and oral sources.

Industrial heritage is a social construct that involves the protection of material or abstract objects according to aesthetic, historical, political, religious, social, or technological criteria. It includes not only production sites but also social, economic, cultural, religious, or sports infrastructures. The complexity of industrial heritage led to the creation of a specific department within the French Ministry of Culture in 1983. Since the late 20th century, research has extended beyond the period of early industrialization, including sites still in operation, such as railway stations and airports. Some areas, such as the Nord-Pas-de-Calais Mining Basin and the hills,

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Historing housing adaptations
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houses, and cellars of Champagne, have been recognized as Unesco World Heritage sites, integrating heritage conservation with local economic activities.
Inclusion in the Unesco World Heritage list has promoted the development of industrial heritage in France, but it has also generated tensions related to mass tourism and the sustainability of the sites. The adaptation of historic housing, such as worker housing, raises dilemmas between respecting historical and cultural significance and adapting to modern needs and climate change. Examples of effective renovations demonstrate that it is possible to improve energy efficiency without compromising external aesthetics.
The preservation of software and source code as new intangible technological objects represents a challenge. Contested heritage, such as colonial industry and the environmental impact of industrial activities, requires further study. The difficulties of preserving heritage linked to polluting and hazardous activities are evident, as demonstrated by the controversy over Marie Curie's laboratory in Paris.
Technological museums, born from interest in industrial heritage, play an important role in transmitting technological and artisanal knowledge. Some museums house valuable collections and offer training to perpetuate skills in the sector.
In conclusion, industrial heritage has become a very active disciplinary field, with significant repercussions on the economy and territorial strategies, as well as representing an important challenge for future research.

1. The Forge de Buffon was established in 1768 by the Count of Buffon, a celebrated French scientist, biologist, mathematician, philosopher, naturalist, and writer. It was one of the earliest integrated factories of the 18th century, where all stages of production were designed and rationalized in the same space, including the owner's home. Buffon conceived the site in the manner of an engineer and stage director, with the discovery of the blast furnace staged via a staircase reserved for distinguished guests. The site also stands out for the generations of energy used, namely water, charcoal and coal. The different phases of historical monument protection (1943, 1985 and 2021) demonstrate how the notion of industrial heritage has evolved from the industrial building to encompass the entire technical site. The site is currently owned by the Buffon family, who have held the property since 1860. It is open to the public as a cultural site, combining industrial and natural heritage. ©Xavier Spertini

Since its advent in the 1960s, industrial archaeology has established itself as a discipline in its own right, with its work lending credence to or serving as the basis for novel heritage initiatives while also contributing to the development of an industrial heritage. It is part of active research and places the historian at the forefront as a fully-fledged actor in the society in which he or she may live and upon which they act in their time period, to quote Lucien Febvre[1]. The cultural impact of this work is eminently tangible. However, the coming to terms with a given industrial heritage also raises contentious issues involving the processes inherent in capitalism and business, in particular with regard to their implications for social and cultural developments.

An epistemological approach

Industrial archaeology first made its appearance in France in the 1970s, most noticeably in the associative and museum spheres while simultaneously enjoying a presence in higher education and research circles. This vibrant community collaborates closely with their European counterparts. Maurice Daumas[2] works, published in 1980, serve as the bedrock for this disciplinary field and marked the beginning of thought on this subject which continues until the present day. Bertrand Gilles, resident professor at the l'École des Hautes Études en Sciences Sociales (School of Advanced Studies in the Social Sciences), author of a solid *histoire des techniques*[3] had already devoted a research seminar to it, an initiative cut short by his sudden passing. In 1989, Denis Woronoff characterised industrial archaeology as a field discipline, defined by «l'étude du lien entre production et lieu de production»[4]. Its subject matter applies to buildings and infrastructure as well as their material, human and abstract elements. The study of a site therefore requires its observation, its excavation and its examination using written, iconographic and oral sources in order to facilitate cross referencing between these separate sources. In the current state of affairs, the contributions of industrial archaeology have widely been recognised as being of import, in particular with regard to the history of labour and to the history of technology. Finally, Denis Woronoff outlined the constraints of the work conducted so far: the abundant (excessive?) attention dedicated to the proto-industrial period and to a select few sites of particular grandeur, such as the Menier chocolate factory, the Royal saltworks at Arc-et-Senans, or the Buffon Grande forge. In 2002, Serge Chassagne[5] underlined the semantic shift made from industrial archaeology towards industrial heritage and the broadening of the concept at hand. He mentioned in particular the «multiples transformations, réhabilitations, muséifications» of productive spaces which have now become objects of novel studies, under what has been termed "conversion". He recalled, similarly as Maurice Daumas before him, how this «vaste champ disciplinaire [est] désormais commun à bien des spécialistes de l'économie, de la société ou de ses productions, matérielles ou artistiques». This represents a similar situation which is commonplace in other disciplines such as environmental history. In this context, the intention is to gather knowledge from field studies, protect these material sources and foster and utilise expertise to safeguard industrial heritage. Other researchers have since then reinforced this reflection, formalised practices and initiated new projects[6].
Heritage, in the cultural sense of the term, is the fruit of social construction, by which institutions or groups of individuals decide to distinguish and protect an object, whether it be material or abstract in nature, according to criteria which are by definition heterogeneous and evolving; the aesthetics of the object and its historical importance are the most determining arguments along with whether or not it relates to political, religious, social or technological history. Industrial heritage does not only extend to sites and their production means; it can also be applied to any and all social, economic, cultural, religious or sporting infrastructures erected as part of a productive activity to supplement the conditions of employee life, as well as to collections of scientific and technological objects and landscapes. Its heterogeneity and its particularities therefore make it difficult, if not impossible, to make use of the criteria taken from the Beaux-Arts which were implemented by the Services des Monuments historiques for a considerable amount of time. It is precisely for this reason that, in France, the Ministère de la Culture (Ministry of Culture) was encouraged to create a department specifically dedicated to industrial heritage under the administration of the Département d'Architecture et du

Patrimoine[7] in 1983.
Since the end of the 20th century, novel developments have occurred at different levels. Researchers have gone beyond the period of nascent industrialisation alone to take into consideration all types of technological heritage over a considerably longer timespan with research efforts no longer solely being concentrated on the study of production sites or obsolete infrastructures but also on material still in operation, such as railway stations or airports. Vast areas are now being researched: territories, such as the *Bassin minier du Nord-Pas-de-Calais* (Unesco, 2012) and the *Coteaux, maisons et caves de Champagne* (Unesco, 2015), requiring the creation and implementation of complex management plans to ensure both the preservation of cultural property and the continuation of economic activities in the territory concerned[8]. Industrial archaeology and its heritage now count among their adherents a vast community of researchers in both French research and higher education establishments. Industrial heritage has had a notable impact on the economy and features in the strategies of both companies and territory administrators[9] at all conceivable levels: museums and visits of facilities/businesses offer two highly visible examples[10]. Testament to this newfound visibility were features written by two well-known French guides: the world-renowned *Guide Michelin* devoted two publications to the topic of *Patrimoine Industriel* (Industrial heritage), while the *Guide du Routard* guidebook did likewise on the topic of *Visite d'entreprise*, which includes regional variations[11]. Cities such as Dunkirk, Elbeuf and Pantin have been developing territorial marketing strategies, dynamics and achievements with this novel heritage aspect serving as the fulcrum[12]. Industrial tourism is growing thanks to the impetus provided by both national and European initiatives, one such example being the European Route of Industrial Heritage[13]. The crowning achievement of this research is that it has also entered the scope of Unesco world heritage site recognition, which offers an accreditation to sites and industrial landscapes of significance with a number of French locations featuring on the Unesco List of world heritage sites.

The impact of Unesco

Addition to the Unesco world heritage list has been one of the key drivers of the development of industrial heritage worldwide of which France has been no exception. This distinction has important consequences with regard to economic, cultural and social factors and can be a source of both tension and conflict[14] with mass tourism, for example, being one of the most undesired consequences of a site's inclusion, one which has proven to be a threat to the sustainability of certain locations.
The preparation of the Nord-Pas-de-Calais mining basin candidacy for its Unesco classification marked an important turning point: the notion of an evolving cultural landscape was successfully appropriated by that of an industrial heritage, but not without difficulty, although it nevertheless remains the most successful example[15]. A number of experts sent in an advisory role by Icomos[16] were present throughout the application process. This on-site expertise and knowledge allowed for the refining of the region's industrial history and its heritage, which subsequently made it possible to conclude on the nature of industrial heritage, to develop methodologies in the heritage analysis of sites and stakeholders as well as to formulate methods of conversion and valorisation[17].
In addition to the material, historical and technological value of the sites, the specificity of industrial heritage must be highlighted. This specificity refers to its inherent capacity to bolster the resilience of territories and their populations and to preserve this intangible dimension through education and technical skills. It was with this nuanced understanding that Jean-François Caron, mayor of Loos-en-Gohelle, put forward the candidacy of the Nord-Pas-de-Calais mining basin[18] for Unesco recognition. Consequently, the active participation of resident populations in heritage projects was both necessary and indeed constituted one of Unesco's expectations. The participation of resident populations takes many different forms; for example, a recent initiative in the mining basin involved a play during which school children from numerous schools reconstructed the process of exchanges which took place at the *Comité du patrimoine mondial* (World Heritage Committee). The project, inspired by an educational ethos, raised awareness of industrial heritage among participating pupils while the play itself was performed in the as-

sembly auditorium of the Hauts-de-France region[19].
The essential role of citizens at the heart of contemporary and future discourse on industrial heritage is therefore a fundamental issue across many different aspects. That of housing is perhaps the most acute aspect, representing as it does a dilemma between needing to adapt lodgings in response to climate change while also conforming to modern comforts. This adaptation, raising as it does the question of respecting the historical and cultural significance of the housing involved, has proven to be a point of contention.

Historic Housing: adaptations

The history of worker accommodation designed for/by companies, their scale, their typology and their heritage value are the subject of numerous multidisciplinary works. These lodgings also form part of an abstract heritage, with interviews conducted with residents demonstrating the value of such places in the collective conscience. Such memories of residents, based on that passed down by their parents or grandparents, reflect specific practices within these housing estates which relate back to a form of identity that is inherent to them. From a material point of view, terminology is important with regard to the characterisation of the intentions, implementation, forms and uses of housing, at both the scale of the neighbourhood and the larger city as a whole. The research work making use of company towns as its subject matter is a telling example: within the same expression, a wide variety of situations can be found[20]. However, on a local scale, there are numerous examples of sites under threat, despite their proven historical and heritage value, whether it be due to being the subject of demolition or modification projects, or due to the pressing concerns of climate change. This phenomenon can only be expected to worsen over time and will persist in being a major issue for years to come.
Highly successful examples exist of climate-change motivated modifications being made to housing which make a compelling case in defence of such a solution. This positive solution can be typified by the example of insulating the interior of such housing without distorting the external façade of the house itself. In 2016, the Subileau report[21], commissioned by le *Ministère de l'Environnement, de l'Énergie et de la Mer* (the Ministry of the Environment, Energy and the Sea) estimated that 70,000 homes in the mining towns of the Nord and Pas-de-Calais *départements* were in a dilapidated state, inadequately renovated and highly inefficient with regards to energy consumption. A partnership contract of national interest was put in place for the mining basin of the Nord and Pas-de-Calais departments, in order to provide sufficient resources to remedy this situation. In 2017, the State, the Hauts-de-France Region, the Departmental Councils of Nord and Pas-de-Calais, the agglomeration communities and municipalities of the territory were all signatories to *l'Engagement pour le Renouveau du Bassin Minier Nord-Pas-de-Calais* (Erbm -Commitment for the Renewal of the Nord-Pas-de-Calais Mining Basin) for a duration of 10 years. This contract concerns 8 inter-municipalities, bringing together 250 municipalities and 1.2 million inhabitants. Essential work is currently underway, being conducted primarily under the auspices of the *Mission bassin minier*, while a reference document has been compiled for the renovation of mining towns[22]. The renovation of the Darcy housing estate in Hénin-Beaumont, one of the first garden cities built by the *Compagnie des Mines de Dourges* (Dourges mining company), began in June 2023. It is one of the 353 elements classified as world heritage on June 30, 2012, by Unesco. An example to the contrary can, conversely, illustrate the difficulty in preserving such heritage. The Courées de l'Épeule housing estates in Roubaix have long been the focal point of an emblematic struggle dating from the beginning of the 20th century[23]. Roubaix is a former textile factory town located in the north of France, whose meteoric rise in the 19th century occurred against the backdrop of its key role in wool processing. The development of the city was not the subject of urban planning, with factories and housing were built on an ad hoc basis. Textile manufacturers, unlike the mining companies elsewhere in the region, built almost no housing for their workforce, delegating this task instead to private investors. As a result, a whole series of modest and rudimentary housing units were built until 1934, primarily in small landlocked spaces in the city featuring small houses most often constructed around a courtyard, hence the name *courée* (from the French *cour*

-courtyard-)[24]. Such phenomena have been common to other economic areas since the Middle Ages. From the end of the 1960s, the city experienced a brutal period of deindustrialisation that was all the more damaging as the textile industry was Roubaix's predominant economic driving force. Today it is one of the most economically deprived French cities. The dilapidated living conditions of the *courée* housing estates were also a reality in the strictest sense; they had no running water, shared toilets located in the courtyard and only a central gutter for sanitation. Though they were appreciated by residents for their conviviality, the *courée* lodgings were nevertheless the subject of criticism from hygienists in the 19th century and became key targets for demolition projects from then on. The desire to eliminate the so-designated unsanitary housing resurfaced in the 1970s with renewed vigour in the form of new legal tools and state aid. However, if the planned demolition of such places was intended to pave the way for high-rise apartment blocks, resistance from residents was always immediate and their advocacy convinced the public authorities to modify their strategy: the proposed *tabula rasa* objective in the 1980s was instead replaced by renovation projects which were more respectful to the architectural, social and cultural characteristics of the locations. In 1998, the Dubar and Dekien *courée* dwellings, still inhabited at the time, were listed as *monuments historiques* (historic monuments) after having undergone renovations.

2. The Royal Salt Works of Arc-et-Senans was constructed between 1775 and 1782 by the architect Claude-Nicolas Ledoux during the reign of Louis XVI. It is a former salt factory that serves as a testament to 18th-century industrial architecture. It is regarded as one of the first factories in the world to be constructed with the same care and architectural quality as churches and castles. Additionally, it serves as the nerve center of an urban utopia. Ledoux designed an entire city in a circle around the factory. It was listed as a Historic Monument in 1930 for its classical architecture, and the listing was extended to the entire estate in 1940. It now belongs to the Doubs département. In 1982, it was included on UNESCO's list of World Heritage Sites, and in 2009 it was joined by the Grande Saline de Salins-les-Bains. The complex is dedicated to the extraction of salt by pumping brine from underground. It reflects both a technical tradition established in the High Middle Ages and an economic project at the heart of modern industrial society, which was at work throughout Europe at the end of the 18th century. The site is now dedicated to culture, history and heritage. ©FHL https://www.salineroyale.com

The appreciation of the heritage potential of a city can be reflected in the protections granted under the monuments historiques initiative. In Roubaix, the first addition of a property to this list was the belated addition in 1975 of a house in the Art Deco style constructed in 1904[25]. The second inclusion was made in 1978, and concerned a factory, the Motte-Bossut spinning mill, which the State was intending to convert into a national archive centre dedicated to the world of labour. In the following decade, two further sites were also added, a church and a vocational school dedicated to training workers destined for textile industry[26]. The subsequent inclusion of the *courées* housing projects was indicative of a notable increase in the number of protection orders granted: 29 between 1992 and 1999, including two factories, a warehouse and a reservoir. Included in this group are twenty-one dwellings of which the Dubar and Dekien *courées* housing projects constitute the only workers' accommodation. Of all the 39 properties protected in Roubaix under the monuments historiques initiative between 1975 and 2023, there is only one worker's housing heritage site; the rest of the number being made up of private mansions and bourgeois houses as well as three factories, a warehouse and a set of four reservoirs intended to supply the city with water. In 2001, the city obtained the *Ville d'art et d'histoire* (City of Art and History) accreditation, an important distinction in France which indicates the historical and heritage value of a city and improves its visibility, particularly from a tourist standpoint[27]. In 2011, Roubaix also earned the European destination of Excellence Eden label[28]. However, ten years after that, the newly elected municipal council began scrutinizing the validity of all these achievements as well as questioning the cultural value of the working-class housing. Despite this, in 2024, a wave of grassroots support and protest from a number of citizens and associations resulted in Europa Nostra classing the *Courées de l'Épeule* among the seven most endangered sites in Europe[29]. This classification is of vital importance, although it is not enough in itself to guarantee the longevity of the housing nor forestall a potential future planned demolition. The situation is all the more distressing given that the ambition of the municipality of Roubaix is to replace these historically significant houses with a parking lot.

Novel research subjects, novel issues

Ever since the work of Robert A. Buchanan in 1972, the chronological field of industrial heritage is no longer limited to the first phase of the "English Industrial Revolution", but rather encompasses the history of humanity, from the exploitation of the first flint deposits up until the manufacture of the latest generation computer[30]. The issues raised by computer software and its source code underlines the difficulty in preserving contemporary objects. Under the direction of a computer science researcher, Professor at Paris-Diderot University, Roberto di Cosmo, Software Heritage is an approach initiated in 2016 and has as its central driving motivation the desire to perpetuate, conserve and keep freely accessible this abstract technical object. This project requires a high level of expertise to find the software and its source code and ensure its conservation. However, in the world of conservation, where collections most often include precious and/or unique objects with a single owner (the State for collections belonging to French museums) and a single place of conservation, this software's implementation work is altogether quite novel. No "owner" exists in the conventional sense as it is royalty-free software, and the conservation model is based on the widest possible sharing of the data collected – to date more than 19 billion unique source files – plotted on a Merkel graph[31]. In April 2017, Unesco gave its support to the project, emphasizing its importance and ambition, and an agreement allowing the realisation of joint actions in favour of the preservation and sharing of software source code was subsequently brokered. The recognition of this heritage is part of a movement started at Unesco in 2003 with the adoption of the Charter on the Preservation of Digital Heritage, under which member States are encouraged to conserve and protect digital heritage (including both hardware and software). A real urgency exists in this domain, one which motivated the creation of a corpus of oral archives permitting the preservation of the collective memory of the scientific and technological community concerned. The software and its source code constitute a new technological object of study, which is distinguished from its predecessors by its immateriality; being reviewed with this perspective in mind, understanding how it has

generated a new field of reflection quickly becomes evident. While the Software Heritage approach has seemingly encountered both rapid and unanimous support, the same cannot be stated for certain domains of industrial heritage, whose importance remains considerably less visible and/or remains contested by multiple opposing stakeholders.

Contested heritage

Colonial industrial heritage, often covering slavery or forced labour, remains a topic requiring a great deal of further investigation. The case study of the old powder mill on Isle de France (Mauritius) is one such example[32]. It is the only known industrial site in the French colonial empire where slaves were armed. Its design, its means of production and its organisation were also unique, specific both to its location and the type of workforce employed. On an international scale, leaving out rare exceptions such as the Whitney plantation in Louisiana where slaves are at the centre of the museum as they were at the heart of the technological and economic system, this Mauritian heritage remains largely unknown. It does not exist in the sense that, although material traces remain, as in the French Antilles, they are not promoted as an essential part of the industrial heritage of slavery. A significant amount of research and mediation work must be conducted in order to identify and affirm its true value. With regard to the former French imperial territory in Chad, the recent thesis of Eric Bouba Deudjambé made it possible to determine the conditions in which the French colonial administrators had pursued France's industrial development of the territory, with a particular emphasis on the establishment of cotton farming[33]. It also highlighted the existence of productive activities before the arrival of settlers, such as the production of bricks, and the permanence of some, prior to colonisation, such as natron, still present. Consequently, this work also demonstrated that Western chronology could not account for the pre-existing industrial heritage: the notion of pre-colonial heritage does not allow one to fully comprehend the depth of the historical field concerned. In addition, the expression of a "post-colonial heritage" is insufficient as economic investments and the use of colonial technology continued after independence. The collective memory of forced labour along with the environmental and social impact of industrial prerogatives are issues which all raise questions which require further in-depth investigation.

Significant difficulties remain in the field of industrial activities deemed polluting and dangerous[34]. Despite being a nuclear power, France has nonetheless implemented few if any measures concerning the preservation of its heritage in this field with this issue requiring further attention. The recent controversy over Marie Curie's laboratory in Paris involving the threat of destruction of one of the two pavilions highlights the fragility and evident lack of concern for the related scientific heritage[35]. More generally, industrial heritage, when one takes into account its environmental and social aspects, contradicts somewhat the otherwise largely positive heritage discourse. The issue of how to interpret the waste and other negative traces remains a topical one with the low representation of the chemical industry among French industrial heritage being a subject of inquiry in itself. An issue of the «Patrimoine industriel» magazine dating from 2016 brought this subject to light and demonstrated to what extent this aspect of heritage was struggling to be integrated into France's collective heritage[36]. Reluctance was evident as much from industrialists as it was from citizens and political institutions, who saw demolition as a means of erasing the traces or symbols of severe pollution. The protection of cheminées rampantes (creeping chimneys), in the creeks of Marseille, illustrates this scenario, especially since their recognition is particularly contentious given the ever-present health risks posed[37].

Museums as conduits for the transmission of technological prowess

Technological museums, many born out of or revived by the growing interest in industrial heritage, have grown into committed players in these territories[38]. France has many museums incarnating industrial and technical themes, some of which are internationally renowned, having earned, not without difficulty, their legitimacy among all other national museums[39]. Some trace their roots back to 18th century cabinets of curiosities, others from 19th century industrial and agricultural museums, often established at the initiative of chambers of commerce and industry and learned societies. They are primarily located in dynamic industrial areas – Lille, Lyon, Mulhouse, Roubaix, Saint-Etienne – though may also be found in more rural areas, particularly in areas where high-quality local production is present. The emergence of eco-museums in the 1970s may have been a response to the anxiety provoked by brutal deindustrialisation, though they gradually became museums like any other, equipped with collections of objects and permanent musicographic tours[40]. This shift requires further analysis.

At the turn of the 21st century, a certain number of French industrial museums underwent significant transformations, and this trend has endured. Many are subject to innovative renovations with new structures being created. They are characterised by close links with active industries and the desire to turn them into places of life, culture and leisure accessible to the widest public possible. They are most often included in territorial development strategies which have as their guiding principal the promotion of tourism, culture, history and the identity of the resident populations[41]. Some of these museums host invaluable collections, testament to the creativity and inventiveness of science, technology and industry.

For some, they have also become places of conservation and transmission of rare technological and artisanal know-how.

This is the case for the *Musée des beaux-arts et de la dentelle d'Alençon* (Alençon Museum of Fine Arts and Lace), whose needle lace-making technique was included on the list of intangible cultural heritage of humanity in 2010. L'*Atelier National du point d'Alençon* (The Alençon National Needle Lace-Making Workshop) is one such system museum where such essential historical know-how is preserved. The *Cité de la dentelle et de la mode de Calais*[42](Museum for Calais Lace and Fashion), inaugurated in 2009, recounts the history of mechanical lace while also maintaining a training aspect so as to perpetuate and promote skills in this industry; there at present exist only six Calais-Caudry lace production companies in France. A partnership has been established with the Lycée des métiers du Dôme, in Calais, in order to train apprentices. The production of lace woven on Leavers requires the collaboration of no less than twenty-five different professions, including among them artisans tasked with pattern creation, preparation of materials and machines, manufacturing and finishing. Objects from the museum are even utilised in the training programs. It is possible to add further museum workshops to these case studies, with examples coming from museums on glass production, or even the workshop-museum of the Bohin needle factory and the hat museum of Chazelles-sur-Lyon, which was a mecca of rabbit hair felt hat production, a fine example of a museum workshop, first opened in 1983 and subsequently renovated in 2013. Finally, it is also important to highlight the attention accorded to scientific heritage, seldom present among the collections. The *Mission nationale pour la sauvegarde du patrimoine scientifique et technique contemporain* - Patstec (National Mission for the Safeguarding of Contemporary Scientific and Technical Heritage) was conceived in 2003 by the *Ministère de la Recherche Français* (French Ministry of Research), which entrusted it to the Musée des arts et Métiers (Museum of Arts and Crafts)[43]. The latter coordinates the production of a prospective inventory throughout France with a view to the conservation of a heritage in the making. It has as its objective the rendering of past scientific and technological developments intelligible in order to make them more accessible both to its stakeholders and, beyond that, to a wider public for educational purposes.

4. The sole surviving edifice from the former Dunkirk shipyards, Halle AP2, was affectionately dubbed the "cathedral" by the employees of Ateliers et Chantiers de France. Constructed in 1949 from concrete and metal, the structure symbolizes the country's renewal following the Second World War and the extensive destruction it had endured. Its imposing height of 32 m made it possible to anticipate the construction of very large ships. The conversion, overseen by the Dunkirk Urban Community, resulted in a pioneering initiative: the construction of a twin building adjoining the Halle to house administrative facilities and contemporary art collections. The original structure, which has been left in its original state, can be utilized for the display of large and heavy works of art, with the use of the 30-tonne overhead travelling crane, which remains operational. The now FRAC Dunkerque was inaugurated in 2013 and was designed and constructed by architects Anne Lacaton & Jean-Philippe Vassal. A proponent of transformation over demolition, they were bestowed with the esteemed Pritzker Prize in 2021. The buildings exemplify the growing awareness among architects of the necessity for sustainable architecture, in which the conversion of industrial heritage plays a pivotal role. ©FHL

3. The headframe of the 9-9bis pithead was constructed in 1930 by the Compagnie des Mines de Dourges in the neo-regionalist architectural style that was typical of the post-war period. When it was first opened in 1933, 8 million tons of coal were extracted from the shafts. The final coal car was ceremonially hauled up from shaft no. 9 on 21 December 1990, marking the conclusion of 270 years of mining in the Nord-Pas de Calais region. The site was saved by an association of former miners and enthusiasts, ACCCUSTO SECI, and was listed as a historical monument in 1994. The protection covers the buildings and the machinery they contain. As part of the Nord Pas de Calais coalfield, the site was included on UNESCO's list of World Heritage sites in 2012 as living and evolving mining landscapes. It is a complete mining complex comprising the pit, the slag heap, and the De Clercq garden city. In a socially deprived area, the site embodies the challenges of the future. It offers a high-quality cultural offering accessible to all, a bold architectural approach with the Métaphone (concert hall and rehearsal studios), the continuing strong involvement of the historical association, which continues to maintain the equipment and offer tours, and the upgrading of the houses to adapt them to climate change while respecting their integrity. ©FHL https://9-9bis.com/

5. The Sucrerie d'Eppeville was established in 1857 and subsequently destroyed by the German army during the First World War. In June 1919, the Compagnie Nouvelle des Sucreries Réunies (CNSR) was established, uniting 14 owners of pre-war sugar factories and rasp mills with the objective of rapidly rebuilding a new site, leveraging financial resources derived from war damage. A renowned architect, Georges Lisch, designed a vast 190,000 m2 industrial and urban complex comprising industrial and administrative buildings, a workers' housing estate and houses for engineers and foremen in the "regionalist" style, as well as the director's "château" in Anglo-Norman style. Construction commenced in 1919 and was concluded in 1922. The industrial site is characterized by its meticulous architecture, which is largely inspired by the Art Deco style, and its highly modern production equipment. It is the largest and most modern sugar factory in France, and one of the largest in Europe. The main workshop, constructed of brick and iron sections, exhibits an ordered elevation and an ornate pediment, with a glass façade under a large segmented arch, inspired by railway stations. The inscription "Fabrique de sucre" ("Sugar factory"), produced in ceramic, adorns the pediment, beneath a series of scale-shaped bricks, which serves to enhance the overall effect. In 2001, the site was acquired by the German group Südzucker. Since the 1990s, Südzucker has been developing an acquisition policy in Europe, with a particular focus on the countries of the former Soviet Union. The company's strategy is based on the acquisition of sugar factories, the subsequent closure of these facilities, and the demolition of the buildings to eliminate any potential future competition. The closure of the Eppeville facility is scheduled for 2020, and negotiations to sell the land have been ongoing since 2021. A mobilization was promptly initiated, resulting in the expeditious commencement of urgent classification proceedings on 5 May 2021, as reported by CILAC-TICCIH France. On 10 December 2021, the site was designated a Historic Monument. Since that time, despite requests from local and national associations, no information has been provided regarding the future of the site, nor has a collective discussion committee been established. Conversely, the proprietor is persistently attempting to demolish the edifice and is exerting considerable influence on the authorities responsible for the protection of historic monuments. The site is notable for its unified industrial and civil architectural design, which includes one of the few remaining art deco-style factories in France and the only such factory in France, and potentially in Europe. The Eppeville sugar factory in the Somme serves as a case study in the challenges faced by local communities in the face of globalization and climate change. ©Bertrand Fournier-Region Hauts-de-France

Conclusion

Industrial heritage has evolved to become a very active disciplinary field, enjoying rich future prospects. Tensions between local and global concerns remain present, reflecting the growing societal demand as well as the effects of the Unesco accreditation, a contentious issue both prior to and after having received such recognition. One of the characteristics of this industry is the mass production of objects and machines, such as the construction of buildings, with all displaying similar features. Revaluating the dichotomy between unique objects and typical ones has become essential, in light of the numerous refusals of protection under the *monuments historiques* in France for factories deemed "run-of-the-mill". However, as demolitions continue, so-called "ordinary" factories become rarer, and the remaining factories, which have become unique on a national scale, are not necessarily the most representative, nor in the best condition.
Many questions remain unanswered. How can contentious issues, such as the trauma of slavery, be studied and accorded their rightful place in the development of heritage with regard to political and technological circumstances? How should environmental problems and major industrial disasters be dealt with effectively? Faced with growing societal demand, the historian has an integral role to play here, in particular with regard to the objectification and historicization of these contentious legacies, frequent in the world of labour. Citizens have always played a leading role in heritage processes, and more particularly in those concerned with industrial heritage. Is it simple nostalgia? Field studies demonstrate, definitively, that this is not the case. The motivations are legion: the desire to safeguard a building as a historical landmark or as a place of shared industrial memory, though also as a testament to the resilience of the resident populations who have been deeply impacted by deindustrialisation or even by pollution and disasters. Converted industrial sites are no longer a fixed memorial: they have become places of life and projects, whether they are "cultural factories" or site museums. Their study would certainly fuel reflection on historicity regimes, for which the economic and technical dimension is often absent[44].

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