

The Protected and Underutilized Industrial Heritage of Ouro Preto from the XVIII to XX Centuries

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Abstract. This paper aims to demonstrate the significance of Ouro Preto's industrial heritage from the XVIII to XX Centuries. For this purpose, information from the Inventory of the Ouro Preto Cultural Heritage conducted by the Ouro Preto Municipal Government from 2006 to 2011 was used. For research methods a mixed-methodology was utilized, combining quantitative and qualitative approaches. Initially, items from the Inventory list were selected, based on the definition of industrial heritage presented in the Nizhny Tagil Charter (2003) and supported by renowned authors. Subsequently, data was organized into spreadsheets and pie charts were elaborated to identify the characteristics of Ouro Preto's industrial heritage. Then, the quantity of industrial heritage items in Ouro Preto, in addition to their legal protection status and their current usage were determined. The conclusions reveal that the town has significant traces of industrial heritage from the XVIII Century, related primarily to the Gold Mining Cycle, followed by the railway heritage. While the majority of Ouro Preto's industrial heritage is protected, particularly in urban areas, most of them remains underutilized. Insights from readings and conversations with an expert and a mine owner suggest that the reasons for the existing industrial heritage being underused are the challenges of adapting them for a new use and the absence of public policies in tourism areas.

Keywords. Industrial heritage, Ouro Preto, Gold Mining Cycle, Railway heritage, Adaptive reuse, Cultural heritage safeguarding.

1. Introduction

Ouro Preto is widely recognised as a colonial town, rich in baroque churches, and as where important Brazilian historical events took place. Despite some old gold mines being explored by tourism, very few people know or remember its industrial heritage as a whole. The present work aims to gather information about the overall Ouro Preto industrial heritages since the XVIII, including those in rural areas.

Although the Ouro Preto Municipal government conducted an inventory of the industrial heritage between 2006 and 2011, this inventory is not well known. Another example that reinforces the lack of knowledge on this subject is that even though the International Committee for the Conservation of the Industrial Heritage - Brazil (TICCIH-Brazil) has committed to conduct a survey about the Brazilian industrial heritage, the only Ouro Preto industrial heritage item from its list is the Iron-factory *Patriótica*, located in Miguel Burnier [1]. What about the other industrial heritage items?

To address this question, the present work examines the Municipal Government Inventory to identify the characteristics of Ouro Preto's industrial heritage

across historical periods, types of industrial heritage, if they are legally protected or not and if authorities or civil society are trying to adapt these remnants for current reuse. In doing so, the work aims to identify the general characteristics of Ouro Preto's industrial heritage so that it could be useful as a foundation for further research focused on the preservation of this heritage within the town.

2. Research Methods

This work aims to show the importance of Ouro Preto's industrial heritage by conducting a survey of all items related to this theme. For this purpose, the author relies on a cultural heritage inventory conducted by technicians of Ouro Preto Municipal Government between 2006 and 2011. This inventory provides information about all registered and unregistered cultural heritage sites in Ouro Preto, encompassing urban and rural areas. The author selected items from the list while considering the industrial heritage concept defined in the Nizhny Tagil Charter (2003) as "the remains of industrial culture which are of historical, technological, social, architectural or scientific value" [2]. By revisiting the Nizhny Tagil Charter, the author extends the scope beyond the Industrial Revolution in England, to include the Gold Mining Cycle in the XVIII Century,

for it was meaningful to the work techniques related to mining matters.

For the presentation of results, they were organized into pie charts. The author initially determined the extent of industrial heritage in Ouro Preto, then divided it into three centuries: XVIII, XIX and XX. The aim was to identify the period when Ouro Preto had a most significant economic boom. Within each period, the author examined the predominant types of industrial heritage. Equally important were the graphs illustrating the extent to which industrial heritage sites were protected and if they are in use, underused, demolished or had undergone adaptive reuse. These data are important to know how effectively Ouro Preto is preserving its industrial heritage.

Therefore, this work has employed a mixed-methodology, combining quantitative and qualitative approaches based on Municipal Government databases. To summarize, quantitative data were organized into spreadsheets followed by a qualitative approach involving its interpretation. This interpretation considered historical information and the concept of industrial heritage according to the Nizhny Tagil Charter, supported by other scholars.

3. Definition of Industrial Heritage

The importance of relating industrial heritage to the field of culture heritage represents a fairly recent approach. Initially, in 1955, the British professor Michael Rix published an article entitled "Industrial Archaeology" in the journal "The Amateur Historian". However, the acceptance and the understanding of the term "industrial archaeology" were not forthcoming. Instead, it emerged as the result of a synergistic effort among scholars and institutions concerned with the preservation of cultural heritage over the last few decades [3].

The turning point occurred in 1964 with the publication of the Venice Charter, as a result of the Second International Congress of Architects and Technicians of Historic Monuments. The contribution of this document to enhancing the definition of industrial archaeology lies in its broadening of the concept of cultural heritage. Since then, not only grand works of art or engineering have been considered culturally important and deserving of preservation, but also more modest buildings of cultural significance and historical contexts. Furthermore, the areas surrounding monuments and urban complexes have become mutually valuable; in contrast to previous conceptions that restricted historic property to individual constructions [4].

Major institutions such as the International Council on Monuments and Sites (ICOMOS) also played their part. In this instance, the International Committee for the Conservation of the Industrial Heritage (TICCIH) was officially established in 1978, serving as a special

adviser to ICOMOS on international cooperation for preserving the global industrial heritage. Regarding TICCIH, its members were responsible for organizing the "XII International Conference of TICCIH" in Nizhny Tagil, Russia, in 2003, where the Nizhny Tagil Charter was formulated [2].

Undoubtedly, the establishment of the TICCIH and the publication of the Nizhny Tagil Charter have been a milestone in both the understanding of the industrial heritage field and to the global protection of this heritage. The Nizhny Tagil Charter is the specific charter for industrial archaeology and industrial heritage matters. Its first topic, "Definition of industrial heritage", is crucial to figure out the academic debates from past decades and to inform the focus of this work. That is, defining the term "industrial archaeology", distinguishing it from industrial heritage; and finally, determining which historical periods scholars may consider for the study of industrial archaeology [2].

According to the Nizhny Tagil Charter:

"Industrial heritage consists of the remains of industrial culture which are of historical, technological, social, architectural or scientific value. These remains consist of buildings and machinery, workshops, mills and factories, mines and sites for processing and refining, warehouses and stores, places where energy is generated, transmitted and used, transport and all its infrastructure, as well as places used for social activities related to industry such as housing, religious worship or education" [2].

So, the industrial heritage encompasses the traces of artefacts, buildings, and places linked to some production chains, including secondary items such as energy and transportation.

Differently,

"Industrial archaeology is an interdisciplinary method of studying all the evidence, material and immaterial, of documents, artefacts, stratigraphy and structures, human settlements and natural and urban landscapes, created for or by industrial processes. It makes use of those methods of investigation that are most suitable to increase understanding of the industrial past and present" [2].

And

"The historical period of principal interest extends forward from the beginning of the Industrial Revolution in the second half of the eighteenth century up to and including the present day, while also examining its earlier pre-industrial and proto-industrial roots. In addition, it draws on the study of work and working techniques encompassed by the history of technology" [2].

It is evident that while industrial heritage is more related to the object of study - the remains of

industry - industrial archaeology serves as the method for studying these objects from an interdisciplinary perspective. Thus, industrial archaeology is not only restricted to tangible aspects of the industrial processes, but it is more comprehensive by considering the intangible data as well. Furthermore, the third excerpt of the Nizhny Tagil Charter definitively establishes the period covered by the study of industrial archaeology, which may include even a period before the beginning of Industrial Revolution, as long as the study involves objects of studies linked to the production process or events that contributed to the advent of the Industrial Revolution.

4. Industrial heritage in Ouro Preto

The history of industrial heritage in Ouro Preto can be divided into 4 periods: the first occurred in the XVIII Century, known as the Gold Mining Cycle; the second, in the early XIX Century, when several factories were established, mainly in the steel industry field; the third, in the late XIX Century, with the arrival of the railroad in Ouro Preto, contributing to economy development despite the relocation of the capital to Belo Horizonte; and the fourth period occurred in the first half of the XX Century with the emergence of a new industrial complex in the Saramenha region.

From the XVIII to XX Centuries, Ouro Preto produced around 259 items of industrial heritage, most of them originating from the Gold Mining Cycle in the XVIII Century. According to the Municipal Government Inventory, industrial heritage from the XVIII Century includes 9 aqueducts, one old ceramic kiln, one mill, 170 gold mines, 2 foundries, 20 reservoirs and 8 bridges. Gold mining artefacts are easily accessible in old mines adapted for tourism, and in some museums, mainly in the Casa dos Contos Museum where there is a Gold Mining Cycle Research Centre and exhibitions showcasing mining and gold foundry processes from the XVIII Century.

The XIX Century was marked by the prominent role of Baron Eschwege and the arrival of the railroad in Ouro Preto. In the early 1812, the Patriótica Iron Factory was inaugurated in the rural area of Ouro Preto, which is now Miguel Burnier District. It stood as Brazil's first iron factory and the first industrial heritage site listed by the National Historic and Artistic Property Service (SPHAN) in 1938 in the Historical Tombo Book. The Patriótica Iron factory was an enterprise of Baron Eschwege, who also acquired a gunpowder factory and a saltpetre refinery in Ouro Preto. He additionally founded the Mineralogical Society of Passagem in 1819, when he started to explore the Passagem Mine, one of the largest gold mines in Brazil from where about 35 tons of gold were extracted until its depletion in 1976 [5].

Nevertheless, the most significant event for Ouro Preto's industrialization occurred after the

introduction of the railway system in the late XIX Century. Since the inauguration of the first railroad track Liverpool-Manchester in 1830, people started to associate the arrival of the train with industrialization, progress and civilization. This perception was similarly shared among the people from Ouro Preto. It was a matter of pride that Ouro Preto, the Capital of Minas Gerais, could be connected to Rio de Janeiro, the federal capital, through the railway system [6].

The Ouro Preto Railway Station was inaugurated in 1889 by King Dom Pedro II and his daughter, Princess Isabel. Additionally, other railway stations were inaugurated in rural areas, such as São Julião (1887), now Miguel Burnier; Rodrigo Silva (1888); Tripuy (1891); Dom Bosco (1896); Sardinha (1896), now Engenheiro Corrêa; Chrockatt de Sá (1897) and Tombadouro or Itacolomy Railway Station (1914), now Vitorino Dias [7].

In general terms, the industrial heritage of Ouro Preto from the XIX Century consist of: 10 bridges, 4 factories (iron and gunpowder), one lime kiln, 18 railway heritages, one mine, one reservoir, one sewage treatment plant, one shop, and one working class village.

On December 17th, 1893, the Minas Gerais Congress enacted a law to move the Capital to Belo Horizonte. After that, Ouro Preto experienced a period of economic stagnation which would only be overcome in the 1940s with the installation of the aluminium factory ALCAN.

The story of ALCAN began in the 1930s, when Elquisa - Eletro Química Brasileira S/A took the initiative to produce aluminium in Ouro Preto. Initially, Elquisa faced some difficulty to sell its production due to international competition. However, with the support of President Getúlio Vargas, it started to produce aluminium in 1938 and during the Second World War, in 1944, it began processing it on an industrial scale. The presence of that factory led to the development of a working class neighbourhood in its surroundings, known as Vila Operária. In June 1950, Elquisa was acquired by the Aluminium Limited from Canada (ALCAN) resulting in the restructuring of the region with the development of new neighbourhoods such as Bauxita, Tavares, Saramenha de Cima, Lagoa, Barcelos and a neighbourhood exclusive for ALCAN engineers, known as Vila dos Engenheiros.

Although ALCAN played a significant role for Ouro Preto's industry in the XX Century, there were other significant types of industrial heritage in the city over that century, such as: 2 factories (footwear and tea), 1 industrial complex (metallurgical park), one mine, 3 railway heritages, one water tank, and one working class village.

4.1. Scope of protection in the Ouro Preto Industrial Heritage

The Ouro Preto industrial heritage holds significant relevance, consisting of approximately 259 items. The number is noteworthy if it takes into account the town's small size and that it has never been at the forefront of industrialization in Brazil. Beyond the relevance of the Ouro Preto industrial heritage, it is evident that it is also relatively protected. Several events may have contributed to this fact:

- In 1933, Ouro Preto was considered a national monument through Decree 22.928/1933, signed by the Chief of the Interim Government, Getúlio Vargas [8].
- In 1937, Getúlio Vargas signed the Decree-law nº25/1937, which established the SPHAN (National Historic and Artistic Property Service), now known as IPHAN [9].
- In 1938, the SPHAN registered the Ouro Preto's architectural and urban complex in the Fine Arts Tombo Book, ensuring its complete protection [10].
- On September 5th, 1980, UNESCO enlisted Ouro Preto as a World Heritage Site - the first one under this category in Brazil [10].
- On September 20th, 1986, SPHAN registered Ouro Preto in the Historic and Archaeological, Ethnographic and Landscape Tombo Books [11].
- In 1989, SPHAN defined the urban perimeter of Ouro Preto town to be protected. It included not only the historical city centre but also its surrounding mountains. As a result, no one is permitted to intervene within this perimeter or even the Ouro Preto landscape without prior authorization from IPHAN.

All those laws and documents that attest the importance of Ouro Preto in the heritage scene have contributed to the preservation of its buildings, monuments and its entire historical centre, including its industrial heritage. The Fig. 1 illustrates how the protection of entire cultural or environmental complexes may be beneficial for preserving particular industrial heritage sites, many of which would be overlooked by common sense due to their lack of artistic appeal.

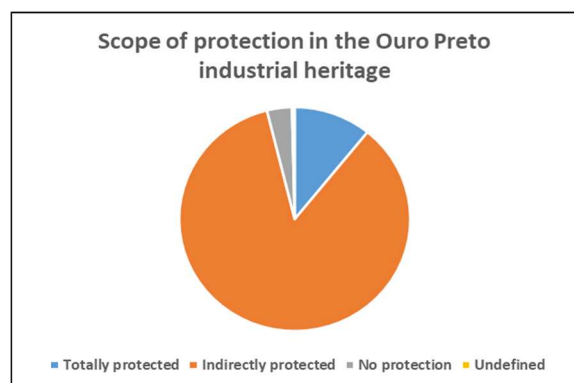


Fig. 1 – Scope of protection in the Ouro Preto industrial heritage. Graph from Martinelly Martins (2024).

On October 20th, 2010, IPHAN published Ordinance

312/2010, which establishes criteria for the preservation of the architectural and urban complex of Ouro Preto town in Minas Gerais and regulates intervention in the protected area under a federal level. It considers not only the protected urban perimeter but also areas of environmental protection identified as Landscape, Archeological and Environmental Preservation Area (APARQ). There is even a Special Section dedicated to the preservation of Ouro Preto Hill. Many industrial heritages from the XVIII Century are located in the APARQ and on the Ouro Preto Hill [12].

Another very important law is the Complementary Law 29, enacted on December 28th, 2006, known as the Master Plan of Ouro Preto. It is a kind of a municipal strategic plan which is mandatory for cities with more than 20,000 inhabitants and it serves as the fundamental instrument for urban development and expansion policies [13].

Both in Ordinance 312/2010 and in the Master Plan of Ouro Preto (2006), information about the Ouro Preto urban zone plan can be found, such as the Special Protection Zone (ZPE), Environmental Protection Zone (ZPAM), Zone of Restricted Density (ZAR), Densification Zone (ZA), Zone of Special Social Interest (ZEIS) and Special Intervention Zone (ZIE). Industrial heritages in the urban area of Ouro Preto can be found within the ZPE and the ZPAM. The ZPE is where people find the essential values that must be preserved in urban complexes, such as the Ouro Preto historic city centre. The ZPAM must be preserved or restored due to its topographical, geological and environmental characteristics. Its importance underlies the nature features, water resources, archaeological sites, and landscape heritage.

Beyond the ZPAM, there are other industrial heritage properties located within protected ecological parks such as: Itacolomy State Park (protected since 1967), Andorinhas Municipal Natural Park (protected since 1968), and Tripuí Ecological Station (protected since 1978).

The “totally protected” items hold such significant importance that they were individually registered. For instance, the first iron factory in Brazil, the Patriótica (1812), was located in the District of Miguel Burnier; its building is currently in a state of ruins.

The only undefined item is an old warehouse from the Cachoeira do Campo District, dating back to the end of the XIX Century. The Ouro Preto municipal inventory was not able to gather accurate information about its safeguarding. An important point to consider is that unprotected industrial heritages lie in the Ouro Preto countryside. Therefore, it is conclusive to state that laws protecting urban complexes can guarantee a more comprehensive protection than registering isolated buildings or monuments.

4.2. The adaptive reuse as a way of protecting industrial heritage

In addition to the registering of industrial heritage and the existence of protective laws to preserve this heritage, another effective measure is adaptive reuse. However, many experts point out the difficulty to reuse industrial heritage buildings due to their large scales and new proposals of use.

The Fig. 2 emphasizes that the majority of industrial heritage in Ouro Preto is not in use. This occurs because it includes all the 163 abandoned gold mines. However, there are other industrial heritages that are either abandoned or underused, such as those belonging to the railway complexes. Nevertheless, the most common solutions for unused industrial heritage are repurposing them for touristic initiatives and requalifying industrial complexes or simple buildings to adaptive reuse.

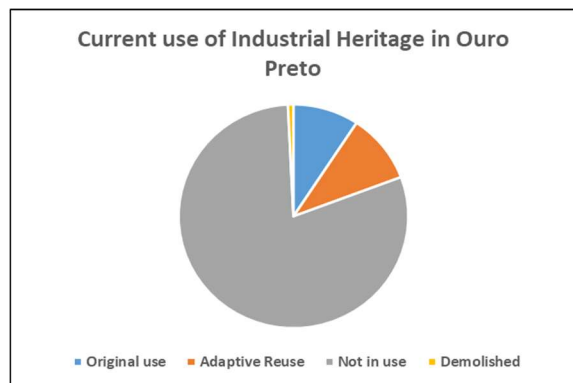


Fig. 2 – Current use of the industrial heritage in Ouro Preto. Graph from Martinelly Martins (2024).

The realization of Ouro Preto's historic gold mines' full tourism potential is hindered by bureaucratic impediments, limited investment, and the absence of regulations governing tour guides [11]. "Excessive bureaucracy offers little guidance", complains Saulo José Saraiva de Souza, owner of the Bijoca Mine. Professor Hernani Mota Lima of the Federal University of Ouro Preto believes that other local historic mines could be opened for visitors. However, investment is necessary, and a lack of regulations allows "predatory tourism" by some guides. These guides prioritize mines offering higher commissions, even if they are not the best options for tourists. The owner of the Chico Rei Gold Mine alleges some guides operate without permits, fostering unfair competition and highlighting the need for public policies promoting responsible mine tourism in Ouro Preto.

Another alternative is to restore railway heritage complexes to stimulate a different kind of tourism in the countryside, by exploring a bucolic lifestyle on farms and in the small villages where vibrant railway stations once stood. However, nowadays, many of these railway stations are in a state of ruin, with some having been demolished, such as the Tripuy Railway Station, and others remaining unused but

awaiting promised investments for adaptive reuse.

The second idea to highlight the industrial heritage in Ouro Preto is adaptive reuse. A more recent example is the Augusto Barbosa Metallurgic Park (Fig 3). In 1910, it was built as a large warehouse to store the goods which were brought by train. In 1946, the same building was converted into a pig iron factory, mechanical workshop, warehouse for storing raw materials and finished products. It was also used for academic activities for the National School of Mines and Metallurgy. In 1969, the complex became part of the Federal University of Ouro Preto (UFOP) which transformed it into a cultural, social, economic, and artistic space of integration. Its final use came in 1993, when UFOP decided to repurpose it into a venue for events, which was inaugurated in 2001.



Fig. 3 – Façade of the Metallurgic Park Augusto Barbosa. Photography of Martinelly Martins (2024).

Finally, the industrial heritages that are still in original use are related to urban infrastructures such as bridges and houses from old working class villages that are still appropriate for housing.

5. Conclusions:

The present work has tried to highlight the importance of Ouro Preto's industrial heritage, considering that there are very few studies on the theme compared to its colonial architecture and baroque sacred art, which are more studied.

To conclude, some points can be highlighted. Firstly, the town has significant traces of industrial heritage from the XVIII Century linked to the Gold Mining Cycle, evidenced by the considerable presence of mines (around 170). Secondly, the majority of Ouro Preto's industrial heritage is well-protected, even though it is underused. The reasons for this include the difficulty of adapting industrial heritage for new uses and lack of public policies in the tourism area.

As mentioned, industrial buildings and complexes are not easy to go through adaptive reuse because they are usually huge structures with limited functional use. This work has demonstrated that adaptive reuse is more common in strategic urban areas, while industrial heritage in rural areas is at

risk of deterioration. Therefore, this work suggests the importance of conducting further research focusing on the development of effective public policies for Ouro Preto's industrial heritage in order to solve these problems, particularly on remnants of mines and railway heritage. As a result, the Ouro Preto industrial heritage can be able to play a significant role for the future generations, both economically and culturally.

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