

Iron Architectural Decorative Elements in the Urban Landscape of the Historic Centre of Lagos, Portugal. A Contribution for Sustainable Tourism

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ABSTRACT

Cultural sustainability matters tangible and intangible heritage, cultural diversity, and the cultural identity of territories. Historic centres have considerable heritage resources that honour the legacy and knowledge generated by humanity in the past, and it is fundamental to preserve and transmit them to future generations. With the industrial revolution, innovative materials and techniques were developed. These are visible in 19th century buildings, as there was an intensive use of decorative elements on their façades, in which the use of cast and wrought iron artwork stood out, such as the window grilles and balconies, fanlights and side panels, doorknobs, knockers and hinges, among others. These metallic elements participate in the composition of the buildings, enhancing the urban landscape. The perception of the importance of these decorative elements in the architectural language of the buildings located in the historical centre of Lagos, Portugal, led to an inventory of the iron elements on the façade of buildings, finding that they have specific characteristics in terms of shape or design, material, and symbolic representation. These architectural elements are adapted to artistic movements and to distinct periods. This study presents the spatial distribution of cast and wrought iron elements indicative of the Romantic period of the end of the 19th century and to the Art Nouveau period of the beginning of the 20th century. The results indicate that the decorative iron elements have great expression, giving aesthetic value to the urban landscape and cultural identity being an opportunity to enhance the attractiveness of the historic centre through outdoor cultural routes.

KEYWORDS

Urban Landscape, Architectural Heritage, Cast Iron Decorative Elements, Wrought Iron, Sustainable Tourism.

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1. Introduction

Historic centres play a decisive role in preserving the tangible and intangible heritage for future generations. These cultural spaces have considerable resources that honour the legacy associated with information and knowledge developed by humanity in the past, and it is essential to identify them in a scientific approach. The preservation and exhibition of historic centres and their exhibition leads to the formation of tangible links between the past, the present and the future, contributing to sustainable development.

Sustainable development perspective finds harmony between social and economic development and the conservation of natural resources (WCED, 1987). The term “sustainability” translates to the quality of maintenance of something, which can continue for an indefinite period of time, like, for example, biological species. Considering a holistic approach, Costanza, Daly and Bartholomew (1991, p. 8) propose that “Sustainability is a relationship between dynamic human economic systems and larger dynamic, but normally slower-changing ecological systems, in which 1) human life can continue indefinitely, 2) human individuals can flourish, and 3) human cultures can develop; but in which the effects of human activities remain within bounds, so as not to destroy the diversity, complexity, and function of the ecological life support system. Consequently, it incorporates a multiplicity of dimensions, all of them inter-related: ecological, environmental, social, and cultural, economic, spatial/territorial, institutional, political, governmental and individual (Rosa, 2013). These dimensions imply deep changes in urban paradigms, that must be considered in tourism planning and management.

The conservation of the basis of natural resources requires the renovation of the built environment, avoiding the urban expansion associated with tourism facilities, and therefore an important opportunity to preserve architectural and vernacular heritage. Environmental sustainability also demands sustainable mobility measures focalized on soft means of transportation. This is consensual with the present context of mitigation and adaptation to climate change and the need for the protection of the atmosphere on a regional and world scale and the mitigation of carbon in the local environment. In touristic cities, pedestrian-oriented routes have increasingly emerged as a response to the COVID-19 pandemic crisis which promoted outdoor activities. For local communities, the challenge is to define thematic routes that reproduce the cultural identity inherent to the spaces where they are created, aligning them with cultural sustainability.

One of the oldest references to the association of cultural diversity with sustainable development was presented by Jacobs, Gardner and Munro (1987). Meanwhile, cultural sustainability has been assumed as one dimension of sustainable development (Hawkes, 2001; Sachs, 2002; Rosa, 2013; Soini & Birkeland, 2014; Dessein, Soini, Fairclough & Horlings, 2015) and it is associated with the consideration and preservation of tangible and intangible heritage, artistic production, as well as the knowledge and skills of social groups, communities and nations (Stylianou-Lambert, Boukas & Christodoulou-Yerali, 2014). Indeed, given the importance of conserving, maintaining and preserving cultural capital in different forms such as art, heritage, knowledge and cultural diversity for future generations, culture has come to be recognized as an independent pillar of social sustainability (Soini & Dessein, 2016).

Cultural dimension of sustainable development is currently considered in national political agendas and figures in the United Nations 2030 Agenda (United Nations 2015). Natural and cultural diversity is promoted and the recognition that all cultures and civilizations can contribute to sustainable development. Goal 4 ensures inclusive and equitable quality education and promotes lifelong learning opportunities for all, specifying the culture's contribution to sustainable development. Goal 8 stimulates sustained, inclusive and sustainable economic growth and devises and implements policies to promote sustainable tourism which promotes local culture and products. Goal 11 is about making cities and human settlements inclusive, safe, resilient, and sustainable by strengthening efforts to protect and safeguard the world's cultural and natural heritage.

Socio-cultural issues are related to a sense of belonging, of identity, of personal and community development. This scope tries to gather all social and cultural positive impacts observed on vernacular heritage. It concerns the protection of cultural landscapes, the transmission of construction cultures, the capacity to stimulate creativity, the recognition of cultural values (tangible and intangible) and the reinforcement of social cohesion. In fact, there are multidimensional benefits (economic, social, environmental, etc.) of

cultural heritage conservation and regeneration, but tools are needed to evaluate the contribution of cultural heritage in the achievement of sustainable development (Nocca, 2017). Comprehensive evaluation methods of the cultural built heritage are needed and various steps are to be undertaken: an inventory (i.e. on site survey), an evaluation of cultural quality, and a formulation of conservation plans (Nijkamp, 1989).

The Venice Charter of 1964 has been the benchmark for principles governing the architectural conservation and restoration of monuments for decades. The identification and preservation of additional heritage associated with vernacular architecture has been developed with the contribution of architects, historians, engineers, and artisans. This effort has sensitized society to the concern of the presumed extinction of historical architectural elements that mark the identity of an era, which constitute values that reflect the cultural and artistic evolution of society, for which they must be preserved. In the same way that a museum, as a monument, welcomes historical information as a way of teaching societal evolution, a city reveals the traces of urban and architectural development over time, constituting an open and living museum in constant transformation, a didactic experience on an urban scale. In fact, the built heritage is not only reflected in great public or private works, in monuments, it is manifested in domestic or productive architecture, in the urban planning of towns and villages, and in the whole of landscape that human beings inhabit and transform. In all this lies the transcendence of the values of traditional architecture as cultural heritage (Carrión Gútiez, 2015). So, traditional architecture is part of the tangible and intangible cultural heritage and adds value to communities. It contributes significantly to the role of cultural heritage to strengthen the link between the past and the future, and so, the transference of this heritage to future generations is one of the most important responsibilities of the present generation in the context of the continuity of social and cultural identity (Akyıldız & Olğun, 2020). Cultural sustainability has become more intimately aligned with architectural outcomes involving associations of behaviors, artefacts, structures and meanings (Memmott & Keys, 2015).

In Europe, the first Industrial Revolution introduced mechanization which launched the transition from artisanal to industrial socio economy, through the use of steam engines, coal and iron. Cast and wrought iron were the key materials in large-scale construction and changed design and construction methods (Rosado-García, Kubus, Argüelles-Bustillo & García-García, 2021). The use of structural and decorative iron symbolizes a significant advance in engineering materials and architectural history. For example, Magaziner & Golding (2000) cover architectural ironworks in Philadelphia, from roughly 1840 to 1930 (the time period called the Golden Age), cast iron prevailed during the nineteenth century and hand wrought iron triumphed from about 1900 to 1930. There are studies of the urban iron architectural heritage in Pelotas, Brazil (Dametto, 2009), Lisbon (Braga, 1995; Barradas, 2015), Oporto (Vieira, 2020). In general, these studies of historic architectural heritage sites are associated with the goals of protection, registration, and identification. The definition of new touristic products, such as cultural routes, can contribute to bring forward the importance of architectural heritage in European and world history.

In Portugal, mainly in the second half of the 19th century, there was an intense use of innovative materials and techniques at a decorative level in buildings, expressing itself in the use of artistic metalwork, in cast and wrought iron, developing external railings and gates, among many other visible hardware on the facades. The continuous loss of these architectural elements in urban renovation processes, has direct negative impacts on the urban landscape and on the cultural identity of the cities. The perception of the importance of decorative elements in the architecture of the late 19th and early 20th century leads the team to consider decorative elements in cast and wrought iron in architecture as the object of this investigation.

It is in this context that at the end of the 19th and early 20th century, the historic centre of the city of Lagos was the target of urban construction and rehabilitation, as the buildings of greatest historical expression were located in this area. This tourist city, with its historical and cultural features, is a pilot city of the Interreg Med Sustowns Project – Sustainable Tourism in small and fascinating villages in the Mediterranean area – which aims to promote sustainability, increase tourism in the area, and generate economic benefits. for the local community, with respect for historical, cultural, social and environmental identities. Local cultural heritage can play an important role in a Mediterranean sustainable development process (Cassalia, Tramontana & Ventura, 2016).

To create new cultural touristic products, it is considered relevant to study the application of metalwork on the facades of buildings in the mid-1800s and early 1900s. In this context, it is intended to identify the grilles or railings of the balconies, existing on the exterior facades of the buildings, directing the research to urban heritage.

The architectural heritage goes beyond the building itself, it covers all parts of the whole, from the doorways to the balcony railings. The elements, due to their uniqueness, are considered part of this heritage, reflecting the design and architectural understanding of the period in which they were produced. It is important to record these components to formulate preservation strategies that contribute to the dissemination of iron arts applied to architecture in Portugal and divulge this important heritage through the creation of touristic routes. Literature related to the aesthetic and cultural value of decorative architectural iron's elements and their importance for urban landscape and tourism are brief, and further research is necessary.

Thus, a phased investigation is developed that involves a bibliographic review, direct observation of the iron elements through fieldwork and an interpretative investigation. A structure with two components is defined, a theoretical and a practical approach. In the theory, the collection of information and its systematization, organization and analysis of data on the object of study is developed. The practical component includes visits to the study sites, an inventory of different types of decorative elements in cast and wrought iron, as well as the production of thematic maps on the distribution of iron artifacts.

The objective of this investigation is to present the spatial distribution of decorative elements in cast and wrought iron existing in the architecture of the late 19th and early 20th century buildings in the intra-mural area of the Historic Centre of Lagos. Additionally, these decorative iron elements are interpreted with the artistic movements in force at the time proving the interest in the formulation of potential touristic routes.

This paper is organized into six parts. The introduction presents the context of considering architectural heritage in cultural sustainability and the contribution of ancestral decorative iron elements in the cultural identity of cities. A literature review is then developed. In parts 3 and 4, the historical centre of Lagos and the developed methodology are described. There then follows the presentation of results and discussion on these in part 5 and finally the conclusions of the research.

2. Literature review

The technological evolutions of industrialization in the 19th century, allowed the development of new techniques for obtaining products and uses in construction. The ease of obtaining and manufacturing cast iron products, using mechanical processes, improved tools, innovations in ovens and industrial processes, gave rise to iron combinations and derivations, which enabled a new vision of the structural and artistic uses of the pieces produced.

With these dynamics, many urban buildings began to display iron ornamentation on the facades. These artifacts emerged associated with the wealthy bourgeoisie, who converted the facades of their houses into a symbol of wealth and power, following the artistic movements. The generalization of art occurred through architectural construction, translating an affirmation of the importance of some families.

The application of iron in architecture became widespread and was influenced not only by the availability of this material, but also, among other factors, by the thoughts and ideas that gave rise to artistic movements. It is understood that since the end of the 18th century, iron made possible the monumentality of large Neoclassical domes, in a combination of engineering and architectural works.

The publication of industrial art catalogues was one of the most innovative phenomena of the second half of the 19th century advocated by the main European foundries. The great universal exhibitions that marked the second half of the 19th century, allowed these catalogues to also contribute to a certain aesthetic unity in the iron pieces that were produced, having as a reference, worldwide, the famous foundries of Val d'Osne (then owned by Barbezat & Cie.) and Antoine Durenne, influencing the design of products in Portugal. The various reissues of the catalogues, largely illustrated, contained hundreds of prints, and constituted a form of mass advertising that marked the time (Queiroz, 2005).

The 19th century arts were characterized by aesthetic revivalist, romantic or naturalist neoclassical

models, often eclectic, inspired by the artistic knowledge of previous centuries, adapted to the sociocultural contexts of the time and to the industrialization that influenced current construction, with emerging products such as iron and glass.

Chronologically placing the use of iron within the artistic movements, in general, it is considered that the second half of the 19th century is marked by two cultural and artistic movements, which were expressed in different areas, Romanticism and Art Nouveau (Gympel, 1996).

Romanticism or Historicism is the movement of revivalisms, a mixture of styles adapted to the country where it is expressed, and which corresponds to the period where cast iron begins to be used more on a structural level, "Iron Architecture". Paradoxically, the Enlightenment rationalism of Neoclassicism helped to create Romanticism, giving rise to a wave of sentimentality that relied on love, religion and patriotism, among others, in opposition to reason. Both defended the "return to nature" as the great influence of their expressions. However, the romantic used to act in a "natural way", in an action of exacerbated, unlimited, uncontrolled, irrational freedom of expression as a noble or vile response to the various emotions felt in his individualistic thinking, thus being contradictory in relation to the Neoclassical rationalist. Although the artistic movement was expressed in different areas, it was in architecture that the greatest adoption of past styles was revealed (Janson, 1988).

Historicism had its beginnings associated with the Gothic revival in England, with examples from the late 18th century, in large country mansions and in 1840 with the construction of the new parliament building "House of Parliament", whose interior design was the responsibility of the architect Augustus Welby Pugin (1812-1852), influencing the former Palace of Westminster in London with the English Gothic style. Thus, the first metallic applications began to be implemented in the ornate railings of the building (Gympel, 1996).

Pugin, despite his medieval principles inspired by botany, reinterpreted the forms of nature, arranging leaves and natural flowers in geometric shapes, creating a wide range of combinations and contemporary decorative patterns. It had a profound influence on several architects, especially William Morris (1834-1896), one of the great names of the Arts and Crafts movement of the 19th century who rescued the manual arts, the appreciation of the artist (craftsman) and the "return of man to craft and art." (Castro & Imbronito, 2020, p. 413). This movement was considered an original response, from an artistic point of view, to the material production resulting from the intense use of the machine.

Historicist architecture was massive, heavy and static, as opposed to the fluidity movement of grace and near-immateriality found in the new artistic movements at the end of the 19th century. New ideals and principles were adopted by European architects and artists, with different adaptations and designations to the new style, in France and Belgium "Art Nouveau", in England "Modern Style", in Germany "Jugendstil", in Austria "Sezessionsstil" and in Italy "Stile Liberty" (Gympel, 1996).

One of the general features of the Art Nouveau movement is its international character (Pirkovič, 1998). The stylistic and ideological movement of Art Nouveau is recognized as a cohesive factor of European continental culture (Ciganović, 2019). The Art Nouveau period is considered one of the most interesting of modern times concerning the variety of materials used for architectural surfaces. The artistic treatment of façades around 1900 was shaped by the many new materials and technologies of the period such as ceramic tiles and metal cast ornaments, among others (Huber, 2019). There are several types of Art Nouveau ornamentation on the façades: geometrical, floral and figural (Mišič & Nahtigal, 2019). The balcony of the windows and door frames were richly decorated with both geometrical and floral ornamentation.

The fluidity of graceful movements inspired by nature, became easy to obtain with the potential of malleable iron, and were used for the first time in the modeling of interior and exterior spaces by architects, instead of the already known "utilitarian constructions", such as, bridges, exhibition halls, markets, train stations, among others, designed by engineers.

In these new projects, iron appears on the facades of buildings as a decorative form. Art Nouveau presents itself with flourishes, organic and natural forms, inspired by foliage and flowers, buildings with curved, delicate, irregular and asymmetrical lines, using mixtures of materials, such as tiles and iron, in an articulation of environments. Interiors and exteriors that were united by form and function, with a fluid and graceful movement.

As the designs were more linear, the cast iron elements were replaced by others in wrought iron,

lighter and more resistant. In the first decades of the 20th century, foundries redirected their production towards mechanical parts, progressively suppressing artistic casting.

In Portugal, Art Nouveau arrived at the beginning of the 20th century, which was marked by the dilution of 19th century naturalism. The first manifestations of the national modern current appear with futuristic expressions, especially in the plastic arts. Modernism in Portugal was consolidated over the first two decades of the 20th century (Mena, 2010). Initially, it was expressed timidly in the buildings, adding some specific elements, by architects with an academic culture and experience in the restoration of monuments. Many railings and wrought iron gates of the time demonstrate the influence of Art Nouveau that rejected symmetrical balance and sought harmony through wavy and sinuous shapes.

3. The historical centre of Lagos

The city of Lagos, located in the Algarve, south of Portugal, is associated with Infante D. Henrique (1394-1460), who was an important figure at the beginning of the Age of Discovery in the 15th century. Many expeditions departed from the port of Lagos, trips that are in the imagination of residents and tourists associated with the bay and the mouth of the Ribeira de Bensafirim. After the conquest of Ceuta in 1415, Lagos became an important centre of war in support of North Africa and the fight against piracy, becoming a major commercial port in the extreme southwest of the peninsula.

In 1573 it was elevated to a city by King D. Sebastião, and became the capital of the then Kingdom of the Algarve, a position it maintained until the earthquake of 1755. As in Lisbon, the city of Lagos was also heavily shaken and practically raised, with the destruction of most of the buildings, forcing the military chiefs and parish priests to leave the city and the population to lodge in improvised wooden and thatched shacks next to the Ermida de Santo Amaro. According to the architect Rui Paula, the governor of the Kingdom of the Algarve, in a letter sent to King D. José, in December 1755, noted about Lagos that that place was the key to the kingdom, as it was located on the coast, with a bay that could accommodate more than two hundred warships and had next to it a beach of more than one league where in a matter of few hours, full disembarkation could take place (Paula, 1992).

The reconstruction of the city was difficult and delayed, due to socio-economic problems that intensified in the early 19th century, with the French Invasions, and later with the Portuguese Civil War that led to the implantation of liberalism.

The recovery of the economic importance of Lagos appears, above all, in the second part of the 19th century, with the implementation of the fish canning industry. The first buildings linked to the conservation of fish by salt appear, inside the walls, and at the end of the century, the first canned factories in olive oil and modern sauces. The demographic and economic dynamics associated with the implementation and expansion of the canning industry in the last decades of the 19th and early 20th century, led to the construction and rehabilitation of intramural buildings and extramural urban expansion, especially in the Rossio area of S. João (Amaro, 2020), as well as improved road accessibility. A series of improvements took place in the port structures and with the arrival of the railway line in 1922, Lagos became one of the cities of national reference for the canning industry.

The city of Lagos has some architectural heritage with classified properties and monuments, namely national monuments, public interest properties, municipal interest properties and properties in the process of being classified, approved as properties of public and municipal interest. Currently, the National Monuments classified in the municipality are the historic walls (Muralhas and Torreões) of Lagos, the Church of Santo António and the Church of São Sebastião.

The economic dynamics that occurred in Lagos at the end of the 19th and early 20th century, were accompanied by the construction and rehabilitation of the intramural buildings. In this time period, in Portugal, the foundry industry evolved in a social, economic and political context favorable to the Portuguese industrial start. The union of art and industry took place, which gave rise to a profusion of artefacts in cast and wrought iron in urban environments, largely through the emerging bourgeoisie. Thus, it is considered that the intramural area of the historic centre of the city of Lagos constitutes an appropriate study area (Fig. 1) to develop an investigation on decorative pieces in cast iron and wrought iron, as architectural elements of the existing buildings.

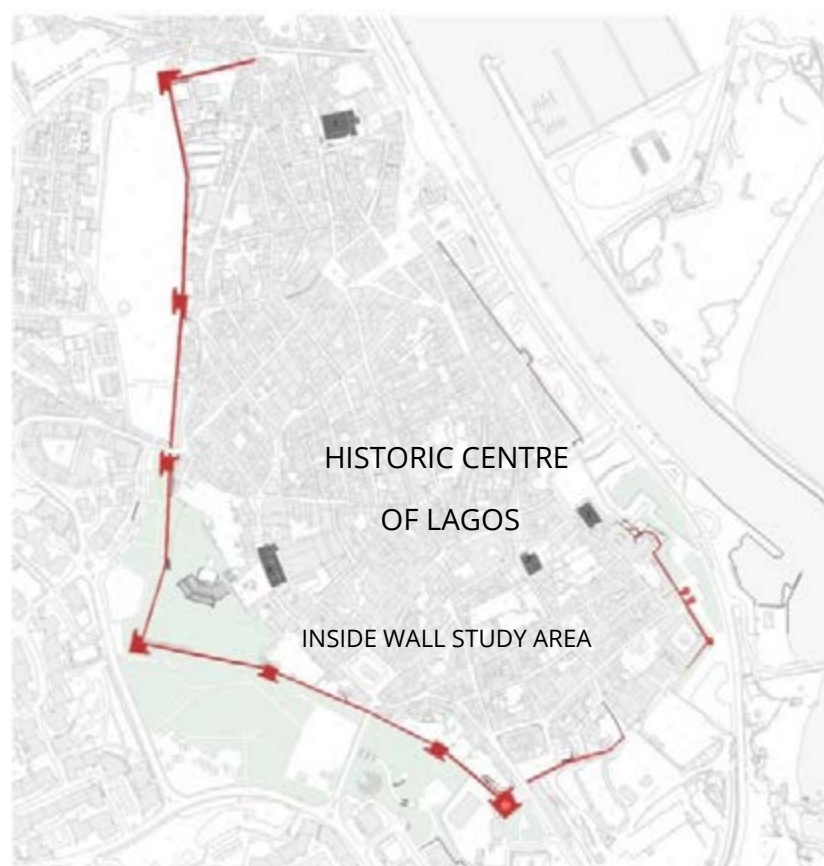
4. Methodology

A previous investigation of sensorial tourism experiences associated with door knockers known as the “Hands of Fatima” (Bender, Rosa, Lopes & Flores, 2021) was developed within the Program Summer with Science 2020 (Verão com Ciência 2020). The Accessible and Inclusive Project was supported by the Portuguese National Funding Agency for Science, Research, and Technology (Fundação para a Ciência e a Tecnologia) and developed within the ambit of the Sustowns Project, in articulation. In this project, the importance of other elements of cast and wrought iron in the architecture of the façades was perceived, adding value to the urban landscape.

In the present research, considering the methodological process, three phases were considered to achieve the proposed objectives. The first stage, developed in the Summer of 2020, included the task of selecting the site of study, taking over the area corresponding to the historical centre of the city of Lagos, the city within the walls. Then data collection was executed by direct observation, in the Spring 2021, through trips made to the study site. An inventory of the building was carried out, which has decorative elements in cast and wrought iron. This work was accompanied by a photographic survey. Paper maps were used to locate and reference the different types of decorative cast and wrought iron elements. This information was transferred to digital cartography, and the graphic production of thematic maps continued using the open source software Krita 5.0. This is one of the tools used for the creation of roughness maps (Pai, 2019).

Specific decorative elements belonging to the facades of the buildings were identified, on windows and balconies, on doors (cushions, flags and knockers), as well as railings and gates in cast and wrought iron used to delimit spaces, the type of materials, form and/or design, which would be related to the characteristics of the artistic movements and catalogues mentioned above. Thus, the work focused on buildings built in the late 19th and early 20th century, and on buildings that were previously the subject of architectural rehabilitation perceived by specific elements such as tiles or balconies.

Figure 1. Study Area: Historic Centre of Lagos Inside Wall



Source: Adapted from cartography map provided by the municipality of Lagos

5. Results and discussion

The facades of the main oldest buildings have a lime and sand-based mortar coating, whitewashed, and occasionally coloured. 750 cast and/or wrought iron elements were identified, allocated on the facades of the buildings and, in some particular situations, on walled walls: 299 grilles, 201 cushions on doors, 132 knockers, 21 gates, 36 flags, 37 handles, 17 ironworks and 7 railings on walls. Figure 2 shows the distribution by typologies, showing the importance of grilles, cushions on doors and knockers.

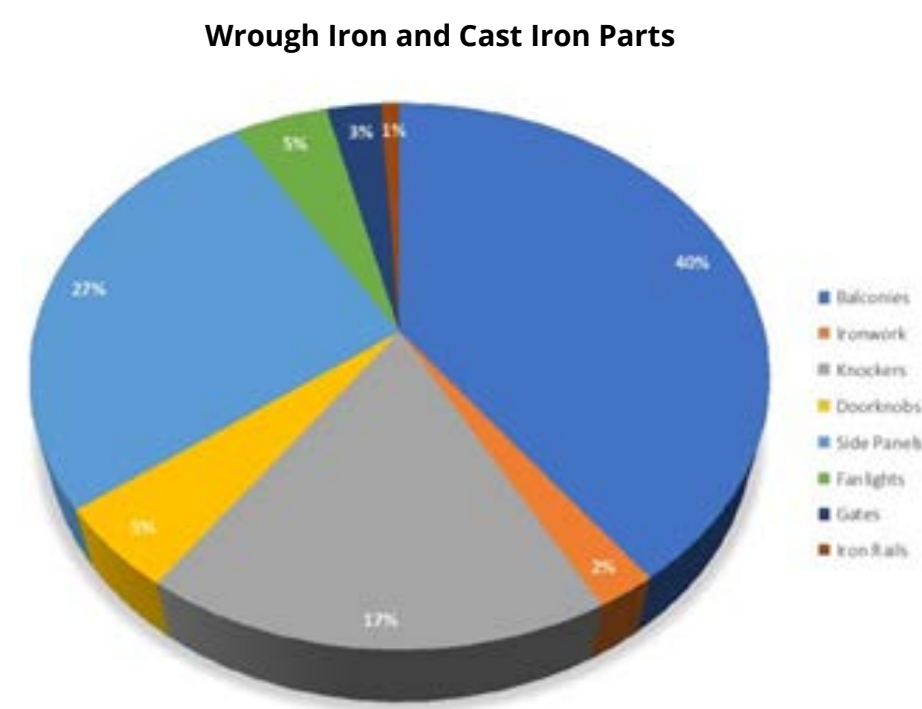
In the case of railings, those on balconies dominate over those on balconies and windows. The grilles come in a wide variety of patterns, both in the use of wrought and cast iron. The ornaments sometimes reveal a date of production or a pattern that identifies the possible time of production that may relate to the style of an artistic movement, for example those of the Romantic and Art Nouveau period.

Effectively, in the urban landscape, the railings on balconies and balconies themselves, with the continuity they present, stand out on the facades in a different way, guaranteeing a great aesthetic and urban sense. It is understood that the iron railings ennobled the facades and ensured a rhythmic sense to the architecture of that period. Flat volume prevails, where the straight line dominates, sometimes with neo-Gothic arches, and designs of wreaths. In addition to being artistic ornaments, they were functional elements, used in urban daily life, as they ensured security in separating the private from the public space. Most of the balcony railings have a flat volume, but some are bulged/convex, or angled, forming two planes.

The cast and wrought iron balcony rails (Fig. 3 and 4) are true pieces of great artistic value, contributing to the enhancement of the urban landscape representing romantic and Art Nouveau motifs.

The analysis of the material and design of the side panels and fanlight on the doors allow us to define the production period and make an association with the movements (Fig. 5 and 6). Regarding the material, it appears that both cast and wrought iron are used, the first associated with Romanticism and the second intensely used during the Art Nouveau artistic movement, a style that is very noticeable in the wicket bars. They are usually surrounded by wooden frames with an appreciable relief.

Figure 2. Typology of decorative architectural elements in cast and/or wrought iron



Source: Own Elaboration

Figure 3. Balcony railings in cast and wrought iron with romantic motifs

Source: Authors

Figure 4. Balcony railings in wrought iron with Art Nouveau motifs

Source: Authors

There is a greater concentration of side panels in relation to fanlights, perhaps because of their functional use, allowing ventilation and lighting inside the buildings, in addition to allowing a discreet view to the outside.

In many situations the doors are surmounted by a top panel or fanlight protected by iron bars. Sometimes the construction date is drawn or monogrammed by the owner. There are some situations in which there is an upper panel, but in most cases they are made up of cast or wrought iron grids made up of bars placed in a radial pattern.

Figure 5. Door side panels in Lagos residential buildings

Source: Authors

Figure 6. Door fanlights in Lagos residential buildings



Source: Authors

In the case of door stops and doorknobs, they are mostly made of cast iron. The knockers are predominantly the so-called hands of Fatima. There are several versions about the genesis of the “Hand of Fátima”. The door knocker in the shape of a closed hand produced in cast iron can be associated with Islamic and Jewish cultures or just a French colonial element that emerged in the 19th century, associated with foundries and romanticism. Its generalization probably occurred due to its utilitarian function, but could also be because of its symbolic and even superstitious role, as it is considered by many as a protective talisman (Bender et al., 2021). There is also the occurrence of some knocker rings or knockers, also in wrought iron and other models with fish, seahorse and snake shapes. These components have different materials and design, ranging from gray cast iron with more accentuated, solid, robust volume and less detail in the relief, to the slender bronze piece of lesser volume, with a more delicate appearance, but with greater detail in shape, texture or protrusion (Fig. 7).

Figure 7. Knockers in Lagos residential buildings



Source: Authors

In fitting doors, locks, hinges and keyhole mirrors or escutcheons were considered, the latter dominating. Many fitting pieces were produced in cast iron, but there were problems with the durability of this material due to the function they performed. The great possibility of the frequency of sudden movements of strong impact on the doors or locks, resulting in broken parts, lead to adopting wrought iron for the better performance of these elements. Those traditional fittings are much smaller in number, most are in wrought iron (Fig. 8), but some in cast iron were still inventoried. Only the hinges visible from the public space were identified. They were produced from wrought iron or sheet iron. Cast iron lock mirrors still exist, despite their fragility, they are decorative and distinct exterior elements. The designs of the keyhole mirrors were made from sheet iron, and are variable in shape.

Figure 8. Wrought Iron door fittings

Source: Authors

Gates and railings, mainly used on the outer limits of dwellings or public buildings, are also rarely used. Most of the houses in this historic centre have the main facades directly facing the public road, without any patio to establish this communication. Of the few railings found, it is observed they are mostly wrought iron and sometimes with cast iron spearheads or arrowheads.

For the spatialization of the cast and wrought iron architectural elements (Fig. 9 and 10) inventoried in this investigation, municipal cartography was used. It integrates the buildings of heritage value, of notable classification and monitoring, existing in the historic centre of Lagos that appear in the plan of the historical and heritage value developed within the scope of the Global Study of the Urban Rehabilitation Operation of the City of Lagos (CML, 2014).

The analysis of the location of iron artifacts in plan allows us to conclude that the area under study, belonging to the historic centre of Lagos, has a high density of decorative elements in cast and wrought iron. The distribution analysis shows that there is greater density in the structuring of access street axes in the historic centre of Lagos, where there are more impressive houses, destined for the middle class bourgeoisie, who lived in the city in the final decades of the 19th century, precisely at a time of economic expansion in which housing became larger, corresponding to a rise in the standard of living of some merchants and industrialists.

Some iron elements analyzed are in buildings that were not identified as having notable classification, in the plan of historical and patrimonial value referred to. It is argued that the architectural heritage goes beyond the scale of the building, some of its elements, due to their uniqueness, as they reflect the design and architectural understanding of the period in which they were produced, and for their artistic and aesthetic value, should be integrated in a heritage preservation strategy.

The spatial distribution of the buildings that have window grilles and balconies made of cast and wrought iron, may allow the development of proposals for urban cultural routes alluding to the romantic period of the late 19th century and to Art Nouveau, from the beginning of the 20th century. With the analysis of this inventory of decorative elements in cast and wrought iron, it is understood that their patterns and shapes allow us to identify the construction and/or rehabilitation of buildings over time.

Cultural sustainability promotes the preservation of tangible and intangible heritage in different forms such as art, heritage, knowledge and cultural diversity (Hawkes, 2001; Sachs, 2002; Soini & Birkeland, 2014; Dessein et al., 2015) which translates local identity. Nowadays the existing architectural assets are increasingly connected with the cultural identity of places. Traditional architecture constitutes a substantial part of the Cultural Heritage (Carrión Gútierez, 2015).

Cast iron is one of the most important products of the industrial revolution. It transformed civil architecture and nowadays it is considered a defining feature of 19th century architecture. The use of new industrial materials, such as iron and glass allowed for the construction of larger lighting open spaces with a new technological appearance and a hitherto unimaginable freedom of expression (Palmero-Iglesias & Bernardo (2022). Currently, it is assumed that iron contributed to the change in the physiognomies of 19th century cities (Cervera Sardá, 2006). Usually, only major cast iron buildings, as structural elements, such

as markets, gardens, and train stations are seen as touristic products with historic and cultural value.

In the beginning of the 20th century, the mixture of cast and wrought iron's decorative elements in civil architecture brought cultural and aesthetical value to urban landscapes (Braga, 1995; Magaziner & Golding, 2000; Dametto, 2009; Barradas, 2015; Vieira, 2020) and retains its value in communities to the present day.

Figure 9. Cast iron and/or wrought iron decorative architectural elements' locations map



Source: Own Elaboration

Figure 10. Cast iron and/or wrought iron fittings locations map

Source: Own Elaboration

The present research identifies a high density and excellent examples of cast and wrought iron decorative elements of architecture in the city centre of Lagos. There are, mainly, traditional cast iron grilles and door knockers from the iron industry, and many wrought ironworks that were created by hand in local forges. A large diversity of these latter elements and compositions can be found in rivets, upset ends, collars, mortise and tenon joints and other traditional joinery techniques. The present research demonstrates that these architectural elements are adapted to different artistic movements and different periods. Although some of them demonstrate different characteristics in the composition of iron materials, they present design intentions close to the original models of a bygone era but with local specificities, as occur in vernacular architecture.

According to the Amsterdam Manifesto, the European Charter for Architectural Heritage, European architectural heritage also considers the sets that constitute ancient cities and traditional settlements in their natural or built environment (Council of Europe, 1975). Vernacular architecture translates an architectural language of the people who have local and regional ethnic dialects (Oliver, 2006) which translates cultural identity.

The legacy associated to cast and wrought iron decorative elements in civil architecture guarantees local authenticity and has brought about a broader understanding of what actually constitutes the value of architectural heritage. Cultural properties of buildings can be positioned as a subset of the cultural properties of places (Memmott & Keys, 2015). On the other hand, successful and profitable destinations will be those capable of being built with clear links to grassroots and thus developed without losing their own personality (Costa, 2001).

According to van Oers (2010) a cultural route ties a series of culturally and historically important elements and its structure can be a physical or perceived product. It can be either a path that existed in history or one that is created in recent times. In fact, local institutions, academia and enterprises have been creating a diversity of new thematic cultural routes.

The density of cast and wrought iron decorative elements of architecture in the centre of the city of Lagos, permits the local definition of new cultural routes, mainly associated to slow tourism and with artistic movements, contributing to bringing forward the importance of architectural heritage in European and world history, tourism being the tool to promote this. Those products can enhance tourist experiences that provide well-being and social inclusion. For example, cast iron knockers are small sculptures of great artistic and aesthetic value, and are considered a tourist resource that allows sensory and inclusive experiences (Bender et al., 2021).

Throughout the process of sustainable development, one also requires profound changes in the pattern of consumption of citizens, either residents or visitors. The individual dimension of sustainability (Rosa, 2018) describes the potential of actions which enable and lead to attitudes and practices according to the sustainable use of natural resources, such as energy and water. The sustainability agenda requires creating new means to convince tourists to take a more responsible approach to their entire holiday, which includes more walking and cycling, visiting nature and cultural attractions (Moon, 2018).

The decorative elements of cast and wrought iron in the architecture of the late 19th and early 20th century can be understood as both tangible and intangible heritage. The Convention for the Safeguarding of the Intangible Cultural Heritage (UNESCO, 2003) considers that the intangible cultural heritage includes practices, representations and expressions, knowledge and skills - as well as the instruments, objects, artefacts, and cultural spaces associated therewith - that communities, groups or individuals recognize as part of their cultural heritage. The techniques and skills related to these traditional crafts have an intangible expression. Thus, it is essential to safeguard the intangible architectural heritage associated with the practices of production and maintenance of cast and wrought iron artifacts, ensuring their identification, preservation and enhancement. The knowledge of building traditions contained in manuals and historical treatise books are exceptional examples where teachings were fixed in time in a kind of anthropology of building culture (Aguar, 1999), and it is essential to preserve this intangible heritage and integrate this narrative in the dissemination of tourism products.

This research advocates that cast and wrought iron decorative architectural elements in the city of Lagos in the late 19th and early 20th century translates cultural identity and so must be preserved for future generations. This is not a mere municipal issue, as the holistic conservation of architectural heritage, which has cultural, economic and historical value, depends on the joint cooperation of people, experts, and governments (Taher Tolou Del, Saleh Sedghpour & Kamali Tabrizi, 2020).

6. Conclusion

All over the world, Historic Urban Landscape, as cultural heritage, integrates historic urban sites and architectural ensembles (UNESCO, 2019). These have been perceived by their cultural interest allowing the embellishment and the particularity of being places characterized by authentic architectural features, and so architectural heritage must be preserved. Historical places, landscape, vernacular and architectural

heritage can offer inhabitants and visitors a place where it is good to live and visit.

The New European Bauhaus movement based on sustainability, inclusion and aesthetics/art, emphasizes the urban experience. The architectural heritage, due to its aesthetic and artistic value, perceptible in the urban landscape, adds value to the memory of the city and can add a lot to the tourist experience. This new urban paradigm provides an opportunity for pedestrian routes that have cultural value as new tourist products. Walking by tourists is a healthy activity and contributes to sustainable tourism. A desire to spend time in open spaces has been associated with COVID-19. For local communities, the challenge is to define thematic routes that reproduce the cultural identity inherent to the spaces where they are created, aligning them with cultural sustainability.

The inventory of artefacts in cast and/or wrought iron carried out in the historic centre of Lagos, made it possible to identify the existence of a large amount and variety of decorative elements in the architecture of the buildings, recording different materials, shapes and design, which allow establishing the association with the artistic movements of Romanticism and Art Nouveau. This rich architecture gives the city a special personality and charm and can be seen through new tourist routes that can contribute to the emphasis on the identity, authenticity and diversity of these unique heritage elements.

This research work reinforces the idea that architectural heritage goes beyond the building itself. Its components, due to their uniqueness, are considered part of this heritage, reflecting the design and architectural understanding of the period in which they were produced. Cast and wrought iron elements were registered in the intramural area of the historic centre of Lagos and their historical significance and artistic value were acknowledged. The knowledge obtained reinforces the recognition of the heritage value of decorative cast and wrought iron components and their importance in the urban landscape.

In the Strategic Urban Rehabilitation Program Urban Rehabilitation Area of the City of Lagos, developed in the last decade, the creation of thematic pedestrian paths it is proposed, as they are understood to be an opportunity that can contribute to the diversification of the tourist product, and the requalification and promotion of the built heritage of the municipality (CML, 2012). It is an opportunity to value the architecture associated with Romanticism and Art Nouveau, where elements of cast and wrought iron are protagonists.

It is necessary to define a municipal strategy to safeguard architectural elements in cast and wrought iron with specific prevention and conservation measures, with training actions, technical support for owners and financial support from central and local governments. To make the replacement of iron elements feasible, it is essential to save historic pieces that are found in abandoned buildings or at the beginning of construction works, through municipal or private material banks.

In the current pandemic context, due to the growing emphasis on outdoor activities, pedestrian routes on architectural heritage can be differentiating, enhancing the attractiveness of the historic centre and contributing to sustainable and healthy tourism.

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