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Industry, Photography, Representations: Portugal, 1897-1914

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ABSTRACT

In late nineteenth century and in the first two decades of the twentieth century, Portugal witnessed a modest industrial growth. This industrialisation process was recorded by thousands of photographs, many of which were published in the illustrated press. In this article, I analyse how Portuguese industry was represented by photography and how that representation was disseminated nationwide through the publication of photographs in the two most important illustrated magazines of that period: *O Occidente* and *Illustração Portugueza*. I rely on a methodology combining semiotics with discourse analysis in journalism. I show that both magazines built an industrial landscape of modernity and progress, which did not coincide with the real condition of Portuguese industry. I add to the discussion advocating photography as an historical source, arguing that it is much more than a mere illustrative support, but a reliable primary source, with a high potential for history in general, and for the fields of business and industrial history in particular, in the sense that photography can provide fresh narratives around technological change.

KEYWORDS: landscape, techno-industrial nationalism, technological sublime, progress

JEL CODES: L60, N13, N53, O14

1. Introduction

The second half of the 19th century witnessed the confluence of three distinct developments: industrial growth, the rise of the illustrated press, and the invention of photography. In this article, I use a methodology combining semiotics with discourse analysis in journalism to explore how the Portuguese illustrated press, namely magazines *O Occidente: Revista Illustrada de Portugal e do Estrangeiro* (hereafter *Occidente*)[1] and *Illustração Portugueza*,[2] utilised photography to create and disseminate a picture of modernity of the Portuguese industrial sector from the final years of the 19th century to the cusp of World War I. This research builds upon a prior study where I examined the portrayal of industry in the press through wood engravings (Pereira 2021a). I add to the

[1] Which translates to *The West: Illustrated Magazine of Portugal and Abroad*. Available online here: hemerotecadigital.cm-lisboa.pt/obras/ocidente/ocidente.htm.

[2] *Portuguese Illustration*, at: hemerotecadigital.cm-lisboa.pt/OBRAS/IlustracaoPort/IlustracaoPortuguesa.htm.

debate about the application of photography as a primary source in historical research and to the promotion of a visual culture perspective on industrial history.

Throughout the 19th century up to the first years of the 20th century, Portuguese industry developed progressively, but moderately, and it remained underdeveloped compared to leading European nations. The period between 1870 and 1913 saw a dynamic increase in industry that benefitted from the improvements in the transportation system, new industrial technologies, and protectionist governmental measures from both the monarchic and the republican regime (instated in 1910). Nevertheless, the scarcity of raw materials, the restricted domestic market, and the lack of infrastructure to maintain industrial machinery limited the growth of Portuguese industry. In the beginning of the 20th century, a few large industrial facilities coexisted with many small units. On the eve of World War I, Portugal remained largely an agrarian country with an underdeveloped industrial sector. Productivity remained low, and both entrepreneurs and labourers lacked sufficient education and training, contrasting with the booming industrial centres of other European core nations (Lains 2005, pp. 259-78; Mendes 1980, pp. 36-42; Reis 1987, pp. 207-27).

In the same period, photography developed in Portugal. Since the 1840s, Portuguese and foreign photographers set up studios across the country. Soon photography became a valuable tool in various fields, including engineering, medicine, or astronomy. It was even incorporated into the curriculum of higher education and amateur courses. However, until the third quarter of the 19th century, photography was a practice reserved for the richest, as it was very expensive. From the late 1880s onwards, a wave of innovations simplified the photographic processes and significantly reduced its price. This shift democratised photography, making it accessible to the middle classes (Sena 1998, pp. 13-199).

The adoption of photography by the press was hindered by technical limitations throughout most of the 19th century. For decades, the illustrated press used woodcuts, a cheaper and faster method of image reproduction. In the turn of the 19th to the 20th century, halftone allowed the printing of photographs, which provided a more realistic and credible representation of the scene than woodcuts (Beegan 2008, p. 6, 12; Sousa 2017a, p. 215). The halftone process involved photographing an image through a special glass scored by a lattice of fine lines onto a layered zinc plate which was outlined with acid to separate light and dark zones (the former, eaten by the acid, did not capture the ink). The halftone merged photography and printing technology, paving the way for photojournalism (Fang 1997, p. 54).

In the Portuguese illustrated press, which dates to the early 19th century, influenced by similar publications across Europe (Beegan 2008, p. 31; Mainardi 2017, p. 34; Sousa 2020), magazines *Occidente* and *Illustração Portugueza* stood out for their abundant use of halftone printing of photographs.

Occidente was founded in 1878. It was published every two weeks until 1880 and three times a month thereafter. Until 1897, it relied on wood engravings to reproduce

photographs; from that year on, it began using halftone. *Occidente* covered a wide range of contemporary topics, with correspondents stationed in Portugal and abroad (*Occidente*, specimen, 1877, p. 4; 1231, p. 60). Its price was steep, but accessible to many, especially in the elites: the price of a single issue was 120 *réis*, whereas an annual subscription cost between 2,600 and 3,800 *réis* (Sousa 2017a, pp. 219-22).[3] For context, daily salaries for rural and industrial workers ranged between 288 and 600 *réis* (Martins 1997, pp. 529-33; Reis 1987, p. 222).

Illustração Portugueza was published weekly since its foundation in 1903. It was slightly more expensive than *Occidente* (an annual subscription cost 4,800 *réis*),[4] but still affordable to most. *Illustração Portugueza* used photography intensively, featuring tens of photographs in each issue. One of its photographers, Joshua Benoliel, provided a rich visual record of various events (Vieira 2009). He is the author of more than 25% of the photos analysed in this article.

The circulation figures of these magazines were not impressive. *Illustração Portugueza*, for instance, printed 25,000 copies per issue (Costa and Serén 2004, p. 46; Sousa 2017b, p. 592). The leading Portuguese daily newspaper at the time, *O Seculo*, printed 80,000 copies per issue. However, *Occidente and Illustração Portugueza* boasted distribution networks spanning Portugal and its colonies (Sousa 2017a, pp. 219-23, 228, 233, 237; Sousa 2017c, pp. 24, 85, 88). These publications likely catered primarily to the Portuguese elites. Beyond the content itself, owning these publications served as a status symbol. Acquiring and displaying them conveyed not just an interest in current affairs, but also a level of sophistication and wealth. Furthermore, it was common practice to share copies with other members within the community (Tengarrinha 2013, pp. 865-6). Considering that the Portuguese population ranged between 4.5 and 6 million in the period analysed in this article (Valério 2001, p. 51), it seems reasonable to believe that both *Occidente* and *Illustração Portugueza* reached a broader segment of the population than just the circulation figures suggest. Moreover, the practice of sharing the contents of the magazines in the community helped overcome the illiteracy rate of 70% in the Portuguese population at the time, even if they could not personally read them. (Candeias and Simões 1999, p. 170). Additionally, the profuse use of photographs transcended language barriers and conveyed information even to the illiterate, considering that examining an image does not call for any specific proficiency (Beegan 2008, p. 14).

Perusing these two publications, I compiled a collection of 579 photographs, depicting assorted aspects of the Portuguese industry from the late 19th century to the eve of World War I, comprehending two distinct political regimes: monarchy and republic.

[3] Around £2.79, £59.68, and £68.51 today, respectively. For these calculations, I used the currency rate *real* to pound sterling estimated by Mata (1991, pp. 39-40) and the online tool *Measuring Worth* (www.measuringworth.com/calculators/ukcompare) to compute the relative value of pounds sterling in 2021.

[4] Depending on the year, around £86.58 and £98.25.

2. Methodology

In the 19th century and early 20th century, photography benefited from the positivist view that it was completely objective. As a product of science and technology, it was accepted that it represented reality as reality was and not as a painter or a drawer subjectively saw it (Daston and Galison 2007, p. 121; Jäger 2003, p. 119). As French philosopher Roland Barthes (1981, p. 40) put it, photography offered the certainty of "having been there".

Although it results from a mechanical act, photography is a subjective practice in the sense that it involves many choices from the photographers, including the angle, composition, depth, characters depicted (human and non-human), etc. (Brollo 2023, pp. 70-89). These decisions depend on the goals sought by the photographers or their commissioners (Freund 1995, p. 20; Pinheiro 2011, pp. 115-17; Serén 2002, pp. 37-8). Moreover, it was possible to tamper with photographs after its development, especially in the halftone printings (Beegan 2008, p. 15). As a subjective practice that was accepted as an objective product, photographs became physical indicators of abstract concepts like progress (Barthes 1977, p. 17) and tools to produce ideology and shape public opinion (Kelsey 2016, pp. 85, 90; Serén 2002, pp. 19, 25; Weiss 2020, p. 743).

The analysis of photography underscores the values of those who produced or commissioned it, but only the study of its dissemination allows to know its impact on society and public opinion. Just as one colloquially asks whether a tree that falls in the forest makes a sound if no one is there to hear it, one may ask: if a photograph is taken and no one sees it, does it have any sociocultural impact? In this vein, the role of the illustrated press becomes central.

Illustrated journalism was the main tool for the dissemination of information before the electronic age, especially after halftone accelerated the circulation of images and offered the illusions of a direct contact with reality and a more immediate consumption of information (Beegan 2008, p. 12, 14, 26; Mainardi 2017, p. 35). What is more, the physical format of magazines encouraged readers to leaf through its pages and look at the images more than to peruse its contents (Costa and Serén 2004, pp. 71, 90). By regularly publishing photographs, the illustrated press accumulated small fragments of knowledge that offered its readers a discernible overview of reality. It helped them to create a reality, conceptualise society, and bring them together as members of a group with common values, establishing national links within a dispersed society (Beegan 2008, pp. 1, 15, 21-4). The consumer of illustrated magazines, by seeing others reading the same source, noted the existence of a national interpretative community that shared the same contents and representations (Anderson 1983, pp. 39-40; Green-Lewis 1996, p. 113). Photography and the illustrated press contributed to the process of unification of the public mind (Tarde and Clark 1969, pp. 297, 318).

There is not a predetermined methodology to analyse photography, as it depends on the research subject, the type of photography, and the breadth of its circulation. To interpret the collection I gathered, I draw from the three-step methodology proposed by

communication expert Márcia Benetti (2007, pp. 112-3) to analyse discourse in journalism:

1. systematic observation of the iconographic discourse of the periodical;
2. categorisation and selection of images with similar characteristics (in this case, images of industry);
3. iconographic examination of the sample.

Steps 1 and 2 were conducted using the online tool STEMgram (www.stemgram.pt) that gathers, catalogues, tags, and identifies people in photographs. As for stage 3, I go back to the false objectivity of photography, and I claim that photos are not transparent but require interpretation to be understood (Daniels and Cosgrove 1989, p. 2). I rely on the approach proposed by Barthes (1972, pp. 109-56; 1977, p. 37) who argues that photographs contain two messages: the denoted message, which is a reproduction of reality, and the connoted message, which is how the community perceives reality. The former includes the signifier (the elements photographed), while the latter includes the signified (the message that is carried out). The repetition and accumulation of signifieds leads to the sign and to the myth. Although Barthes' methodology was devised in the 1970s, I argue that his approach is essential to understand the representations created by photography and that it remains one of the most effective to study these issues, as illustrated by recent literature that revisits and uses the Barthesian model (Batchen 2009; Knight 2000; Pereira 2023).

To grasp the connoted message, it is necessary to analyse the image's *studium*, that is, its sociocultural context. In this sense, Barthes (1977, p. 28; 1981, pp. 26-27) emphasises the historicity of the connotation code, meaning that its interpretation requires that the observer is familiar with its historical context and with the goals of the photographers or their commissioners. In this article, the images are from the industrial sector of a semi-peripheral country who was struggling to modernise its infrastructure and sought to get closer to the levels of development of the European core nations.

To understand the *studium* it is necessary to include in the analysis written sources that accompany the photographs or that help to characterise the scenes photographed, bearing in mind that visual culture cannot be dissociated from written culture (Daniels and Cosgrove 1988, p. 1; Vicente 2014, p. 12). As art historian Nuno Porto (2014, p. 494) rightly points out, a picture is not worth a thousand words; it requires a thousand words to be well interpreted. Moreover, the analysis of written sources contributes to curb the preconceived ideas of the researcher and to ascertain which of the signifieds embedded in the image stands out (Barthes 1977, pp. 25-26, 39; Daniels and Cosgrove 1989, p. 1). In this vein, the exam of the photographs' original captions is central to determine its goals. The caption directs the eye of the observer to a specific detail of the image that the photographer wished to underpin (Franklin et al. 1993; Landau 2002, p. 15), and it is a way to induce the *punctum*, what Barthes (1981, pp. 26-27, 42) describes as that element that rises from the photograph and pierces the mind of the observer (Burgin 2009, p. 33).

I underscore the importance of captions in the reproductions of photographs included in this article. Knowing the author of the photographs is an important detail to consider, but in this sample, that information is not available for more than half of the images. The remainder are divided amongst tens of photographers. As mentioned before, Joshua Benoliel stands out as author of roughly a quarter of the sample.

Photography is intimately connected with landscape (Jäger 2003, p. 121; Kelsey 2016, p. 71). Like photography, landscape is a social construct, as advocated by cultural theorist Raymond Williams (1973, p. 120), who claimed that landscape should be related with the history of a territory and its dwellers. Photography can create specific landscapes according to the specifics it emphasises and accumulates (Pereira 2023), which in this article translates into the creation of industrial landscapes.

The methodology I used in this article is in line with these guidelines. I start by identifying images with signifiers of industry in Portugal, and by dividing them into categories, considering the predominant signifier in each: type of industry and type of scene portrayed. Secondly, I move to the analysis of the signifieds present in each, bearing in mind the textual elements that accompanied them. The conclusion wraps up the myth created by photography.

3. Portuguese industry as seen by *Occidente* and *Illustração Portugueza*

Industry was represented visually long before the invention of photography. Different painters pictured industrialisation, exalting the mechanical arts and the monumentality of factories, often with political motivations. In the first half of the 19th century, academic journals used technoscientific drawings to disseminate technical innovations. Photography initiated a new stage in the visual representation of industry. Since the late 19th century, industrial photography became a popular genre in Europe (Klingender 1968, pp. 55-64, 148, 165; Matos 2000; McCauley 1994, p. 19). Throughout the 19th and 20th centuries, photography became indispensable for industry (Freund 1995, 20) and its "seeming transparency, clarity and precision made it the obvious form of representation for corporations whose power was founded on technology and modernity" (Foster 2003, p. 114).

This section is dedicated to analysing the messages transmitted through photographs published on *Occidente* and *Illustração Portugueza*. I start with a statistical treatment of the sample and then I take a qualitative approach, in accordance with the methodology described previously.

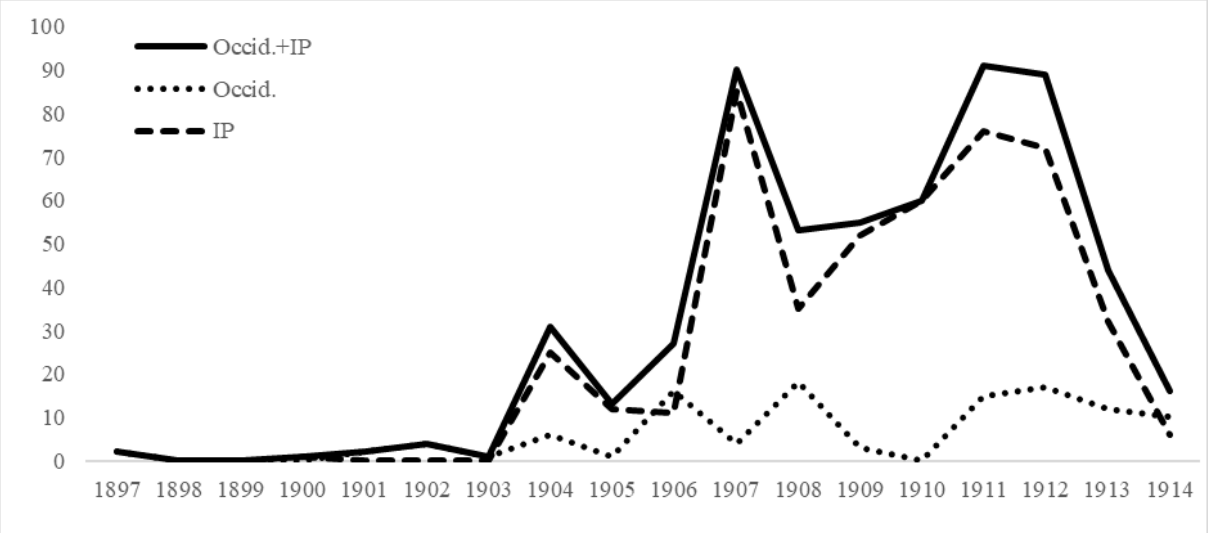
3.1. Statistical perspective

The publication of photographs of industry in *Occidente* and *Illustração Portugueza* was residual until 1906 (figure 1). By then, *Occidente* used mostly wood engravings, whereas *Illustração Portugueza* was a recent periodical. Additionally, both were more interested in other subjects ranging from the technoscientific achievements of Portugal to mundane national affairs or foreign events.

From 1904 onwards, peaks in the publication of industrial photographs are noticeable. In 1907 more images of industry were published than in the sum of the previous ten years. This coincided with an industrial surge in Portugal, motivated by a policy of substitution of imports to respond to the economic crisis that affected the country, to the deficit in the balance of payments, and to the devaluation of Portuguese currency (Ferreira 1999, pp. 236-41; Reis 1987, p. 209; Saraiva 2007, pp. 268-70). There was a technoindustrial nationalism (Amir 2007) associated with that surge that photography and the illustrated press enhanced. A decrease is visible after 1912, due to the political instability of the First Republic (instated in 1910) and to the impendence of World War I.

Illustração Portugueza was the main responsible for the dissemination of industrial photographs because it was published more often, and it made a more profuse use of photography.

FIGURE 1. Number of photographs published per year by *Occidente* and *Illustração Portugueza,* 1897-1914

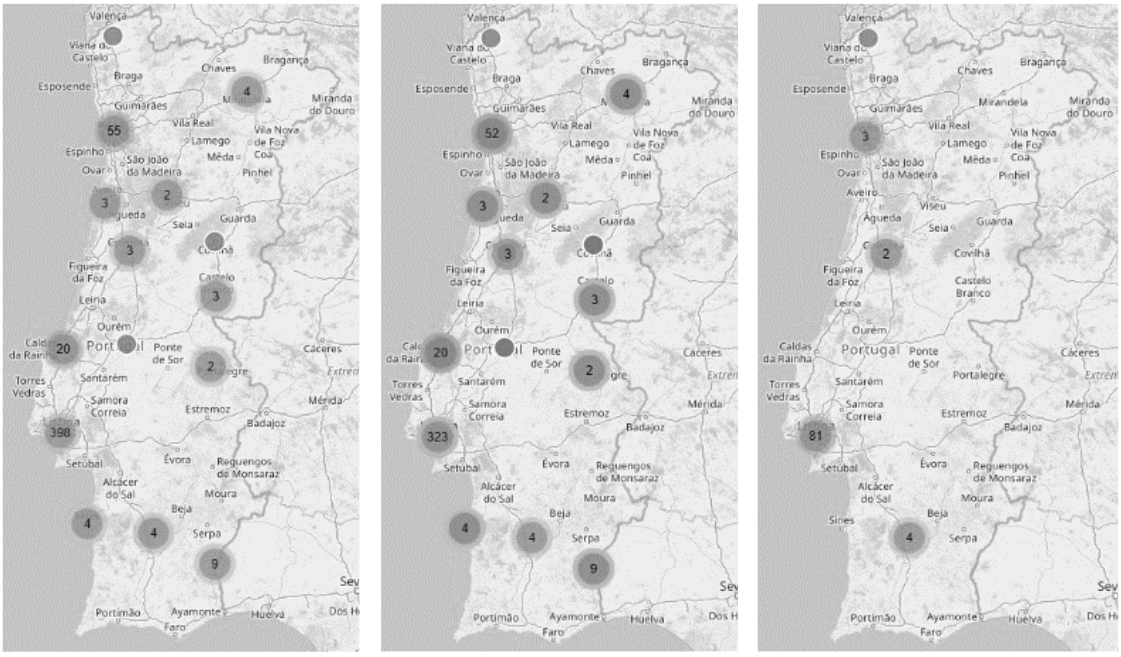


Source: STEMgram (www.stemgram.pt) and own elaboration.

About half of the photographs depict industrial activities in Lisbon. If we include the neighbouring municipalities (note 5, table 1, and figure 2) that figure rises to 70%. This is not surprising, considering that Lisbon was the capital of Portugal and that both *Occidente* and *Illustração Portugueza* were seeded there.

Other areas of Portugal are clearly underrepresented, while some (like the Algarve or the northern Alentejo) are completely absent. Porto, the second largest city in the country with a relevant industrial sector (Ramos 1995), only has 41 photographs of its industry. This contributed to the construction of the visual representation that outside Lisbon, Portugal was an agricultural (and, consequently, backward) land.

FIGURE 2. Geographical distribution of industrial photographs in the Portuguese mainland in *Occidente* (B), *Illustração Portugueza* (C), and both magazines (A), 1897-1914



A B C

Source: STEMgram (www.stemgram.pt) and own elaboration.

Finally, the sample includes a few dozen images taken outside the Portuguese mainland and its archipelagos of Madeira and Azores. Some depict industrial activities in Angola, the only Portuguese colony represented in the sample. The photographs taken in Argentina (Buenos Aires), Brazil (Rio de Janeiro), and Spain (Madrid) refer to international exhibitions that counted with the presence of Portuguese industries.

TABLE 1. Geographical Distribution of industrial photographs, 1897-1914

Region/Country		Total		*Occid.*		*IP*	
		No.	%	No.	%	No.	%
Portugal	**Greater Lisbon**[5]	397	68.6	80	72.1	317	67.7
	Greater Porto[6]	41	7.1	3	2.7	38	8.1
	Greater Coimbra[7]	13	2.2	2	1.8	11	2.4
	Alentejo[8]	19	3.3	4	3.6	15	3.2
	Minho[9]	10	1.7	1	0.9	9	1.9
	Azores (Angra do Heroísmo and Praia da Vitória) and Madeira (Funchal)	21	3.6	5	4.5	16	3.4

[5] Includes these municipalities: Almada, Amora, Amadora, Barreiro, Cascais, Lisbon, Loures, Setúbal, Sintra, and Vila Franca de Xira.

[6] Matosinhos, Porto, Vila do Conde, and Vila Nova de Gaia.

[7] Coimbra, Ílhavo, Ovar, and Viseu.

[8] Aljustrel, Alter do Chão, Mértola, Portalegre, and Sines.

[9] Braga, Famalicão, Guimarães, Paredes de Coura, Santo Tirso, and Vizela.

Region/Country		Total		*Occid.*		*IP*	
		No.	%	No.	%	No.	%
	West[10]	22	3.8	0	0.0	22	4.7
	Beira Baixa (Castelo Branco and Covilhã)	4	0.7	0	0.0	4	0.9
	Trás-os-Montes (Mirandela)	4	0.7	0	0.0	4	0.9
Colonies	Angola (Benguela, Bom Jesus, and Luanda)	17	2.9	2	1.8	15	3.2
Abroad	Argentina (Buenos Aires)	2	0.3	2	1.8	0	0.0
	Brazil (Rio de Janeiro)	28	4.8	11	9.9	17	3.6
	Spain (Madrid)	1	0.2	1	0.9	0	0.0
Total		579	100.0	111	100.0	468	100.0

Source: STEMgram (www.stemgram.pt) and own elaboration.

An important detail is that most photographs (less than 40% in total, but more than half in the case of *Occidente*) focused on the technological or infrastructural details of industry and do not include any human figures (table 2 and figure 3). This hints at the persistence of three sociocultural constructs:

1. the belief in the *technical fix*, the undisputed power of machines and technology to solve social, economic, and political problems (Ross 1980);
2. the influence of the *technological sublime*, the pleasure of watching a machine operating as a token of humankind's ingenuity and triumph over nature (Kasson 1976, pp. 162-75);
3. a representation of industry that followed the deterministic view of technology in the late 19th and early 20th centuries: invest in technological systems, and progress will follow (Marx and Smith 1994).

In the photographs that include human actors, the presence of male individuals is overwhelming, which does not surprise bearing in mind the patriarchal characteristics of the Portuguese society of that period (figure 3B).

[10] Caldas da Rainha, Golegã, Mafra, and Santarém.

TABLE 2. People depicted in industrial photographs, 1897-1914

	Occid. + IP		Occid.		IP	
	No.	%	No.	%	No.	%
In General:						
General public	46	6.6	11	8.5	35	6.1
Industrial workers	196	28.0	24	18.5	172	30.2
Industrialists	8	1.1	0	0.0	8	1.4
Nobody	276	39.4	69	53.1	207	36.3
Non-industrial workers	56	8.0	10	7.7	46	8.1
Police/military authorities	19	2.7	1	0.8	18	3.2
Prisoners	12	1.7	0	0.0	12	2.1
Public figures	46	6.6	6	4.6	40	7.0
Rulers	29	4.1	8	6.2	21	3.7
Students	12	1.7	1	0.8	11	1.9
Total	700	100.0	130	100.0	570	100.0
By Gender:						
Men	384	90.6	41	95.3	343	90.0
Women	40	9.4	2	4.7	38	10.0
Total	424	100.0	43	100.0	381	100.0

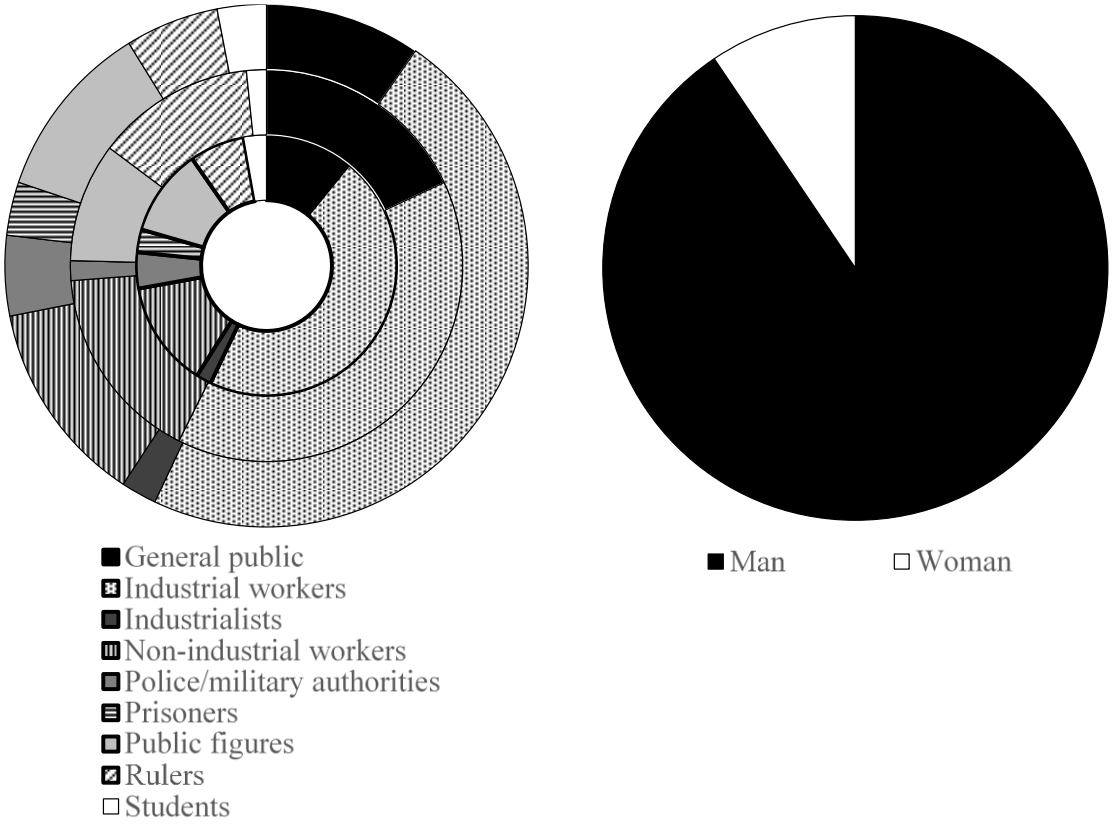
Source: STEMgram (www.stemgram.pt) and own elaboration. *Note*: *public figures* include those whose name is mentioned in the original captions and that are not rulers; rulers include the head of state, the royal family, and members of government; classification by gender excludes non-identified people.

The image of the industrial worker (man, woman, and child) predominates in both journals, who frequently informed about the dimension of the workforce in different enterprises (600 workers in Lisbon's cookie factory Pampulha, 1,500 in the Porto's textile Jacinto, 2,000 working in Almada's cork factory Caramujo). Together with textual depictions, photography gives visibility to these usually invisible actors, but offers a predominantly romantic view of industrial labourers: accomplished, hardened, and hard-working, especially those who worked near heat sources, compared to the helpers of Vulcan, the smith-god. For the purposes of composition, they played the instrumental role of scale to appreciate the dimension of the technoindustrial artefacts or structures that surrounded them. Machines could throw many of these labourers to unemployment, but the illustrated press preferred a narrative that reconciled mechanical and human work (*Illustração Portugueza*, 57, pp. 70-71; 90, p. 639; 183, p. 239; 247, p. 626; *Occidente*, 835, p. 50; 1060, p. 126; 1079, p. 275; 1177, p. 197; 1211, p. 182).

The figure of the low-ranked labour is much more common than the industrialist or business owner, who, in *Occidente*, apart from portraits, is completely absent. In *Illustração Portugueza* they appear in photographs of visits or ceremonies in their establishments (which are less frequent than images of work or the interior of factories). Even so, they are outshined by public figures or rulers (especially king Manuel II who took a special interest in the industry) who attended those events and lent some of their prestige to the sector (*Illustração Portugueza*, 146, p. 718; 261, p. 227). However, both publications praise entrepreneurs in their texts, raising them to the condition of national heroes, with whom workers should cooperate, acclaiming their intelligence,

entrepreneurship, number of jobs created, or capability to develop industrial processes, describing them as promoters of *civilisation*. It was the case of Harry Hinton (sugar producer in Madeira), the Bordalo Pinheiro family (owners of a ceramic factory in Caldas da Rainha), or the shoemaker businessman José António Ramos, "one of those creatures born to refute the southern laziness" (*Occidente*, 835, p. 50; 954, p. 143; 957, p. 163; *Illustração Portugueza*, 17, pp. 527-9; 96, p. 842; 346, p. 468).

FIGURE 3. People depicted in industrial photographs: by profession/civil status (A) and by gender (B), 1897-1914



A

B

Inner circle: *Occid.* + *IP*

Middle circle: *Occid.*

Outer circle: *IP*

Source: STEMgram (www.stemgram.pt) and own elaboration.

There are people unrelated to industrial activities who are portrayed in industrial photographs. This can be explained by the fact that the photographer was focused on other events or specifics than the industrial details present in the image (figure 7A). Many pictures taken during the troubled times of the First Republic depict industrial strikes, overseen by the police or the military. Visits to industrial sites account for the presence of students in the photographs (*Illustração Portugueza*, 57, p. 360; 307, p. 40; 418, p. 243). Finally, industrial work was included in the regeneration of felons, which explains the presence of prisoners in the photographs. Photography and texts emphasise the joy in

those workshops (carpentries, ironworks, weaving and shoemaking shops), underscoring the regenerative powers of industry (*Illustração Portugueza*, 82, p. 473; 221, pp. 618-21).

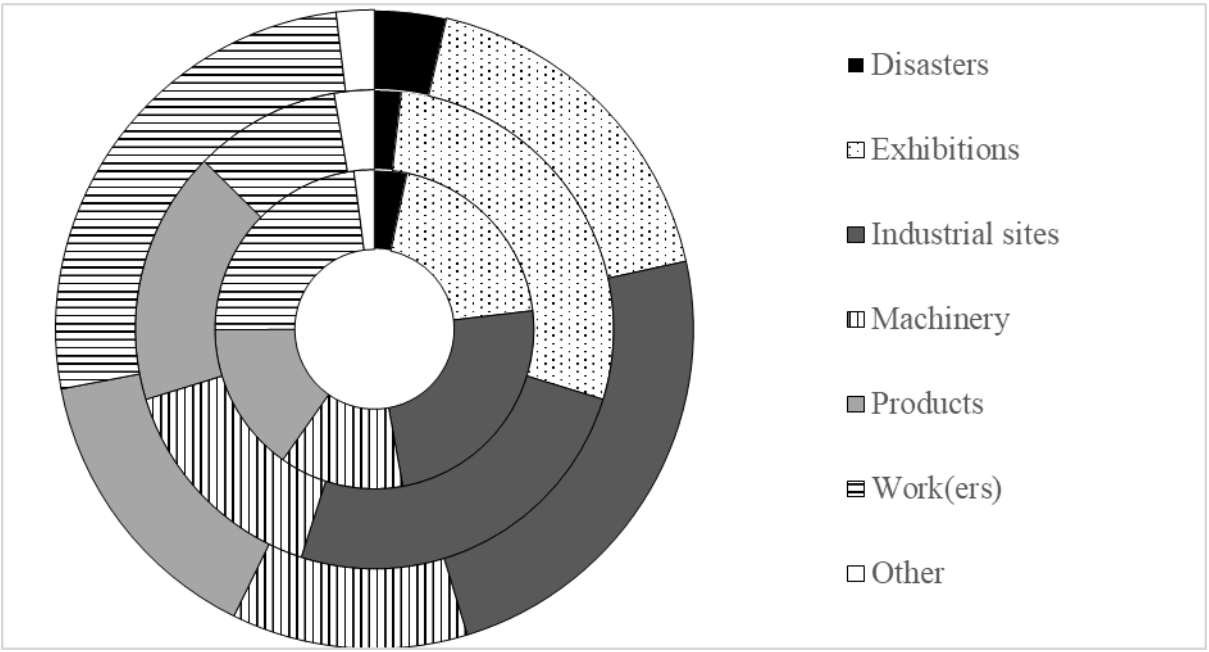
As for the theme of the photographs, a preference for industrial sites (factories or mining facilities) is noticeable in both magazines (table 3 and figure 4). The early years of the 20th century witnessed the construction of several factories in Portugal, especially in the textile, milling, and chemical sectors. Factories were the paramount symbol of industrialism, although they were clearly the exception in the Portuguese industrial sector, crowded with small and artisanal manufacturing establishments (Ferreira 1999, p. 149; Reis 1987, pp. 207-8, 213).

TABLE 3. Distribution according to the theme of the photographs, 1897-1914

	Total		Occid.		IP	
	No.	%	No.	%	No.	%
Disasters	19	3.3	2	1.8	17	3.6
Exhibitions	115	19.9	31	27.9	84	17.9
Industrial sites	139	24.0	28	25.2	111	23.7
Machinery	73	12.6	17	15.3	56	12.0
Products	88	15.2	19	17.1	69	14.7
Work conditions	133	23.0	11	9.9	122	26.1
Other	12	2.1	3	2.7	9	1.9
Total	579	100.0	111	100.0	468	100.0

Source: STEMgram (www.stemgram.pt) and own elaboration.

FIGURE 4. Theme of industrial scenes depicted, 1897-1914



Source: STEMgram (www.stemgram.pt) and own elaboration. *Note:* Inner Inner circle: Occid. + IP, Middle circle: Occid, Outer circle: IP.

By publishing photographs of factories, *Occidente* and *Illustração Portugueza* created a representation of modernity of the Portuguese industry, which did not coincide with the

reality of the industrial sector. In the case of mining facilities, it was clearly admitted that grand mining explorations were rare in Portugal. The mines of São Domingos in southern Alentejo were presented as a novelty and as an example to follow. They did not attest for the development of the Portuguese industry, but as a proof that the industry could grow with investment and good management (*Illustração Portugueza*, 425, p. 470; Mendes 1907, p. 457).

Illustração Portugueza underscored labour scenes (in workshops, assembly lines, engine rooms) in its photographs, often commending the good working conditions of those sites (*Illustração Portugueza*, 57, pp. 70-71; 96, p. 843; 358, p. 861), whereas *Occidente* gave more relevance to the photographic coverage of international, national, or regional industrial exhibitions, where operating machines were part of the show, promoting and benefiting from the technical sublime. These were the most effective venues for publicising industrial products and for attesting the success of Portuguese productions, especially those outside Portugal (*Illustração Portugueza*, 272, p. 607; Cunha 1908, pp. 128-9; Dantas 1907, p. 255; Fonseca 1908, p. 779; Matos 2000; Silva-Passos 1909, p. 508). The textual descriptions that accompanied those images characterise them as "civilising festivities", when not progress incarnate, even with diplomatic consequences, that together with photographs materialised abstract values like "work", "fame", and "progress" (*Occidente*, 1213, p. 193; *Illustração Portugueza*, 54, p. 258, 264; 82, p. 473; 273, pp. 631-2; 334, p. 85).

Both magazines included photographs of assorted machinery (electrical, steam powered, or using compressed air) and manufactured products, as well as a few images of the aftermath of disasters in industrial facilities (especially fires).

The machines that replaced or complemented manual labour were a symbol of progress and modernity in industry. In a time when technological prowess was the gauge to measure each nation's worth, from the Portuguese perspective in the European technological periphery, it was very important to emulate the nations in the technological centre and counter the shameful condition of being peripheral (Adas 1989, p. 134; Shils 1975, pp. 9-13; Vasileios 2015).

It was usual to show operating machines in the inauguration ceremonies of new industrial facilities. In two 1907 and 1911 pieces, machines were called labourers of steel that seemed to have an intelligence of their own, considering the easiness with which they completed complex tasks (*Illustração Portugueza*, 96, p. 842; 262, p. 284). Often the texts accompanying the photographs described in detail the machines used in every step of the industrial process and stressed that the machinery used in the work sites were the finest and newest models, as those in foreign facilities, while underpinning the perfection, mathematical precision, quickness, easiness, and large amounts of items produced by them, thus accentuating the intimate relationship between machines and progress. In one piece published in 1910, *Occidente* (1137, p. 171) compared the clatter of machines working with the national anthem. Another perk associated with machines was the possibility of replacing the exportation of raw materials with the exportation of

transformed goods, with higher value – in this vein, cork was one of the sectors that most benefited from the investment in machinery (*Illustração Portugueza*, 17, pp. 527-9; 59, pp. 100-101; 89, p. 590; 157, pp. 251-2; 224, pp. 707-8; 247, p. 628; *Occidente*, 1211, p. 182; Mendes 1907, p. 461). Nevertheless, the dissemination of machinery in the Portuguese industrial sites was slow and most labourers were unskilled to operate it (Lains 2005, p. 267; Reis 1987, p. 225).

Photographs of products offered visual materialisations of the results of the industrial process. Jewellery, metal work, and ceramic products had a special relevance as manifestations of the alliance between industry and art (*Illustração Portugueza*, 317, pp. 380-1; Figueiredo 1906, pp. 683-6) and as tokens of the quality of Portuguese production – in a 1907 issue of *Occidente* the products of Lisbon's goldsmiths Leitão & Irmão were compared to those of New York's Tiffany's (*Occidente*, 1037, p. 226).

TABLE 4. Distribution according to the type of industry, 1897-1914

	Total		Occid.		IP	
	No.	**%**	**No.**	**%**	**No.**	**%**
Agricultural production[11]	15	2.6	1	0.9	14	3.0
Ceramics[12]	78	13.5	8	7.2	70	15.0
Chemistry[13]	26	4.5	8	7.2	18	3.8
Energy production[14]	40	6.9	2	1.8	38	8.1
Food industry[15]	92	15.9	21	18.9	71	15.2
Media and communication[16]	19	3.3	13	11.7	6	1.3
Metal work[17]	131	22.6	21	18.9	110	23.5
Mining	17	2.9	4	3.6	13	2.8
Textiles/Shoemaking[18]	34	5.9	2	1.8	32	6.8
Transportation[19]	60	10.4	7	6.3	53	11.3
Woodwork[20]	18	3.1	13	11.7	5	1.1
Undetermined	49	8.5	11	9.9	38	8.1
Total	579	100.0	111	100.0	468	100.0

Source: STEMgram (www.stemgram.pt) and own elaboration. Highlighted in grey and bold are the industries most photographed in both magazines.

[11] Includes cattle breeding and cork making.

[12] Production of faience, porcelain, tableware, bricks, and glass.

[13] Production of explosives and cement.

[14] Production of gas and electricity

[15] Transformation or production of grain, biscuit, bread, sugar, chocolate, dairy, canned food, wine, and olive oil.

[16] Includes typographies and telephonic centrals, and the production of paper.

[17] Metallurgy, steel industry, coin making, brass work, and the manufacture of machines, tools, and jewellery.

[18] Production of clothing and footwear, seamstry, and silk work.

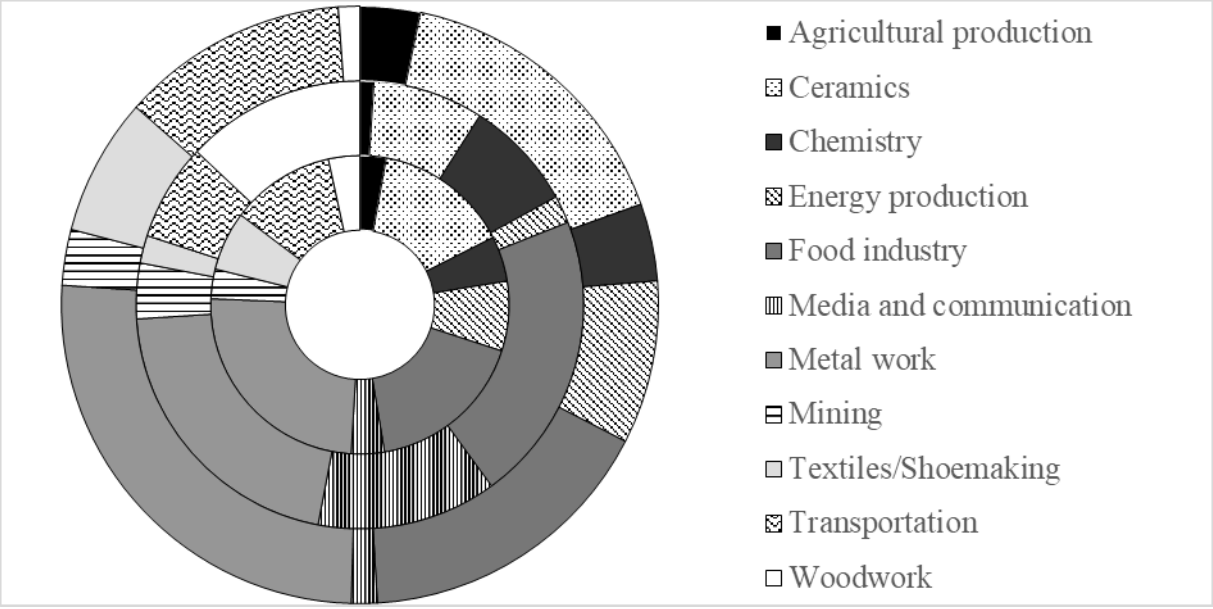
[19] Includes railway maintenance/production, ship repair, and car assemblage.

[20] Mostly production of furniture.

Illustrations of catastrophes in industrial sites met the demand in the visual economy for images of horror that simultaneously disgusted and fascinated the observer. Random estimates of the damages, amounting substantial amounts of money, added to the grisliness of the situation (*Illustração Portugueza*, 110, p. 392; 289, p. 307; 348, p. 541).

As for the type of industry portrayed in *Occidente* and *Illustração Portugueza* (table 4 and figure 5), both magazines highlight the industrial activities related to metal work and food that account for roughly 40% of their photographic records of industry. *Occidente* underscored the relevance of woodwork and media/communication, whereas *Illustração Portugueza* emphasised the importance of ceramics in the Portuguese industrial panorama.

FIGURE 5. Type of industry depicted, 1897-1914



Source: STEMgram (www.stemgram.pt) and own elaboration. *Note:* The category *undetermined* was not included in the chart.

This distribution does not translate the sectorial development of the Portuguese industry of that time. Textiles, cork, or tobacco industries underwent a faster growth (Mendes 1980, pp. 37-9; Reis 1987, p. 218), which is not visible in the photographic imagery of *Occidente* or *Illustração Portugueza* (there is not a single image of the tobacco industry, for instance).

The facts that the food industry used raw materials produced in Portugal or its colonies, that it was responsible for feeding the nation, and that it represented an investment of 8,500 *contos*[21] in 1907 (Ferreira 1999, pp. 154-5; Reis 1987, p. 218) may account for its predominance in the collection. On some cases, like the Hinton sugar factory in Madeira and the canned sardine activity in Setúbal, the food industry was the main support of the local economy (*Illustração Portugueza*, 224, pp. 705-6; Foyos 1990, pp. 54-5). The case of the Iniguez chocolate factory in Lisbon is telling, as it used one of the most valuable

[21] 1 conto = 1 million réis. 8,500 contos is around £223 million today.

commodities of the Empire: the cocoa of São Tomé e Príncipe (Macedo 2016). Those enterprises that operated directly in the colonial territories received a larger praise. It was the case of the Companhia do Cazengo in Angola that grew and transformed coffee and sugar (*Illustração Portugueza*, 89, pp. 590-1).

It is likely that many of the photographic reportages published in the illustrated press were commissioned by those firms to advertise their products. Companies operating in the sectors of metal and wood works faced strong competition from national and international enterprises, and they used photography and the illustrated press as marketing tools.

Finally, both *Occidente* and *Illustração Portugueza* emphasised their own activity in the industry of media and communication, with different pictures illustrating the industrial paraphernalia required to print and publish or typographic products showcased in exhibitions (*Illustração Portugueza*, 399, pp. 419-421; *Occidente*, 1274, p. 165).

3.2. Representations, myths, and industrial landscape

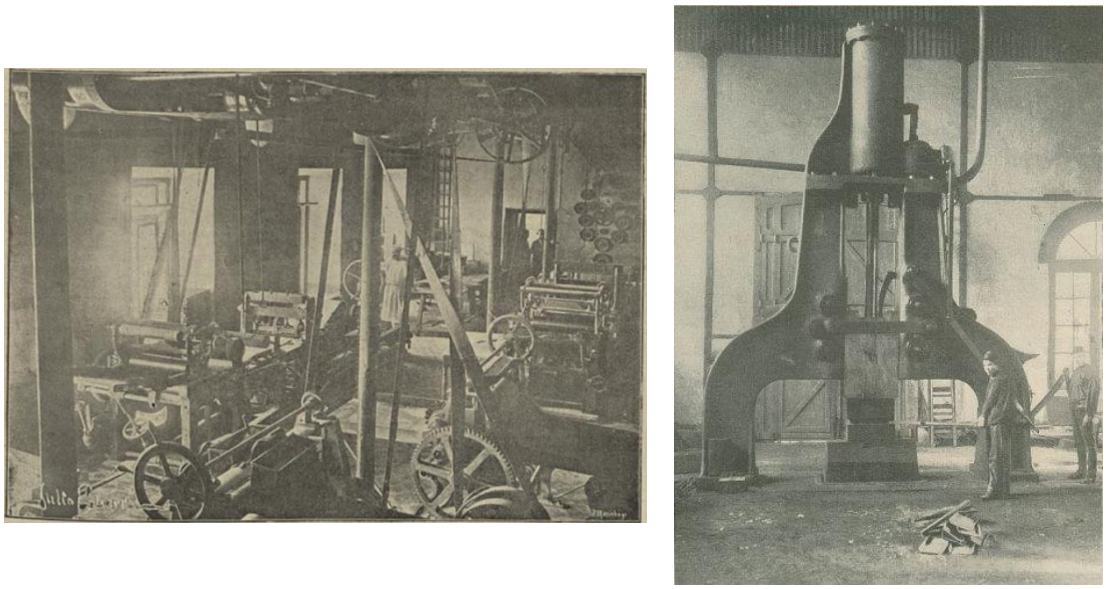
Progress and modernity are the most evident signifieds in the sample, materialised in the photographs of machines, innovations, products, and work in the industrial sector. *Occidente* and *Illustração Portugueza* published images of factories with complex mechanisms, vouching for the high quality of their outputs. The textual dimension of those magazines added that industry was an ambition of all nations which ennobled their agents, was crucial to the economic regeneration of Portugal, and was the foundation for progress (*Occidente*, 475, p. 51; 1008, p. 283; 1211, p. 182). To promote these broad representations of industry, *Occidente* and *Illustração Portugueza* emphasised some details of the industrial work in the images and the texts they printed.

Machinery was one of the favourite topics, as vehicles of the technical sublime (figure 6). Seeing machines operating "is perfectly something of wonder, which one only believes if one sees it" (*Illustração Portugueza*, 96, p. 843). The photographs depicted various types of machinery, steam or gas-powered, hydraulic, or electrical in different industries. The texts added to the technical sublime, with such expression as "fantastic", "stunning maze of gears and belts" that "placed the national industry side by side with the most reputed foreign workshops" or attaching moral values, like nobility, beauty, or strength (*Illustração Portugueza*, 54, pp. 278-9; *Occidente*, 1254, p. 336). Simultaneously, the dimension and power of the machines were underscored, and some were compared to colossal monsters that, notwithstanding, were controlled by a handful of labourers. For example, the mechanic process to make steel was considered by *Illustração Portugueza* the transformation of vile iron into a noble alloy, and its sparks were compared to fireworks or to a fiery bouquet (Figure 7B) that left the workshop silent and in awe (*Illustração Portugueza*, 54, p. 278-9; 241, p. 183: 243 and 277-8, p. 754; *Occidente*, 835, p. 50; 957, p. 163; 1072, pp. 221-2; 1137, p. 171; 1153, p. 4; 1211, p. 182; 1254, p. 336; Matos 1909, p. 253).

The written descriptions of the machinery were often hermetic, which enhanced the sublime of the machines (Saraiva 2007, p. 267). The texts were charged with technical

details, foreign brands, incomprehensible expressions, or strange measurements, only accessible to the experts and unfathomable to the lay audiences. Readers were informed about the 600 HP Babcock & Wilcox steam boilers, the 200 HP Korting engine, or the 70 HP Tosi engine, the dynamos Siemens & Halske and Siemens & Schukert, the 70 kw, 220 A, and 23 V Deavel engine, the Mohr & Federhaff machine, the Robinson mechanical jointer, the 148 m^2 of heating surface of the Butner boilers that worked with a pressure of ten atmospheres in the railway workshops at Barreiro, where different workers performed hydrometric analysis of the water used in the locomotives or experimented with traction, flexion, and compression of metals (*Illustração Portugueza*, 17, pp. 527-9; 262, p. 281; *Occidente,* 835, p. 50; 957, p. 163; 1137, p. 171; 1137, p. 171; 1253, pp. 321-2; Matos 1909, pp. 249-56).

FIGURE 6. Machines of the cookie factory Pampulha (A) and a mechanical pounder in the Navy Arsenal (B) in 1902 and 1907



A B

Notes: These photographs show different, yet interwoven, perspectives on machinery. On the left, a number of similar machines covers the area of a plant, overshadowing the human figures therein; on the right, the human figures are more evident to serve as scale to illustrate the huge dimension of the pounder.
Source: (A): *Occidente*, 835, p. 53; (B): *Illustração Portugueza*, 59, p. 100.

The foreign inception of different industrial details added to the idea of progress. The participation of international experts was underscored, like the French chemist who oversaw the laboratory of the sugar factory Hinton, or the French mechanical engineer, graduated from the Ecole d'Arts et Metiers de Paris, who supervised the assemblage of cars in Auto Agência do Bolhão in Porto (*Illustração Portugueza*, 17, pp. 527-9; 262, p. 285; Sousa 1913, p. 717). The same happened with Portuguese experts who had graduated from foreign schools. Their academic background and the foreign influence evidenced in their works was emphasised to promote their expertise and the innovative nature of their labour (*Occidente,* 818, p. 203; 957, p. 163; 990, p. 139; 1071, p. 211; 1101, p. 167; 1171,

p. 149; 1253, pp. 321-2; 1278, p. 210; Arroyo 1910, p. 76; Silva-Passos 1909, pp. 507, 510).

Nonetheless, there was a clear intent to promote a technoindustrial nationalism, based on industrial development, which had its origins in 1890 after the British Ultimatum (Teixeira 1987, p. 706). In 1892, *Occidente* claimed that industry was "the strongest stay of our autonomy". In this sense, it does not surprise that the awards given to Portuguese industrial products in international events were given a broad dissemination (*Occidente*, 835, p. 50; 990, p. 140; 818, p. 203; 992, p. 154; 1070, p. 206; 1098, p. 140). In 1906, the British Ultimatum was still remembered and pointed out as a reason to invest in those industries that replaced imports and used national commodities (*Occidente*, 475, p. 51; 1008, p. 283).

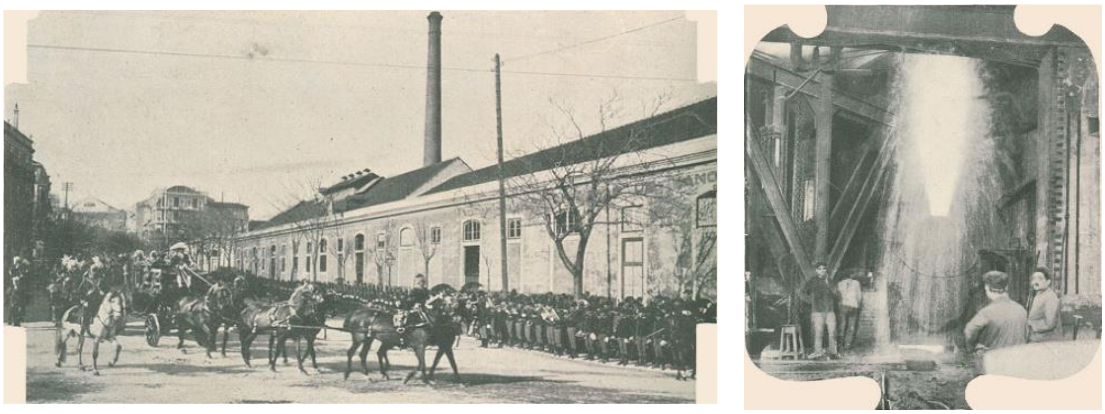
Many companies were presented in photography and text as examples of that mission: Tejo, Iniguez, and Lobatas reduced the need to import cement, chocolate, and bottles from abroad. *Occidente* estimated savings of 500 *contos*/year[22]. Other similar companies included cork industry, canned food production, textiles, and metallurgy. Cork was considered a genuine Portuguese activity that, however, was underexplored, as it was mostly exported raw and imported back as transformed goods: "it is a Portuguese mine where the Portuguese earn the wage of miners" (*Occidente*, 1177, p. 197). Canned sardine factories in Setúbal had done the opposite, by replacing foreign olive oil by national oil in their manufacturing process. In the textile sector, the company Santos, Matos & Co. had an important role in the substitution of corsets bought from France. Companies Massarelos, Empreza Industrial Portuguesa, and Auto Agência do Bolhão produced machines, tools, cars, metal structures, and alloys, competing with foreign firms, while the Navy Arsenal assembled different vessels. The workshops of the state railways in Barreiro manufactured rolling stock that usually had to be imported, whereas the workshops of the Companhia Real dos Caminhos de Ferro Portugueses, the major railway company in Portugal, were commended for having built two new locomotives, as seen in figure 8 (*Illustração Portugueza*, 57, pp. 100-1; 272, pp. 604-5; 359, pp. 7-8; *Occidente*, 990, p. 139; 1008, p. 283; 1061, p. 132; 1071, p. 211; 1177, p. 195; 1195, p. 53; Foyos 1990, p. 58; Matos 1909, p. 256, Sousa 1913, p. 716). *Occidente* considered it "a satisfaction for the national pride" and a large step to "emancipate our industry from foreign dependency" (*Occidente*, 654, p. 42).

The locomotive was still a "leading image of progress" (Marx 1994, p. 244), and paramount vehicle of the technical sublime (Kasson 1976, p. 172), central to technoindustrial nationalism. Locomotives were presented in the press in indecipherable terms, describing their pressure cylinders, their heating surface of 170 m^2, and their 650 mm pistons, or underpinning impressive figures like their weight (several tens of tons) or their speed (Matos 1909: 244-6). It is important to point out, though, that those two locomotives of Companhia Real were not new, but overhauls of two engines imported a

[22] Around £12 million today.

few decades earlier (Oliveira 2010, p. 60). Notwithstanding, the photograph lent truth-value to the written report.

FIGURE 7. The facilities of two Portuguese industrial companies: Iniguez (A) and Empreza Industrial Portugueza (B) in 1910 and 1904

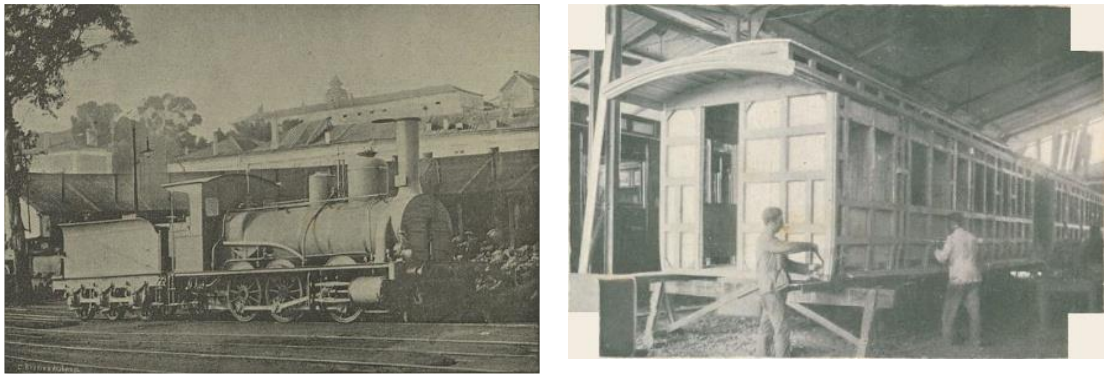


A B

Notes: Iniguez (A) illustrates the naturalisation of industry in the urban landscape of Lisbon, considering that the goal of the photographer was to capture a moment in the celebration of Luís Filipe as crown prince. The original caption of the latter underscores the "wonderful spectacle" of steel casting.

Source: (A): *Illustração Portugueza*, 214, p. 402; (B): *Illustração Portugueza*, 59, p. 100.

FIGURE 8. Railway rolling stock as industrial products in 1897 and 1909



A B

Notes: Original caption of photograph A reads "Portuguese Industry – The first locomotive", making a clear, but fake, claim, that the engine was manufactured originally in Portugal. Image B leaves no doubt on the originality of the narrow-gauge coach being built in Barreiro, showing its wooden structure in the first stages of assembly.

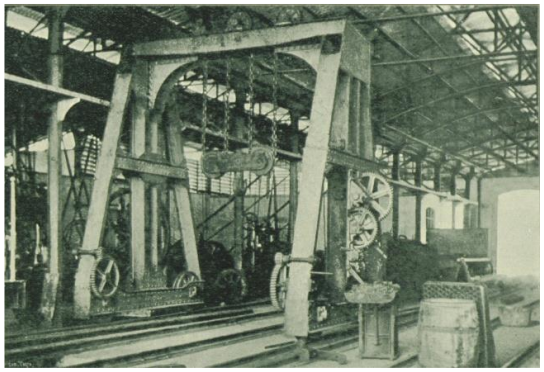
Source: (A): *Occidente*, 654, p. 45; (B): *Illustração Portugueza*, 157, p. 256.

Nationalistic feelings were endorsed with history or tradition present in Portuguese industry, by retelling the century-long histories of some industries or its evolution from small workshops to large factories, where the same centennial job was done, only faster and with larger outputs. Other pieces announced how industrial work was sometimes accompanied by traditional folk songs or how some companies revived traditional Portuguese activities (*Illustração Portugueza*, 59, pp. 100-1; 262, pp. 281 and 284;

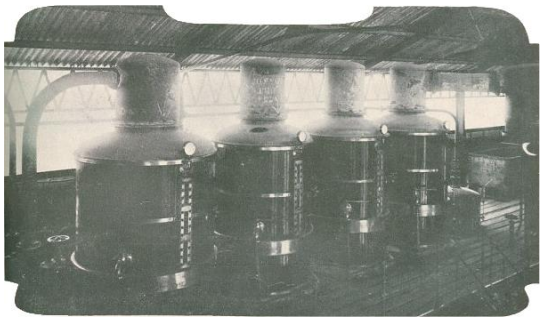
Occidente, 990, p. 139; 1060, p. 126; 1153, p. 2; 1211, p. 182; Foyos 1990, p. 58). While looking at the future in the innovations introduced in industry, the duo photography-text remembered the past to give a Portuguese specificity to industry.

The promotion of technoindustrial nationalism was completed with the relationship between industry and the imperial project (figure 9). The idea that the Portuguese colonial project was successful was stimulated by photographs and textual descriptions of industrial activities that supplied the colonies or used colonial raw materials (the wagons of Empreza Industrial Portugueza, the chocolate of Iniguez, the steel for a gunboat to patrol colonial rivers, or the imperial currency manufactured in Lisbon).

FIGURE 9. Two colonial industrial enterprises: workshops of Companhia Real do Caminho de Ferro Atravez de Africa (A) and the sugar factory at plantation Bom Jesus (B) both in 1907



A



B

Notes: Both original captions highlight imperial expressions ("the penetration in Africa" and "our great colonial cultures", respectively) before mentioning the technologies shown in the photographs (a crane and the factory).

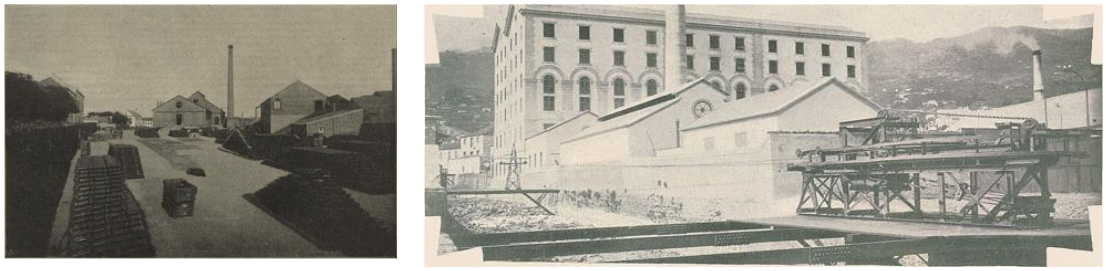
Source: (A): *Illustração Portugueza*, 82, p. 372; (B): *Illustração Portugueza*, 89, p. 589.

Industry produced symbolic icons, like the sword used by captain Mouzinho de Albuquerque in a campaign in southern Mozambique or a silver plaque manufactured in the mainland, celebrating the works in the Benguela railway, offered by the leasing company to prince Luís Filipe. In the colonies, the industrial sector was underdeveloped, but the illustrated press emphasised the strengths of the companies that had invested overseas, like the Companhia do Cazengo who grew and transformed colonial commodities or the railway workshops of the Companhia Real do Caminho de Ferro Atravez de Africa who maintained the rolling stock operating in the route between Luanda and Ambaca (*Illustração Portugueza*, 89, pp. 586-8; 183, p. 237; 340, p. 276; *Occidente*, 818, p. 203; 990, p. 140; 1153, pp. 3-4; 1195, p. 53; Arroyo 1910, p. 76; Caldas 1913, p. 778; Pereira 2021b, p. 265). *Occidente* (290, p. 11) argued that the use of steam engines in some activities turned them into "small centres of civilisation", crucial to the Portuguese *civilising mission* (Jerónimo 2015).

The concept of progress was materialised in impressive figures, often given without any context or terms of comparison, allowing readers to correctly appraise their real dimension. Both journals informed its readers on the areas of different enterprises, from

the 1,200 m^2 of Lisbon's Empresa Nacional Editora's iron and glass hall, to the 23,000 m^2 of the cement factory Tejo in Vila Franca de Xira, or the 180 m long façade of the Hinton sugar company. On some occasions, readers were told about the evolution of the dimension of the factories, like the textile company Confiança, in Porto, that started in the 1890s with a small plant of 600 m^2, but, by 1913, had grown to cover an area of 4,800 m^2.

FIGURE 10. The inner yard of glass factory of Lobatas and the industrial complex of the Hinton sugar factory in 1908 and 1910



A B

Notes: Taken from afar, as panoramic shots, these images underscore the dimension of those facilities. Both include chimneys, industrial icons and centrepiece of the factory.

Source: (A): *Occidente*, 1071, p. 212; (B): *Illustração Portugueza*, 224, p. 706.

In the colonial setting, the huge dimension of the territory of the Companhia do Cazengo was underpinned with the detail that it was served by three stations of the railway from Luanda to Ambaca that traversed it throughout 90 km (*Illustração Portugueza*, 89, p. 589; 224, p. 708; *Occidente*, 1008, p. 286; 1195, 541; 1207, pp. 147-8; 1254, p. 336; Caldas 1913, pp. 778-779).

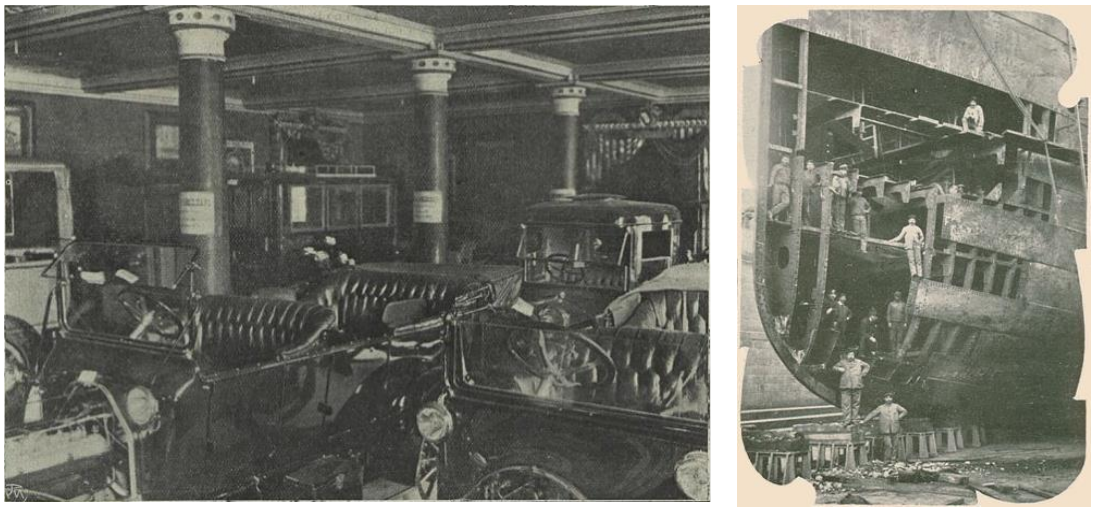
In the same vein, the volume of the industrial production was underscored and associated with progress. When the Portuguese magazines mentioned the 12,500,000 bottles produced annually by the glass factories in Almada and Amora, the 75,000 corsets weaved yearly by the firm Santos, Matos & Co. in Amadora, or the 400,000 tons of ore extracted from the mines of São Domingos, they sought to impress their readers. The growth of the output figures was a different way to illustrate industrial progress. A piece in 1913 published in *Illustração Portugueza* about Auto Agência do Bolhão informed how its production rose from one automobile/week in 1898, to six cars/week in 1904, sixty cars/week in 1911, and 20 cars/day in 1913 (*Illustração Portugueza*, 272, p. 606; 425, p. 470; *Occid*ente, 835, p. 50; 1008, p. 284; 1071, p. 211; 1137, p. 171; 1195, p. 54; Mendes 1907, p. 460; Sousa 1913, p. 718).

Adding significant amounts of money to the narrative was another effective way to impress. Readers learned that the sugar industry in Madeira had consumed almost 1,200 *contos* of sugarcane in 1906 and that its overall worth in 1910 was around 10,000 *contos*. In the mainland, the industry of canned sardine had exported 908 contos in 1910. The magazines also informed about wages that in a textile factory in the outskirts of Lisbon

in 1911 amounted to 30 *contos*/year[23]. These figures were more graspable than those of areas or outputs and they suggested the huge dimension of the Portuguese industry (*Illustração Portugueza*, 224, p. 707, 710; 272, p. 606; Foyos 1990, p. 56).

The consequences of industrial development on society were part of the narrative of progress. Different articles stressed the amenities of "modern life" promoted by industry that people had gotten used to and that had become indispensable for human dwelling (figure 11). Three industries were praised: energy production, automobile assemblage, and ship repair. When electrical public illumination was inaugurated in Ovar (a small town in the north of Portugal), *Illustração Portugueza* commended the new facilities, and claimed that the town became more modern and more beautiful, adding to the natural beauty of Ovar's women. The industry of car assemblage was praised for its ability to offer cheaper vehicles (custom duties for automobile pieces were lower than those applied to the importation of cars) and to facilitate the access to the new icon of progress in transportation: the automobile (Sousa 2016, p. 154), "nowadays, a transport faster than the locomotive, and ready to go at all times" (*Occidente*, 1207, p. 150). The capability to repair clippers and steamers in Lisbon's port promoted the Portuguese capital in the international routes of shipping. An article published in 1910 stated that ships in need of repair that previously docked in Cadiz, Spain, were now seeking the harbour of Lisbon. It concluded that repair docks were a signal of *civilisation*, more important than the revenues they generated (*Occidente*, 1207, pp. 148-50; *Illustração Portugueza*, 90, p. 637; 250, pp. 732-4; 311, p. 1919; 406, p. 654).

FIGURE 11. Automobiles assembled by Empreza Industrial Portugueza in 1914 and 1910



A B

Notes: Automobiles assembled by Empreza Industrial Portugueza are exhibited in Porto's Crystal Palace (itself a marvel of steel and glass), showcasing the newest form of motorised transportation (A). On the right, a different mode of transportation is under repair in Lisbon. Human figures serve again as scale to illustrate the dimension and complexity of their work

Source: (A): *Occidente*, 1278, p. 210; (B): *Illustração Portugueza*, 250, p. 733.

[23] Around £30 million, £250 million, £20 million, and £2.6 million today, respectively.

Another facet of progress in industry was related to the working conditions, namely their cleanliness. Concerns about hygiene had developed in Europe during the second half of the 19th century (Barnes 2006). Photographs and texts of the illustrated press relayed the signified that the Portuguese industry worried about the hygienic conditions of production, especially in the food industry.

Arguably the best example is the establishment Nutrícia (Lisbon) that made "hygienic food", mainly dairy. The photographs published in *Occidente* and *Illustração Portugueza* showed its white installations and uniforms, "as white as a bride's veil" (*Occidente*, 1171, p. 149). Written pieces underscored the innovative and strict hygienic conditions of production and packaging, countering the alleged absence of sanitary concerns during the milking of cows. Furthermore, the journals guaranteed that the food did not lose any of its flavour, despite being produced in an aseptic environment. Other examples include the industrial mills, where machinery and sealed ducts replaced the manual handling of ingredients, almost eliminating any human intervention; or the chocolatier Iniguez, whose "carbonic acid" freezers guaranteed the quality of its products (*Illustração Portugueza*, 273, p. 619-21; 262, pp. 282-3 *Occidente*, 990, pp. 139-41; 1160, p. 59; 1207, pp. 148-50).

The symbiosis between photography, the press, and textual sources contributed to the creation of an industrial landscape in Portugal connoted with values as progress, modernity, and development. Landscape theorist John Jackson (1984, pp. 5-8) identifies two defining traits of landscape: permanence and distinct character, either topographical or cultural, shared by a community; and human-made spaces overlaying the territory serving the same community. Industrial photography showed its viewers groups of sturdy and permanent human-made industrial facilities that satisfied some of their needs and that were mostly different from any other structures in the territory.

The industrial landscape created by the photographs analysed in this article is mostly a landscape of success. Apart from a few photographs depicting disasters, most images portrayed thriving companies, with assorted machinery, different innovations, high employment rates, and high outputs (Caldas 1913; Sousa 1913).

In visual terms, photography naturalised industry into the landscape as something benign and progressive. Even sound was incorporated in this construct, with frequent descriptions of the racket of the labourers working, the pulleys spinning, or the machines operating (*Illustração Portugueza*, 183, p. 242; 224, p. 711; 250, p. 732). Industrial structures that are now considered obsolete and harmful to humans were praised for their dimension and technical prowess (Matos 1909, p. 114). In Alcântara, a neighbourhood in Lisbon with a high concentration of factories (Pereira 1994, p. 518), chimneys and columns of smoke were described as "altars of progress" (*Illustração Portugueza*, 96, p. 841; figure 9). In southern Alentejo, the company exploring the mines of São Domingos was praised for having transformed the surrounding landscape from an arid mountain range to an area with lakes, trees, and a small town, which according to one of the reporters of *Illustração Portugueza*, was one of the most beautiful in Alentejo (Mendes

1907, pp. 461-2). The naturalisation of industrial facilities in the landscape was especially efficient in those many photographs that caught mundane events, but inconspicuously included industrial facilities (figure 7A).

Taking advantage of the objectivity and truth-value given to photography, *Occidente* and *Illustração Portugueza* pointed out some of the factors they believed hindered industrial development in Portugal. The major criticism was directed at the state and its inability to protect the national industry and offer it efficient transportation solutions, despite the strong protectionism promoted by different governments until the eve of World War I and the investment in the transportation system since 1850 (Alegria, 1990; Lains 2005, p. 261). This is visible both during the monarchic and the republican regimes. The change of regime did not introduce a different way of looking at the industry. *Illustração Portugueza* demanded a fiercer diplomatic strategy that opened new markets for Portuguese products abroad. The lack of professional training to develop the expertise of Portuguese labourers and the excess of educational offer in the fields of war and arts were also criticised. Private initiative was chastised when it preferred investments on the financial markets and on public debt rather than in industrial enterprises (*Illustração Portugueza*, 247, p. 632; 262, p. 284; 272, p. 606; 313, p. 250; *Occidente*, 457, pp. 51 and 54; 1008, p. 283; 1177, p. 195; 1211, p. 182; Fonseca 1908, p. 779). Photography was a valuable ally to this criticism, considering it shown the success of Portuguese factories and it promoted national industry as a profitable investment.

Most of the associations photography-text favoured industry and an industrial landscape. However, it is important to point out that there some residual voices (monarchic and republican) that relied on photography to counter that narrative and to underscore dire aspects of industrialisation.

FIGURE 12. The Belém Tower in 1912 and 1907

A B

Notes: The Belém Tower, a nationalistic token of its own, is almost completely overshadowed by the gas factory that neighbours it (its top emerges above the roof of the factory between the two chimneys), whereas it is sullied by another chimney on the right (A). In the factory, the "fire people", as they are described in the caption, unload coal amidst clouds of smoke. Different perspectives are offered on the grim consequences of industrialisation that most did not want to see.

Source: (A): *Occidente*, 1195, p. 49; (B): *Illustração Portugueza*, 90, p. 639.

One of those voices used photographs to illustrate the degradation of the Belém Tower (a 16th-century building evoking the period of the Portuguese expansion overseas) due to the activity of a gas factory nearby (*Occidente*, 1195, pp. 49-50; Martins 1912; figure 11A). A reporter from *Illustração Portugueza*, Alfredo Guimarães (1909, p. 448), testified the negative impact of textile industry in the territory of the Ave River valley (in the north of Portugal), namely the destruction of pinewoods and the pollution of rivers with used coal and ink. Other columnist was critical of the lack of quality of industrial products and called for a return to the traditional ways of production. He considered that clothing and shoes deformed bodies and feet; industrial mills did not grind the grain as well as traditional wind or watermills; bread was undercooked and unleavened with a sticky dough; it was rich in carbon and starch, but poor in gluten and with low nutritional value; and hygiene conditions during production and distribution were not trustworthy (F. 1913).

Most called out the bad working condition in industries nationwide (figure 11B). Work in the industry was dirty, unhygienic, violent, immoral for women, underpaid, and harmful to the body and to the mind, especially that near heat sources (like furnaces or boilers) or in mines, which resembled Dante's inferno and where men and women turned into living ghosts. They added that it created absent-minded and indifferent people, miserable, illiterate, ridden with tuberculosis and other sicknesses. Due to the low wages, workers dressed poorly, lived in shabby houses, and were treated in inadequate hospitals (*Illustração Portugueza*, 90, p. 636-8; 169, pp. 609 and 612; Guimarães 1913, pp. 464-5; Mendes 1907, p. 460). Nonetheless, these opinions were clearly a minority, and some accepted these conditions as a fair price to pay for the progress imbedded in industry and the goods and services it provided to society.

4. Conclusions

Taking advantage of the objectivity given to photography, *Occidente* and *Illustração Portugueza* built an industrial landscape of progress, modernity, and success, imbedded harmoniously in the territory, in a deterministic fashion that resonated the axiom: invest in technology and progress will soon follow. Additionally, through the textual dimension of the photographic image, industry was infused with abstract values like nationalism, work, and, in the colonial setting, civilisation. Whether the photographs were taken and published during the monarchic times or after the implementation of the republic, photography lent part of its alleged technoscientific and mechanical reliability to the articles published in those magazines, overshadowing their authors perceived subjectivity.

Photography merely opened very narrow windows to look at Portuguese industry. The representations and landscape it created was therefore very limited and biased. It focused mostly on industrial innovation evinced in machines and large factories. The reality of the sector was much different, with numerous artisanal workshops, but photography suggested that the landscape it created was dominant and more generalised than what it truly was.

What is more, it promoted the idea that only Lisbon was undergoing an industrialisation process, while the rest of the country lingered. In the same vein, it presented the few industrial undertakings in the colonies as illustrations of the colonisation effort, the imperial agenda, and the *civilising mission*. Both situations evidence how those who have the power to wield photography have the power to create narratives.

Albeit most of the photographs of the collection depict technical and infrastructural details of Portuguese industry, where humans are absent, many others give visibility to those historical agents that usually are invisible: workers, labourers, maintainers, repairers frequently are forgotten or amalgamated in monolithic masses. Despite emphasising the impact of machines and factories, photography gave faces and bodies to these actors.

This article also showed how photography was used to counter the dominant narrative that embellished industrialisation and overlapped industry and progress. A few voices underscored the negative consequences of factories on historical heritage, nature, and humans (both those who worked in industry and those who consumed industrial products). However, these were clearly a minority, who were overwhelmed by the industry-praising narrative. This also illustrates how the same images may be used for different purposes or to share opposing messages (hence the need for a critical historical reflection on photography that includes its written dimension).

To conclude, this article contributes to the discussion of photography as primary historical source and its potential for industrial and business history, in the sense that it reveals the sociotechnical factors surrounding technical innovations in industry, the sociocultural concerns regarding its shortcomings or unanticipated consequences, and additional details about those historical agents that are usually invisible in History.

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Indústria, Fotografia, Representacions: Portugal, 1897-1914

RESUM

A finals del segle XIX i en les dues primeres dècades del segle XX, Portugal va experimentar un modest creixement industrial. Aquest procés d'industrialització va ser registrat en milers de fotografies, moltes de les quals es van publicar a la premsa il·lustrada. En aquest article, analitzo com la indústria portuguesa estava representada per la fotografia i com es va difondre aquesta representació a tot el país mitjançant la publicació de fotografies a les dues revistes més importants il·lustrades d'aquell període: *O Occidente* i *Illustração Portugueza*. Utilitzo una metodologia que combina la semiòtica amb l'anàlisi del discurs en el periodisme. Demostro que ambdues revistes van construir un paisatge industrial de modernitat i progrés, que no coincidia amb la condició real de la indústria portuguesa. Contribueixo al debat sobre la fotografia com a font històrica i defenso que aquesta font no és només un simple suport il·lustratiu; sinó una font primària fiable, amb molt potencial per a la història en general i per a la història empresarial i industrial en particular, en la mesura que pot aportar noves narratives a l'entorn al canvi tècnic.

PARAULES CLAU: paisatge, nacionalisme tecnoindustrial, sublim tecnològic, progrés

CODIS JEL: L60, N13, N53, O14

Industria, Fotografía, Representaciones: Portugal, 1897-1914

RESUMEN

A finales del siglo XIX y en las primeras dos décadas del siglo XX, Portugal experimentó un modesto crecimiento industrial. Este proceso de industrialización fue registrado por miles de fotografías, muchas de las cuales fueron publicadas en la prensa ilustrada. En este artículo, analizo cómo la industria portuguesa estuvo representada por la fotografía y cómo esa representación se difundió en todo el país a través de la publicación de fotografías en las dos revistas ilustradas más importantes de ese período: *O Occidente* e *Illustração Portugueza*. Uso una metodología que combina la semiótica con el análisis del discurso en el periodismo. Muestro que ambas revistas construyeron un paisaje industrial de modernidad y progreso, que no coincidió con la condición real de la industria portuguesa. Contribuyo al debate sobre la fotografía como fuente histórica y defiendo que esta fuente no es sólo un simple soporte ilustrativo, sino una fuente primaria fiable, con mucho potencial para la historia en general y para la historia empresarial e industrial en particular, en la medida en que puede aportar nuevas narrativas en torno el cambio técnico.

PALABRAS CLAVE: paisaje, nacionalismo tecnoindustrial, sublime tecnológico, progreso

CÓDIGOS JEL: L60, N13, N53, O14