

HERITAGE AND HISTORY OF THE MARBLE INDUSTRY

10 YEARS OF THE ESTREMOZ ANTICLINE STUDY (PORTUGAL)

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Summary:

In Portugal, the largest marble reserve is located on the region of Alentejo, in the southern of the country. For centuries, the continuous exploration of these quarries, led to the creation of an industry. The transmission of know-how of its operation was associated with the evolution of production techniques and technologies, in order to satisfy the demands of the national and international markets of architecture and sculpture.

Since the Roman period (1st century), these marbles have been taken to different places, and in the last 150 years, with the intensification of merchandise circulation, they have been exported to many faraway countries, reaching the five continents.

The present text aims to show how the multidisciplinary study "Heritage and History of the Marble Industry" developed by the CECHAP Studies Center in cooperation with research centers from Portuguese Universities, has been contributing (since 2012) to the historical, heritage, social and economic knowledge of this industry.

Key words: Marble, Portugal, Alentejo, History, Industry

1 – Geological context and economic value

In the Alentejo region, in southern Portugal, there is a unique geological formation that extends throughout the municipalities of Sousel, Estremoz, Borba, Vila Viçosa and Alandroal, know as Estremoz Anticline. This deposit provides the country with its finest marbles, whose physical-mechanical characteristics and polychromatic proprieties have made the preferences of quarrymen in the last two millennia.¹

In this context, it is not surprising that marbles of great beauty and varied colors have been extracted. Today, the predominant ones are white, pink, cream and grayish blue, which are current used for ornamentation in urban architecture (facades, walls, floors, stairs, balustrades, columns, moldings and coatings) as in funerary architecture and sculpture [Casal Moura:2007, 20-30]

In 2012, the reserves of these marbles were estimated around 51 million cubic meters, with a

commercial use of only 20% of the extracted material [Carvalho:2012]. Extraction, in turn, recorded in 2019-2020: 335,281 tons, being mainly destined to exportation, which reached in 2021 a gross value of one hundred and six million euros. The main markets were France, Saudi Arabia and China [D.G.E.G.:2021 and I.N.E.:2022].

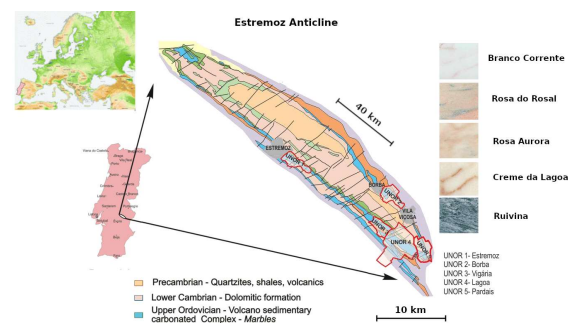


Fig. 1. The anticline of Alentejo Marbles. Source: Adapted from Cartografia Temática, 2008

¹The Portuguese marble can be found in the Alentejo region, but the only one zone in operation in the last 30 years is the Anticline of Estremoz. We note that despite Alandroal and Sousel being included in this geological

formation, in these municipalities no stone is extracted for ornamental purposes.

According to data from 2019, as far as enterprises are concerned, there were in Central Alentejo, 45 for extraction and 57 for processing, with a turnover of 57.797.431€ and 33.507,795€. In terms of gross value added, the extraction companies reached 22.158.388€ and the processing companies reached 9.594.693€. Regarding human resources, there were 418 employees in the processing. No data are available for extraction, but it should not be too far from half of that number, due to the smaller quantity of quarries in operation today [Quintas:2022,270-271].

2 – The historical and heritage study of the Alentejo marbles

The relevance of a research in the social and human sciences about these marbles was due to the fact that they are widely represented in abundant technical literature (geology, economy, technology), but not in historical literature. A new field of study that allow us to understand the evolution and the importance of the cultural and social heritage of this industry.

For this reason, it was launched in 2012 by CECHAP (Vila Viçosa), a non-profit association dedicated to culture and science, the study PHIM – Heritage and History of the Marble Industry. The studies are developed in partnership with research units of Portuguese Universities as: Cidehus Centro Interdisciplinar de História, Culturas e Sociedades (University of Évora); IHC – Instituto de História Contemporânea (Universidade Nova de Lisboa); CIES – Centro de Investigação e Estudos de Sociologia (ISCTE – Instituto Universitário de Lisboa), ARTIS – Instituto de História de Arte (Universidade de Lisboa), IURIS – Instituto de Investigação Interdisciplinar em Direito (Universidade de Lisboa) and CEG – Centro de Estudos Globais (Universidade a Aberta).²

This is a multidisciplinary study that addresses different research lines focus on the survey, treatment and inventory of national and international archives, documents, audiovisual and archaeological sources. Covers the areas of geo-sciences; classical archaeology (roman empire - 1st century to the 6th century); industrial archaeology; technical processes and technological evolution; social and organizational aspects; history of art,

construction and urbanism; oral history with interviews of former industrial actors; mining and quarrying legislation; economics and entrepreneurship history; environmental and sustainability resources, and digital humanities with the processing of cartography and information on the creation of dedicated website and public database.

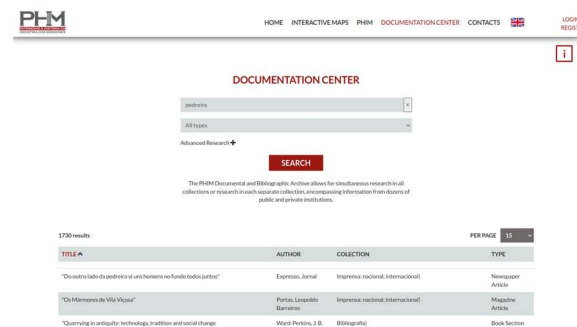


Fig. 2. The database from website project, 2022

All of them are related to their relationship with the territory in the various periods of history. It intends to contribute to a permanent update on the sustainability and use of this natural resource, playing a role in its cultural affirmation, throughout the promotion of industrial tourism.

It also seeks to contribute to a better performance in decisions about the organization of the territory, with emphasis on the mitigation of environmental problems in the context of the circular economy.

The funding for this study relies on CECHAP own resources, contracting support, research support from the partners, but mostly on the European Regional Development Fund (FEDER), which throughout the Alentejo programs, has already supported this project three times (in 2015,2019, and 2022)³

The research work continues, with new expected outputs as early as 2023-2024, namely in the research in the field of marble enterprises history, participation in academic and cultural forums, scientific articles, master's and doctoral dissertations and production of new heritage educational content.

3 – Outputs, transfer and dissemination of knowledge and marble industry promotion

In 2022, ten years of the study dedicated to the Alentejo marbles were completed, with broad and

² <https://www.marmore-cechap.pt/en/aboutUs>

³ ALENT-08-0347-FEDER-002329; ALT20-08-2114-FEDER-000077; ALT20-08-2114-FEDER-000213.

significant results for the historiography of this economic activity, and a preparation to discuss the actual marble industry issues.

First, the outputs achieved with the scientific production: survey and inventory included in a database (more than twenty thousand records referring to the consulted documentation). Five monographs that targeted themes such as geology, history, economics, art history, architecture, companies, history of work and social organization, trade unions, tourism, and heritage [Alves:2015; Serrão et al.:2019; Alves et al.:2019; Carneiro et al.:2022; Matos et al.:2022].

This is the first global study dedicated to the ornamental stone sector in Portugal, covering, the chronological period from the 1st century until the present. In parallel, two heritage educational notebooks have already been produced – “Discovering White Gold”, dedicated to elementary and high school students. The booklets aim to sensitize young people to themes about geology, the mineral constitution and characteristics of marble, the industrial activity of extraction and processing, the landscape and the uses of marble in architecture. Besides these publications, about forty scientific have already been published, as well as the participation in more than sixty events, both national and international. Around two dozen scientific events (symposiums, workshops, congresses and exhibitions) on the subject of history and heritage of marble industry have also been organized.

Secondly, using the digital humanities, all the project's activity is available online, aggregating it throughout the dedicated portal to the study of the Heritage and History of Marble Industry.⁴ In the website it is possible to find the production performed⁵, have access to a set of Georeferenced data, to a 360 degrees images, published news and access to the repository of information in the documentation centre. In the same dynamic, an online game (for young students) with questions and answers entitled “Ouro Branco – the challenge” was launched in 2022.⁶

Third, and as result of the production and dissemination developed, the study team, became part of two networks. First the NEREMA – International Network on Research on Marble and

Decorative Stones, composed by members from Spain, France, Italy, Belgium, Germany, Denmark and Netherlands. Second, a network on extractive landscape research with members from Spain and Italy.

In this way it has been possible to understand the evolution of this industry and its historical and territorial dynamics, to increase knowledge about its actors (entrepreneurs, workers, technicians and engineers), to understand the impact of its foreign trade since 1850, to know the markets and exports destinations and the problems manifested in the industry, both in its internal trade and in its impacts on the quarries territory [Quintas:2020;93-116 and Filipe:2015,57-93].

On the other hand, the continuous research on these marbles has allowed the team of this study to follow the present dynamics of this industry and to understand the current situation. The team, therefore, is geared to public discussion, promoting reflection with the various economic agents and politicians, in order to change the mentalities and draw attention to real opportunities for this industry, taking into account the current problems.

And to this aim, it has been participating in several forums and integrating a consortium of companies, public and private institutions, and other associative entities⁷. One of the discussed problems is the excessive waste, in order of 80% of extracted marble, that ending up in the impacting heaps. Their multiplication over dozens of years has been disturbing the landscape, the agricultural areas, water lines, access to properties and even the industrial spaces. But their rubble is not deprived of possible uses and therefore should be considered an asset with economic value of greater interest. Therefore, it is necessary to develop a strategy that aggregates research and innovation oriented to technology transfer processes for the creation of new ornamental products, the use of rubble for ceramics, lime, mitigation of heavy metal pollution (by using geomaterials), and also for the production of stone paper from marble calcium carbonate. Another identified problem concerns the industrial uses of water uses in extraction and processing, The most part, from aquifers, as well a sludge that is originated by sawdust and that is not stored in

4 www.marmore-cechap.pt/en

5 www.marmore-cechap.pt/en/publications

6 <https://ourobranco.pt/login>

7 Consortium Stone Cast Portugal – Pedra como pilar para o futuro. http://lp.boldint.com/stone_cast

properly protected spaces, polluting surrounding agricultural land and contaminating water lines because don't have required treatment. In addition, it must be decided what to do with the hundreds of large and deepness abandoned quarries, in order to prevent new accidents. In the 2018 the National Road 255 between Borba and Vila Viçosa collapsed resulting in five deaths⁸. Until few months there was constraints and dangers for the circulation on other roads, as was the case of Vila Viçosa-Alandroal and the entrance in city of Estremoz⁹. And the situation of Vila Viçosa – Bencatel remains with various problems in different sections of that road. [Quintas:2022]



Fig. 3. Abandoned quarries. Source: Marble Route, 2022

In the field of industrial tourism, the marble route (managed by CECHAP) offers a series of routes throughout industry, heritage and landscape, in which marble is the central element¹⁰. This a cultural product of an industrial nature, emerged from an academic project, that turned in a commercial activity [Filipe et al.:2014]. The itinerary most sought after by tourists is the one dedicated to visit the quarries with the enjoyment of their landscapes changed by the industry¹¹. The marble

route is a window on the territory, growing and evolving with the transfer of knowledge from the scientific study about history and heritage of marbles. Only with a permanent and systematized research is possible to create, innovate and improve the offer of industrial tourism, allowing to guide a privileged knowledge about the evolution of the territory in terms of landscape, economic and social role that marble represents. The testimony evidenced by the visitors at the end of their visits is gratifying. The marble route already reached more than 50 nationalities, a significant part of the visitors are professionals of stone, like architects and engineers.

4 – Final considerations

The marble study has already evolved beyond history itself, as it has already posed a series of current and pertinent questions about this industry. In this sense, the study begins to focus on environmental problems and land management. By this way it has contributed with awareness-raising actions, resulting from the transfer of knowledge, carried by the CECHAP team, seeking to disseminate good practices to be introduced, refocusing the importance of this mineral reserve on the international scene and seeking solutions to existing issues by seeing them as an opportunity.

In practical terms, in addition to the published scientific production, the experience acquired with this study made possible, to increase the practice and development of integrated industrial tourism in marble sector, and enable the CECHAP team to participate in the discussions about the importance of this sector and its territory, as an agent of civil society.

It is a territorial study model that can be transferred to other geographies and other ornamental stone productions, such as limestone's, granites or slates.

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⁸ https://pt.wikipedia.org/wiki/Trag%C3%A9dia_de_Borba

⁹ <https://rr.sapo.pt/noticia/pais/2022/07/13/estremoz-encerra-estrada-devido-a-proximidade-de-pedreira/291966/>

¹⁰ <https://rotadomarmoreae.com/en>

Registered in IGAC – Propriedade Intelectual nº 3855/2011; INPI – Propriedade Industrial nº 177/2012; Turismo de Portugal – RNAAT nº 145/2014; EUIPO – *European Union Intellectual Property Office* nº 017947184.

¹¹ <http://rotadomarmoreae.com/en/visit/2/tour-dos-marmores-em-vila-vicosa>

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