

The historical importance and architectonic relevance of the applications of the “extinct” Arrábida Breccia – proposals for its preservation and future uses

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The upper Oxfordian Arrábida Breccia is a unique lithological type in Portugal and probably in the world because it was formed through several particular geological conditions acting simultaneously. The rock is a conglomerate composed of carbonate pebbles of different colors, cemented by a red, ferruginous, clayey carbonate. It is the expression of a fossilized karst that marks one of the major unconformities of the Lusitanian Basin, associated with the early stages of the opening of the North Atlantic.

The use of Arrábida Breccia dates back to Roman times, as a structural element. But it was from the fifteenth century onwards that its use gained importance, mainly as an architectural element during the Manueline period (the end of the Gothic) and, later, during the Baroque, as a decorative element. The exploration of this ornamental stone ended in 1973 with the creation of the Arrábida Natural Park.

The Arrábida Breccia assumes a structural and ornamental preponderance in the building up of Jesus Monastery, in the city of Setúbal. This monument has great importance in the Portuguese artistic panorama, since that is the forerunner of Manueline architecture. One of the key episodes of national history was held in this monastery in 1494: the ratification of the Treaty of Tordesillas, the agreement between Spain and Portugal aimed at settling conflicts over lands newly discovered throughout the world.

There are several examples of Arrábida Breccia applications in other monuments, that form part of the national heritage. Most of them were built at the reign of King Manuel I (1469 – 1521), that had a personal preference for this rock. There are also vestiges of the use of Arrábida Breccia in a few emblematic buildings of this reign that have been destroyed by the great earthquake of Lisbon, in 1755.

Some uses of the Arrábida Breccia are known beyond Portuguese borders, namely in Spain and Brazil. And there is a possible more extensive use in France, within the French elite during the seventeenth century.

The use of Arrábida Breccia at the exterior of buildings is not the most appropriate, because of intense matrix weathering. Given the absence of extraction of this georesource in our days, the restoration and conservation of built heritage is made with synthetic materials that are not entirely appropriate. For this purpose, it could be used original blocks of Arrábida Breccia that are exposed in one of the historical quarries, the Jasp quarry. It's urgent an immediate intervention to prevent the loss of this rock stocks by weathering.

The natural occurrences of the Arrábida Breccia are rare and sporadic. The dispersed geographical distribution of outcrops and quarries will necessitate the creation of scientific and cultural routes to protect the geological patrimony and organize and facilitate visits by the thousands of tourists who travel to the Arrábida region each year. The quarry landscape of Arrábida Breccia is an important geoheritage of Arrábida Natural Park, that requires protection, revealing a great scientific, historical and pedagogical potential for geotouristic purposes, and consequentially, a surplus value in regional development.