

# The Stone in the Identity of the Landscape

Maria Diogo, and Patrícia Diogo

**Abstract**—The stone is a constituent part of the geological structure of the Territory, introducing himself as a subject that has always interconnected human and environment in the development of a discourse of meanings and symbols that reflect elements realized in different cultures and experiences.

This action meant that the first settlements and their areas of influence gained importance in the field of humanization and spatial organization of the territory, not only for the appropriation that its inhabitants did, but mainly because the community regardless of their economic or social condition, used it as living space and cultural integration.

These factors become decisive in the characterization of the landscape area in the northwest of Portugal, because the stone is a material that appears not only in the natural landscape, but is also a strong element in humanized landscape, becoming this relation the main characterization of the study area.

**Keywords**—Landscape, Men, Stone, Territory.

## I. INTRODUCTION

ALTHOUGH the most characteristic feature of the soil of the region of Trás-os-Montes in its northern slope be the predominant land-archaic pre-Cambrian granites, when the “silúricas” formations (from the people of Silúrica, the ancients of Brittany, in Wales today) joins to the main deposits of limestone rise to a gradual transition to shining shale and clay schist. That presents intermediate layers of quartzite and quartz veins in irregular beds, which predominantly leads to the formation of quartz schist in the upper plateau Mirandês, more specifically near the municipality of Vimioso.

Alongside this shale formation, the gneiss that appears in the form of varying composition - sometimes granitoid, sometimes well-defined schistosity - is almost always composed of pink feldspar, white quartz and talc more or less metamorphosed into contact with the granite [1].

With this material, always comes associated the talc schist of various colours, often quite full of talc and which, like granite, contributes to the characterization of the pre-Cambrian regional archaic-crossed by granite formation in the

This work is a I&D project in all Cientific Domains coordinated by Phd Manuel Maria Diogo entitled “Territory, Settlements and Border Architecture”. It is co-financed by National Funds through FCT – Foundation for Science and Technology and FEDER funds through COMPETE – Program of Competitivity Operational Factors with the ref. PTDC/AUR-AQI/120606/2010.

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topography. This influence is felt in most areas of the plateau and sometimes extends along the Douro International Park and part of the territory of the municipalities of Bragança and Vimioso.

Although the lime stones of the Vale da Porca has a much reduced importance in Trás-os-Montes, where the lime is an extremely rare material, also deserve special mention because they appear intercalated in the schist, with a value of milky-white colour, very homogeneous and granular, located in the municipality of Macedo de Cavaleiros.

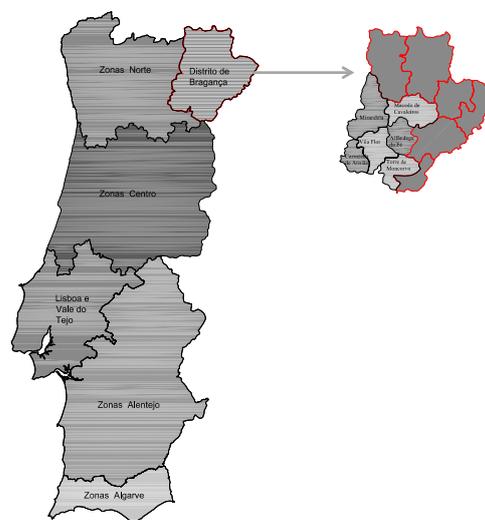


Fig. 1 Map of Portugal and definition of study area

However, Vergilio Taborda claims that "the most important limestone area of the region extends from Vimioso to São Pedro da Silva, in the municipality of Miranda do Douro, constituting the famous marble quarries of Santo Adrião [2]", which features rock crystal and fine grain, sometimes white, sometimes bluish white and grey, and the lighter varieties endowed with some translucency.

It should be noted that the wider field, by the words of Nery Delgado [3], is lined with alabaster white, cloudy or yellowish white, and completely fills some of the caves and galleries, representing undoubtedly the principal wealth of the deposit.

In addition, the area of study presents two levels generally adjusted to the regions at east and west that are developed from the orographic alignment of the mountains of Nogueira characterized for broads and plateau that extends to the river Douro and covers a significant portion of the watershed of flavour; and Montezinho that is covered with sharp relief by the currents of the rivers Tuela and Rabaçal that feed respectively the rivers Tua and Douro.

## II. PHYSICAL AND HUMAN ENVIRONMENT

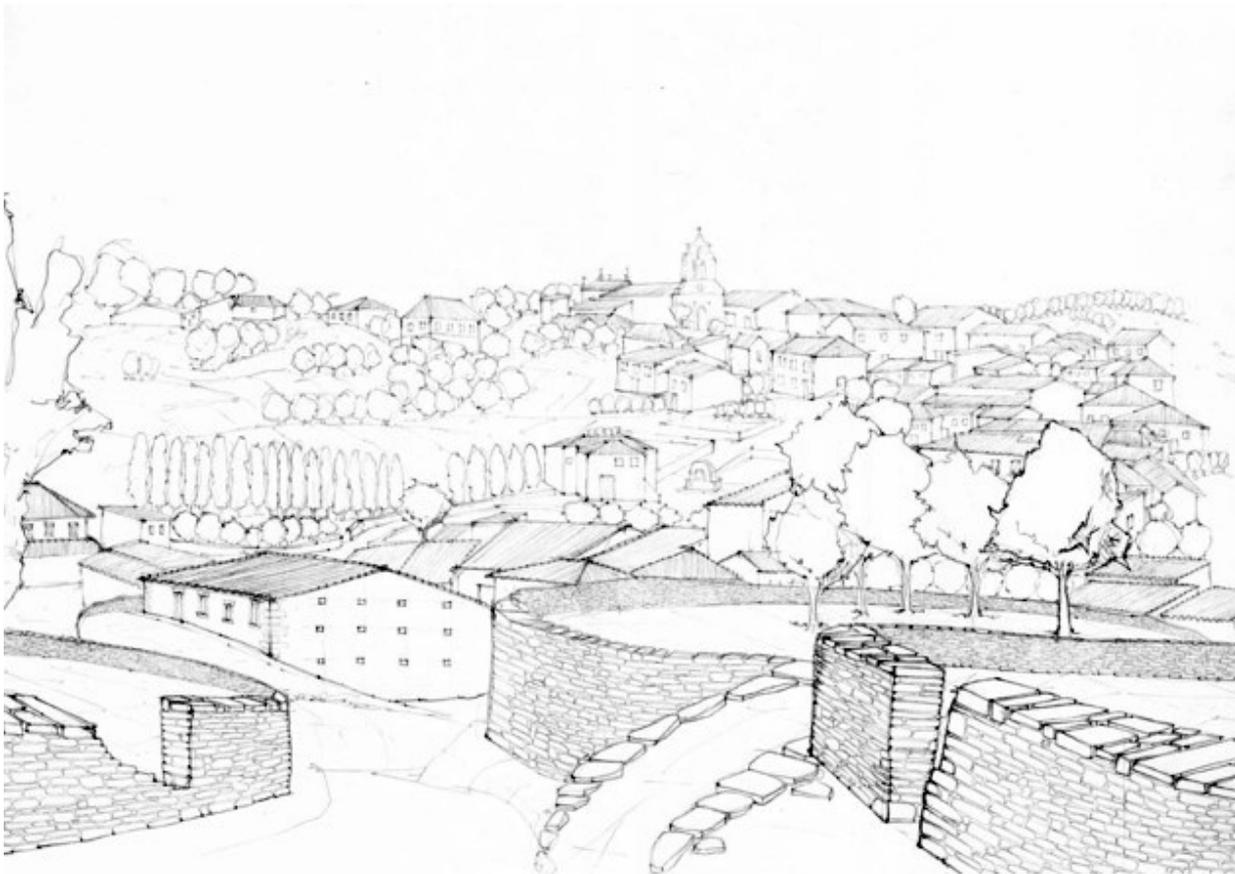


Fig. 2 Village of Caçarelhos drawn by Joana Diogo

Although the configuration of the territory is defined by its boundary lines, the climatic variations are not more pronounced than would be expected, since the relief is not a decisive point to enhance the contrast.

Despite this fact, this sub-region cannot be considered as if it is disconnected from the rest of the country and the Iberian Peninsula because, from the point of view of human geography, cross-border relations between contiguous regions are increasing. In fact, it is even less appropriate to speak about frontiers in physical geography because there are rare cases where the boundary has a natural basis and, where available, most of the natural regions are common to both sides.

Therefore, this work has privileged an approach based precisely on the geological structure, since this allows us to realize the importance of the Hesperian Massif in the peninsular context, while telling the story of the study area in a comprehensive and minimally intelligible form.

According to research carried out, about two thirds of the surface of Portugal corresponds to the Hesperian Massif [4] - set that occupies the western and central Iberian peninsula and forms the core of the original territory - whose formation is composed of sedimentary, igneous and metamorphic rocks,

especially when consolidated Hercynian movements that were responsible for overall guidance and the promotion of extensive granitization phenomena.

Besides, as is typical of crystalline platforms, the Hesperian Massif consists of balanced or fractured surfaces of erosion and raised to different levels presenting some residual relief and testimonies of local deposits of continental origin that can help replenish its geomorphological history.

Even though the Palaeozoic substrate often be presented covered by the sediment mask, it may appear short forming flattened areas such as region Transmontana, or with reliefs that surround it, as is the case of mountain ridges Meseta. From the geo-structural point of view, Meseta corresponds either to the surface erosion of rocks of Hesperian Massif and to a surface accumulation of material tertiary based on that surface erosion.

On the map of Lautensach of the geographer Hermann Lautensach, it can be seen that the way to describe the topography of the Iberian Peninsula based on descriptive concepts such as division of the country in provinces climate and organization of relief, does not always match with the description based on structural concepts. This author considers the peripheral location of Portugal as the most

decisive factor in global climate of the territory whose specificities are the result of latitude and its distance from the coast.

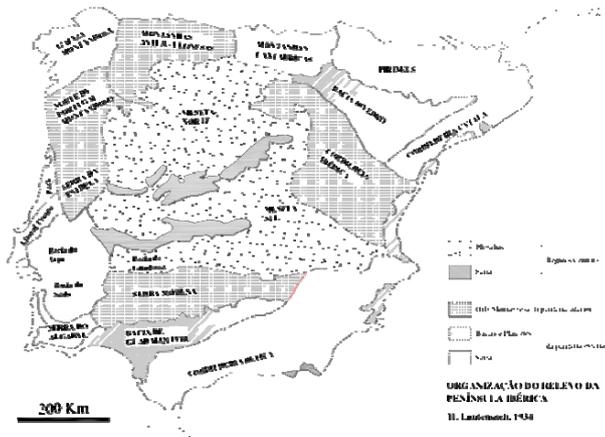


Fig. 3 Map of Lautensach, 1934

According to A. Ribeiro and E. Pereira [5] a notable feature is the fact that it has five rounded massive rocks composed of high-grade metamorphism that would have matched the ancient sequence of basic fusion material related to the filling of a geosyncline which are situated in Cape Ortegala, Santiago de Compostela, Lalín, Bragança and Morais.

Although this hypothesis seems to respond quite well to the geometry of mass and how they relate to the rocks, one cannot exclude the possibility of carrying of a complex metamorphosis starting from a root placed in the contact zone between the Central Iberian and Ossa-Morena, near the Oporto region.



Fig. 4 Lorga de Dine

In this sense we can say that human occupation in the territory comprising the Bragança region, dates back to prehistoric times witnessed by numerous archaeological remains such as mounds of Donai and the mountain Coroa (Travanca and Paçó), the Lorga of Dine - karst cave that have played roles in housing and Chalcolithic burial - and deposit of smelter Valbom-Deilão attributable to the Late Bronze Age.

Despite the fragility of the documentary that has been possible to consult on the proto-historic period, in particular on the existence and configuration of villages, some references appear giving an account of the existence of about three dozen fortified settlements built on ridges significantly elevated.

Noting also the weakness of the sources and documentary evidence referred, the Romanization of the area led to major changes in the structure and organization of the territory that is now part of a designated administrative district of civitas Zoelorum, since the ethnic group that has occupied this territory was the Zoelas.

The preservation of these testimonies which constitute the legacy that gives identity to the landscape, and in the words of Norberg-Schlutz with Genius Loci [6] makes each place as unique, gains an extraordinary importance in 2000 when the publication of the Charter of Krakow comes to recognize the landscape "as cultural heritage result from and reflect a prolonged interaction in different societies between man, nature and the physical environment. They are testimony to the evolving relationship of communities, individuals and their environment. In this context their conservation, preservation and development focus on human and natural features, integrating material and intangible values. It is important to understand and respect the character of landscapes, and apply appropriate laws and norms to harmonize relevant territorial functions with essential values [7]".

### III. NATURAL STONE IN ARCHITECTURE LANDSCAPE



Fig. 5 Property limits, Avelanoso

In the twelfth century, with D. Afonso Henriques, was born the Kingdom of Portugal and, little by little, was consolidated the current territorial structure, with particular focus on the location of major population centers in areas of hillside or open valleys and sunny that directly influenced the shaping environment and the form of agglomerated by marking the structure that is defined by axis more or less numerous and complex corresponding to the spaces defined by the limits of properties.

When we begin to the principle that the concept of habitat contains a large set of tangible and intangible factors that influence the existence of man inserted within a given community, can also be inferred that through our history it was both creature and creator of the environment that gave him physical sustenance and safety that would create the opportunity to develop intellectually, spiritually and physically.



Fig. 6 Property limits in Stone, Urrós

As regards Juan Báez Mezquita "peoples and rural architecture, in particular, are a true reflection of the geology of the place, having been used constituent materials of the subsoil as elements incorporated in the houses and monuments throughout history. Thus, the appearance of the buildings is similar to its surroundings and contemplation assumes that heritage for us all a lesson in geology applied to architecture [8]".

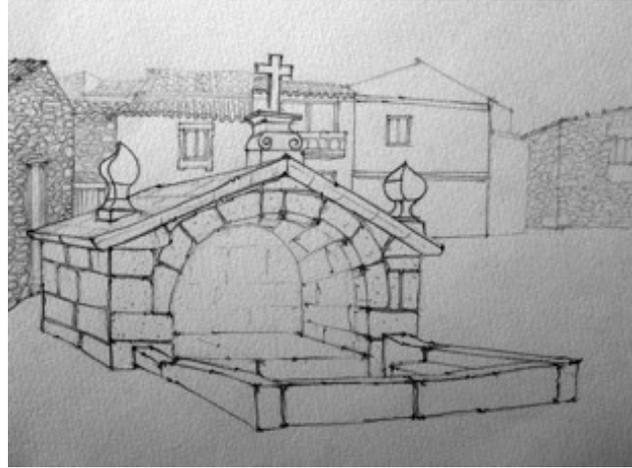


Fig. 7 Fountain in Stone, Sendim drawn by Patrícia Diogo

According to this author, the characteristics of durability, multi-functionality, flexibility and availability have become the fundamental building material, and its use all over the time reflected both in the popular construction as in classical architecture, presenting as a vehicle of civilization which has come down to our days.

The same opinion has Manuel Diogo, who has conducted a research on the subject of Vernacular Architecture in the Land of Miranda, when dealing with materials and construction elements noted that "the first of the physical constraints that determine the characteristics of vernacular architecture is the exclusive use of local materials, unmanufactured and almost in their original state [9]".



Fig. 8 Village of Cércio drawn by Maria Diogo

The use of man-made stone was based on the geologic availability of the local, in the relative ease of extraction and diversity of possible functions, connecting the biophysical characteristics of a place or a region with the survival of pragmatic needs.

This finding leads us to consider that the buildings that sprang up to fill those needs reflected the complicity between the expression of human creation and nature.



Fig. 9 Stone benches

Since "the connection between the underworld and the building constructed is through the activity of the quarries, in the case of rural architecture the abundance of the stone easy to extract is the support of the humble construction, moreover, is fully integrated into the landscape [10]"

In the construction of the humanized landscape, stone appears in an invariant form, sometimes associated with building elements with structural support functions – buildings that are simultaneous housing and work, walls, stairs and curbs, bridges and water systems, fences and trellises – and with other elements such as finishing and decoration, such as floors and walls, sculptural elements, masonry, roofing slate and furniture.

In all these situations, the stone demonstrates its multifaceted character, revealing its resistance against wear and abuse conditions, but also the flexibility and adaptation to different shapes and functions at the same time allowing, by its diversity, to apply as floors and coatings with fullness standards in terms of colors and textures as well as possibilities of articulation with other materials.



Fig. 10 Village of Granja da Silva

Thereby, as regards Joana Diogo "morphological elements that should inform the different scales of the cluster approach, can effectively enhance the character of the various participants on the formation of rural settlements, determining the situations of opposition and continuity, as well as the differences and similarities that establish a sense of affinity between the agglomerates and sites, allows to establish the degree of correspondence between the factors of the environment and the humane expressions of territorial occupation, using for this purpose a variety of morphological phenomenon [11]"

By analyzing the history of landscape architecture from the Medieval "gardens conclusus" to nineteenth-century "country parks", from the geometric Renaissance gardens and Enlightenment, to the organic lines of romantic and pictorial gardens, we can note that the use of stone in gardens or paisagistic architecture, has always played a central role in structuring the physical and symbolic space, particularly as a means of sustaining or simply highlight key elements in giving them a greater aesthetic enrichment and giving them also leadership or intentions formally defining the conceptual designer, hierarchies or lines illuminating the living space.

#### IV. CONCLUSION

The relationship between the stone and landscape architecture develops in a various spatial and temporal scales evoking functional issues, aesthetics, economics, technical and environmental factors that have their reflections both at the project for a specific site, as well as the scale of planning of human activities on the territory. "To any observer the result of this struggle, tenacious and continuous agricultural landscape is a deeply humanized and transformed with a huge density of paper placed in it [12]"

The basis for allowing a correct interpretation of the use of stone in both scales, as well as an understanding of their relations must be based in the principles of sustainability, and between man and landscape looking for "the integration of cultural landscape conservation, and the sustainable development of regions and localities with ecological activities, and the natural environment require awareness and understanding of the relationships over time [13]"

This morphological recovery is therefore made by the transition between the established contrasts and the magnificence of its geographical causes, marking the specifics of a territory that press "a never-ending thick land, cliff, with difficult access, that so often raises the pin an urge to climb to the sky as it sinks in some depths of anguish, no one knows why telluric contrition [14]"

#### REFERENCES

- [1] T. Vergilio - *Alto Trás-os-Montes: Estudos Geográficos*, Livros Horizonte, Lisboa, 1987, pp.33-37.
- [2] T. Vergilio - Op. cit, pp.33-37.
- [3] N. D., Joaquim Filipe - *Da existência do homem no nosso solo em tempos muitos remotos provada pelos estudos das cavernas. Notícia acerca das Grutas da Cesareda*, Academia Real de Ciências, Lisboa, 1887.

- [4] R, Orlando, L. Hermann; D. Suzanne – *Geografia de Portugal: A posição geográfica e o Território, vol.I*, Edições João Sá da Costa, Lisboa, 1998.
- [5] A. Ribeiro, E. Pereira e R. Dias - *Structure of Centro-Iberian allochthon in northern Portugal*; In R. D. Dallmeyer e E. Martinez Garcia (Eds.), *Pre-Mesozoic Geology of Iberia*, Springer-Verlag, Berlin Heidelberg, 1990, pp. 220-236.
- [6] N.-S. Christian, *Genius Loci: Towards a Phenomenology of Architecture*, Ed. Rizzoli, 1991.
- [7] Charter of KraKow, 2000. Information captured in 12/05/2012 at <http://leceworkshop.unile.it/Downloads/The%20Charter%20of%20Krakow%202000.pdf>
- [8] G. de los R. C. José Ignacio, B. M. Juan Manuel - *La Piedra En Castilla y León*, Junta de Castilla y León 2001, p.21.
- [9] D. Manuel, “*Arquitectura Vernácula em Terras de Miranda*”, Escuela Técnica Superior de Arquitectura (Departamento de Expresión Gráfica Arquitectónica), Universidad de Valladolid, 1994. Tese de Doutoramento, p.66.
- [10] G. de los R. C. José Ignacio; B. M. Juan Manuel - Op. cit. p. 21.
- [11] D. Joana. Tese de Doutoramento subordinada ao tema Morfologias e Tipos Arquitectónicos no Espaço Rural, pag. 117
- [12] G. L. Miguel, Z. Arturo – “*Arquitectura Popular: La vivienda rural temporera en las comarcas del Maestrat y les Terres de L Ebre. Les pallisses y les casetes de volta*”: Centro de Estudios del Maestrazgo, Boletín Número Uno, 1998, p 55.
- [13] T. Miguel - *Portugal*, Editora Dom Quixote, Lisboa, 2007, p.25.
- [14] Charter of KraKow, 2000. Information captured in 12/05/2012 at <http://leceworkshop.unile.it/Downloads/The%20Charter%20of%20KraKow%202000.pdf>

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