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Lithologic combinations in Romanesque churches of Álava, northern Spain

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ABSTRACT: Certain windows and doorways on twenty five Romanesque churches of Álava (XII–XIII centuries) were built using six types of rock in nine different combinations. These compositions were intended to highlight the contrast in colour between different rocks, from which it can be deduced that the openings were not hewn to be painted. After almost seven centuries during which the use of stone was anecdotal, Romanesque artists burst in with colourful blends, demonstrating a broad knowledge of the characteristics of each rock and its availability. The uniqueness of these openings is represented on lithologic maps which, in addition to facilitating its analysis and dissemination, serve as a reference in its restoration.

KEYWORDS: Carving; Lithologic combination; Romanesque, XII-XIII centuries; Álava

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RESUMEN: *Combinaciones litológicas en iglesias románicas de Álava, norte de España.* Algunas ventanas y portadas de veinticinco iglesias románicas de Álava (siglos XII-XIII) fueron construidas con hasta seis tipos de rocas en nueve combinaciones diferentes. Estas composiciones pretendían resaltar el contraste cromático entre rocas distintas, de lo que se deduce que los vanos no fueron tallados para ser policromados. Después de casi siete siglos en los que el uso de la piedra fuera anecdótico, los artistas románicos irrumpen con mezclas coloristas, mostrando un amplio conocimiento de las características de cada roca y su disponibilidad. La singularidad de estos vanos está representada en mapas litológicos que, además de facilitar su análisis y divulgación, servirán de referencia en su restauración.

PALABRAS CLAVE: Talla; Combinación litológica; Románico; Siglos XII-XIII; Álava

1. INTRODUCTION

Medieval archaeology in Álava (Figure 1) has examined numerous buildings, interpreting walls and proposing construction phases. An example of this is the cathedral of Vitoria-Gasteiz (1). In addition, lithologic maps of the 487 churches in the diocese have been prepared (2). This recognition and mapping of materials has been used as a reference for studying monuments as well as for their conservation and restoration (3).

Using lithological maps and spatiotemporal relationships between different lithologies, it has been deduced that the stone walling is always local and that the rocks favoured for masonry and sculpture work vary over time depending on their availability in the quarries (4). In addition, in reference to Paleocene limestone, which is the stone most used in Álava, several extraction sites have been located and different types of quarries dating back to the first century (5) have been identified. All this has helped to piece together the construction processes,

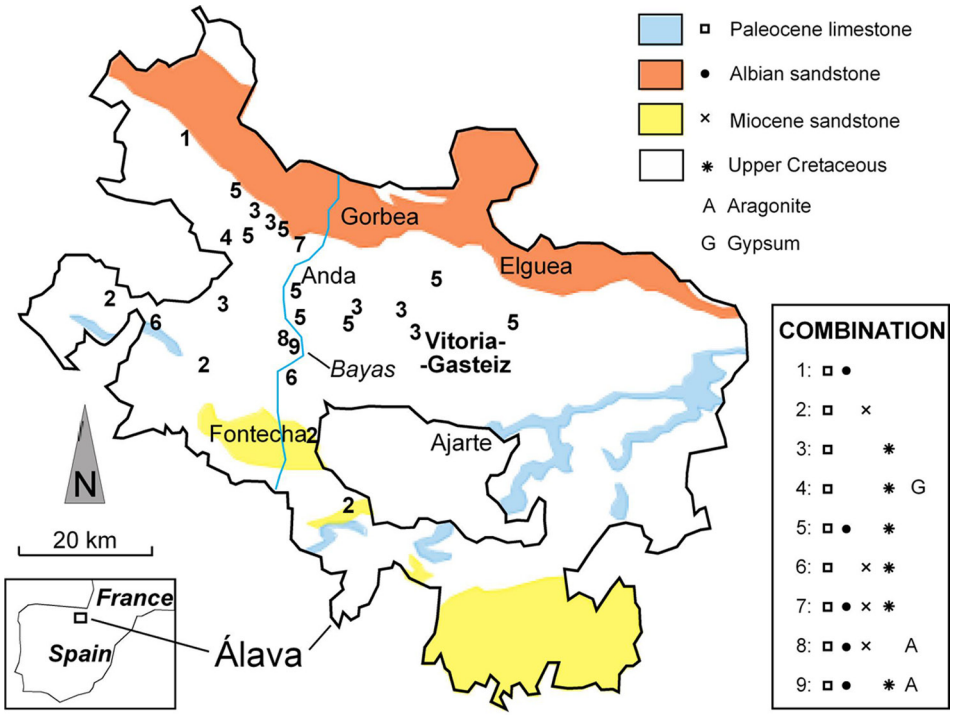

FIGURE 1. Location of Álava and the river Bayas, indicating some ancient quarries mentioned. The numbers indicate the types of combinations described in the text. The colours and symbols indicate the lithologies.

including, in the case of the aforementioned Cathedral of Vitoria-Gasteiz, the medieval road that connected the ancient quarry with the gothic monument, currently used as a tourist attraction (6).

With reference to a single artistic style, lithologic maps of Álava Romanesque show that Paleocene limestones are the preferred stone for masonry work and sculpture (7). Furthermore, up to six different lithologies have been identified on the windows and doorways of twenty five churches. This paper describes the rocks used on the openings of the Romanesque churches of Álava employing lithological mixes, along with their characteristics and origin. These compositions created during the transition from the XII to XIII centuries, although only employing local materials, are so far unique in European Romanesque and, therefore, worldwide.

2. LITHOLOGIES

Most of the Romanesque churches in Álava employing lithological combinations are concentrated around the municipalities of Urcabustaiz and Cuartango, alongside the river Bayas, which with a 65 km N-S path is a tributary of the river Ebro (Figure 1). The substrate is calcareous series from the Upper Cretaceous Basque-Cantabrian Basin.

Masonry in the aforementioned municipalities has always used rocks from the local surroundings, mainly Upper Cretaceous limestones. However, up to six different types of stone have been used in the masonry work and sculpture: Paleocene limestones, Albian sandstones, Miocene sandstones, Upper Cretaceous limestones, and two monomineral rocks: aragonite and gypsum. Though of very different composition, all of them are autochthonous, i.e. from Álava itself.

2.1. Paleocene limestones

The Paleocene limestones are the preferred lithology during the Álava Romanesque period and are present in all windows and doorways that employ lithological combinations. In general, these are locally dolomitised limestones, of sparitic character and non connected moldic porosity. They are very fossiliferous, being considered locally as lumachelle for their high content lamellibranch fragments. The alteration colour is white to slightly yellowish, and in fresh fracture it displays almost white creamy greenish and yellowish tones.

Paleocene limestones lend themselves readily to carving due to their mineralogical composition and porosity. Although it cannot be polished, the final carved surface is homogeneous with neither grain nor pore being perceptible, which together with its whitish colour, intensely highlights the chiaroscuro, making it highly sought after in sculpture. Several old quarries have been identified; most notably Ajarte (Figure 1), which after the Romanesque period stone was extracted for

gothic cathedral of Vitoria-Gasteiz (6). Many of the Paleocene limestones present in the Romanesque churches discussed here may have come from this location.

2.2. Albian sandstones

Albian sandstones are, grains and cement, siliceous with connected porosity which facilitates drainage. Because of its composition it is inalterable and also very abrasive and arduous to carve. Moreover, this rock is used to hone, including quarry tools. Albian sandstones has porous texture with soft ochre, green and yellow tones which blur the chiaroscuro, in contrast to what happens with the Paleocene limestones. Its origin may be quite diverse and many old quarries are located in the wide northern band of Álava where there are outcrops of Albian materials. Most notable among the locations with these old quarries are Sierra Elguea and Gorbea (Figure 1).

2.3. Miocene sandstones

The grains are usually calcareous and if there are siliceous grains present these are always secondary. The cement is calcareous and there is always a small clay fraction. The porosity tends to be connected, which facilitates drainage and also favours the breakdown of the calcareous cement. As with Albian sandstones, carved surfaces are porous in texture with ochre to greenish tones that blur the chiaroscuro. Most notably in its favour is its low hardness, making it easy to carve, and of all the rocks discussed here it is the most alterable. The old Miocene sandstone quarries are difficult to identify because they have been worked until recently, meaning that the hollow observable today corresponds to the last extraction and this could be very recent. One location with old quarries is Fontecha (Figure 1).

2.4. Upper Cretaceous limestones

On the churches discussed here, these are mostly used for the stone walling. Furthermore, some black micritic limestones from the Coniacian base are suitable for slabs, but not suitable for blocks, given that the thickness of the layers is very small. Nevertheless, some openings usually have internal vertically positioned lamination, like a veneer to imitate stone blocks. This is also fitted as drip flashing on many of the windows.

Its durability and resistance to breakage and friction is very high. Due to conchoidal fracture they are not usually employed for sculpture although they can be polished and the corners bevelled or bead moulded. They have dark bluish grey to black tones. One interesting old quarry for this lithology is located in Anda (Figure 1), however, unfortunately has recently been restored. In any case, these quarries remained active after the Romanesque period and the resulting hollow is difficult to date.

2.5. Gypsum

Microcrystalline gypsum was most likely used as cladding on many Romanesque windows. For structural purposes a window has been conserved in the church of Délica with two stone blocks on the inner jamb, in combination with other stone. Because gypsum is translucent and the inner corner of the blocks is beveled, this would produce interesting iridescence in the interior. Its provenance is local, given that Délica is located on the Orduña Triassic salt diapir, where this mineral comes to the surface.

2.6. Aragonite

Aragonite, also known as onyx marble, is a polymorph of calcite whose structure is very sensitive to environmental changes and the time (8). The few pieces of aragonite observed most likely come from quaternary flowstones, formed in karst caves of Coniacian limestone. These aragonite flowstones are characterised for being very easy to work, readily admitting a polishing with very striking results. The choice of this mono-mineral rock by Romanesque sculptors is somewhat mysterious due to its unique origin, in any case, the source is local.

3. LITHOLOGIC COMBINATIONS

The six previous lithologies, likely to have been carved as stone blocks or sculptures, appear mixed on the lithological maps of two doorways and twenty four Romanesque windows (Figure 1). In total, nine distinct types of combination have been identified. The combinations of rocks and the locality with the most representative church (Figure 2) for each type are:

Type 1: Paleocene limestones+Albian sandstones: Respaldiza.

Type 2: Paleocene limestones+Miocene sandstones: Bellojín.

Type 3: Paleocene limestones+Upper Cretaceous limestones: Oyardo.

Type 4: Paleocene limestones+Upper Cretaceous limestones+gypsum: Délica.

Type 5: Paleocene limestones+Upper Cretaceous limestones+Albian sandstones: Lezama.

Type 6: Paleocene limestones+Upper Cretaceous limestones+Miocene sandstones: Subijana-Morilla.

Type 7: Paleocene limestones+Upper Cretaceous limestones+Albian sandstones+Miocene sandstones: Belunza.

FIGURE 2. Lithological maps of the nine types of combinations in the most representative locations. Type 1: Respaldiza; Type 2: Bellojín; Type 3: Oyardo; Type 4: Délica; Type 5: Lezama; Type 6: Subijana-Morilla; Type 7: Belunza; Type 8: Ullíbarri de Cuartango; and Type 9: Aprícano.

Type 8: Paleocene limestones+Albian sandstones+Miocene sandstones+aragonite: Ullíbarri de Cuartango.

Type 9: Paleocene limestones+Upper Cretaceous limestones+Albian sandstones+aragonite: Aprícano.

Paleocene limestones are present in all of these combinations. The next most used lithology is Upper Cretaceous limestones, Albian sandstones and Miocene sandstones. Finally, there are carved pieces of mono-mineral aragonite and gypsum. In the first three types two lithologies are combined, in types 4, 5 and 6 three, and for types 7, 8 and 9 up to four rock types are combined.

4. DISCUSSION AND INTERPRETATION

In most of Álava and neighbouring areas the Romanesque style is monolithologic, using the same type of rock for the sculpture and the block work (7). Very exceptionally one lithology is employed for sculpture and another in the block work. To give one example on St. James' Way, in the chapel of Nuestra Señora del Torreón, Padilla de Abajo, province of Palencia, the stone blocks are made of Lower Cretaceous sandstones, whereas the windows are made of white Paleocene limestones, probably from Ajarte (Figure 1), a quarry located 150 km away (2). In no case has the use of different rocks in sculpture been cited.

Outside of Spain lithologic combinations have been described in Italian Romanesque, most notably the Pisan style, with its greatest exponent in the cathedral of Pisa, where white and green marble are regularly mixed. From the same Pisan style, but in Corsica (France), the church of St. Michelle of Murato stands out because of its irregularly mixed white limestone and green serpentinites. In the case of mainland France, where lithological information is available for some of its monuments, no unique lithologic combinations stand out (9). Therefore, from the available lithological and descriptive maps, the lithologic combinations of Álava are, for the time being, an exception within the Romanesque style.

Such a varied selection of stone will not be repeated until the XVI century during the Italian Renaissance (10), being able to state that the lithologic combinations are a characteristic feature of this style. In Álava it will be necessary to wait until eighteenth century neoclassicism to return to a combination of different rocks on the facade of the Hospice of San Prudencio or the chapel adjoining the portico of the church of San Miguel, all in Vitoria-Gasteiz (2). In the above examples the most characteristic feature is the combination of colours.

If the sculptor has various types of stone suitable for working, it would be logical to choose the least expensive or the one that would require less effort. Hovewer, undoubtedly, as was the case in the Renaissance and Neoclassicism, the Romanesque sculptor sought to emphasize the contrast of colour. A good example this is the apsidal window of San Román of Arriano (Figure 3), a type 3 combination. Because of its location close to the wing, the window has remained free of patinas of mineral or organic alterations. A strong contrast can be seen between the white of the Paleocene limestones and the dark bluish grey of the Upper Cretaceous limestones. It seems clear that the intent of the artist was to contrast different colours. All the rocks selected were likely to be carved and the only difference between them is the colour.

On the same window there are remains of a very old layer of lime, although it appears that its application was after the construction of the window and even much later than the Romanesque style. Obviously, once rocks of very different colours have been selected, carved and placed, it would not be justifiable to coat them in paint. For this reason, it can be stated that the windows with lithologic combinations were not to be carved to be then polychromed.

The makers of these lithologic combinations knew the qualities of each rock and also had access

FIGURE 3. Church window of San Román de Arriano. Type 3 combination, white Paleocene limestones and dark bluish gray Upper Cretaceous limestones, with a strong colour contrast. Remains of lime that covered the entire facade, including the window.

to the various quarries or suppliers. Curiously enough, during the transition from the XII to XIII century, when these Romanesque churches were built (11, 12, 13), previous cases of such sculpture in the area are nonexistent. As in all of Western Europe, rock carving from the year 411 with the fall of Rome up until approximately the year 1000, when the Romanesque style began in France, the sculpture is very scarce (14). Hardly any sculptural vestiges remain from the pre-Romanesque period in Álava, however, foundations that act as a base for later Romanesque churches have been identified (15). Therefore, some Romanesque sculptors in western Álava reinitiated the carving of stone for openings with unique lithologic combinations.

In the year 1127, when the churches in question are being built, the Pact of Tamara (16) is signed, by which the border between the Kingdom of Castile and the Kingdom of Pamplona and Aragon, is established along the river Bayas (Figure 1). We do not know the influence that this frontier had on the work of the sculptors of the time; nevertheless it is a political element to consider, seeing as how the rocks selected were found on both sides of the border. In any case, the use of such a lithological variety would involve a significant transportation infrastructure, not to mention an interesting relationship between the quarrymen, stonemasons, sculptors and the owners of the stone.

Recognition of rocks and their representation on lithological maps has made it possible to distinguish Romanesque openings with lithologic combinations in western Alava. The special nature of this, in an area with abundant rural Romanesque heritage, makes it possible to relate artistic, historical, political and territorial features and to present them as both an educational and tourism resource. Added to which, the characterization of the rocks employed and the lithological maps serve as a reference in the restoration or replacement of extremely eroded elements.

5. CONCLUSIONS

The lithological maps for certain windows and doors of twenty-five Romanesque churches in Álava, during the transition from the XII to XIII century, show the use of up to six different lithologies in the carving of sculptures and stone blocks. Up to nine types of different combinations have been identified. If we compare these openings with other monolithologic work, the distinctive feature is the colour difference between different rocks. Consequently, the aim behind these combinations was chromatic contrast.

The quarries were scattered between the Kingdom of Castile and the Kingdom of Pamplona and Aragon, which would involve particular relationships between sculptors, carriers, stonecutters and quarry owners. But above all, within this historical context, it is remarkable how eight centuries after the fall of Rome, when pre-Romanesque sculpture in rock was nonexistent, that stonemasons and sculptors reinitiate such work by selecting all the lithologies suitable for carving, including two monomineral rocks such as gypsum and aragonite.

Finally, recognition of Romanesque building materials has increased the importance of some small rural churches and permitted a multidisciplinary analysis to further their diffusion and guide in the restoration and maintenance of monuments.

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