

Azurite for a Kingdom. An overview of the pigments, binders and painting technique used in the craft of mural painting in the Kingdom of Navarre from the 12th to the 14th century and the symbolic implications of blue color*

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ENG Abstract: The importance of the Navarrese mural painting in the thirteenth and fourteenth century has been already pointed by art historians in the past. But in the last three decades, many unrevealed sets of medieval mural paintings have been discovered behind altarpieces or whitewash layers. In Navarre, since 1993, for each new finding of a wall painting a restoration report has been carried out. Since 2002 samples of pigments were sent to laboratories to be analyzed. Such corpus of scientific data brings a new source of study for the art historian, added to the previous style-based and iconographical analysis.

This article pretends to gather all these data from twenty restoration –with the available data up to 2022–reports and draw a small history of the use of pigments and binders in Navarrese mural painting from the thirteenth to the fourteenth centuries. From those reports, it is clear that there is a shift in the pigments used during the fourteenth century, when the gothic linear style arrives to the cloisters of the Cathedral of Pamplona, and later to parish churches through the kingdom. Among these new pigments is significative the presence of azurite.

Through the rich documental sources of the Archivo General de Navarra, we find that a local Navarrese painter was sent to the Pyrenees mine of Urrobi, to gather silver, copper and azurite. As such, combining the data of the restoration reports and archival documentation, in the last part of this article I discuss the importance that this pigment had in the Navarrese painting scenario of the fourteenth century. Such importance was not material, but symbolic too, as the 14th century blue color was highly esteemed as a sacred color.

Keywords: mural painting, Navarre, pigments, 14th century, azurite.

ES Azurita para un Reino. Una visión general de los pigmentos, aglutinantes y técnica pictórica utilizados en el oficio de la pintura mural en el Reino de Navarra de los siglos XII al XIV y las implicaciones simbólicas del color azul.

ES Resumen: La importancia de la pintura mural navarra en los siglos XIII y XIV ya ha sido señalada por historiadores del arte en el pasado. Pero en las últimas tres décadas, se han descubierto numerosos conjuntos de pintura mural medieval que permanecían ocultos tras retablos o capas de cal. En Navarra, desde 1993 por cada nuevo hallazgo se ha realizado un informe de restauración. Desde 2002 se han enviado muestras de pigmentos de estos murales a laboratorios para su análisis. Este corpus de datos científicos aporta una nueva fuente de estudio para el historiador del arte, que se suma a los estudios basados en estilo e iconografía.

Este artículo pretende recoger todos estos datos de veinte informes de restauración y trazar una pequeña historia del uso de pigmentos y aglutinantes en la pintura mural navarra de los siglos XIII al XIV, con los datos disponibles hasta 2022. De esos informes se entiende que hubo un cambio en los pigmentos y aglutinantes utilizados durante el siglo XIV, cuando el estilo gótico lineal llega a los claustros de la Catedral de Pamplona, y posteriormente a las iglesias parroquiales de todo el reino. Entre estos nuevos pigmentos aparece con fuerza la azurita.

A través de las ricas fuentes documentales del Archivo General de Navarra, encontramos que un pintor local navarro es enviado a la mina pirenaica de Urrobi, para recoger plata, cobre y azurita. Así, combinando los datos de los informes de restauración y la documentación archivística, en la última parte de este artículo discuto la importancia que este pigmento tuvo en el panorama pictórico del trecento navarro. Esta importancia no fue solo material, también simbólica, ya que durante el siglo XIV el azul era valorado como un color sagrado.

Palabras clave: pintura mural, Navarra, pigmentos, pintura trecentista, azurita.

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Summary: 1. Introduction and Methodology. 2. Historical Context. 3. Technique and Materials of the Navarrese Duecento and Trecento Painters 4. The Importance of the Urrobi Mine 5. Symbolic implications of blue color 6. Conclusion

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1. Introduction and methodology used

As Daniel V. Thompson stated in *The Materials of Medieval Painting*, technique and style should not be separated.¹ If we are aware about the exact materials used in historical paintings, we can begin to understand the tendencies followed, limitations, and value on the craft of painting. Something that was difficult in the past, when restoration reports were not available for art historians.

Understanding technique is even more fundamental for medieval mural paintings as most of them have reach us quite deteriorated as well as fragmented. An analysis of such heritage based solely on a stylistic and iconographical reading in their current damage condition, can overlook crucial details for the understanding of the murals as they were originally designed. It is, hence, fundamental to learn how medieval murals were created –with which materials– in order to have a proper understanding of their true original aspect.

The Kingdom of Navarre, a small kingdom straddling the western Pyrenees between Iberian Peninsula and continental Europe, received due to its location, artistic and cultural influence from France and England in the 14th century, rather than the Hispanic world. Despite its small size, it is well known the importance that the Navarrese school of painters had in the thirteenth and fourteenth century.² From this century about thirty-seven sets of murals paintings have been found in Navarrese churches, from small fragments to full ensembles. A number that will change, discovering new ensemble in the future.

Since the turn of the new millennium, the Navarrese government and the Diocese of Pamplona-Tudela have carried out about twenty assessments and restorations on medieval mural paintings in the nowadays autonomous community of Navarre. Each of these scientific assessments include a restoration report, which variates on length and quality of information provided. Of these twenty reports, thirteen include laboratory analysis on the pigments and binders present in the samples of murals selected by the restorers. The results of these labs analysis are the core of these paper.³ The quantity and quality of information in these reports helps us to put together a small history on the use of pigments and binders during the thirteenth and fourteenth centuries in the art of monumental painting in Navarre.

The data gathered in the charts of this paper has to be considered with much care as these only represent selected samples by the restorers from some murals. Consequently, these are far from representing the exact reality of this craft during the thirteenth and fourteenth century. The absence of binders and pigments could mean that they simply disappeared and more resistant binders, like linseed oil, have survived.⁴ Plus, the restorers take samples, tiny fragments from the murals, which are considered the most interesting or representative for a laboratory analysis. Taking into consideration these important biases, I believe that the data gathered in these charts is still helpful to understand the general tendencies of mural painting during the thirteenth and fourteenth centuries in Navarre. On the other hand, it would be unwise not to study this data, continuing a tendency of approach to medieval painting only from iconographic and stylistic aspects.

Additionally, Navarre has one of the richest Late Medieval administrative archives of Iberia. The *Archivo General de Navarra* (forward on AGN) keeps the *Cámara de Comptos* and *Registros* section. These two sections of the *Archivo* keep documents from the Navarrese royal administration, mainly from in the 14th and 15th centuries: bills, invoices and summaries of the activities carried out by royal servants, similar to what we should imagine of a modern state administration. Among these documents there are those which describe the activities of certain Navarrese painters, but only when these painters were related in some way to the royal administration. Such frame means that there is no information available of Navarrese painters outside the circle of the royal court, as none parish, or noble family archives have survived from the Middle Ages, and cathedral and Diocesan archives have no information on this topic.⁵

The chronological frame of this study has been set from the twelfth century –using the only Romanesque mural in Navarre– to 1399. I did not include 15th century paintings as murals from this century are few remaining and without a sufficient quantity of laboratory analyses to trace a solid line of samples.⁶ The aim of this article is

¹ Daniel V. Thompson, *The Materials and Techniques of Medieval Painting*, Martino Fine Books (New Haven: Yale University Press, 1936), 9.

² The entire body of work by M.C. Lacarra Ducay is essential when it comes to understanding medieval mural painting in Navarre and Aragon. Here, by means of an introduction, I will just cite her published doctoral thesis and latest article on the topic: M.^a Carmen Lacarra Ducay, *Aportación al Estudio de La Pintura Mural Gótica En Navarra* (Pamplona: Diputación Foral de Navarra, Institución Príncipe de Viana, 1974)., and M.^a Carmen Lacarra Ducay, "Pintura mural gótica en Navarra y sus relaciones con las corrientes europeas. Siglos XIII y XIV," *Cuadernos de la Cátedra de Patrimonio y Arte Navarra*, no. 3 (2008): 127-71.127-71, for a concise summary of the various styles employed in fourteenth century Navarrese painting.

³ Most of the restoration reports have been carried out by ARTE-LAB in Madrid.

⁴ Romero Barrios, "Manifestaciones Pictóricas en el claustro gótico de la catedral de Pamplona. Técnicas, materiales y estado de conservación," 51.

⁵ This point was developed by Martínez de Aguirre in 1987 in his chapter about parish churches. Javier Martínez de Aguirre, *Arte y monarquía en Navarra, 1328-1425* (Pamplona/Iruña: Gobierno de Navarra, 1987), 292-300.

⁶ In fact, the only reports for the few fifteenth century murals are those from the Garro Sepulchre in the Cathedral of Pamplona and those

double. First, with the available scientific data from 1993 to 2022, draw a history of the use of pigments and binders, and thus painting technique in the Kingdom of Navarre from the twelfth century to 1399. Then, is to answer what caused, the great use of the azurite pigment in the Navarrese murals during the fourteenth century. For this last purpose I will use the information from the documents of the *Cámara de Comptos* and *Registros* section of the AGN.

2. Historical Context

Due to its unique position, the Kingdom of Navarre played the role of a bridge territory between peninsular and continental Europe. After 1234, royal dynasties of French origin inherited the throne of Navarre; and by 1328 the counts of Evreux and their inheritors had come to the throne in this Pyrenean kingdom up to 1441.

As explained European international trends thus had a significant impact on local Navarrese art, for example in the linear Gothic style of painting. The trecento mural paintings in Navarre demonstrate an interesting catalog of European stylistic trends and iconography, reflecting influences from France, England, and Italy.⁷

Actually, the Navarrese-Aragonese art historian M.C. Lacarra Ducay has pointed the important position that Navarrese mural painting occupies in European art at this time—due to its geographical position, which facilitated these external influences. The high quality of mural paintings in fourteenth-century Navarre is remarkable, especially those by the painter(s) called John or Johan Oliver (documented appearances between 1316-1390) in the refectory of the cathedral of Pamplona.⁸ As a result of his masterpieces in the linear Gothic style, painted in the 1330s, Oliver created a dominant style in Navarre that endured for the next several decades, in urban spaces as well as parish churches located in rural areas.

Under this influence, a group of painters based in Pamplona (Navarre's capital), followed John Oliver's style. This "school" has been named by the art historian Carlos Martínez Álava as the "Escuela de Pamplona."⁹ Such group painted numerous churches in the area surrounding Pamplona after John Oliver established himself in the realm around 1330. Moreover, so many are the fourteenth-century Navarrese wall paintings that have reached us, that, in order to catalog them Martínez Álava suggests three substyles or groups.¹⁰

First, those how followed the gothic linear style under the direct influence of Oliver, between 1330 and 1350, as Roque from Pamplona.¹¹ The second group, labeled as "Other works in the orbit of the Escuela de Pamplona," includes murals close in style to those of Oliver and Roque, which were painted also during the first half of the fourteenth century.¹² Finally, a third group was catalog as "Diffusion persistence and degradation on rural areas".¹³ In this section, Martínez Álava includes many of the paintings in rural churches that have been discovered in recent decades, "in the linear gothic style" of the Escuela de Pamplona but with a "purely popular style."¹⁴ These murals can be dated to the mid or second half of the fourteenth century, with no Italian innovations, such as the first trials of linear perspective in the paintings. But it is, also in this period when the first Italian innovations, such as, shy attempts to draw linear perspective in architecture starts to appear in Navarrese wall paintings, such as in the paintings of San Pedro de Olite.¹⁵

The rich documentation kept in the Navarrese archives, help us to know the trade of a common Pamplona painter as Pere de Eugui (documented activity 1340-1355). The first new is about this painter gathering silver, cooper and azurite from the mine of Urrobi in the Navarrese Pyrenees, for his trade.¹⁶ As common for his period, he collaborated with other painters and painted over different mediums and surfaces, as decorating in the funerary chapel of the king in the cathedral of Pamplona, or painting two diptychs ("tablas doblas") for this same chapel.¹⁷

In the second half of the fourteenth century the interiors of Navarrese parish churches built during the

from Yesa parish church mural paintings. "Pinturas Murales de La Iglesia San Estaban de Yesa," Restoration report (Pamplona/Iruña, 1999), Obras y Bienes Muebles archive. And Romero Barrios, "Manifestaciones Pictóricas en el claustro gótico de la catedral de Pamplona. Técnicas, materiales y estado de conservación," 192.

⁷ Lacarra Ducay, "Pintura mural gótica en Navarra y sus relaciones con las corrientes europeas. Siglos XIII y XIV," 359-61.

⁸ The first study of the figure of John Oliver was by R. Chandler Post, *A History of Spanish Painting*, vol. 2 (Cambridge, MA: Harvard University Press, 1930). Thereafter, French and Spanish art historians also came to examine his work. See, for example, R. Mesuret, "De Pamplona a Toulouse: En torno a Juan Oliver," 9-18; and M.C. Lacarra Ducay, "En torno a Juan Oliver," 373-77.

⁹ Martínez Álava, "El gótico radiante (1276-1387). Pintura, miniatura y artes suntuarias s. XIV," 371-73. In her 1974 work Lacarra Ducay uses the term "La escuela Navarra de pintura" (The Navarrese school of painting), but with a perspective that only includes Navarrese painters between the thirteenth and fifteenth centuries.

¹⁰ In my research I counted a total of sixty-two wall paintings done in Navarre during the Middle Ages (from the twelfth century up to the fifteenth century). From this total up to thirty-seven can be dated during the fourteenth century, about a 59%.

¹¹ Martínez Álava, "El gótico radiante (1276-1387). Pintura, miniatura y artes suntuarias s. XIV," 374-393.

¹² Martínez Álava, "El gótico radiante (1276-1387), 393.

¹³ Martínez Álava, "El gótico radiante (1276-1387), 394-99.

¹⁴ Martínez Álava, "El gótico radiante (1276-1387), 395.

¹⁵ These Italian innovations arrived from Siena through the hub of international painters that was at the papal court of Avignon. M.^a Carmen Lacarra Ducay, "Influencia de la escuela de Siena en la pintura navarra del siglo XIV. Los murales de la Catedral de Pamplona," *Reales Sitios: Revista del Patrimonio Nacional*, no. 82 (1984): 65-72.

¹⁶ AGN, Comptos, Caj. 24, N. 38, 1. In this document Deugi appears described as "pintor de Pamplona". Fernando de Mendoza, "Pintores y tapiceros en Navarra a fines del siglo XIV," *Revista internacional de los estudios vascos = Eusko*, RIEV 24, no. 2 (1933): 184-85.

¹⁷ AGN, Reg., 1^a serie, 67, fol. 40 v. and AGN, Reg., 1^a serie, tom. 76, 2. fol. 185 v. It also appears in the previously referred article of Mendoza from 1933. This and other painters as well as the chapel of San Esteban in the cathedral of Pamplona, have been researched by Javier Martínez de Aguirre. Martínez de Aguirre, *Arte y monarquía en Navarra, 1328-1425*, 330. Javier Martínez de Aguirre, "La capilla funeraria en la Navarra medieval," in *Correspondencia e integración de las Artes*, vol. 3 (XIV Congreso nacional de Historia del Arte, Málaga: Departamento de Historia del Arte, 2006), 117-18.

thirteenth and early fourteenth century –churches that it seems that still needed mural decoration–, were decorated with numerous mural paintings, most probably painted by these painters of Pamplona. But, of course, the most important painting effort was done in the cloisters of the Cathedral of Pamplona, painted by John Oliver and other unknown painters. As said, in this paper I will frame the study only to the technique and materials of those mural paintings done in the thirteenth century and the fourteenth century, up to 1399.

3. Technique and Materials of the Navarrese Duecento and Trecento Painters

Next, I will examine the results of the previously mentioned restoration reports. In order to do so, I will gather them in three groups. In the first, I include murals done in the thirteenth century, the transition between the Romanesque to an early Gothic style in Navarrese painting. In the second, the most numerous, I include the paintings in Pamplona Cathedral and those that were part of the mentioned Escuela de Pamplona, like the paintings of the parish church of San Adrian de Oloki. Finally, in the third group, I include those paintings in rural parish churches, the last group of paintings cataloged by Martínez Álava as “Diffusion persistence and degradation on rural areas”.

For each of the three groups, I created two charts (Table 1-3). In the first, I include only the pigments detected. In the second the binders:

1.1 Pigments/Metallic foils	Santa María de Olite (apse)	San Saturnino de Artajona	San Martín de Peña ¹⁸
White (Lead)	X	X	
White (Lime)	X		
White (Others)	X	X	
Yellow (Iron oxides)	X	X	X
Red (Minium)	X		
Red (Earth-based iron oxide)	X	X	X
Red (Colourant)			X
Red (Vermillion and cinnabar)	X	X	
Black (Coal black)		X	
Black (Charcoal)	X	X	
Blue (Indigo)		X	A non-defined blue
Green (Malachite)	X	X	
Green (Verdigris/cardenillo)		X	
Browns (Ochre earth)		X	X
Browns (Siena earth)		X	
Copper sheet			X

Table 1.1: Pigments detected in the 13th century Navarrese wall paintings¹⁹. Source: author.

1.2 Binders	Santa María de Olite (apse)	San Saturnino de Artajona	San Martín de Peña
Calcium carbonate + water	X	X	X
Linseed Oil	X	X	
Egg yolk (Tempera)		X	X

Table 1.2: Binders detected in the 13th century Navarre. Source: author.

¹⁸ Martínez Álava, cataloged the medieval mural paintings of San Martín de Peña as part of the gothic linear style paintings done in the second half of the 14th century. Martínez Álava, “El gótico radiante (1276-1387). Pintura, miniatura y artes suntuarias s. XIV,” 399. I do not coincide in this date, but the one of the restorer Alicia Ancho, who by style dated the paintings at the end of 13th century in the Restoration report quoted before.

¹⁹ In order to compile this chart, I used the data available in the reports on Santa María de Olite, San Saturnino de Artajona, and San Martín de Peña. Artelán Restauración, S.L. and Javier Latorre Zubiri, “Memoria final del tratamiento de conservación de las pinturas murales de la cabecera de la Iglesia de Santa María de Olite,” Sagarte, S.L., “Memoria de la restauración de las pinturas murales de la Iglesia de San Saturnino de Artajona. Fase II: cabecera.” Alicia Ancho, “Estudio sobre la correspondencia de policromías de la iglesia San Martín de Peña.”

2.1 Pigments/Metallic foils	Sangüesa	Olite	Ororbía	Oloki	Sanchez de Asiáin's	Cloister's Section L	Heraldic emblem, cloister's section N
White (Lead)		X	X	X	X	X	X
White (Lime)		X	X	X		X	X
White (Others)		X					
Yellow (Lead Tin)		X	X		X ²⁰		X ²¹
Yellow (Iron oxides)		X	X		X		
Yellow ochre					X		
Red (Earth-based iron oxide)		X		X			
Red (Colourant)		X				X	X
Red (Vermillion and cinnabar)	X	X	X		X	X	X
Black (Coal black)	X						
Black (Charcoal)		X		X			
Black (Bone)		X			X		
Blue (Indigo)		X					X
Blue (Azurite)	X	X	X	X	X	X	X
Green (Malachite)					X		
Green (Verdigris/cardenillo)		X	X		X	X	
Green (Copper Resinate)		X			X	X	
Browns (Siena earth)	X						
Orange (Iron oxide)	X	X	X	X			
Orange (Minium)		X	X	X	X	X	X
Golden sheet		X	X		X		
Gold brocade							X

Table 2.1: Pigments detected in the Escuela de Pamplona mural paintings including the cloisters of the cathedral of Pamplona. Source: author.

2. 2 Binders	Sangüesa	Olite	Ororbía	Oloki	Sanchez de Asiáin's	Cloister's Section L	Heraldic emblem, cloister's section N
Calcium carbonate + water	X	X		X	X	X	X
Linseed Oil		X	X	X		X	
Nut Oil					X		
Egg yolk (Tempera)			X				
Animal glue		X			X	X	

Table 2.2: Binders detected in the Escuela de Pamplona mural paintings including the cloisters of the cathedral of Pamplona. Source: author.

3.1 Pigments/Metallic foils	Ardanaz	Aibar	Eristain	St. Brígida	Gallipienzo	Caseda
White (Lead)	X		X	X	X	X
White (Lime)	X		X	X	X	
White (Others)					X	
Yellow (Iron oxides)	X	X			X	
Yellow ochre			X			

²⁰ Naples Yellow.

²¹ Naples Yellow.

Red (Earth-based iron oxide)	X	X	X		X	
Red (Coloring)			X			
Red (Vermillion and cinnabar)				X	X	
Black (Coal black)			X	X	X	X
Black (Charcoal)	X		X			
Black (Bone)				X		X
Blue (Indigo)		X				
Blue (Azurite)	X		X		X	
Cobalt blue (smalt)					X	
Prussian blue			X ²²			
Green (Malachite)			X		X	
Green (Copper based)		X			X	
Orange (Iron oxide)	X	X			X	
Red (Minium)			X			
Copper sheet	X					

Table 3.1: Paintings in rural parish churches. Source: author.

3. 2 Binders	Ardanaz	Albar	Eristain	St. Brigida	Gallipienzo	Caseda
Calcium carbonate + water	X		X	X	X	X
Linseed Oil				X		
Egg yolk (Tempera)	X			X		

Table 3.2: Binders in paintings in rural parish churches. Source: author.

²² Prussian blue, an artificial pigment created in the early 18th century has been detected in Eristain, over the layer of gothic paintings. *“La Paleta de La Fe. Explorando Las Pinturas Murales de Eristain”, Por D^a Pilar Giráldez* (Civivox Iturrana, October 2024), <https://www.youtube.com/watch?v=xERqp9cyUsQ>. It was thus, applied before the documented whitewash layers of 1817. Eneko Tuduri, “Eristain, solar de los Solchagas y sus pinturas murales,” *Príncipe de Viana*, Separata, no. 288 (2024): 20.

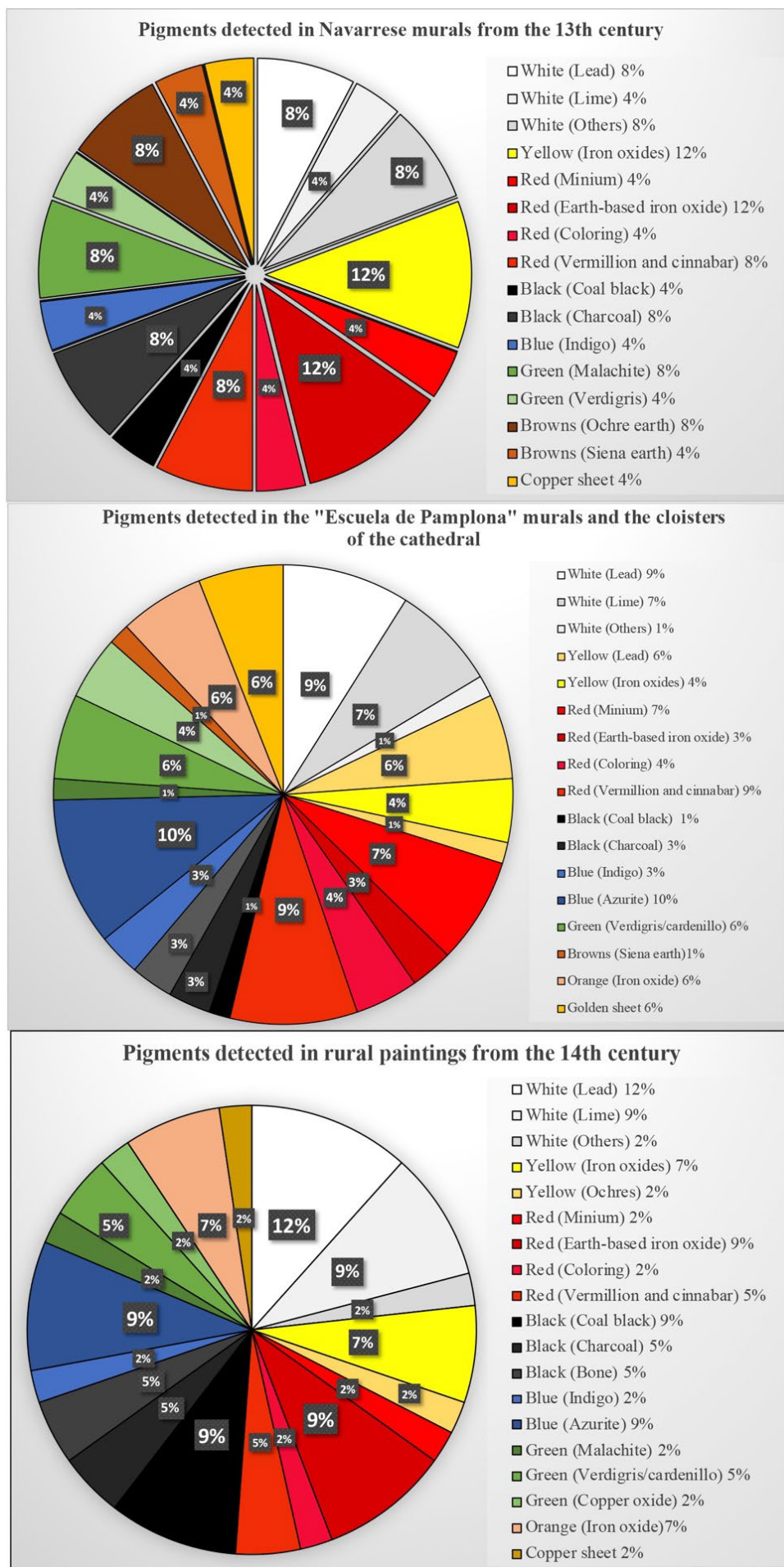


Fig. 1. Evolution of the pigments detected by laboratory analysis in Navarrese mural painting from the 13th century to 1399. Data from the Tables 1, 2 and 3. Images by the author.

3.1. Painting techniques and materials used in Navarre between the twelfth and fourteenth centuries

The only surviving Navarrese twelfth-century mural paintings are located in a small church in the village Rocafort. These fragments of paintings show a pure *fresco* technique, only using water and calcium carbonate as a binder without any animal or vegetable binder.²³ The style determined by Martínez Álava shows great similarities with the paintings in the church of Sant Climent de Taüll (Catalonia), thereby indicating an influence of Catalan workshops in twelfth-century Navarre.

However, this *maniera* changed radically by the end of the thirteenth century. From that moment on, wall painting technique in Navarre appears to have become a mixed, neither pure fresco nor pure *secco*.²⁴ Depending on the chemical stability of each pigment, painters used different binders and techniques in a single mural.²⁵

For example, for azurite, white lead, and vermilion, Navarrese painters used linseed oil as a binder, whereas for red oxide and other common mineral oxides or hydroxides, they used calcium carbonate and water (Table 2.2).²⁶ This pattern of use in Navarre matches the individual recommendations of Cennino Cennini to use a different binder according to the nature of each pigment.²⁷ Like their Italian colleagues, it seems that Navarrese painters knew the reaction of each binder as well as the potential danger of agglutinating a pigment with the wrong binder.²⁸

In regard to the pigments used in murals dating from the thirteenth century (Fig. 1, first chart, Table 1.1), the absence of undetected blue color pigments is remarkable. There is only a small sample of indigo blue found in Artajona, and there is no use of azurite at all. In contrast to cold tones, warm color pigments dominate the chart. Reds, yellows, and brownish colors used over white backgrounds with black lines predominated in the thirteenth century.

The analysis of the colors and binders used in thirteenth-century murals in Navarre shows a style and technique closer to Romanesque and to the twelfth-century *maniera* of painting: the inheritance of a pure fresco technique is visible and one notes the presence of warm colors—typical of the Romanesque painting style—with a particular absence of blues, which is very significant.

²³ Carlos J. Martínez Álava, “Las pinturas murales de Rocafort, un ‘unicum’ en el románico navarro,” *Zangotzarra*, no. 24 (2020): 201-39.

²⁴ In contrast to fresco, *secco* consists of painting over the wall once the preparation layer of mortar is already dry. For this task, pigments have to be agglutinated with durable binders, such as linseed oil.

²⁵ Violeta Romero Barrios, “Manifestaciones Pictóricas en el claustro gótico de la catedral de Pamplona. Técnicas, materiales y estado de conservación”, 51.

²⁶ Carlos J. Martínez Álava, “Recepción y difusión del gótico clásico. Artes del color y suntuarias,” in *Arte Gótico en Navarra*, 142.

²⁷ Cennini describes each type of pigment used in his lifetime individually, from chapters 40 through 62.

²⁸ From the numerous warnings that Cennini raises, we know that Italian trecento painters were aware of the deterioration that pigments could suffer if mixed wrongly. Chapter 59 in *On the Nature of White Lead* is a good example of these warnings. Cennino Cennini, *El libro del arte* (Madrid: AKAL, 1988), 103.



Fig. 2. The lower layer of paintings in the apse of San Saturnino de Artajona, showing the remains after the detachments with *strappo*. After detaching the superficial layer of the mural (today in the Museo de Navarra, Pamplona), this inferior layer was not destroyed. This second layer allow us to observe the colorful base, where upon it, the figures were outlined in *secco*. Photo by the author.

Once in the fourteenth century, the technique of John Oliver and his immediate followers (the referred Escuela de Pamplona) has been detailed by Martínez Álava, when studying the example of the church of San Julián de Ororbia murals, which Oliver painted around 1335:²⁹

1. First, over the thin layer of wet plaster, with a sharp-pointed ruler and compass, the painters draw the trefoil arches and straight sections that will eventually delimit the scene. Therefore, these false architectures frame figures and scenes therein.
2. Next, the outline of the figures is sketched using a thick brush in ochres or red tones, a process called *sinopia*.³⁰
3. The details that will receive golden foil or *stucco* (golden halos, sword hilt, crowns...) are prepared by removing part of the plaster layer, creating a hole a few inches deep to be filled later.
4. Then the main surfaces (such as backgrounds) are painted with the base color, usually whites, ochres, greens, oranges, reds, or blues. As noted, for each pigment a different binder is used. After the base is applied, different tones of color are painted over, creating volume, shadows, and lights, using glazing techniques. By the end of this step, the *sinopia* layer is completely covered.
5. Golden foil stucco or gold leaf brocade are applied in this step in the areas prepared in step three.
6. Finally, the outline is painted around the figures and on top of the colored areas. This strong line gives the name to the style: Linear gothic. The color of this line changed depending on the base: black for white backgrounds, sepia for the skin and hair, red for halos, hands, faces, and white over the greens, oranges, and blues.

²⁹ Javier Latorre Zubiri, "Restauración del retablo mayor y pinturas murales," in *La Iglesia de San Julián de Ororbia, Historia y Restauración*, Fundación para la conservación del Patrimonio Histórico de Navarra, 155-56 and Martínez Álava, "El gótico radiante (1276-1387). Pintura, miniatura y artes suntuarias s. XIV," 378.

³⁰ The characteristic color of these sketches (red or orange) has historically been related to an earth-based pigment from the Anatolian city of Sinope, hence *Sinopia*.

The technique used by Oliver in San Julian the Orobía was *secco* with two binders, tempera and linen oils. According to Latorre Zubiri, this combination of the two techniques allowed for a richer range of tones than fresco. These characteristics can be found in some rural murals, such as that of San Martín de Ecay.³¹



Fig. 3. Scene of the Three Marys and the Resurrection of Christ in Pamplona cathedral refectory, painted by Oliver and heavily retouched by Ramón Gudiol in the 1940s. Today displayed in the Museo de Navarra. Notice the use of golds and rich palette on the blue, with glazes as well as in the reds. Photo by the author.

If we compare the Navarrese *maniera* with the technique described by Cennini in chapter 67 of *Il libro dell'arte*,³² there are several differences. Steps 1, 2, and 3 in the Navarrese technique are almost identical, but once the *sinopia* was painted, the Italians covered a small section with wet plaster (*intonaco*) to paint the covered section in a single day (a *giornata*), while the plaster was fresh (hence, the name of the technique, fresco). Once the *intonaco* was dry, Cennini recommends giving volume to the figures by using the glazes with *secco* technique, using as binder tempera and drying oils. This method was long and uncomfortable but allowed the painter to paint directly over the wall, without any need for cardboard models.³³

The Catalan painter Ferrer Basa followed the same Italian tradition when he painted the Chapel of Saint Michel in the Monastery of Saint Mary of Pedralbes in 1346.³⁴ On the contrary, it seems that Navarrese painters did not follow these Italian traditions, and not using fresco did not affect the skill or immediate results of the best Navarrese trecento murals. For example, in the Refectory Mural, the shadows and volumes made out with glazes are perfectly visible, even if this painting has to be considered with much care, as it was heavily restored in the 1940s (Fig. 3). However, it seems that not using fresco did have a major effect on the conservation of paintings in parish churches, because *secco* paintings do not resist the deterioration of time so well.

As seen in the second chart of the Fig. 1, Table 2 and Fig. 3, by the mid-fourteenth century, the palette had changed significantly. In general, there was a richer variety of colors that was visible in the rich range of reds used. There was, furthermore, a balance between the plaster white and the white lead. Blacks, which had represented up to twelve percent of the colors employed in the preceding period, had become almost testimonial in this phase. But the most significant development during this time was that the appearance of azurite blue (in the 1330s) and the predominance of vermillion as the most used pigment. The explosion of azurite blue can be seen in paintwork of the bosses of the cloister of the cathedral of Pamplona, where in all the blue backgrounds azurite has been detected.³⁵

³¹ Martínez Álava, "El gótico radiante (1276-1387). Pintura, miniatura y artes suntuarias s. XIV," 391.

³² A technique inherited from the workshop of Agnolo Gaddi and Giotto.

³³ Commentary by Franco Brunello Cennini, *El libro del arte*, 113.

³⁴ The restorers have detected 113 *giornata*, with four-millimeter thick plaster coats made out of lime. Lidia Font et al., eds., *Conserving Trecento Mural Paintings: The Role of Painting Technique*, 74-75.

³⁵ Romero Barrios, "Manifestaciones Pictóricas en el claustro gótico de la catedral de Pamplona. Técnicas, materiales y estado de conservación." 58-171.



Fig. 4. A scene of the wall paintings of San Pedro de Olite, chapel of La Virgen del Campanal. Note the introduction of Italian influences as the light perspective in the building, while keeping the gothic-linear style in the figures.

Cennini calls azurite "German blue" mentioning that it was extracted from mines in Germany and Siena.³⁶ Azurite it is formed by lead basic carbonate and has a tendency to oxidize into a green basic carbonate, known as malachite.³⁷ This is what happened in the parish church of San Juan Bautista de Eristain (Fig. 5) with the backgrounds of some scenes; namely, they turned into a greenish color from their original blue.³⁸ Moreover, azurite and malachite can suffer other types of degradation.³⁹ To sum up, pigments containing a large amount of lead, such as azurite or white lead, eventually have a tendency to oxidize, especially if they are mixed with the incorrect binder.

The restorer Romero Barrios points out how the use of oil as binders predominates in the cathedral cloisters.⁴⁰ This appears to have been so in Oliver's circles as well, with Ororbia being an exemplary case in which the restorers did not detect any calcium carbonate but only oils and tempera.⁴¹ There is up to 18 percent less use of tempera and animal glues than in the thirteenth-century data (Table 2.2). And lastly, the Escuela de Pamplona used a variety of techniques to apply metallic foils—mainly golden sheet—, such as stucco, or golden brocade.

³⁶ Cennini, *El libro del arte*, 103.

³⁷ A. Lluveras et al., "Degradation of Azurite in Mural Paintings: Distribution of Copper Carbonate, Chlorides and Oxalates by SRFTIR," 363.

³⁸ Eneko Tuduri, "Between Heaven and Hell: Salvific Murals to Transform a Pre-Romanesque Parish Church into a Noble Funerary Pantheon in 14th- Century Navarre.," *Peregrinations: Journal of Medieval Art and Architecture* 8, no. 4 (2023): 223, <https://digital.kenyon.edu/perejournal/vol8/iss4/5>.

³⁹ For example, if azurite is mixed with white lead, it has a tendency to oxidize into brown. This may also have happened in Eristain. Lidia Font and Rosa Senserrich, "The conservation of the paintings in Saint Michael's Chapel in the Monastery of St. Mary of Pedralbes," 99.

⁴⁰ Romero Barrios, "Manifestaciones Pictóricas en el claustro gótico de la catedral de Pamplona. Técnicas, materiales y estado de conservación," 51.

⁴¹ Latorre Zubiri, "Restauración del retablo mayor y pinturas murales," 156.

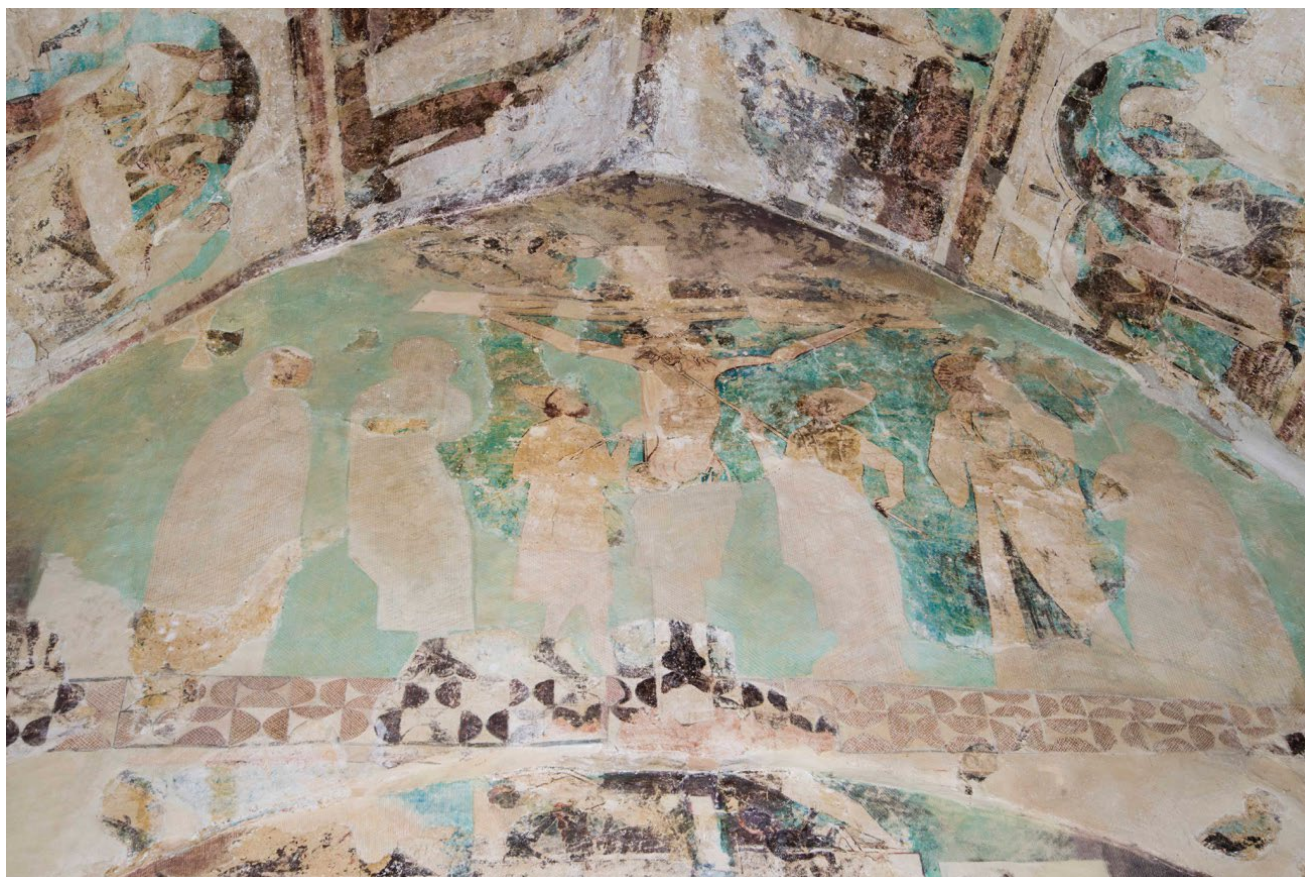


Fig. 5. The crucifixion in San Juan Bautista de Eristain. Note the greenish backgrounds, azurite turn into malachite.

Finally, Navarrese rural churches display a high percentage of azurite blue (up to 9 percent). But this percentage is even bigger if malachite is considered as a former azurite (rising to 11 percent). The number is high because of the presence in the two churches of malachite, and one should add San Martín de Azanza to the list (Valley of Goñi, Navarre), a church about which there is no restoration report, but which shows a clear use of azurite on its walls (Fig. 6 and 7). However, paintings in churches as Aizpún included in this style group do not appear to have azurite blue in their palette. Instead, their style is closer to the thirteenth-century aesthetic with warm dominating colors. Therefore, it does not seem that azurite was used in all the murals located in rural parish churches during the fourteenth century.

There is less use of red than in the work of the Escuela de Pamplona, but there is still a rich variety of different pigments used for this color. On the contrary, blacks are much more predominant than in the Pamplona paintings, a detail that may be due to the easy access to this pigment.⁴² It is possible that the use of black was avoided in the case of Pamplona Cathedral because it was cheap, and it was therefore replaced by brighter colors and more expensive pigments.

⁴² Through mineral or plant-based charcoal as well as the black gathered from burned bones and horns.



Fig. 6. Weighing of souls in San Martín de Azanza, restored in 1990s.



Fig. 7. Azurite gathered in the mine of Urrobi, compared with the blue of the murals of Azanza. Photo by the author.

The binders used in these churches show much use of calcium carbonate, significant use of tempera, and only

limited use of linseed oil (Table 3.2). These results may reflect a stronger attachment to the thirteenth-century traditions by the painters of these churches.

3.2. Cost of the pigments and binders

A document conserved in the AGN reveals the cost of the pigments used to paint the king's chambers in Tudela Castle in 1388, a year after the death of Charles II.⁴³ These pigments were bought in the market of Zaragoza (Crown Aragon). In the next table I translated all the prices to *dineros*, the lower coin used by the Navarrese administration:

Pigment (one Navarrese ounce) ⁴⁴	Price ⁴⁵
Vermilion	20 <i>dineros</i>
Oropigment	18 <i>dineros</i>
Berdet (Green)	26 <i>dineros</i>
Azur acre (Lapislazuli)	192 <i>dineros</i> jaqueses
Azur de Allamayna (Azurite)	27 <i>dineros</i> jaqueses
Polvo verde (Green powder)	15 <i>dineros</i>
Blanquet (White lead)	4 <i>dineros</i>

Table 4. Prices listed in the document: AGN, Registros, 1^{er}S., N. 205. fol. 437 v., r. and 438 v., r. The original prices are in *florines*, *sueldos*, and *dineros*. All of them have been translated into the lower value coin, *dineros*, to facilitate a comparative of prices.

The same document also lists the price of the binders used with these pigments.

Binder	Weight	Price
Varnish	1 Navarrese ounce	10 <i>dineros</i>
Glue ⁴⁶	1 Navarrese ounce	4 <i>dineros</i>
Ollio de moso (Linseed Oil?)	No data	4 <i>dineros</i>
Bol de armeni (Armenian Bole)	1 Navarrese ounce	24 <i>dineros</i>
Arabic Gum	1 Navarrese ounce	3,3 <i>dineros</i>

Table 5. Table with the prices of the binders.

With the exception of the exotic Armenian bole, binders were relatively affordable. If we compare these prices with the same and similar products of the period, the purchase of 50 *cahices* of lime to cover the walls of Miranda de Arga Castle (in southern Navarre) cost the Navarrese administration 10 *libras*, 10 *sueldos*, and 4 *dineros*.⁴⁷ In order to evaluate whether this was a high price for the period, I will compare it to the salary of Martín Periz de Solchaga, a judge in the royal court and king's counselor as well as to the extraordinary tax that the village of Azanza had to pay in 1366:

⁴³ This document was first discussed by Mendoza already in the mentioned article of 1933 and later by Martínez de Aguirre in his thesis published in 1987.

⁴⁴ The Navarrese ounce weighs 31 grams. The nowadays imperial ounce weighs 27 grams. The data on Navarrese ounces is taken from: José Yanguas y Miranda, *Diccionario de Antigüedades del Reino de Navarra. Tomo II. L-R.*, vol. 2, 795 and Francisco Javier Zabalo, *La administración del Reino de Navarra en el siglo XIV* (Pamplona/Iruña: Universidad de Navarra, 1973), 232.

⁴⁵ During the reign of Charles II in Navarre, several kinds of coins in circulation, both local from Navarre and foreign. Because of the huge and constant devaluation of the local Navarrese currency during this reign, however, court officials and accountants instead used a fictional "administrative coin" that had a fixed value. This was useful for them to calculate payrolls and salaries and it is useful for us today to understand the values of certain goods, such as the pigments in the paintings, in fairly straightforward terms. The values are the following: 1 florin = 30 *sueldos*, 1 libra = 20 *sueldos*, and 1 *sueldo* = 12 *dineros*. Francisco Javier Zabalo, "Los resortes de la monarquía," in *Historia de Navarra. Edades antigua y Media*, 232.

⁴⁶ The document does not specify which kind of glue it is (whether animal-based or some other kind)

⁴⁷ *Cahices* is a content measurement unit that varied from valley to valley all over Europe. Ounces are a weight unit, and therefore we cannot compare both measurement systems. Zabalo, *La administración del Reino de Navarra en el siglo XIV*, 228. The latter number is a total of 2,524 *dineros*. Information from AGN, Comptos, Caj. 25, N. 51, 3.

Example	Cost ⁴⁸
Salary of Martin Periz de Solchaga in 1368 as head of Valdorba Valley, plus his salary for being a king's counselor. ⁴⁹	145 florines (52000 dineros)
Extraordinary tax on eleven hearths in 1366 in the rural village of Azanza	30 florines (10800 dineros)
Fix Miranda de Arga Castle with lime in 1366	2524 dineros
A wall painting of the Virgin and the Child with a donor painted around 1373 ⁵⁰	4980 dineros
An ounce of azurite in 1388	27 dineros jaqueses
An ounce of white lead in 1388	4 dineros
An ounce of glue (binder) in 1388	4 dineros

Table 6. Chart comparing different salaries, services and goods.

The numbers included here can be deceiving. First, the calculations have been based on an accounting coin, a fictitious currency used only by the Navarrese administration. Hence, they do not reflect the extreme devaluation of real coins used in Navarre during the reign of Charles II. Furthermore, medieval metrology can be misleading, as in the case of measuring a Navarrese *cahiz*. Therefore, in citing these numbers, I do not aim to understand in detail the economic reality of the period. However, they can be of use when it comes to understanding the costs involved in painting church interiors, and the capacity to afford such costs.

Covering the important Miranda de Arga Castle with lime increased the cost to 50 *cahices* of lime, and 2,524 dineros. Lime would have been cheaper than white lead (4 *dineros* in Navarrese ounces), which implies that covering stone buildings with lime was cheap for the standard of the period.⁵¹ On the other hand, a single painting of the Virgin and the Child with a donor in the church of Santa Maria of Puente de la Reina by a local painter costed twenty *escudados*, which can be translated to 4980 *dineros* even if the translation from *escudados* to *dineros* can be deceiving.⁵² This exemplifies the higher cost of the trade of painting.

With the extraordinary tax paid by the eleven households of the rural village of Azanza, the aforementioned castle could have been covered with lime four times. Of course, the powerful Martin Periz de Solchaga was in a much better financial position to pay this cost: The salary of a nobleman at the top of the administration of the kingdom was much greater than the (high) taxes paid by the villagers of the rural area.⁵³ Therefore, a single powerful nobleman could afford such expense much easier than a rural village. These noblemen seem to hire Navarrese painters working in Pamplona, painters who probably enjoyed their biggest source of revenue from these nobles. And the discovery of azurite in a Navarrese mine, around 1340, only helped to enrich this artistic scenario.

4. The Importance of the Urrobi Mine

Like his contemporaries in Navarre, Cennino Cennini termed the azurite “German blue.” As said, he located the origin of this mineral in the silver veins of Germany and Siena.⁵⁴ Thompson affirms that azurite was an expensive and much esteemed pigment. It was expensive in the Middle Ages because, if used correctly, it could impart a deep blue color that was very similar to the tone and hue of lapis lazuli.⁵⁵ According to Thompson, due to the expensive nature of the pigment azurite in Europe, it was customary to use a cheaper variant of copper-based blue pigments.⁵⁶ However, as seen in the Navarrese rural paintings, there are entire walls painted with this pigment, like the Crucifixion of San Juan Bautista de Eristain.⁵⁷ Despite the demonstrable wealth of the noblemen who financed such works, one may ask how did accessed such large quantities of azurite. Was it imported from other regions of Europe, like Siena and Germany or Zaragoza, as understood from the abovementioned 1388 document?

A document in the Registros section of the AGN, dated May 13, 1340, records that the painter Pedro de Eugi was sent for thirty days to the royal mine of Urrobi, in the Navarrese Pyrenees, to get “*argentum et cuprum ad*

⁴⁸ Once again, the prices are in *dineros*. If this is the lowest coin, it is easier to compare it to the information in figs. 41 and 42.

⁴⁹ The first salary is listed in AGN, Comptos, Caj. 25, N. 43, 16. and the second is calculated by Zabalo, *La administración del Reino de Navarra en el siglo XIV*, 95, 249, 279.

⁵⁰ AGN, Comptos, Caj. 29, N.1, 16 v.

⁵¹ On this point, it would be interesting to know the cost of covering a wall surface with azurite.

⁵² Zabalo, *La administración del Reino de Navarra en el siglo XIV*, 244.

⁵³ In comparison with the Ollo Valley, the village of Azanza paid a bigger percentage of tax in 1366, namely 65 *florines* to 212 *florines*. AGN, Comptos, fuegos 1, f. 80 r. See also Carrasco, *La Población Navarra En El Siglo XIV*, 525.

⁵⁴ Cennini, *El libro del arte*, 103.

⁵⁵ For example, Thompson claims that several layers of azurite had to be applied in order to create a deep blue color that was similar to ultramarine. Hence, a degree of skill was needed to apply the color. Thompson, *The Materials and Techniques of Medieval Painting*, 34, 133.

⁵⁶ Thompson, *The Materials and Techniques of Medieval Painting*, 156.

⁵⁷ Tuduri, “Between Heaven and Hell: Salvific Murals to Transform a Pre-Romanesque Parish Church into a Noble Funerary Pantheon in 14th-Century Navarre,” 242.

azurum,” silver, copper, and azurite.⁵⁸ The document is part of series of reports by Paulo Giralddi, a Florentine miner hired by the Navarrese Crown to oversee the extraction of silver in the Urrobi mine.⁵⁹ The information in this document helps answer to the previous question, namely that Navarre enjoyed access to azurite and, as a derivate thereof, malachite. The Pamplona painters were sent to the mine itself to get the mineral. Also, it is worth to mention that Pedro de Eugi could be the painter of the bosses of the cloisters of the cathedral of Pamplona, as these are painted with azurite blue and it is documented he worked in the cathedral by 1351, a date close to Urrobi mine's work.⁶⁰

After Pedro de Eugui was initially discussed by Mendoza in 1933, in 2002 Mugueta noted the presence of azurite in Urrobi.⁶¹ However, these scholars do not relate their information on azurite to the presence of this pigment in Navarrese medieval murals. As far as I know, this presence was first detected in the 2002 restoration report on Ardanaz, so it was impossible for them.⁶² In a visit to the Urrobi mine in 2022, I was able recover some samples of this mineral:



Fig. 8. Fragments of azurite and malachite found near the Urrobi mine, July 2023. Photo by the author.

I will now turn to the documents kept in the AGN about the exploitation of this mine and the research that Mugueta carried out on mining in the kingdom. According to the first reports from the abovementioned Paulo Giralddi, it seems that mining activity was already underway by 1338.⁶³ This exploitation was extended, under the direction of Giralddi, until 1344.

After a two-decade hiatus, a March 1362 document mentions the “discovery” of the mines.⁶⁴ This time, another

⁵⁸ Petro deeugui pictori pamplone pro salario suo eligendo audorium seu azurum i minna regis de Urrobi ubi magister paulus et socii sua operabantur in argento et cupro ad azurum redditur regi mfivic in recepta in fime putis compoti in XXX diem per diem. AGN, Comptos, Reg., 1^a S., N. 44/140 v. GPS coordinates: 42.91113752207253, -1.3788816733089584.

⁵⁹ The receipt of this document is in AGN Comptos, Caj. 24, N. 38, 1. Date: 05-13-1340.

⁶⁰ AGN, Reg., 1^a serie, tom. 67, fol. 40 v.

⁶¹ Mendoza, “Pintores y tapiceros en Navarra a fines del siglo XIV” and Iñigo Mugueta Moreno, “Minería cuproargentífera en el reino de Navarra (siglo XIV),” *Príncipe de Viana* 66, no. 235 (2005): 411.

⁶² Arantza Martinena, Marta Vidador, and Joaquín Martinena, “Informe final sobre el trabajo realizado en la pintura mural de Ardanaz,” Restoration report (Pamplona/Iruña: Arzobispado de Pamplona-Tudela, June 31, 2002), Departamento de obras archive. In 2008, the presence of azurite in the Eristain murals was discovered by the team of mineralogy specialists from the University of Barcelona. Noticias de Navarra, “La iglesia de Eristain acoge la que puede ser la pintura más antigua de Navarra.”

⁶³ AGN, Registros, 1^a S. N. 43, fol. 324 v., 337 v., 356 v., and 358 v.

⁶⁴ Even if they had already been discovered. AGN, Comptos, Caj. 15, N.33, 2.

Italian, Brace de Florencia was in charge of the mining activity.⁶⁵ It would appear, from the quantity of documentation dating from this year stored in the archive, that the mine was worked continually from March 1362 to May 1363. The peak of this activity was during Christmas 1362, when the king himself ordered the villagers of the local valley to lend a hand to the efforts of Urrobi miners.⁶⁶

After a further thirty-year break, information on this mine is once again forthcoming in July 1392, when Charles III ordered the mine to be exploited once more.⁶⁷ Two years later, there is the second reference to azurite I found in the documents, when German miners were working in the Urrobi mine, and a year later when “Richard Angles” was recorded as working there.⁶⁸ In 1420 in the place of Urrobi is mentioned as abandoned, where only local springs and pastures are used.⁶⁹ By 1448, the king and the Príncipe de Viana (the heir to the Navarrese crown) claimed all the gold and silver found by chance in the place of Urrobi.⁷⁰

Mugueta reaches the conclusion that the mine was exploited between 1340 and 1344 and again between 1362 and 1363 as well as during the late fourteenth and early fifteenth centuries.⁷¹ The main goal of these mining campaigns was to gain access to silver in order to mint coins of higher value in Navarre (with more silver in each coin). This was truly necessary during the reign of Charles II, when the Navarrese coinage was losing value. Access to a rich silver mine would help solve the problem and bring economic stability to his reign. However, these numerous short-lived mining campaigns appear to have failed in their mission of finding a rich source of silver.

But for my purposes here, the interesting fact is that the discovery of copper together with the copper-based minerals of azurite and malachite would allow for a second mineral resource to be exploited. Unfortunately, the word “*azurum*” is only mentioned twice in the Registros documents. Luckily, though, the 1340 document referred confirms the involvement of a painter (not a miner), who was sent to get this mineral by himself (and probably to select the most appropriate kind).

As noted above, the Urrobi mine was worked during the years 1340-1343, 1362-1363, and the last years of the fourteenth century. These dates coincide with those examined about the activity of Navarrese painters in the mid and second half of the century. Most probably, this local azurite was cheaper than that from the market of Zaragoza, and it was certainly more accessible.⁷² This access to azurite and malachite would help the Navarrese painters to source a high-quality blue (and green from malachite), thereby improving the profession of painting in general, and bringing more interest to decorate church interiors in Navarre during these decades. Decades of intense activity by the Escuela de Pamplona.

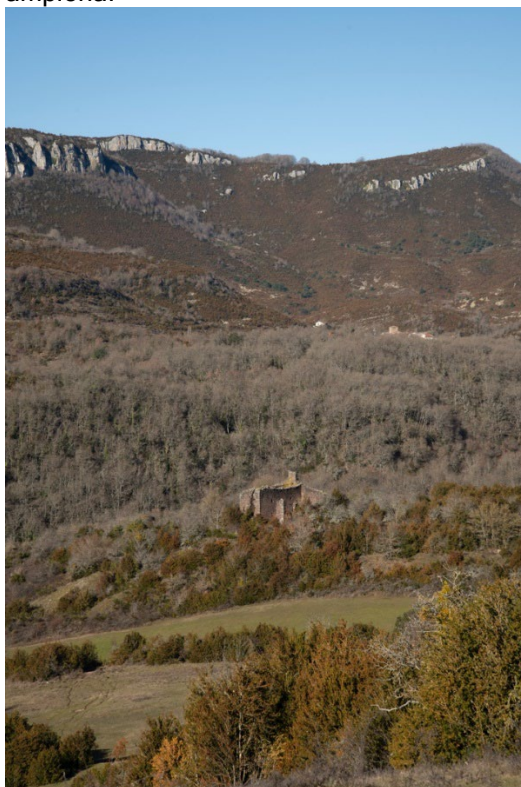


Fig. 9. The mine of Urrobi, near Roncevaux Pass, and the Navarrese Pyrenees.

⁶⁵ AGN, Comptos, Caj. 16, N.15, 6.

⁶⁶ AGN, Comptos, Caj. 15, N.87, 1.

⁶⁷ The document says: “Karlos por gracia de dios Rey de Navarra . . . nuestro mandamiento por ciertas misiones y expensas fechas . . . en razón de las minas durrobi”. AGN, Comptos, Caj. 63, N. 56, 8.

⁶⁸ Mugueta Moreno, “Minería cuproargentífera en el reino de Navarra (siglo XIV),” 412.

⁶⁹ AGN, P.S. 2ª, Leg. 12, N. 34, 1.

⁷⁰ AGN, Comptos, Caj. 153, N.50 and Caj. 154, N. 50.

⁷¹ Mugueta Moreno, “Minería cuproargentífera en el reino de Navarra (siglo XIV),” 410-12.

⁷² In any case, by 1388, Navarrese painters were importing azurite from the abovementioned market.

5. Symbolic implications of the blue color

As we have seen, at least after 1338, Navarrese painters had access to a local source of azurite. Applied correctly, azurite provides a deep blue tone similar to the lapislazuli can provide, a tone of blue available only for the wealthiest pockets of Europe. Painting the backgrounds of sacred scenes with a deep blue allowed to depict a simple but powerful chromatic division between hagiographic scenes and hell scenes inside the Navarrese parish churches. Such chromatic division appear in the churches of San Juan Bautista de Eristain and San Martin de Ardanaz. Specifically, the north and south walls of the single nave are painted with blue and red backgrounds.⁷³

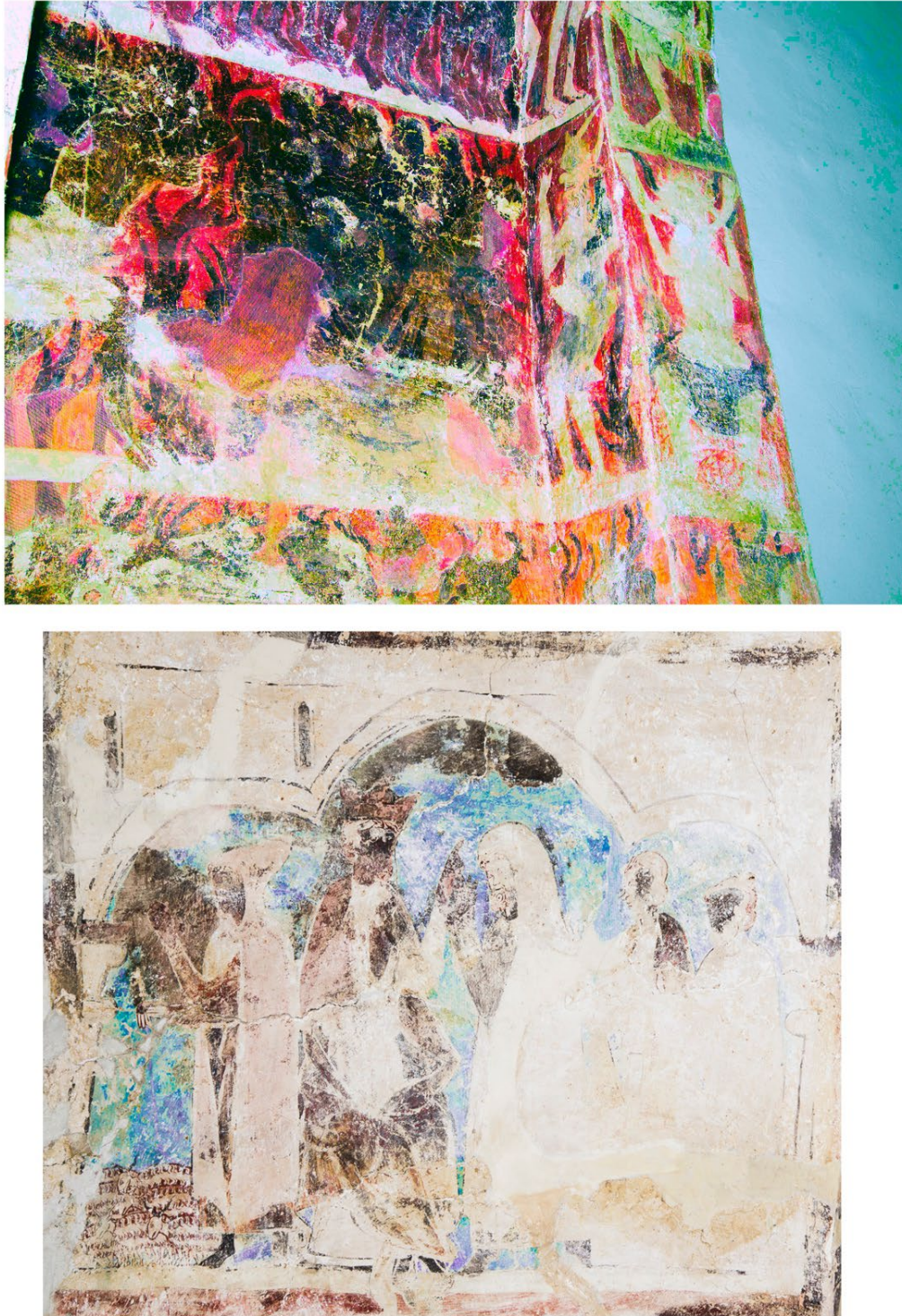


Fig. 10. Wall paintings in the chancel of San Juan Bautista de Eristain, Navarre. Top scene: with a red background, hell scenes, two major demons, and a group of the condemned marching to the mouth of the Leviathan. Lower scene: with a blue background, Joachim meets the high priest of the temple of Jerusalem, one of the scenes five in the hagiography of the birth of Mary. Images enhanced digitally.

⁷³ Eneko Tuduri, "Buttressing Our Souls for the Last Judgment: Female Artistic Patronage in a Navarrese Parish Church after 1348," *Comitatus: A Journal of Medieval and Renaissance Studies* 53, no. 1 (2022): 121-46 and Tuduri, "Between Heaven and Hell: Salvific Murals to Transform a Pre-Romanesque Parish Church into a Noble Funerary Pantheon in 14th-Century Navarre."

On the other hand, I did not find such a great use of deep blues in other mural paintings located in parish churches of the period. All over Europe, it is easy to find fourteenth-century murals with a limited palette of pigments: whitewash or white lead, oxide red or other earth-based colors, and carbon or bone black—as we have seen all of them quite affordable pigments (Table 4). After all, to seek an affordable use of pigments was common in mural paintings.⁷⁴

Focusing only on western Europe there are many examples of parish churches decorated with red, brownish, and black figures, over white backgrounds. In Álava, the parish church of la Natividad de Añua as well as La Asunción de Alaiza were decorated with enigmatic red schematic figures over a white uniform background.⁷⁵ In the Museo Diocesano de Jaca, which displays many wall paintings from the Kingdom of Aragon, we have several wall paintings where the mentioned color scheme dominates the paintings as the murals from Nuestra Señora del Rosario in Osia. In France, dated in the mid-fourteenth century the wall paintings of the church of Saint Etienne de Paulnay in the Berrichon, use also the preferred color palette.⁷⁶ Also, from the fourteenth century appear the elegant and extensive wall paintings from the church of St. Arbogast in Oberwinterthur, Switzerland.⁷⁷ Back in Navarre, by the fifteenth century the church of San Esteban de Yesa was painted with earth colors (cheap mineral origin pigments) as ochres and brownish.⁷⁸

Eristain's and Ardanaz parish church "axial division" (Heaven, blue=north wall, and Hell, red=south wall) has not to be considered as an oddity, on the contrary. A color reconstruction of the famous "Portada del Juicio" from the Collegiate of Tudela, depicts the exact same chromatic dichotomy for this monumental entrance.⁷⁹ And without preserving its original color there are many examples of Romanesque sculptural programs in Navarre where this division between Heaven and Hell—and references to a new idea: the Purgatory—is very evident.⁸⁰ But returning to mural painting, such contrast that gave to the analyzed parish churches implications that go beyond the simple decorative function of mural paintings: the interior of the building was filled with a simple but powerful eschatological message.

As referenced, other many European parish churches by lack of adequate pigments could not represent this division and were decorated with more accessible red, ochre, black and white colors. Thus, in those Navarrese parish churches where azurite was used in great quantities, the access to blue allowed the painters to represent a richer decoration than other painted programs in Western European parish churches, particularly those enlaced in rural areas.

But, the implications of being able to access the appreciate blue color went beyond just technical aspects. It is not a coincidence that blue color, was highly esteemed after the 12th century, when it became the color of the Virgin and of the royal house of France.⁸¹ Surely, in a Navarre ruled by a Capetian dynasty—the Évreux—, blue was highly considered as a symbolic color of divinity and royalty. The explosion of blue in the 14th century is not merely a coincidence of finding azurite in a silver mine. Also, the use of blue in wall paintings contrasts with the more common and affordable use of red pigments over white backgrounds, common in the European wall paintings of the period. Thus, to be able to use the color of the Virgin and the Capetian dynasty in a local parish church probably had favorable social implications on the prestige of the patrons of the murals. Specially in a public space as the interior of a parish church.

6. Conclusion

After abandoning the—typically Romanesque— pure fresco technique, thirteenth-century Navarrese mural paintings maintained the Romanesque aesthetic in the palette of colors, in which blacks, reds, oranges, and yellows were mixed with calcium carbonate, but also with linseed oil and egg-yolk (tempera) as binders.

However, by the fourteenth century a new style, the Linear Gothic, arrived from France and England. In this style a much richer palette of colors was part of the new style. The Navarrese painters of the Escuela de Pamplona had access to a wider range and better materials, as was reflected in the richer use of pigments, binders, and different techniques to apply golden foil.

By the mid-fourteenth century this new style already reached rural parish churches. The data reveals a less rich use of pigments, binders like oils and tempera, than the painters of the cathedral. It seems that the Gothic Linear style was adapted to the resources and technique available in the parish churches of these rural areas,

⁷⁴ Ana María Cuesta, "Un análisis interdisciplinar del conjunto escultórico del Monasterio de San Salvador de Oña (1141-1460)," *De Medio Aevo* 13, no. 2 (2024): 409.

⁷⁵ Gorka López de Munian, "Románico en blanco y rojo. Introducción a la pintura mural en Álava (siglos XII y XIII)," *e-imagen Revista* 2.0, no. 8 (2021).

⁷⁶ Christophe Lefébure, *Eglises peintes: peintures murales du Moyen âge* (Rennes: Ouest-France, 2010), 89.

⁷⁷ D. Lyle Dechant, "The Case of Arbogast: Image and Identity in a Swiss Gothic Parish Church," in *Towards an Art History of the Parish Church, 1200-1399*, ed. Meg Bernstein, Courtauld Books Online (London: The Courtauld Research Forum, 2021), 193-211, <https://courtauld.ac.uk/research/research-resources/publications/courtauld-books-online/parish-church/>.

⁷⁸ "Pinturas Murales de La Iglesia San Esteban de Yesa," Restoration report (Pamplona/Iruña, 1999), Obras y restauración archive.

⁷⁹ Among the rich and abundant scholarly studies on the iconography of the Portada del Juicio de Tudela, for the purposes of our study I want to quote the color reconstruction done in 2013 by Tudela journalist Blanca Otamendi and Diego Carasusán, which—if not an exact depiction—transmits the original colorful aspect of the of this monumental entrance. Diego Carasusán and Blanca Aldanondo, *La Puerta del Juicio* (Pamplona-Iruña: Fundación Diario de Navarra, 2013).

⁸⁰ Esperanza Aragonés, "El más allá. Premio y castigo para cada alma. Cielo e infierno.," in *Signos de identidad histórica para Navarra. Tomo I de II*. (Iruña/Pamplona: Biblioteca caja de ahorros de Navarra, 1996), 259-70.

⁸¹ Michel Pastoreau, *Azul. Historia de un color*. (Barcelona: Folioscopio, 2023), 66, 77.

with the best resources (such as linseed oil as a binder) being reserved for paintings in the cathedral and urban areas. This coincides with the stylistic evolution proposed by Martínez Álava: the diffusion of the gothic linear style into the parish churches located in rural areas, was possible thanks to a lesser quality on the use of binders and skill of local painters.

However, this does not explain the generalized use of azurite (which in 1388 was the second most expensive pigment in the market of Zaragoza) in these rural churches as well as in the cloisters and other murals related to the best painters of the kingdom. The discovery of Urrobi mine thus answers this question: in short, they had access to a local source of this mineral, as well as cooper silver and malaquite. This fact allowed to the Navarrese painters of the Escuela de Pamplona to use the appreciate azurite to decorate even local humble parish churches as Eristain or Ardanaz (Table 3.1, Fig. 10).

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