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The Colours of medieval English Alabaster Panels. Polychromy, production and perception

Markus Schlicht, Aurélie Mounier, Maud Mulliez, Pascal Mora, Romain Pacanowski

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**The colours
of English alabaster panels**

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Medieval polychromy, production and perception
Markus Schlicht, Aurélie Mounier, Maud Mulliez
with the assistance of Pascal Mora and Romain Pacanowski
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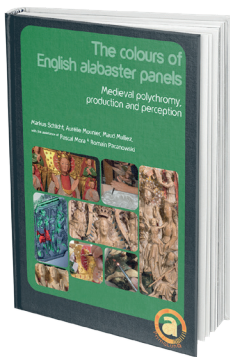
The colours of English alabaster panels

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The publication of the English version of this book was made possible thanks to the financial support of the University of Bordeaux Montaigne, its Ausonius and ArchéoSciences Research Institutes, the Federation of archaeological sciences of Bordeaux and the Archaeological sciences department of Bordeaux University.





- 1• Top left: *Assumption* (Bordeaux, Musée d'Aquitaine). Reconstruction of the medieval polychromy (digital painting on 3D model). Image: P. Mora and M. Mulliez.
- 2• Top centre: A. Bély carving an alabaster panel with a mallet and a gradine. Photo: M. Schlicht.
- 3• Right: *Adoration of the Magi* (detail), Bordeaux, altarpiece of Saint Michel. Photo: M. Schlicht.
- 4• Left, centre: 3D-scanning of the *Flagellation* (Bordeaux, Musée d'Aquitaine) by Archeovision. Photo: M. Schlicht.
- 5• Centre: *Assumption* (detail), Bordeaux, altarpiece of Saint Michel. Cl. M. Schlicht.
- 6• Left, bottom : *Entombment* (detail), Périgueux, Musée d'art et d'archéologie. Photo : © Musée d'art et d'archéologie de Périgueux.
- 7• Bottom, 2nd image from the left: Colorimetric measurements of a painted sample performed with a spectrophotometer. Photo: M. Schlicht.
- 8• Bottom, 3rd image from the left: Pigment identification using a fibre optic reflectance spectrometer (FORS). Photo: M. Mulliez.

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English medieval alabasters were sold throughout Europe. It therefore seemed necessary to us, with a view to making comparisons, not to limit our research exclusively to works preserved in Aquitaine. Colleagues and friends from several major museums have made an important contribution to our research. This is particularly true of Damien Berné, curator at the *Musée national du Moyen Âge*, Pierre-Yves Le Pogam and Florian Meunier, respectively chief curator and curator at the *Musée du Louvre*, Charlotte Riou, curator at the *Musée des Augustins* in Toulouse, Nicolas Hatot, curator at the *Musée départemental de la Seine Maritime* in Rouen, and Lise Leroux, research engineer at the *Laboratoire de recherche des monuments historiques*; all of them have shared with us their perfect knowledge of these works and provided us with valuable

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*“Remove from a statue its polychromy, and it loses something of its beauty:
remove the light that makes it shine, and it loses all aesthetic value.”*

*De Bruyne 1946, 213, paraphrasing a sermon
by St. Bonaventure in honour of the saints.*



Fig. 1. Eyrene painting a statue of the *Virgin and Child*. Early 15th century illumination (Boccaccio, *Des cleres et nobles femmes*, BNF ms fr. 12420, fol. 92v) Photo: © Bibliothèque nationale de France.

INTRODUCTION

During the last two centuries of the Middle Ages, between about 1330 and 1530, English sculptors exploited the alabaster deposits in the Midlands on a large scale to create funerary monuments with recumbents, altarpieces and small devotional reliefs (figs. 2, 3). These works were produced both for the English domestic market and for export to other European countries. During the Anglican Reformation from 1532 onwards, and later during the English Civil Wars (1642-1651), almost all the religious scenes from altarpieces and devotional images were destroyed in England. Despite these massive losses, more than 2,400 alabasters from the quarries in Derbyshire and Staffordshire still survive, mainly in various European countries, but also in American museum collections and as far away as Australia.¹

Immediately recognisable, English alabasters show a remarkable formal and visual homogeneity, almost as if they were produced by the same workshop. The majority of the panels have similar dimensions (approximately 40/50 x 25/30 cm), highly standardised iconographic compositions and colour layout as well as a particular stylisation of the figures, characterised primarily by their elongated proportions.²

Because of the close historical links with England, a large quantity of these alabasters have been preserved in the south-west of France and in particular in and around Bordeaux. More than a hundred have been inventoried in the region.³ Initially, their number was certainly much higher, as illustrated by the fourteenth-century Passion altarpiece, now in the Victoria and Albert Museum in London,⁴ the *Weighing of the Souls* panel now in the Louvre,⁵ and the Compans Altarpiece, recently sold by Sotheby's – all originating from Bordeaux or its region.⁶

1 In his book published in 2003, Francis Cheetham could list more than 2,400 panels. According to Zuleika Murat, there are even more than 3,000 known panels. See eadem 2019, 8, note 38.

2 Careful examination of the panels sometimes makes it possible to reconstruct part of the 'oeuvre' of a particular sculptor, such as the 'Master of the Lydiat Altarpiece' (De Beer 2018, 196 sq.). However, the general impression of stylistic homogeneity clearly prevails, as is demonstrated by the difficulty of dating the so-called Nottingham alabasters.

3 The inventory and study of the alabasters was carried out by Le Noan-Vizioz 1957. The corpus was extended to the south-west of France in Gorguet's master's thesis written in 1984.

4 Inv. no. A.48 - 52-1946. For the (probable) Bordeaux origin of the altarpiece, see first Hildburgh 1925, 307.

5 Inv. no. RF 1959; the first known owner of the panel, François-Vatar Jouannet, was librarian of the city of Bordeaux (Bresc-Bautier 2006, 59).

6 The altarpiece was sold in 2016; see <https://www.sothebys.com/en/auctions/ecatalogue/2016/treasures-l16303/lot.2.html> (last accessed on 11 February 2022). According to the information provided by the auction house *ibid.*, "it is most probable that the original home of the Compans Retable was in a church in the area around Bordeaux, given that it was here that Mgr Alexandre Compans acquired it circa 1905."

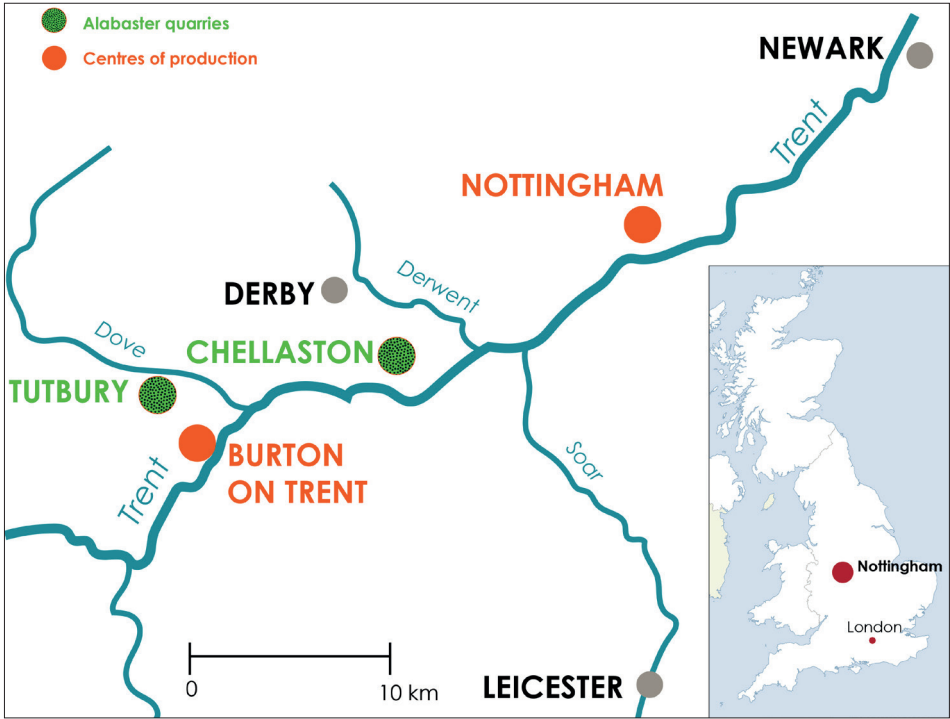


Fig. 2. Alabaster quarries and centres of production in the English Midlands (after Cheetham 1984).



Fig. 3. Block of raw alabaster from the Nottingham area.

THE STUDY AND RECONSTRUCTION OF THE POLYCHROMIES OF MEDIEVAL ENGLISH ALABASTER PANELS: HISTORIOGRAPHY AND METHODOLOGY

A BRIEF HISTORIOGRAPHY

The medieval English alabasters preserved in the south-west of France have already been the subject of several research works. However, these studies are often outdated and some are unpublished.¹ As they only marginally address questions relating to polychromy, without devoting any specific development to them, it is necessary to broaden this brief historiographical review by including the main works devoted to these works which came from across the English Channel.

Although they have been mentioned in a number of earlier studies, English alabasters have only been the subject of real research since the end of the 19th century. It was only then that the English origin of these panels, previously forgotten, could be demonstrated.² As the alabasters were scattered all over Europe, the first studies were devoted in particular to their survey and inventory. This was the case with the numerous publications by Philip Nelson and Walter Leo Hildburgh, the first of which date back to the 1910s.³ At the same time, criteria for dating the alabasters were developed, based in particular on the shape of the panels' frames, this chronological grid primarily being the work of Edward Prior.⁴ Researchers also examined the iconography of the slabs and since the 1940s studies have been published on certain categories of alabaster, in particular on statues of the Virgin and Child.⁵ At the end of the 20th century, comprehensive inventories and classifications of English works emerged,⁶ while in recent years, context has played an increasingly important role, characterised by a burgeoning of scholarly interest in alabasters.⁷ Their function as devotional⁸ or memorial⁹ objects has thus been highlighted. At the same time, a series of studies has been undertaken to track the provenance of alabaster works, in particular in order to distinguish pieces executed in England from those created in other countries, mainly France.¹⁰

It should be noted that despite its omnipresence on the panels, polychromy is not among the major research themes outlined above, and its study remains marginal. For example, the catalogue of the exhibition devoted to English alabasters in Normandy, published in 1997, does not contain a thematic article on polychromy; yet this aspect is nevertheless detailed for two of the altarpieces exhibited.¹¹ Similarly, the book written for the *Object of Devotion* exhibition – a presentation of panels from the Victoria & Albert Museum in London shown in various

1 Leaving aside the works of local 19th century scholars, most often related to the Bordeaux archbishop Pey Berland and his role as a commissioner of English alabasters, these include the following works: Brutails 1907, Le Noan-Vizioz 1957, Gardelles 1976, Gorguet 1984, Meunier 2003.

2 Hope 1890.

3 See Nelson 1914, *idem* 1915, *idem* 1917, etc.; Hildburgh 1916, *idem* 1917, *idem* 1918, etc.

4 Prior & Gardner 1912; Prior 1913.

5 Hildburgh 1946, *idem* 1955; Land 2011.

6 Cheetham 1984, reprint 2005; *idem* 2003; Dréan 1987; Gorguet 1984; Murat 2016.

7 De Beer 2018; Murat, ed. 2019.

8 Williamson, dir. 2010.

9 De Beer 2018; *idem* 2020.

10 Kloppmann *et al.* 2014; Kloppmann *et al.* 2018; see also the other contributions contained in vol. 200 of the *Revue de l'art* 2018.

11 Flavigny, 1997a (about the altarpiece of Saint Nicolas du Bosc/ Eure); Colinard & Klein 1997 (concerning the Rouvray altarpiece kept in the Musée départemental des Antiquités of Rouen).

American museums – does not include a contribution on the colour of these works either.¹² Katrin Land's recent thesis on English alabaster statues representing the Virgin and Child discusses in a few pages the issues of polychromy where there is partial covering in some cases and complete colouring in others.¹³ Lloyd de Beer's thesis deals with the colours and gilding of some of the works he examines, but the author makes no attempt to draw up a broader synthesis beyond these individual observations.¹⁴ The two recent collections of essays published respectively in 2019 and 2020 do not contain contributions examining polychromy from an art or culture historical perspective.¹⁵ Finally, in 2020 Kim Woods provided a broad overview of polychromy in late medieval alabaster sculptures in Europe, distinguishing between 'minimal' and full polychromy, but English panels are just treated briefly.¹⁶

The polychromy of alabaster is somewhat better known from an archaeometric point of view. In his 1984 book, Francis Cheetham presented a number of data collected during physico-chemical analyses of panels kept in the Victoria & Albert Museum collection in London. In 1997, Pascale Klein and Sylvie Colinart published a brief report on the Rouvray altarpiece in Rouen.¹⁷ The English reliefs preserved in Bilbao were studied in two articles published in 2008 and the painting materials of the panels were identified thanks to *in situ* and sample analyses.¹⁸ The other English alabasters preserved in the Basque Country were examined in two studies by Xabier Martiarena Lasa and published in 2012 and 2013 respectively.¹⁹ In 2018, a team from the British Museum, operating with state-of-the-art equipment, published an in-depth study of the pigments and binders of three panels and a statue from the museum, and proposed a reconstruction of their medieval polychromy.²⁰ Finally, in 2019, three alabasters – representing the so-called 'St John's heads' – from the Burrell Collection in Glasgow were analysed.²¹

Given the quantity of panels and statuettes preserved – there are more than 2,400 – of which several hundred still retain substantial remains of their polychromy, our knowledge of this aspect of the panels remains rudimentary. There are many reasons for this lack of interest, particularly on the part of art historians. One of these is the prevalence of current aesthetic codes. Since the beginnings of art history as an academic discipline, polychromy in ancient art (Antiquity, Middle Ages) has constantly been the subject of controversy; for a long time, its very existence was at best ignored, at worst denied. The evolution of taste since the Renaissance has in fact led to a separation between the art of sculpture on the one hand and the art of painting on the other.²² This division has had strong repercussions up to today and often leads to a marked lack of understanding of the 'unnatural mixture' that the combination of sculpture and painting seems to constitute for contemporaries.

The limited amount of research on polychromy is also explained by the difficulty of ascertaining its initial appearance. The medieval colours are very rarely preserved in a satisfactory manner. The polychromy is generally incomplete and the pigments are more or less altered, *i.e.* they have lost their original colour. In order to get an idea of what the medieval colours looked like, physico-chemical analyses and the observation of well-preserved pigments

12 Williamson, dir. 2010a.

13 Land 2011, 65-72.

14 De Beer 2018, in particular 115 (about the panels from Kettlebaston kept in the British Museum), 158-160 (about the Virgin and Child in the same museum) and 168-169 (about the Saint George slaying the dragon, National Gallery of Art in Washington).

15 Murat, ed. 2019a; Brantley *et al.* 2020.

16 Woods 2020.

17 Colinart & Klein 1997.

18 Castro *et al.* 2008; Sarmiento *et al.* 2008.

19 Martiarena Lasa 2012 *et idem* 2013.

20 Pereira-Pardo *et al.* 2018.

21 Philipps & de Roemer 2019.

22 See the concept of *paragone*: Sauerländer 2002, 27-34.



Fig. 4. Left: Evangeliary, Northern Italy (?), early 12th century, silver embossed, Paris, Musée de Cluny, CL 22653. Right: Bust of St. John from an *Entombment* (Musée de Cluny, CL 19322).



Fig. 5. Head of Christ from the *Appearance to Mary Magdalene* (Leicester, Jewry Wall Museum, inv. no. LEICT L.A20.1949). Present state (left) and completed polychromy (right).

under a microscope or binocular loupe are necessary. However, this equipment is not always at the disposal of researchers working on English alabasters.

The study of polychromy has also long suffered from the difficulty of reproducing works of art in colour in scientific publications. This is probably one of the reasons why, throughout the 19th and 20th centuries, colour was the poor relation of art history. It is only in recent years that this obstacle has been overcome and that colour prints are becoming common practice.

To these three points we should add a fourth, and not the least important: the lack of knowledge about the role and function of polychromies. In most of the studies that refer to the colouring of alabaster, it is termed 'decoration'. This expression seems to us to be an obstacle to understanding the true nature of these works. Indeed, the alabaster panels are not sculptures that have been embellished with a few brushstrokes. Rather, they are works of art that form a synthesis between sculpture and painting, even if this is not specific to English alabasters. As we shall see, the term 'three-dimensional painting' perhaps does them more justice than 'painted sculpture'. In a way, alabaster could be compared to the core of an artwork by a goldsmith: it allows the coloured epidermis to be given form and relief (fig. 4). In both cases, however, this core was not intended to be seen as such. This is clearly illustrated by the very special way in which the eyes of alabaster figures are shaped. The sculptors only carve globular protuberances into the eye socket. It is then up to the painter, with a few skilful brushstrokes, to transform them into eyes and thus give life to the protagonists (fig. 5).

The loss of the coloured epidermis is therefore equivalent to a partial destruction of the works of art. In order to be able to study and appreciate the alabasters more accurately, we felt it was essential to restore as much as possible of their original coloured appearance. This book describes the research work carried out to reconstruct the medieval aspect of some alabaster panels, by determining the nature of the pigments and the different visual qualities of the colours (chromatic palette, opacity, brilliance etc.). It also aims to identify the aesthetic and symbolic principles governing the use of colours. Finally, the study attempts to expose the criteria determining how the spectator in the late Middle Ages would receive and judge these polychrome works.

ON THE METHODOLOGY OF THE RECONSTRUCTION OF THE POLYCHROMIES

In order to achieve these objectives, a corpus of more than one hundred English alabasters preserved in the Aquitaine region was examined; most of them are concentrated in the Bordeaux area. This corpus was studied at their places of conservation, namely museums and a number of churches in the region (fig. 6 and table fig. 15). Within this corpus, three panels were selected because of the good state of conservation of their polychromy, in order to benefit from as complete a restitution as possible of their initial coloured aspect.

The study was carried out as part of a *Laboratoire d'excellence* research programme by a multidisciplinary team comprising an archaeometer, an art historian, an archaeologist and a painter specialized in the reconstruction of ancient polychromies, 3D engineers and an opto-numerical research engineer. The Aquitaine panels were first subjected to a visual examination. Any remnants of polychromy were documented by micro-photography and then mapped by pencilling on printed images in order to obtain a first overview of the distribution of colours. At the same time, non-invasive archaeometric measurements made it possible to determine the pigments and binders used, and to study the alteration phenomena undergone by the paint layers over time. Observations were first carried out using a portable optical microscope and a Wood (UV) lamp to assess the state of the surfaces, alterations, possible repaints and fluorescent binders. For the analyses of the materials, non-contact spectroscopic methods



Fig. 6. Location of English alabasters preserved in the Bordeaux region.

were used. Portable spectrometers²³ connected to a computer, a halogen lamp and an optical fibre were used to illuminate the works over a few millimetres and to collect the signal emitted by the pigment. The reflectance spectra obtained were recorded and compared with reference spectra in a database in order to identify the pigments. Analyses were carried out in the visible and near-infrared (400-1000 nm) and infrared (1000-2500 nm) light ranges. In some cases, in particular for the altarpiece of Saint Michel in Bordeaux, additional measurements were carried out with a portable fluorometer and a hyperspectral camera to obtain spectra of the integrity of the panels.²⁴

The results of these approaches, complemented by the consultation of ancient recipes for the manufacture of paints, provided the necessary data for the recreation of hues similar to those that medieval artists may have used. Eighty samples were created reproducing the different configurations of painted layers found on the entire corpus of New Aquitaine alabasters: the different pigments were applied to alabaster using linseed oil as a binder; gilding was carried out on different mixtures and the superimposition of several layers was reproduced. These samples made it possible to recover the original appearance of the colours, before they faded over the centuries. The alabaster copy of a medieval panel was also painted and gilded according to the findings and observations made on the original. Finally, the model samples were 'translated' into digital colours using a spectrophotometer.²⁵ The digital colours thus created were used to paint three 3D models of the alabaster panels that had been produced during the research programme.²⁶

23 Fibre optic reflectance spectrometers (FORS).

24 The archaeometric results of the study on the polychromy of Aquitaine alabasters were presented in detail in Mounier *et al.* 2020.

25 A spectrophotometer measures the chromaticity coordinates $L^*a^*b^*$, where L^* is the lightness (derived from the luminance of the surface) and a^* and b^* express the deviation of the colour from that of a grey surface of the same lightness. The $L^*a^*b^*$ coordinates were then converted to the RGB coordinates used by computer graphics software.

26 The experimental part (sculpture, painting, gilding) of the study on the polychromy of English alabasters kept in Aquitaine was presented in detail in Mulliez *et al.* 2022.



Fig. 7. Comparison between a photogrammetry (top) and a 3D scan (bottom).
Libourne, Musée des Beaux-Arts, *The Elect entering Paradise*: detail of the Elect.

The observations and results carried out during the carving and painting of the material copy of the alabaster panel will be detailed further in the book.²⁷ As for the digital copies, they were created using a double process combining acquisition via a 3D scanner²⁸ and by dense-matching photogrammetry. The files acquired in this way were merged into a single digital model, which made it possible both to complete the areas that were difficult to access using either of the techniques and to obtain the best possible compromise between maximum fidelity of reproduction on the one hand and, on the other, the smooth, polished appearance that the surfaces of the medieval alabaster initially had (fig. 6). These models were computer processed for digital painting²⁹ and then painted employing Autodesk's Mudbox software, which uses a tier system to imitate the layering of the various coats of paint. Once the work on the copies is completed – this work is still in progress – comparisons between the physical and digital copies will be possible. The convergence between the visual aspect of the two types of copies, one real, the other virtual, is being improved thanks to measurements of the optical properties of the panels, carried out with a specific device.³⁰ Next, these measurements are employed to obtain a reflection model which can then be used in turn in a rendering engine, serving as a specific 'shader', in order to reproduce as faithfully as possible the translucency of alabaster or the reflections of gold, which change considerably according to the lighting conditions. Yet, it is the optical qualities of both alabaster and gold that are essential for the accurate appreciation of these late medieval works of art.

AN ARCHAEOLOGICAL CHIMERA OR THE LIMITS OF THE METHOD

To what extent is it possible to restore the medieval appearance of an alabaster panel? The results that are presented here lead to a visual outcome that necessarily bears the marks of the 21st century, and not to a 'photograph' of the works of art as the medieval viewer saw them. We do not insist on the biases of the study induced by our own representations and mental images of the Middle Ages, which have already been highlighted by numerous studies but let us nevertheless mention the fact that the simulation of new colours, applied to a digital copy of an original that has aged for several centuries, with its patina and its defects, necessarily leads to a collision between two very distinct historical moments, one medieval, the other contemporary.

This unavoidable chronological telescoping has forced us to take decisions that may seem questionable. Since it is not possible to restore them to their original subtlety and precision, the surfaces of the scanned alabaster panels, now more or less heavily abraded, have not been subjected to any real retouching (with the exception of a slight smoothing). The obvious fractures and gaps, on the other hand, have been digitally repaired. Leaving these gaps would have led to embarrassing inconsistencies. The breaks would have created white areas that

27 For more details, see also Mulliez *et al.* 2022.

28 The scanner used is a HandySCAN 700 from Creaform.

29 The 3D model was obtained from 260 digital images, which were transformed into a point cloud using Photoscan software. This point cloud was then meshed: each point in the cloud is connected to the two closest points to create a triangular surface. The set of triangles thus created forms the surface of the virtual model. The 3D model is then transferred to a new chain of computer graphics software. The purpose of these is to simplify the model so that it can be manipulated on the computer. The decimation and retopology operations thus make it possible to reduce the number of triangles from several hundred million to a few million without significantly degrading the fidelity of the reproduction of volumes. The model is then textured using calibrated high-resolution photographs to restore its current appearance.

30 Developed at the Institut d'optique d'Aquitaine, this device, called the *Coupole*, combines a dome of 10 000 LEDs and a camera mounted on a robotic arm. The alabaster panel is placed under this dome. The LEDs make it possible to create a large number of different lighting situations, each of which is documented by means of a digital photograph. The data collected in this way is then processed by computer. For more details, see Mounier *et al.* 2020, 435-436 and 445.

would have impaired the overall reading of the work. Without claiming to put ourselves in the place of the medieval sculptor, we therefore opted to fill in the gaps by digitally 'resculpting' the missing parts, in order to remain as close as possible to the coloured masses and their initial visual balance – since it is precisely these that we wanted to study and interpret.³¹

Despite the precautions and the care taken in the analyses and observations, not all uncertainties could be resolved. For example, the portable and non-invasive instruments used for *in situ* physico-chemical analyses are not (yet) as efficient as those installed in a laboratory and based on the study of paint samples taken from the panels. The use of micro-photography, limited to a magnification ratio of 1:1 (lens) or even 1:2 (extension ring), does not allow the detection of the smallest traces of polychromy. Other uncertainties are linked to the precise shade of a particular colour which is, in turn, due to natural variations in the hue of the pigments employed. For example, differences in the quality and origin of a mineral, such as azurite or cinnabar, or the fineness of the grinding process, generate variations in colour. Other pigments, such as red ochre, have a wide variety of shades ranging from deep brown through intense red to orange-red. Due to the gradual alteration of certain pigments over time, the colour shade visible today is often not the same as it was in the Middle Ages. Consequently, approximations cannot always be avoided.

For our purposes, English alabasters nevertheless present a series of specificities that greatly facilitate the reconstruction of their polychromy, specificities to which we will return later in detail. The first of these is the very high number of artworks preserved. As English alabaster panels are remarkably homogeneous from a stylistic point of view, potential comparisons can be counted in the hundreds. These comparisons are all the more relevant as their painting follows a certain number of principles that apply to the whole of the production, or nearly so. This fact legitimises our attempts to fill in the gaps in the polychromy by relying on comparisons. Painters generally avoided mixing several colours and using half tones, preferring colours made up of a single pigment. This practice considerably restricts the pictorial palette and thus makes it easier to imitate it. The same holds true for the habit of the *alabastermen* of applying the colour in a covering and homogeneous manner, often creating monochrome flat tints: this avoidance of nuances and their giving up on modelling colours according to light and shade facilitate their reproduction. Given that these pictorial conventions were not those of an individual, but were shared and reproduced by a large number of painters for more than a century means that the conditions for reproducing them, even today, appear particularly favourable.

31 The fact that alabaster panels very frequently reproduced the same scenes composed in the same way usually limits the risk of error for this type of virtual restoration.

A TYPICAL COLOUR SCHEME: THE ELECT ENTERING PARADISE FROM LIBOURNE

CONTEXT AND DATING

The study of a first panel, preserved in Libourne (Gironde), allows us to illustrate the approach used and the type of observations that can be made, as well as the reconstruction of its polychromy.

The panel illustrating St Peter greeting the Elect to Paradise is kept in the Musée des Beaux-Arts in Libourne (fig. 8).¹ Placed in front of the open door of the Celestial Jerusalem, the first apostle welcomes three Elect, their hands clasped in prayer. Behind them rises the battlemented wall of the heavenly city. The archangel Michael, who stands before this wall, invites the Elect to approach the entrance. Behind the battlements appear two angels, one playing a psaltery, the other a guiterne or small lute. The tablette is part of a set of three panels illustrating scenes of a Last Judgement, each measuring 42 x 27 cm.² This small set comes from the private chapel of what was, in the 18th century, the house of the Bulle family, one of the most influential in Libourne. Unfortunately, we do not know since when these panels have been in this house nor who commissioned them.³

The panel depicting the *Elect entering Paradise* is relatively well preserved, as indicated by the large areas of medieval polychromy, under which the alabaster's epidermis is still intact. However, there are several damages and losses. The head of the angel in the upper right-hand corner of the panel and the two pinnacles above the door have been destroyed; they have since been reconstructed in plaster. The keys of St Peter are missing, and the tips of the angels' wings on the wall are chipped. All of this damage and the subsequent repairs predate the beginning of the 20th century, as they already appear in a photograph by Jean-Auguste Brutails.⁴

The dating of the Libourne panel, like that of the vast majority of English alabasters, is difficult to establish. The chronological grids that are usually applied to them do not allow us to specify this beyond a very vague fifteenth century. Considering other chronological clues, such as the very smooth and unbroken folds of Peter's draperies, the formal treatment of the

1 Inv. no. 02.1.45.

2 Curiously, the Judgement itself is not represented, or at least has not been preserved. Francis Cheetham has been able to identify only two panels depicting this subject, one in a British private collection and the other sold by Sotheby's in 1984. Both panels feature an enthroned Christ, two angels, the Virgin and St John kneeling, and naked men emerging from their graves. See Cheetham, 2003, 145.

3 The house and its chapel have now disappeared. In the 18th century, two members of the Bulle family were subdelegates of the Intendant, i.e. representatives of the king in Libourne ("Séance du 18 mars 1984", *Revue historique et archéologique du Libournais*, 1984, 54, 59-60). Léonard Bulle, who died in 1773, was the first president of the *présidial* of Libourne, subdelegate of the Intendant, lieutenant general of the seneschal and, from 1747 to 1749, mayor of Libourne. See Ardouin 1923.

4 The date of Jean-Auguste Brutails' photograph is not known. The eminent scholar arrived in the Gironde *département* in 1889 and took a large number of photographs of the region's cultural heritage, many of which were intended for publication in his book *Les vieilles églises de la Gironde* published in 1912. We would like to thank Julien Baudry for providing us with this information.



Fig. 8. Libourne, Musée des Beaux-Arts, *The Elect entering Paradise*, state in 2020.

architecture of the doorway and that of the figures' hairstyles, we would tend to place the alabaster in the first half of the fifteenth century, perhaps as early as its first quarter.⁵

The medieval polychromy of the panel, consisting of large areas of bright red, gold, pink and dark green, is fairly well preserved. It has recently been restored, which has made it possible to consolidate the pictorial layers, which were powdery in places, and to eliminate the greyish salt deposits that were partially masking them.⁶ The freshness of the colours has thus been partially recovered and their reading has been significantly improved. Nevertheless, the polychromy shows many gaps and alterations. The identification of the remaining chromatic data (colours and pigments) is therefore an essential step in attempting to restore the original appearance of the panel.

THE POLYCHROMY OF THE PANEL

The figures on the panel, whether clothed (Peter, the angels) or naked (the Elect), almost everywhere show the colour of alabaster. The Elect therefore do not have a pink complexion, but an entirely white skin. Their hair and certain facial features, the painting of which is now usually lost, were the only coloured elements. Their hair is of various colours: that of the left-hand figure is painted in yellow ochre, that of the middle figure in red ochre and that of the last figure shows a pale yellow tint, the dye of which, probably of an organic nature, could not be determined (fig. 9 and 10).

St Peter also has a white complexion and bright red lips; the paint on the nostrils, eyes and eyebrows – still clearly visible in the case of the figures on the panel of the *Resurrection of the Dead* in Libourne (fig. 11) – has disappeared here. The apostle's tonsured hair and beard are gilded, as are the two fragmentary keys in his right hand. He is wearing a long robe with fitted sleeves and a cloak. The robe is white (alabaster) on the obverse side and was originally provided with a row of large golden buttons on the bust.⁷ The lining is painted bright red with cinnabar, traces of which remain on the collar. The coat also has a white obverse, while the lining is coloured with a strong azurite blue. All the hems of the dress and coat are highlighted with gold-leaf edging (fig. 9).

St Peter stands before the gate of Paradise, whose late gothic architectural frame is entirely gilded. The two main pinnacles above his head are each decorated with two pairs of green lines (copper resinate) disposed in a chevron pattern, painted directly onto the gilding (fig. 9). These pinnacles end in two gargoyles at the bottom. Their monstrous heads are white (alabaster); their

5 According to traditional chronological classifications, the presence of a battlemented canopy over the scene, carved from the same block as the scene, is considered characteristic of the period between 1380 and 1420 approximately; the Libourne panel, devoid of these battlements, should thus be dated, according to these criteria, after 1420. The hairstyles of the male figures, typical of the Anglo-Burgundian fashion of the years 1410 to 1440, also allow a slightly earlier date. Peter's flowing draperies, with their thin folds and harmoniously rounded curves – which do not feature any drawn folds, edges or breaks – are still very close to the stylistic conventions in vogue in the 14th century. The stylistic archaism that is often postulated for English alabasters has not yet been fully demonstrated (nor disproved) – which is why we do not consider it necessary to rejuvenate this dating.

6 The restoration was carried out in January 2019 by Tiziana Mazzoni.

7 There are clearly visible remains of the upper golden button. The size of this button, as well as the location and shape of the other two, can easily be deduced from the smooth, circular marks that remain on the chest, due to the fact that here the alabaster surfaces have long been protected by the gilding. The areas around the buttons, in contrast, are rougher. In addition, comparisons with alabaster panels showing a better preserved polychromy, such as those from Rabastens, now in the Musée des Augustins in Toulouse, give a fairly accurate idea of the initial layout: three superimposed gilded buttons, linked together by a red line (which corresponds to the lining, as the dress is slit on the bust).





Fig. 9. Details of the medieval polychromy of *the Elect entering Paradise* (from left to right and from top to bottom): hair of the Elect in the middle, wings of the angels in the upper right corner, flower of the green grounds. Blonde hair (yellow ochre) of the first Elect; detail of Saint Michael's wing; lining of St Peter's cloak; white 'sun' on red background in the opening of the door to Paradise; golden border of St. Peter's cloak; monster's head and green chevron lines of the door to Paradise.

mouths and nostrils are painted bright red, their large eyes show a black iris (very fragmentary) on a gilded background (of which only the undercoat remains). The door to Paradise opens onto a bright red (cinnabar) monochrome 'space' strewn with white 'suns' (lead white). This door is surmounted by three shallow barrel vaults, uniformly painted with red lead, which produces a bright orange colour.⁸

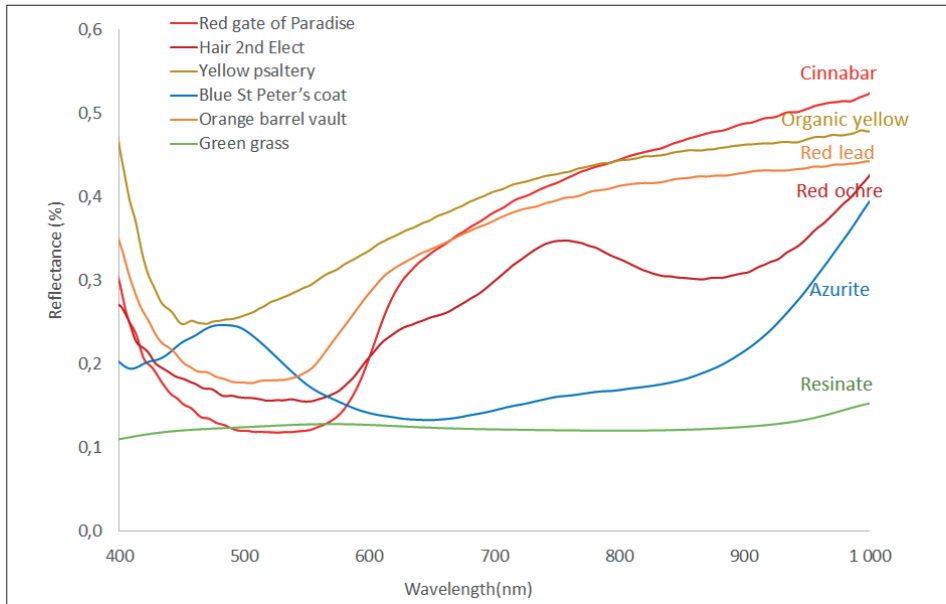


Fig. 10. *The Elect entering Paradise*: reflectance spectra of the different pigments identified.



Fig. 11. Libourne, Musée des Beaux-Arts, *Resurrection of the dead*: three heads of men.

8 Two patches of cinnabar red appear on these barrel vaults; given their asymmetrical and irregular location and shape, they are probably accidental.

The wall of the Celestial Jerusalem, which adjoins the door to the right, is made of pink large-scale masonry (a mixture of cinnabar and, probably, lead white), the joints being drawn in white (lead white). It rests on a moulded plinth decorated with gesso nodules (now lost), all of which have been gilded with gold-leaf. The pink wall is topped by a corbelled parapet. The courses of the parapet, left in white (alabaster), are surrounded by a cinnabar red line; the battlements are painted with the same bright red. The merlons are white (alabaster) and end in a semi-cylindrical moulding adorned with gold-leaf.

St Michael stands before the pink wall. Like the other figures, his complexion is entirely white and, like that of St Peter, his hair is golden. With the exception of the cinnabar red lips, his facial features (eyes, eyebrows, nostrils), which were once painted, have now disappeared. He is dressed in an entirely white alb with a raised collar. The lower part of the alb is decorated with a wide gold band overlaid with black diamond-shaped lines. The upright collar – probably an amice – has gold foil edges; the lining is painted cinnabar red. The wings of the archangel show a complex superimposition of colours, the stratification of which could not be determined with certainty due to a lack of sampling. According to our observations, they were first gilded – the leaves were placed on an orange mixtion (oil and red lead) –, then painted in translucent green (copper resinate and oil); tear-shaped feathers were then placed on this green glaze. Green tears with white spots, arranged fairly freely in registers, alternate with rows of red tears, also adorned with white spots (fig. 9 and 12).

The angel playing the guiterne has a white (alabaster) skin, golden hair and a white alb with a raised collar surrounded by golden borders. His red wings, painted with cinnabar, are decorated with white tear-shaped feathers, each with a black dot (carbon black; fig. 9). His musical instrument is gilded on the front, while the sides are painted with an unidentified

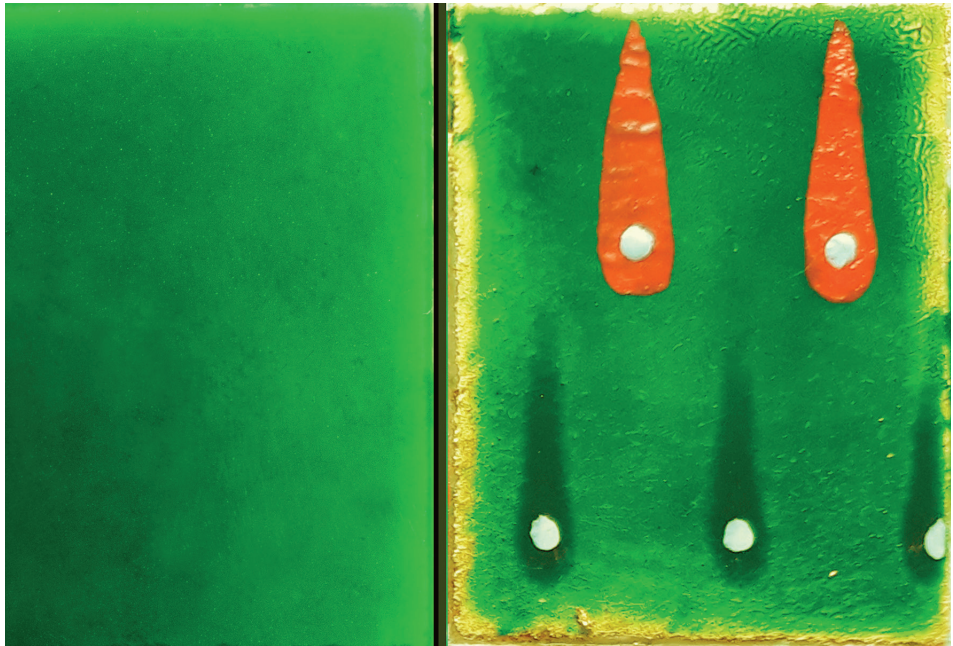


Fig. 12. Colour samples:
copper resinate on alabaster (left) and on gold leaf (right);
the sample on the right reproduces the probable arrangement of the wings of St. Michael.

organic yellow; the strings have been drawn in red. The angel with the psaltery is dressed in the same alb as his neighbour, and his wings show the same white tears with black spots on a cinnabar red backdrop. The frame of the psaltery is golden, the triangular area it encloses being painted pale yellow; the strings are drawn in black.

The backgrounds of the panel are divided into two parts with different colouring. The Elect and St Peter stand on a monochrome green meadow (probably copper resinate) with stylised flowers consisting of six lead white dots around a cinnabar red dot (fig. 9). Behind the door of Paradise and the angelic musicians, the backgrounds are gilded with gold-leaf and strewn with gesso nodules, similarly gilded.

OBSERVATIONS AND INTERPRETATION

Taken as a whole, the polychromy of the panel consists of a relatively limited range of colours, generated by as many different pigments. Apart from the alabaster, which is often apparent, and the gilding, it is essentially made up of bright red (pigment used: cinnabar), orange (lead red), deep green (verdigris and/or copper resinate) and intense blue (azurite). In addition to these pigments, which are used in large quantities, other colouring materials are employed much more sparingly. This is the case with the red showing purple shades (red ochre) that colours the hair of the central Elect and the eyebrows of the two monsters at the gate of Paradise.⁹ The hair of the last Elect and the triangular area of the psaltery were painted with a 'citrine' colour, generated from pale yellow organic pigments.¹⁰ Yellow ochre was used to colour the hair of the first Elect. White paint – lead white – was used for the 'suns' on the doorway to Paradise, as well as for the flowers on the green background and the tear-shaped feathers (fig. 9). Black is almost completely absent: only a few lines on the trimmings of St Michael's alb were drawn with carbon black. Initially, the pupils (now erased) of the figures and the small gargoyles of the gate of Paradise were probably depicted with this same black.¹¹

The pigments used were almost always applied pure. The main exception to this rule is the pink or 'incarnal' tone covering the wall of the heavenly Jerusalem.¹² It was obtained by mixing cinnabar and, probably, lead white.¹³ If pigment mixtures were therefore part of the painting practices of the Libourne panel painter, it is striking to note that he only rarely had recourse to them.

9 As strongly suggested by the painting practices observed on other English alabaster panels, the openings of the nose and the eyelids of the eyes of the figures, now lost, were probably also painted in red cinnabar (or ochre?).

10 The precise nature of the pigment could not be determined. For the name of this colour, we could refer to a passage in Sicille's treatise on heraldry, which explains about yellow: "Ceste couleur est de trois genres. La premiere est jaune moyenne couleur, la seconde est plus clere, et est couleur citrine, que nous disons jaune palle, la tierce punicee, et traict sur le rouge, et est ce que nous disons jaune orange." [This colour is of three kinds. The first is yellow medium colour, the second is clearer, and is citrine colour, which we call pale yellow, the third punicate, and it has a red tinge, and it is what we call yellow orange.] (Sicille, ed. Cocheris 1860, 82).

11 As far as we know, all the pupils of English alabasters have been painted in black.

12 According to the herald Sicille (15th century), incarnal or incarnate was "une couleur moult belle et gaye. Elle approche fort du rouge, mais elle est ung peu plus chargée et traict fort sur le blanc". [incarnal is a very beautiful and gay colour. It is very close to red, but a little more charged and has a strong white tinge]. (Sicille, ed. Cocheris 1860, 89) The author considers *incarnal* to be a colour in its own right, in the same way as white, red, green etc.

13 Due to the lack of a suitable instrument, the white pigment in this panel has not been formally identified. However, it is the white dye usually used by alabaster painters, and it has been detected on other panels in the Aquitaine corpus.

Some pigment mixtures, as revealed by physico-chemical analyses, were not so much used to generate additional colours as to reduce the drying time of the paints. The binder used on the alabasters to fix the pigments was in fact an oil (of the linseed or walnut oil type). As the drying time of this binder was very long – from several days to several weeks – the addition of a siccative did not delay the completion of the work too much. The addition of small amounts of lead, in the form of red lead (for red surfaces or gilding mixtions) or lead white (for blue surfaces, for example), considerably shortened the drying time.

The limited range of colours was sometimes extended by the superimposition of several layers of paint. This is the case for the wings of St Michael (fig. 12). The green copper resinate is superimposed on gold-leaf. Thanks to this process and the transparency of the resinate, this green appears more yellow, but also more luminous, than when it is applied directly to the alabaster. The same applies to the small green chevron-shaped lines on the golden pinnacles of the gate to Paradise (fig. 9).

These multi-layer overlays, which play on transparency effects, are however limited to these two examples. As a rule, the colours are opaque – despite the fact that they are applied directly to the support, without the intermediary of underlays. Only the azurite blue of Peter's mantle was applied on a blackish underlayer (fig. 9).¹⁴



Fig. 13. Patinated alabaster. Bordeaux, cathedral, detail of the robe of the *Virgin and Child* (protected for a long time by gilding, the letter 'M' adorning the robe shows the original white polished surface; the surrounding areas are pitted and patinated). Right: Aspect of new alabaster: detail of a polished Spanish alabaster panel, carved and painted in 2018.

14 The pigment used for the undercoat has not been identified: indigo or carbon black?

The colouring of the alabaster is not exclusively based on the use of pigments. In fact, the main colours of the panel have not yet been addressed: white and golden yellow.

Despite the many painted surfaces, white – alabaster white – remains the dominant colour of the panel. When exposed to the air for a long time and under the effect of environmental agents, alabaster takes on a greyish, yellowish or beige patina. However, freshly quarried alabaster from England is distinguished by its bright white colour, as recent breakages confirm. Moreover, the surfaces often appear slightly rough and ‘pitted’ today, whereas they were originally polished, as shown, among others, by those that were until recently protected by a layer of paint (fig. 13).

It should be remembered that alabaster can be naturally coloured in different shades, such as yellowish, light grey, green, red-brown and even black.¹⁵ Unlike some 20th century sculptors who used coloured English alabaster such as Cumberland alabaster (pink or honey-coloured),¹⁶ their medieval predecessors used only Derbyshire and Staffordshire alabaster, which is characterised by its pure milky white.¹⁷ The immaculate, brilliant white colour was obviously a decisive criterion for the choice of this material.¹⁸ Albert the Great echoes this medieval admiration for the colour of alabaster: “But among marbles, the white [kind] called alabaster is undoubtedly composed of a great deal of transparent [material...]; and the result is a most noble, sparkling colour in it.”¹⁹ On English panels, the whiteness of alabaster thus takes the place of colour. It replaces the actual white paint, which is only used when white is applied to a surface that has already been painted with another colour, as in the case of the ‘suns’ that dot the red space behind the door to Paradise.²⁰

After white, the most used colour is gold. The precious metal colours the most diverse elements, from the frame of the door to Paradise to the hair of the angels and St Peter, not forgetting the gold edging on the clothes and the backgrounds adorned with gesso nodules. It may seem inappropriate to include a metal in the inventory of colours of the Libourne panel. However, as Michel Pastoureau has pointed out, the colour yellow, which was not much appreciated by the medieval viewer, gradually disappeared from painted works and dyed fabrics at the end of the Middle Ages; it was replaced more and more systematically by gold, which was charged with positive connotations.²¹ Many medieval authors, such as the herald Sicille

15 Lipińska, 2015, 17; the author goes on: “Historically, however, only light-coloured types were referred to as alabaster. The various types of alabaster also differ in the forms and colours of their veining and clouding.”

16 Lipińska, 2019, 66-70.

17 The alabaster of the Midlands is not always free of impurities (often orange-brown in colour), but the immaculate whiteness of the material clearly remains predominant.

18 Some authors tend to think that the predilection for this material is explained by the more or less miraculous virtues that the Middle Ages attributed to alabaster. Thus, it was thought that this stone could slow down the corruption of corpses, preserve ointments or perfumes, or create friendship. The first of these supposed properties certainly had an influence on the widespread fashion for alabaster tombs, especially in England. However, alabaster does not seem to have been used in medieval England for the manufacture of ointment jars; unlike the Egyptian calcareous alabaster used in Antiquity, English gypsum alabaster is unsuitable for containing such substances. The miraculous properties mentioned in medieval treatises cannot therefore explain, at least not on their own, the popularity of this material in the late Middle Ages and beyond.

19 Albert the Great trans. Wyckoff 1967, 44.

20 Other examples are the small stylised white flowers on the green background of the panel, the white joints of the wall of Paradise or the white tears on the angels’ wings.

21 Pastoureau 2012, 231-232.

(c. 1435), considered gold to be a colour – in this case yellow – in the same way as azure, red or green.²²

Most often, objects or even entities such as the landscapes of the backdrops or the sky are painted in a single colour. These monochrome colours have not been chromatically ‘modelled’. For example, the space to which the door to Paradise opens is indicated by a uniform red surface. As far as the strong alteration of the pigments makes it possible to judge, the same was true of the green backdrops. It is the relief of the support that introduces nuances of colour, certain zones being exposed to light, others on the contrary plunged into shadow.

As each object has a specific, highly saturated colour, the panel as a whole is characterised by a multitude of brightly coloured chromatic poles. As a rule, two colours that are adjacent to each other have very different colour values, such as white and red or gold and green. No attempt has been made to smooth the transition from one colour to another, such as a gradient. On the contrary: the precise delineation of coloured surfaces and objects and their clear separation from those around them is a constant concern for the painters. The colouring of St Peter’s clothes illustrates this. Without the colouring, it is sometimes difficult to decide whether a particular piece of cloth belongs to the cloak or to the tunic of the saint. In order to disambiguate the composition of the draperies, the painter encircles all the hems of the cloak and robe with golden borders. These borders create sharp, clear-cut boundaries that the eye immediately grasps. The same hemlines also create ‘visual barriers’ between the robe and the skin of the saint, both of which are white (alabaster; fig. 14).

The exclusive use of pure, plain colours, their direct juxtaposition and the absence of modelling – even though the modulation of the colours occurs ‘naturally’ through the relief of the sculpture – give the panel a highly artificial appearance. Objects are repeatedly not given the colours that are naturally theirs. For example, skin tones are white rather than flesh-coloured, and hair frequently has the metallic lustre of gold rather than a realistic colour approaching blond. The reduction of certain natural elements to simple geometric forms reinforces the abstract dimension of the image. For example, the infinite natural diversity of plant species is reduced to a single one, in this case the ‘daisies’ on the green background, and the morphological complexity of actual flowers is simplified to the extreme (a red dot surrounded by six white dots; fig. 9 and 14).²³ The painter thus deliberately turns away from *mimesis*, *i.e.* the imitation of nature. On the contrary, the painting confirms and accentuates the non-realistic tendencies of the sculptor’s work, which are manifested, among other things, by the marked elongation of the proportions of the figures, by the simplification of anatomical details (or even by their pure and simple suppression, as in the case of the ears) or by the way in which the various architectural elements are assembled, which is not aimed at creating a coherent three-dimensional space.

22 The herald Sicille states in his chapter “Comment se doit porter le jaulne” [“How to wear the colour yellow”]: “Les roys, princes, chevaliers le portent en leurs heaulmes, harnoyz et esperons dorez, qui est couleur jaulne. Aussi les femmes portent plusieurs anneaulx d’or qui représente le jaulne.” [“The kings, princes, knights wear it in their golden helmets, harnesses and spurs, which is yellow in colour. Also the women wear several rings of gold that represents the yellow colour.”] See Sicille, ed. Cocheris 1860, 109.

23 It would probably be wrong to consider this motif as an expression of ‘naïve’ or ‘popular’ painting. It can also be found in court art, for example in the backdrops of the enamelled scenes decorating the base of the *Virgin and Child* donated by Joan of Evreux to Saint Denis, and dated 1339 (Paris, Musée du Louvre). According to Pitman 1954, 217, the ‘floral dotted foreground’ also appears in the illuminations of Mary Tudor’s Psalter (14th century) and the Duke of Bedford’s Book of Hours (early 15th century), both in the British Library. These examples had already been cited by Prior 1913, 23.



Fig. 14. *The Elect entering Paradise.*
Reconstruction of the medieval polychromy (digital painting on 3D model).

PRINCIPLES GOVERNING THE COLOURING OF THE ALABASTER PANELS KEPT IN AQUITAINE

Is the polychromy of the Libourne panel representative of other English panels, or is this one a case apart? Are the choices of colour and aesthetic choices common or unusual? An examination of the other English alabasters in the Aquitaine corpus will provide answers to these questions.

Among the hundred or so English alabasters from the Aquitaine region, only a limited number still show significant remains of polychromy. Indeed, many works, such as the two altarpieces of Saint Seurin in Bordeaux, the one in Génissac or the panels in Avensan, have been stripped and now appear entirely white.¹ Other sets, such as the five panels preserved in Saint Caprais de Bordeaux, were completely repainted in the 19th or 20th century. If we also disregard the individual statues and consider exclusively the narrative panels, there are only about twenty artworks with usable chromatic information. These are, first of all, the eight medieval panels that make up the altarpiece of Saint Michel of Bordeaux (which also contain some repainting),² as well as tablets preserved in Saint André of Bordeaux (1), Cambes (3), Castelnaud (1), Lormont (1). To this should be added the panels in the Musée d'Aquitaine in Bordeaux (3), as well as those in the museums of Libourne (2 additional panels) and Périgueux (1). These twenty or so works were subjected to physico-chemical analyses (see **table fig. 15**).

In order to expand this limited corpus and increase its representativeness, a number of other works with well-preserved polychromy were examined and documented with the help of macro photographs. These supplementary elements include the collections of several French museums³ as well as the altarpieces of Nailloux, Montgeard (in the region of Toulouse) and Saint Nicolas du Bosc (Normandy). In a less systematic way, other panels were taken into account when it was possible to obtain colour photographs of sufficient quality.

A STEREOTYPED POLYCHROMY

Contrary to our initial expectations, the range of colours selected by the alabaster carvers proved to be highly standardised as was the way in which they were distributed within the same panel.

Among the most significant and immediately identifiable elements of this standardised colour scheme is the arrangement of the backgrounds. On all the historiated panels examined, the lower part invariably shows an uneven terrain painted in green and decorated with 'daisies', while the upper part, dotted with gesso nodules on a smooth background, is always gilded.

- 1 A refutation of Francis Cheetham's view that the altarpieces of Saint Seurin are not of English origin would go beyond the scope of this study. See Cheetham, 2003, XVI and 177; id. 2005, 51. Not all scholars share the opinion of the eminent English specialist; see for example Williamson 2010, 21, note 10.
- 2 The ninth panel, depicting St. Joseph, is a 19th century pastiche. However, the original one, representing John the Evangelist, is probably the one now in the Walters Art Museum in Baltimore (inv. no. 27.310). See Schlicht 2020.
- 3 These are the Musée de Cluny and the Musée du Louvre in Paris, the Musée départemental de la Seine Maritime in Rouen, the Musée des Augustins in Toulouse and the Château Comtal in Carcassonne.

Sites	Number of panels	Topics	Remains of polychromy
Avensan, Saint Pierre	4	Life of St Peter	—
Bordeaux, cathedral Saint André	2	<i>Resurrection; Assumption</i>	—
Bordeaux, Saint Michel	7	Joys of the Virgin	xxx
Bordeaux, Saint Seurin	14	Lives of St Martial and St Seurin; <i>Annunciation; Crucifixion</i>	—
Bordeaux, Saint Seurin	12	Infancy and life of the Virgin	—
Bordeaux, Musée d'Aquitaine	5	<i>Assumption; Flagellation; Ascension; Nativity of the Virgin; Crucifixion</i>	xx
Cambes, Saint Martin	3	<i>Flagellation; Entombment; Throne of Mercy</i>	xx
Castelnau, Saint Jacques	1	<i>Throne of Mercy</i>	x
Génissac, Saint Martin	10	5 panels representing the life of St Martin; 5 panels with scenes of the life of the Virgin.	—
La Rochelle, museum	1	<i>Assumption (fragments)</i>	xx
Libourne, museum	3	Last Judgment	xxx
Lormont, Saint Martin	1	<i>Adoration of the Magi</i>	xx
Périgueux, museum	2	<i>Crucifixion; Entombment</i>	xx
Saint Caprais de Bordeaux, Saint Caprais	5	<i>2 x Annunciation; Adoration of the Magi; Ascension; Resurrection</i>	Repainted in the 19th or 20th century
Saint Emilion, collegiate church	2	<i>Adoration of the Magi; Resurrection</i>	Panels stolen
Soussans, Saint Romain	1	<i>Crucifixion (avec Pietà)</i>	—

Fig. 15. Panneaux d'albâtre anglais représentant des scènes narratives, conservés dans la région bordelaise.



Fig. 16. Fleurettes on green background (from left to right): Libourne, *Resurrection of the Dead*; *Assumption* from the Musée d'Aquitaine (bottom); model sample painted in 2019 (copper resinate, lead white and cinnabar).



Fig. 17. Gilded gesso nodules.
Left: *Descent from the cross* from the Rabastens altarpiece (Toulouse, Musée des Augustins).
Right: side view of a gesso nodule with partially lost gilding (*The Elect entering Paradise*, Libourne, Musée des Beaux-Arts).



Fig. 18. Gesso nodules (now lost) reproducing the form of a daisy fleurette (*Resurrection*, Musée de Cluny, Cl 19327).

These green 'meadows' and golden skies characterise all the scenes examined, regardless of whether the event depicted took place inside a dwelling or outside. The flowers on the green background are highly stylised: a bright red dot painted in cinnabar is surrounded by five or six white dots in lead white. The appearance of stylised leaves, and even more so that of real flowers, as is the case at Saint Michel in Bordeaux, remains very rare (figs. 16 and 40).

The golden backgrounds of the upper part of the panels are always sown with gesso nodules (fig. 17). However, the size of the nodules and the density of the scattering vary. Occasionally, the gesso knots are arranged in a particular pattern, such as a flowerette: a large central knot is surrounded by five smaller ones (fig. 18). Even more rarely, the gesso nodules are aligned to form squares or rhombuses; exceptionally, they take the form of stylised leaves.⁴ In the vast majority of cases, however, the nodules, about five millimetres in diameter, are distributed randomly, though fairly evenly spaced, across the gold background.

On some panels, a pink area is inserted between the green 'meadows' and the golden sky. There are well-preserved examples in Saint Nicolas du Bosc (*Annunciation*, fig. 19; *Adoration*

4 For the arrangement of the nodules in rhombuses and squares, see the *Passion Altarpiece* inv. no. 50-1946 and the *Annunciation with the Trinity* in a wooden case, inv. no. A.193-1946, both in the V&A Museum, London, or the *Resurrection* in Hawkey Church, Hampshire, UK. The stylised leaves can be found on the large *Passion altarpiece* from Naples, formerly in the church of San Giovanni a Carbonara and now in the Capodimonte Museum in Naples, inv. no. A.M. 10816.



Fig. 19. Saint Nicolas du Bosc (Normandy), *Annunciation*.



Fig. 20. Nicodemus, one of the Marys and the Virgin (detail of the *Entombment* of the Rabastens altarpiece, Musée des Augustins de Toulouse). The arrows indicate the red and blue lines corresponding to the lining of the buttoned-up dress.

of the Magi). In the Aquitaine corpus, only the *Flagellation* in Cambes seems to present such a (very fragmentary) pink zone. The pink surfaces are always decorated with small darker dots, often purple, sometimes black or green. As these pink surfaces with darker dots also cover the tomb of Christ or the throne of God the Father (*Throne of Mercy*) or the Virgin (*Coronation*), it may be inferred that they represent stone surfaces – coloured marble? – and indicate an interior space.⁵

The colouring of the clothes is no less stereotypical than that of the backgrounds. Whether they follow the fashion of the time of the creation of the alabasters or are atemporal like the tunics and cloaks of the saints, and even the armour of the soldiers, they adopt the white colour of alabaster.⁶ The linings always show a frank monochrome colour, most often cinnabar red, less frequently blue, obtained either from indigo or from azurite, exceptionally they are green. Very often, even the soldiers' armour has a cinnabar red 'lining'.⁷ On some panels at least, the painters even went so far as to indicate the lining with a thin red (or blue) line in places where it was not actually visible, such as on the collar or on the fitted sleeves.⁸ With the notable exception of the angels, both clothing and armour are systematically hemmed in gold.⁹ The white obverse sides of dresses are frequently animated by a row of gold buttons on the bust; the slit in the dress is indicated by a red or blue line connecting these buttons (fig. 20).¹⁰

- 5 There are, however, several panels belonging to the same altarpiece, preserved in the Musée de Cluny in Paris, which show such a pink area, although the scene depicted takes place outside, in this case the *Arrest of Christ* (inv. no. Cl 19345) and the *Crucifixion* (inv. no. Cl 19334).
- 6 When an English alabaster panel shows coloured obverse sides of the garments, this is generally due to a recent repainting. This is the case, in Aquitaine, of the five panels of Saint Caprais near Bordeaux. Outside the Aquitaine region, we can mention, among many others, the St. Ursula from the Musée de Cluny in Paris (inv. no. Cl 19336), the altarpiece dedicated to St. James the Greater from Santiago de Compostela, the panels from the chapel of Haddon Hall in England, the Passion altarpiece of Coudray en Vexin, or a *Crucifixion* from the Musée des Beaux-Arts in Lille (inv. no. A 2063). However, vestments with painted obverse sides were not completely unknown in the Middle Ages. See, for example, the kneeling donors at the bottom of the *Throne of Mercy* of Anglesqueville la Bras Long (Rouen, *Musée des Antiquités*, inv. no. D.91.7.3). Clerics wearing the habit may also have coloured obverse sides, as in the case of the St. Anthony in the La Selle altarpiece (in the Musée d'art, histoire et archéologie of Évreux) or the cardinals on the panel of *Thomas Becket meeting the Pope* in the V&A Museum in London (inv. no. A.166-1946). As we shall see below, some apparently early panels also escape this convention, such as the *Assumption* in the Musée d'Aquitaine.
- 7 This red 'lining' of the armour can be found, for example, on the panels of the *Arrest of Christ* and the *Crucifixion* in the Musée de Cluny in Paris (inv. no. Cl 19345 and Cl 19334), the *Resurrection* in the Musée des Beaux-Arts in Dijon, the panels of the Rouvray altarpiece (kept in the *Musée départemental des Antiquités* in Rouen, inv. no. R. 90.3.a-e) or on those of the Passion altarpiece in the Capodimonte Museum in Naples (inv. no. A.M. 10816).
- 8 Given the fineness of these coloured lines, which increases the likelihood of their disappearance over time, it is not easy to know whether or not the lining of the sleeves and collars were systematically coloured. The altarpiece of Saint Nicolas du Bosc offers well-preserved examples, including the Virgin of the *Annunciation*. In the Aquitaine region, several figures on the panels of Saint Michel of Bordeaux still show, in a more or less fragmentary manner, red lines encircling the fitted sleeves of their dress. Remains also exist on the *Entombment* in Cambes.
- 9 The robes or albs worn by angels usually only show gilding on the collar.
- 10 These elements are very fragile and have very often disappeared. Among the well-preserved examples is the Rabastens altarpiece in the Musée des Augustins in Toulouse. The colour chosen for the line is that of the lining of the robe.



Fig. 21. Christ and a Roman soldier (detail of *Christ before Pilate*, Rabastens altarpiece, Musée des Augustins, Toulouse).



Fig. 22. Painted faces. Top: Christ; the Virgin; a Roman soldier (all Rabastens altarpiece, Musée des Augustins, Toulouse). Bottom: Judas (Rabastens altarpiece, Musée des Augustins de Toulouse); Joseph (Bordeaux, altarpiece of Saint Michel); a Roman soldier (Musée de Cluny, Cl 19345).



Fig. 23. Painted mouths: Carcassonne, Musée du Château Comtal, detail of the *Crucifixion*.



Fig. 24. Painted eyes (from left to right, top): Christ (Leicester, Jewry Wall Museum, inv. no. LEICT L.A20.1949); the Virgin (Rabastens altarpiece, Musée des Augustins de Toulouse); an executioner (Musée de Cluny, Cl 19346). Below: Christ (Musée de Cluny, Cl 19337); Christ (Rabastens altarpiece, Musée des Augustins, Toulouse); a Roman soldier (Musée de Cluny, Cl 19345).



Fig. 25. Flagellation, detail (Lille, Palais des Beaux Arts, inv. no. A 31).

The obverse of coats and dresses may have various gold motifs, but as these fragile motifs have often disappeared, it is difficult to know whether they were widely used or not (fig. 21).¹¹

The complexion of the figures is almost always distinguished by its immaculate whiteness (alabaster). Only the negative characters, such as the torturers of the martyrs or the Roman soldiers in the scenes depicting the Passion, have a pink complexion (fig. 22). Many studies of English alabasters indicate that the skin of the vile characters was painted brown or black. We have not come across any documented cases of this practice. Since lead white, which is a component of pink skin tones, darkens over time, this alteration may have resulted in brown or black tones on faces originally painted pink. The pink skin of negative figures may be overlaid with black or red-brown lines.¹²

The details of the faces are generally indicated as follows: the eyes, surrounded by fine lines of a purplish colour (red ochre), consist of a black pupil and a green-blue iris;¹³ the eyebrows are drawn in yellow ochre, sometimes in red ochre; the lips and nostrils are painted in cinnabar red (fig. 23).¹⁴ In the case of negative characters, certain colours differ: the eyebrows are painted in black or red ochre, but never in yellow ochre; strikingly, the irises are frequently coloured bright red, this colour being characteristic of the eyes of diabolic beings (fig. 24).¹⁵ In one of the panels of the Naples Passion Altarpiece, Pilate's eyes are composed of a black pupil surrounded by a first golden circle and a second bright red circle, probably to indicate that he is possessed by the devil.¹⁶

Without exception, the hair of the holy figures was gilded. Ordinary men, even if they represent the elected as in Libourne or pious men devoted to Christ like Joseph of Arimathea, have less resplendent hair, painted in grey or red-brown. In view of these observations, the

- 11 Well-preserved examples include the figures of Christ and Pilate on a panel of the Rabastens altarpiece (Musée des Augustins of Toulouse), an apostle preserved in the Louvre (inv. no. OA 202), the apostles of the Apostolic Creed preserved in the V&A Museum in London (inv. no. 148 - 159-1922) or the executioners of the *Carrying of the Cross* from the altarpiece in Naples (Museo di Capodimonte, inv. no. A.M. 10816). A few rare panels show motifs painted in red and black on the obverse of the mantles (Munkaþverá altarpiece in the National Museum of Copenhagen); on others, they are painted in red and blue (*Adoration of the Magi and Assumption* in the Ávila Cathedral Museum).
- 12 The pink complexion distinguishes the torturers of the *Flagellation* of Cambes; it is better preserved on the *Flagellations* of the Musée de Cluny, on the soldiers of the various panels of the altarpieces of Rabastens (Toulouse, Musée des Augustins), of Rouvray (Rouen, Musée des Antiquités), of Naples (Capodimonte Museum) or of Plentzia (Spanish Basque Country). The men-at-arms of the *Arrest of Christ* in Lade (Norway) show black lines in superimposition (the faces have been at least partially repainted).
- 13 Examples of irises are only very rarely preserved, and even less often documented in sufficient detail; most often, the blue irises are very fragmentary, and we have not been able to determine the nature of the pigment used (azurite?). Fairly well-preserved examples can be found in the Jewry Wall Museum in Leicester (Christ of *The Resurrected appearing to Mary Magdalene*), in the Musée des Augustins in Toulouse (Christ of the *Crucifixion*), in the Musée de Cluny in Paris (Christ of the *Coronation of the Virgin*, inv. no. Cl 19337), in the Burrell Collection in Glasgow (God the Father of the *Annunciation*), as well as in the Musée des Beaux-Arts in Dijon (Christ of the *Resurrection*).
- 14 Almost intact examples can be found in Libourne (*Resurrection of the Dead*, inv. no. 02.1.44), in the Musée des Beaux-Arts in Dijon (*Resurrection*) or in the Metropolitan Museum in New York (*Adoration of the Magi*, inv. no. 25.120.485); the altarpiece of the Capodimonte Museum in Naples, with its exceptionally well-preserved polychromy, offers numerous examples, even if the irises seem to have disappeared in most cases. As for the nostrils painted in cinnabar red, only those of the Roman soldiers in the *Resurrection* and those of the Virgin of the *Nativity* in the altarpiece of Saint Michel de Bordeaux have been analysed.
- 15 See the literary examples analysed by Logié 2000, including for example the description of the devil Astarot in the *Roman de Thèbes*, § 15: 'les [oils] ot rouges come lepart / onc homme ne vit tant laide regarde (v. 2856-7)' [He had red eyes like those of the leopard/ no man ever saw such an ugly gaze].
- 16 The eyes of the devil or the monsters are usually painted in black on a gold background. The face of Pilate is reproduced in Giusti 2013, 192.



Fig. 26. Nimbuses. Above: The Virgin (*Adoration of the Magi*, Lormont); Christ (*Descent from the Cross*, Rabastens altarpiece, Musée des Augustins, Toulouse). Bottom: the Risen Christ (*Resurrection*, Carcassonne, Musée du Château Comtal); Christ (*Coronation of the Virgin*, Birmingham, The Barber Institute of Fine Arts).

range of colours in the Libourne panel *The Elected entering Paradise* must be considered atypical, as it is exceptionally diverse, since the elected have yellow ochre, pale yellow and red ochre hair. The villainous figures, on the other hand, have black hair¹⁷ or, less often, reddish-brown hair with a purple tinge (fig. 25).¹⁸ Some characters, such as the Magi, may have golden hair on some panels, as in the case of the *Adoration of the Magi* in Lormont, and grey and brown hair

17 Within the Aquitaine corpus, the four soldiers in the *Resurrection* of Saint Michel of Bordeaux as well as the Herod in the *Adoration of the Magi* in the same altarpiece have black hair. The same applies to two of the torturers in the *Flagellation* at Cambes. Examples outside this corpus are too numerous to be listed here.

18 This is true of two of the torturers of the *Flagellation* at Cambes.

on others.¹⁹ This variation of colours for the same person on different panels is nevertheless exceptional.

Some of the details of the panels show a particular colour scheme, specific to English alabasters. This is the case for the wings of the angels, the vast majority of which are painted in cinnabar red and adorned with feathers in the form of white teardrops decorated with a black dot (fig. 9, 19).²⁰ Most often, these white feathers form a *semé* on the red backdrop; sometimes they are aligned in registers.²¹ The wings of the angels are also sometimes coloured in green, and perhaps also in white.²² However, these are exceptions to the rule. This is also the case with the St. Michael of the *Elected entering Paradise* in Libourne, whose green wings on a gold background hardly seem to have any parallels.²³

The colouring of the nimbus is also characteristic of English panels. Uncommonly large, they are not gilded as one might expect, but painted in red (cinnabar) and/or blue (indigo, less often azurite). Frequently, motifs painted in white decorate the residual lobes cut by the arms of the cross which ornate the haloes of God, Christ and, sometimes, the Holy Spirit (fig. 26). In fact, only God, Christ and the Virgin are endowed with haloes. The saints, like the apostles and angels, are only given this attribute when they are the main subject of an altarpiece.²⁴

Unexpectedly, the cross of Christ was most often painted blue. In Aquitaine, only the *Thrones of Mercy* in Castelnau (azurite) and Cambes (indigo) show faint traces of this practice. The fact is, however, well established: perfectly preserved blue crosses decorated with white flowers containing a red heart appear in the altarpieces of Châtelus-Malvaleix (Creuse; 1 panel), Rabastens (3; fig. 27), Swansea (3) and the Passion Altarpiece (3), both in the Victoria and Albert Museum in London, the Compans Altarpiece (1), the Passion Altarpiece from the abbey of Cluny (Berlin, Bodemuseum), the Rouvray Altarpiece in Rouen (2) and the Passion Altarpiece in Naples (3). In addition to these altarpieces, there are the isolated panels of the *Crucifixion* in La Trinité in Cherbourg, the *Crucifixion* (Cl 16599) and the *Entombment* (Cl 19322) in the Musée de Cluny in Paris, or a fragmentary *Throne of Mercy* in the National Museum of Iceland in Reykjavik.

- 19 The grey and brown-haired Magi can be found, for example, on the panels of the *Adoration of the Magi* in the altarpiece of Saint Nicolas du Bosc, in the Metropolitan Museum in New York (inv. no. 25.120.485), or in the Castle Museum in Nottingham.
- 20 Among the few works which, apart from the production of English *alabastermen*, show red angels' wings with white feathers is a French *ronde-bosse* enamel depicting the dead Christ between the Virgin and St. John (New York, Metropolitan Museum, inv. no. 17.189.931).
- 21 The wings of the angels of the Cambes' *Throne of Mercy* were probably adorned with white tears aligned in registers. The angels of the *Throne of Mercy* in the V&A Museum in London (inv. no. 901-1907) constitute a very well-preserved example of this arrangement, and the one in the *Entombment* Cl 19322 in the Musée de Cluny in Paris is another example.
- 22 Green wings appear on the *Entombment of St. Catherine* in Vejrum (Denmark); although the polychromy has certainly be retouched, it seems to faithfully reproduce the medieval painting. White wings with black teardrops appear on the *Throne of Mercy* in Montgeard (Haute-Garonne); as the panels in Montgeard are not free of repaints, it is not certain that this colouring is medieval.
- 23 Similar wings apparently distinguish one of the angels of the *Assumption*, the feathered body of the angel of the *Nativity*, and the eagle of St John in the Möðruvellir altarpiece (Reykjavik, National Museum of Iceland). The altarpiece was repainted in an attempt to reproduce, more or less faithfully, the medieval polychromy.
- 24 The vast majority of English altarpieces are devoted to the Passion of Christ or to a series of Marian scenes commonly referred to as the Joys of the Virgin. The altarpieces dedicated to saints - Catherine, John the Baptist, Peter, Martin, George, Edmund or several martyrs - do not always show them haloed. Thus, in the altarpieces dedicated to various martyrs, preserved in Gondreville in Picardy and in the Denver Art Museum, none of the saints is provided with one (only God the Father, who appears on the central panel of the two altarpieces, shows one). On the altarpiece of La Selle (kept at the Musée d'art, histoire et archéologie d'Évreux) dedicated to St. George and the Virgin, only the latter is distinguished by a nimbus. The five panels illustrating the life of Martin at Génissac, on the other hand, show the saint displaying a large halo. On the Gdansk altarpiece dedicated to John the Baptist, the Precursor is provided with one only on the central panel.



Fig. 27. Blue cross with daisy flowers
(*Christ carrying the Cross*, Rabastens altarpiece, Musée des Augustins, Toulouse).



Fig. 28. *Nativity*, Bordeaux, altarpiece of Saint Michel.

THE GENERAL PRINCIPLES OF COLOURING

To sum up, the study of the Aquitaine corpus as a whole confirms the limited number of colours that make up the usual range selected by the English painters, as was already apparent in the chapter dedicated to the *Elected entering Paradise* located in Libourne. The colours of most of the panels are even less diversified than those of the Libourne example. The latter, for example, has three different yellows, namely gold, yellow ochre and 'citrine' (pale yellow). The other Aquitaine panels generally display only one yellow, namely gold. Yellow ochre is employed elsewhere, but, apart from being used in some eyebrows and only as a component of the mixtion, intended to be covered with gold-leaf, and so it was not meant to be seen.

The same applies to the reds. While the Libourne panel shows three different reds, composed of cinnabar, red lead or ochre pigments, on other panels one hardly finds any other pigment than cinnabar. Red lead, like yellow ochre, was frequently deployed, but it is used almost exclusively as an undercoat for gilding. As red ochre was only applied for small lines or surfaces,²⁵ such as



Fig. 29. Detail of *The Damned led to Hell* (Libourne, Musée des Beaux Arts): blue-green cloud (copper acetate) and green rays (copper resinates) on a golden background.

25 Exceptions to this are the panels depicting executioners or torturers, often with reddish-brown hair, such as those of the *Arrest of Christ* or those of the *Flagellation*.

the eyebrows, cinnabar tended to be the only shade of red utilised on the panels. The painter of the *Nativity* in the altarpiece of St. Michel of Bordeaux, for example, applied cinnabar to colour the wings of the angels, the lining of the Virgin's robe and that of one of the midwives, Joseph's staff, the 'poppies' and the hearts of the flowers on the green background, and the lips and nostrils of the figures (fig. 28). Red ochre was only used for the eyebrows, the outline of the eyes and for the gilding mixtion. Red lead is only found on the inside of the Virgin's crown, which is barely visible.²⁶

The reduction of the colour range to one shade per colour also applies to blues and greens. As already mentioned, English painters had indigo or azurite pigments to produce blue paint. It is striking, however, that none of the panels examined contains both blue pigments at the same time;²⁷ the painters chose either one or the other. Regarding the greens, they can be generated from copper-based pigments: physico-chemical analyses generally conclude that either copper acetate (verdigris) or copper resinate (copper acetate mixed with oil and Venetian turpentine) is present. According to our observations, only one or the other variant of green usually appears within the same panel. Within the Aquitaine corpus, only the panel of the *Damned led to Hell* in Libourne shows both types of green simultaneously (fig. 29).

In most English panels, the number of colours is almost as limited as the variety of pigments used. The painters did not try to increase their diversity by mixing pigments. In most cases, they did not even try to superimpose several partially transparent layers which, as in the *Elected entering Paradise* in Libourne, would have created a second shade of green (copper resinate on gold-leaf).²⁸ Other Aquitaine panels rarely show such superimpositions,²⁹ and they seem to be just as infrequent on alabasters preserved in other regions.³⁰

Mixtures of pigments do exist in the Aquitaine corpus, but they remain rare. Apart from pink, which is found quite frequently, blue, probably mixed with green (indigo and verdigris), was used to paint the reverse of Joseph's cloak on the panel of the *Adoration of the Magi* at Lormont. The two sarcophagi of the *Resurrection of the Dead* in Libourne are painted pink for one, and light green for the other, the latter being composed of a mixture of indigo, organic yellow and lead white (fig. 30). Finally, some of the panels also show grey surfaces or orange-red (red lead and red ochre) – mixed colours to which we shall return later.

- 26 The red of the letter 'G' on the angel's phylactery could not be identified with certainty: organic red or perhaps lead red?
- 27 To our knowledge, only a panel in Fuentarabia (Spanish Basque Country) depicting the *Beheading of St Catherine* apparently contains indigo and azurite at the same time. See Martiarena Lasa 2012, 166.
- 28 Referring to Aristotle, Vincent of Beauvais stated (around 1240) that colours could not be mixed. Intermediate colours would be obtained by the transparency of the colours, non-miscible and one on top of the other. To illustrate this idea, Vincent of Beauvais evokes the example of fingernails: "And so we obtain the middle of the upper and the lower, as can be seen in a man's fingernail, which has a translucent colour, completed by the colour of blood underneath. So, generally, with all intermediate colours." Trans. after Hüe 1988, § 15. See also Pastré 1988, § 8 and 9, who insists on the superposition of white complexion and red cheeks (a rose petal on a lily) in medieval German authors; there is no mixing between the two colours.
- 29 The scene of the *Damned led to Hell*, kept in the Musée de Beaux-Arts in Libourne (inv. no. 02.1.43), depicts an angel emerging from the clouds; the rays emanating from these clouds are painted in translucent green on a gold background. Christ's crown of thorns in the *Entombment* in the Museum of Art et Archéologie in Périgueux also shows a translucent green on a gold background.
- 30 The *Entombment* (inv. no. CL 19322 from the Musée de Cluny in Paris) features a thurifer angel with a green glaze on the neck against a golden background. This same technique was used for the Virgin and Child recently acquired by the British Museum (Pereira-Pardo et al. 2018, 8); the authors note *ibid.* that other examples exist in the collections of the V&A Museum in London. In the Munkaþverá altarpiece (Copenhagen, National Museum of Denmark), the gilded globe of Christ is partially covered with translucent green paint.

ENGLISH ALABASTERS AND HERALDRY: TWO SIMILAR CHROMATIC UNIVERSES

Taken as a whole, the English panels are essentially made up of five colours, namely – in order of their quantitative importance – white (alabaster), golden yellow, cinnabar red, copper green and indigo blue, sometimes azurite. The use of a range limited to only a few basic colours is reminiscent of one of the most important symbolic universes of the Middle Ages, namely heraldry. Heraldry only allows these five colours, as well as black and sometimes purple, to the exclusion of all others.³¹ The way colours are used, for example, is similar in heraldry and in English alabasters. In both, the colours are used pure, without darkening, breaking or



Fig. 30. Tomb chest painted in light green, black and pale yellow, detail
(*Resurrection of the Dead*; Libourne, Musée des Beaux Arts).

31 Heraldry uses the often specific colour terms argent (white), or (yellow), gules (red), vert (green), azure (blue) and sable (black) to refer to these six colours. Some treatises on heraldry, such as that of the herald Sicille (c. 1435), admit a seventh colour, namely purpura, while insisting that its use remains rare.

fading them – in other words, by discarding the shades. The objects or ‘charges’ on the coats of arms (crescents, towers, lions, etc.) are painted in a single highly saturated colour; as so with alabaster, the depiction thus foregoes any suggestion of volume, light and shadow that might enhance the relief of the sculpture itself. The attribution of a colour to an object is not conditioned by the aim of imitating nature: a lion can be black, an eagle red. In the field of a coat of arms, as in that of alabaster, adjoining surfaces always show very different chromatic values. In heraldry, there are even rules governing the combination of colours, including the rule of ‘the contrariety of colours’, which states that a charge painted white or yellow must be placed on a red, green, blue or black field, and *vice versa*.³² This rule does not exist in the strict sense for alabaster, as gold is frequently placed upon the white of alabaster, but painters widely adopted the principle by alternating ‘light’ colours (white and gold) with ‘dark’ colours (red, green, blue). The green meadows of the background, for instance, are embellished with flowers with white petals. The red wings of the angels – red is considered in heraldry to belong to the group of ‘colours’, which – in contrast to the metals argent and gold – can be assimilated to the dark colours – are adorned with white feathers, themselves decorated with a black dot. The sarcophagus in which Christ is placed is painted (clear) pink with (dark) brown or purple dots, etc.

The pictorial practices of heraldry also resemble those of English alabasters in the way coloured surfaces are combined. Both share the tendency to stylise objects (or ‘charges’), to multiply them while standardising their form, and finally to distribute them evenly over a monochrome surface (called a ‘field’ in heraldry). To mention just one well-known example: until the end of the 14th century, the King of France wore a coat of arms displaying a field of azure semé-de-lis Or, *i.e.* with densely arranged gold lilies, all identical to each other. The flowers of the green meadows or the feathers of the angels’ wings of the English alabasters are characterised by this same stylisation and simplification, the replication of the same form and its distribution as patterns of charges on a monochrome field.

THE MORAL CONNOTATIONS OF COLOUR

Despite these similar uses, the pictorial conventions of heraldry are not always the same as those of English alabasters. While black (or ‘sable’) is fully included in the range of heraldic colours, this is not the case for the polychromy of alabasters. On most of them, black is used only for the pupils of the figures’ eyes, *i.e.* its occurrence is so limited in surface that it is almost invisible. There are exceptions, however. Within the Aquitaine corpus, the Libourne panel of the *Damned led to Hell* shows extensive areas of black, as well as other unusual colours, including an orangey-brown tone, but also purplish red and brown (fig. 31-34). The devil pulling the chained damned, the Hellmouth and a little devil riding on its snout are painted exclusively in these unusual colours.³³ In contrast to all the other characters, their clothes – rudimentary loincloths – are not white, but orange-brown and highlighted with black lines. The fact that the men, even though they are damned, have the usual white (alabaster) complexion emphasises the particularly negative connotation of these dark or mixed colours, which are reserved for infernal beings. As we have already seen above, with regard to the colouring of the skin and hair of the vile characters, the colours of the English alabasters are not used neutrally, but carry a strong moral charge.

32 Heraldry distinguishes between two groups of colours, namely ‘metals’ (argent and or) and ‘colours’ (gules, vert, azure, sable, sometimes purpura). When a charge is placed on a field, their respective colours must not belong to the same group.

33 The panels featuring negative characters, where the colour black is frequently used for beards, hair and shoes, display these colours regularly.



Fig. 31. *The Damned led to Hell* (Libourne, Musée des Beaux Arts).

While it is easy to understand the diabolical symbolism that the Middle Ages attributed to black, it is perhaps more surprising to note that orange-brown (a mixture of red lead and red ochre) had the same connotation. As Michel Pastoureau has pointed out, this colour was considered in the Middle Ages to be the colour of lies and treachery; Judas, the archetypal traitor, was supposed to have had red hair.³⁴ Although Judas' hair is always black on English alabasters (in contrast to the golden hair of the other apostles; fig. 22), the red-brown colour had a negative connotation. According to some medieval authors, it was an assorted mixture



Fig. 32. Black, red and brown: small devil on the Hellmouth (Libourne, Musée des Beaux Arts).

34 See the suggestive passage in Pastoureau 2012, 221-230, part. 221 : “Depuis longtemps, en effet, la trahison avait en Occident ses couleurs, ou plutôt sa couleur, celle qui se situe à mi-chemin entre le rouge et le jaune, qui participe de l’aspect négatif de l’une et de l’autre et qui, en les réunissant, semble les doter d’une dimension symbolique non pas double mais exponentielle. [...] Dans la rousseur médiévale il y a toujours plus de rouge que de jaune, et ce rouge ne brille pas comme du vermeil, mais au contraire présente une tonalité mate et terne comme les flammes de l’Enfer, qui brûlent sans éclairer”. [For a long time, in fact, betrayal had its colours in the West, or rather its colour, the one that lies halfway between red and yellow, which participates in the negative aspect of both and which, by bringing them together, seems to endow them with a symbolic dimension that is not double but exponential. [...] In medieval freckles there is always more red than yellow, and this red does not shine like vermillion, but on the contrary has a dull, matte tone like the flames of Hell, which burn without illuminating.]



Fig. 33. Detail of the devil leading the damned into Hell (Libourne, Musée des Beaux Arts).



Fig. 34. Surfaces with irregular stains, the brush strokes remaining visible: detail of the Hellmouth (Libourne, Musée des Beaux Arts).



Fig. 35. Ass and ox
(Adoration of the Magi, Saint Nicolas du Bosc).

of white, black and red – in other words, the three extremes of the medieval colour spectrum³⁵ – which were mixed or ‘scrambled’.³⁶ One author stated bluntly that it was the ugliest of all colours.³⁷ It is therefore not surprising that this orangey-brown was chosen to paint dragons, the most diabolical of all creatures. Most often, the red-brown is there combined with black.³⁸ In the same vein, the red-brown camail, often combined with black chain mail, worn by Roman soldiers – including those in the *Resurrection* of Saint Michel in Bordeaux – underlines their vile character (fig. 21).³⁹

More surprisingly, the red-brown colour was also chosen for the ox of the *Nativity* or the *Adoration of the Magi* (fig. 35).⁴⁰ Within the Aquitaine corpus, those of the *Adoration of the Magi* in Lormont and Saint Michel in Bordeaux still show some traces of it. Given the natural variability in the colour of different breeds of cattle the consistent selection of orange-brown

35 Pastoreau 2012, 168 notes about the codification of liturgical colours: the system is built around the three ‘basic’ colours of early medieval Western culture: white, red and black, *i.e.* white and its two opposites.

36 The poet Jean Robertet (d. 1502/1503), for example, calls this colour ‘riolé-piolé’, a variegation defined as follows: “Broille meslé de rouge, noir et blanc”. See Hüe 1988, § 6.

37 Pastoreau 2012, 228.

38 For some medieval authors, black and russet are so closely related that they use the same word, ‘*brisis*’, to designate both. See Hüe 1988, § 34, who refers to the glossary preceding the compilation of recipes on the art of painting by Jean le Bègue, dated 1431 (BnF Ms lat. 6741). Red and black dragons appear, for example, on the well-known group of St George slaying the dragon in the National Gallery of Art in Washington, D.C., or on the left side panel of the altarpiece in the Danish church of Borbjerg, also dedicated to St George.

39 Among the many examples preserved outside the Aquitaine region, we should mention the panels of the Rabastens altarpiece (preserved in the Musée des Augustins in Toulouse), a *Resurrection* in the Musée de Cluny in Paris (Cl 19328) or the *Crucifixion* in the Compans altarpiece. Most often, the chain mail of the camail was schematically indicated with black paint.

40 See the ox from the *Adoration of the Magi* in Saint Nicolas du Bosc, Anglesqueville la Bras Long and an isolated panel (the latter two preserved in the Musée départemental des Antiquités in Rouen, inv. no. D. 91.2 and 4503), or the ox from the *Nativity* Cl 23755 in the Musée de Cluny and from the altarpiece in Munkaþverá (National Museum in Copenhagen).

for the one shown on the alabaster panels appears to be the result of a deliberate choice. Perhaps some of the exegetical texts on the Nativity help to explain this choice. According to the Gospel of Luke 2:7, Mary gave birth to Jesus, wrapped him in swaddling clothes and laid him in a manger. The prophecy of Isaiah 1:3 was linked to this phrase: "The ox knows its master, the donkey its owner's manger, but Israel does not know, my people do not understand." Some Church Fathers saw the ass in this prophecy as the symbol of the *Gentiles* (i.e. the converted pagans) who recognised the divinity of Christ, whereas they saw the ox as the symbol of the Jews who denied this divine nature and caused the death of Jesus.⁴¹ So it was maybe as a symbol of the Jews and their disbelief that the ox was given its orange-brown colour.

If the reddish colour of the ox has a negative connotation, the grey of the ass should in principle be charged with positive values.⁴² The use of this colour in other contexts seems to confirm that it has been taken in good part. Grey is used only for the hair and beard of Joseph of Arimathea and Nicodemus (in the *Entombment* scene, as in Cambes and Périgueux⁴³), of the oldest of the Magi (in some of the *Adorations of the Magi*⁴⁴) and of the centurion crying out in front of the crucified Christ: "Truly this was the son of God" (*Crucifixion*).⁴⁵ In all cases, these are venerable and pious men of advanced age.

To this group should be added Joseph, whose hair and beard are also often painted grey.⁴⁶ It should be noted that the grey tones are very diverse, more or less light or dark, and generally 'coloured'. Grey is tinged with shades of blue, more rarely with green (fig. 36).

In short, the polychromy of the alabaster panels is characterised by standardised practices governing the use of colours. Few, highly saturated, juxtaposed and (rarely) superimposed according to a number of aesthetic principles, colours are assigned to people and objects according to a series of conventions. In this way, they create a visual code of a symbolic nature to express notions such as 'good' and 'evil'. This strong symbolic codification distinguishes the world of alabasters from that of heraldry, where a given 'charge' can indiscriminately adopt one of the six 'tinctures'.

41 Grousset 1884, 337-338.

42 The ass in the *Adoration of the Magi* in Lormont and the ass in the *Nativity* in the Saint Michel altarpiece in Bordeaux still retain some traces of grey. Examples with better preserved polychromy can be found in the *Nativity* of the altarpiece from Munkaþverá (National Museum of Copenhagen), on the panel representing the same theme in the V&A Museum in London (inv. no. A.94-1946), or on the *Adoration of the Magi* in the Ashmolean Museum in Oxford, in the Ávila Cathedral Museum (Spain) or in the Metropolitan Museum in New York (inv. no. 25.120.485).

43 Among the alabasters preserved outside Aquitaine, the *Entombments* in the Musée de Cluny Cl 19325, Cl 19322 and Cl 19324 show Nicodemus and Joseph of Arimathea with grey beards and hair.

44 See the altarpiece at Saint Nicolas du Bosc and a panel in the Castle Museum, Nottingham (inv. no. NCM 1954-38).

45 This phrase appears in the Gospel of Matthew, 27, 54 and in Mark, 15, 39 ("*Vere filius Dei erat iste*"). The text, which must have been inscribed on the phylacteries near the centurion in the Naples Passion Altarpiece (Capodimonte Museum, inv. no. A.M. 10816; only a few black letters are preserved) and on many other alabasters depicting the *Crucifixion*, has apparently only been preserved on the panel forming part of the Passion Altarpiece in the V&A Museum in London ("*Vere filius dei*"; inv. no. A.172-1946). The phylactery of the *Crucifixion* in the completely repainted altarpiece in Compiègne bears the inscription "*Jesus Nazareus rex Iudeorum*"; this is most likely a restoration error. For the grey hair of the centurion, see among others the following *Crucifixions*: Rouvray altarpiece (Rouen, Musée départemental des Antiquités, inv. no. R. 90. 3c); Cl 19334 from the Musée de Cluny; A.9:1-1943 from the V&A Museum in London.

46 This is the case with the Joseph of the *Nativity* in the altarpiece of Saint Michel in Bordeaux; however, the authenticity of the grey does not seem to be beyond doubt. Joseph's hair is undoubtedly grey, for example, in the *Adoration of the Magi* in the Ávila Cathedral Museum.



Fig. 36. Beards and grey hair of Nicodemus and Joseph of Arimathea on various panels representing the *Entombment*: Musée de Cluny Cl 19322 (top left); Cl 19324 (top right); Cl 19325 (bottom left); Rabastens altarpiece, Musée des Augustins, Toulouse (bottom right).

COLLECTIVE CODIFICATIONS AND INDIVIDUAL COLOUR CHOICES

The chromatic conventions we have just reviewed apply to almost the entire production of English alabasters that we have been able to take into account, *i.e.* more than a hundred works still showing significant remains of their medieval polychromy. Given that the English panels were produced by several generations of sculptors and, no doubt, in workshops far apart, this finding implies that the colouring of the alabasters was not a matter of free choice for each painter, but that all the alabaster makers used the same codified language – which, moreover, raises questions as to the way in which these conventions were fixed, transmitted and unanimously followed.⁴⁷ It also follows that the patrons and clients, too, had little or no say in the choice of colouring of the works they acquired: whether purchased in Kirkjubær in Iceland, Lade in Norway, Bordeaux in France, Naples in Italy or Čara in Croatia, the works everywhere show the same decorative patterns.

The strong codification of the use of colour does not mean, however, that the painting of alabasters was done in a stereotyped or even mechanical manner. The colours of the angels' wings, the nimbus and the cross of Christ, which are specific to English alabasters, illustrate the fact that their creators took the liberty to depart, at least in some cases, from the pictorial habits of Western Christian art. The generally observed conventions were not a rigid straitjacket, as the panels of the altarpiece of Saint Michel in Bordeaux or the *Entombment* in Périgueux illustrate. The painters refrained from the usual alternation between white obverse and red or blue reverse; the mantles of Christ and the Virgin have white reverse sides; in Saint-Michel, these reverse sides are also strewn with black ermine spots (figs. 38, 39). Similarly, the decoration of the green meadows is not limited to the usual stylized 'daisies', but also introduces individual flowers, a kind of poppy, which are less strongly stylised and seen from the front (and not from above; fig. 40).

Not all the elements of the panels have a specific 'colour code', leaving it up to the painters to colour them as they wanted. This is true of the *Flagellation* column, which can be painted red (Cambes), pink (Rabastens), blue (Rouvray), purple (Paris⁴⁸), grey-green (Lille,⁴⁹ fig. 25), and may or may not have a speckled decoration – not to mention its capital and base, which are often adorned with other colours and ornaments.

The usual reduction of the palette to a few basic colours and the renunciation of mixtures do not prevent the creation of chromatic combinations that seem surprising or daring. This is the case with the beard and hair of Joseph of Arimathea in the *Entombment* of Rabastens, whose blue-grey colour is combined with lines of purple separating the strands (fig. 36). In some *Coronations*, the Virgin's throne is painted in pink with green flecks; the same is sometimes true of Christ's tomb chest.⁵⁰ The clouds from which the angel of the *Damned led to Hell* in Libourne emerges consist of a blue-green backdrop with red parts and white 'tears' superimposed on it; in addition, green rays on a golden background emanate from it (fig. 29). The work of the alabaster painter was therefore not mechanical and purely repetitive. In any case, as with the iconographic composition of the scenes, no two alabaster panels appear to be completely identical in colour.

47 Most often, the alabaster panels seem to have been carved and painted by the same person. On this point, as well as on the puzzling question of the standardisation of the works and their colouring, see for example Schlicht 2019, 190-191.

48 Paris, Musée de Cluny, inv. no. Cl 19347.

49 Palais des Beaux-Arts in Lille, inv. no. À 31.

50 For the throne of the *Coronation of the Virgin*, see for example Cl 19337 of the Musée de Cluny in Paris; for the tomb chest, see for example Cl 19322 in the same museum.



Fig. 37. Coronation of the Virgin, Bordeaux, altarpiece of Saint Michel.



Fig. 38. *Coronation of the Virgin*: reconstruction of the polychromy (digital painting on 3D model). Bordeaux, altarpiece of Saint Michel.



Fig. 39. Ermine spots: *Resurrection*, Bordeaux, altarpiece of Saint Michel; on the right: reconstruction of the motif



Fig. 40. 'Poppies' in the green background: *Nativity*, Bordeaux, altarpiece of Saint Michel).

AN ATYPICAL COLOUR SCHEME: THE ASSUMPTION IN THE MUSÉE D'AQUITAINE, BORDEAUX

CONTEXT AND DATING

The panel depicting the *Assumption* of the Virgin, kept in the Musée d'Aquitaine in Bordeaux, stands out from the English panels examined so far.¹ It displays many atypical features, starting with the way in which the iconographic theme has been treated (fig. 41). Mary is not surrounded by the large halo that usually envelops her on English panels, as is the case, within the Aquitaine corpus, with the representations of the *Assumption* in Saint André Cathedral and the altarpiece of Saint Michel in Bordeaux. This absence of the halo leads to a second feature that is also highly atypical. Instead of raising the mandorla, as they usually do, the angels who are watching the scene are lined up along the side edges of the panel. Emerging from highly stylised clouds, they join their hands in prayer without intervening directly in the scene. The Virgin is carried up to heaven by a ninth angel, of whom only the top of the skull, the wings and the arms are visible, and who has seized her shoe-clad feet. In the lower left corner, St Thomas receives in his clasped hands the belt that Mary has untied from her dress to prove the reality of the miraculous event. Contrary to iconographic tradition, the apostle is not shown barefoot, but wearing pointed shoes.

In the absence of English panels with a similar iconography – the standardisation of compositions however being one of the outstanding features of alabaster – one might almost wonder whether the Bordeaux *Assumption* really belongs to the artistic production from across the Channel. Certain features, however, such as the summary treatment of the eyes forming globular protuberances, or the motif of the angel lifting the Virgin, are so specific to Midland alabasters that there is little room for doubt.²

The panel is not only atypical from an iconographic point of view, but also, as we shall see, with regard to its polychromy. As a consequence, it should be noted that this atypical character hinders the possibility of reconstructing the missing parts based on comparisons and obliges us to observe and analyse the preserved polychrome remnants in greater detail. When there is a great deal of material missing, the interpretation and reconstruction of the colours are necessarily weakened. The observations that follow will therefore be more laborious and the results obtained cannot claim to be as reliable as in the case of the other panels of English origin.

- 1 Inv. no. 11775. The provenance of this panel, which entered the museum's collections as a legacy in 1887, is unknown. The panel, currently in the museum's storerooms, is broken into seven pieces; it was reassembled and glued to a stone support probably in the 1960s.
- 2 For similar angels lifting the Virgin, see for example the Assumptions Cl 19 333 and Cl 19 341 in the Musée de Cluny in Paris, as well as the one in the La Selle altarpiece (Évreux, Musée d'art, histoire et archéologie).



Fig. 41. *Assumption*, current state (Bordeaux, Musée d'Aquitaine).

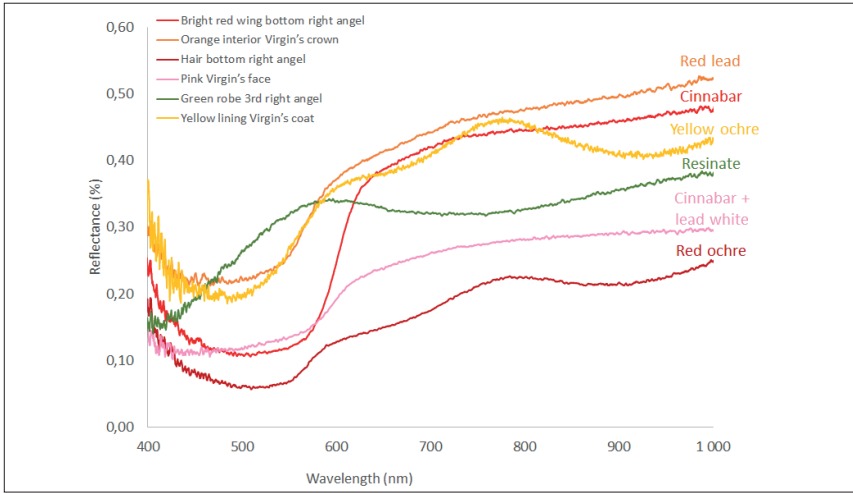


Fig. 42. *Assumption*: reflectance spectra of the different pigments identified.

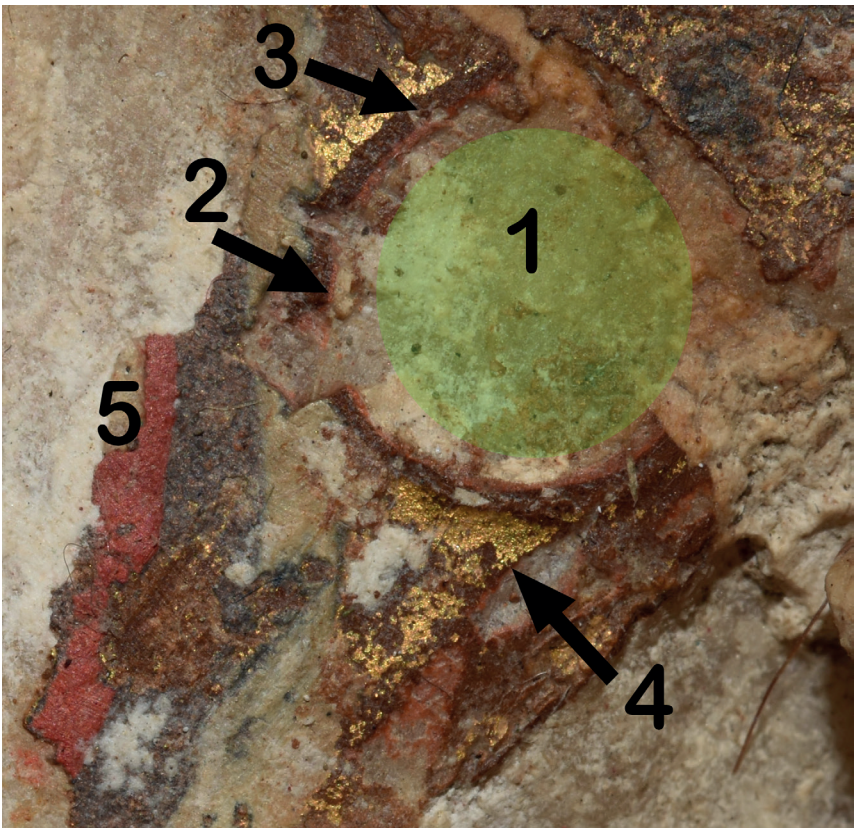


Fig. 43. Detail of the polychromy of the *Assumption* in the Musée d'Aquitaine: 1) remains of a detached gesso nodule; 2) first undercoat containing red lead; 3) second undercoat containing red ochre; 4) gilding; 5) remains of cinnabar (nimbus of the Virgin?).

REMAINS OF THE POLYCHROMY

In the lower part of the panel, the Assumption still shows some traces of green paint and the usual white and red flowers (fig. 16), although they have deteriorated considerably (fig. 16). As this area has not been painted with any other colours or motifs, it is reasonable to assume that it was painted in monochrome green and animated with the usual pattern of 'daisy' florets. Several of these florets are preserved below the elbow of the lower right angel, which makes it possible to restore the density of the pattern, *i.e.* the spacing between two neighbouring daisies. In the absence of explicit colour traces, of any break in plane or incision, the lower and upper limits of this 'flower meadow' are however difficult to determine. For example, it is not certain that the green area extended forwards on the projection of the plinth, to the left and right of the angel lifting the Virgin.

The backgrounds of the upper part of the panel were gilded. Only the upper register shows the characteristic circular losses caused by the accidental detachment of the gesso nodules (fig. 43). The backgrounds and the nodules were covered with a layer of lead red, then with a thick brown layer containing a high proportion of red ochre; this serves as an undercoat for the gilding. In this same upper register, a very small bright red area (cinnabar; fig. 43) appears. This is probably a remnant of the nimbus of the Virgin, as indicated by the inclination and distance of this zone from her head, as well as by the fact that this remnant is bordered on the outside by the gilding (on the left side, towards the head, any traces of paint have disappeared). As is the case with most of the nimbus of the Virgin on English panels, the halo on the Bordeaux *Assumption* was therefore red in colour and large in size (fig. 26). Since the nimbus of English

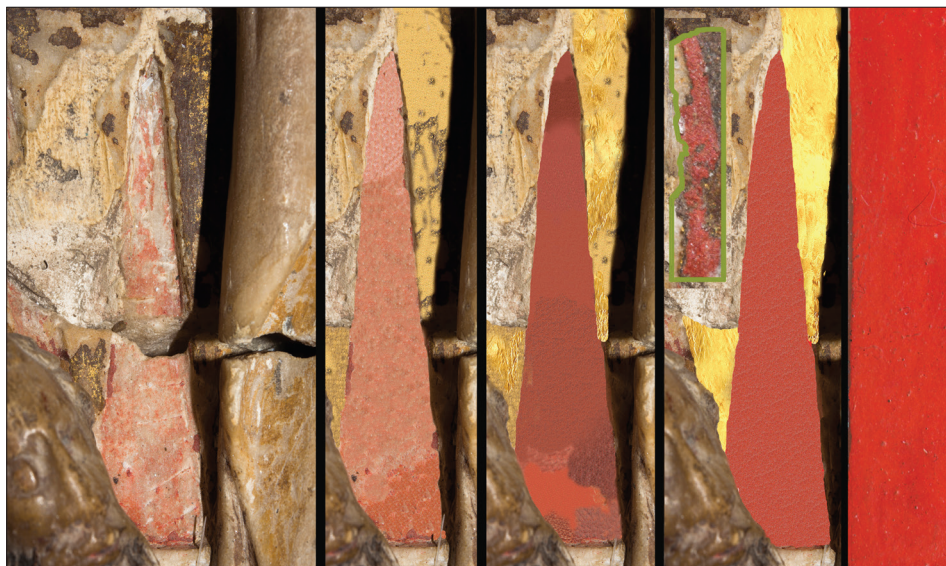


Fig. 44. Successive stages of the reconstruction of the polychromy of one of the red 'flames' of the *Assumption* in the Musée d'Aquitaine (from left to right): current state; filling in of the gaps by photo-retouching; filling in of the background by using the unabraded polychrome remains preserved near the borders of the 'flame'; filling in of the background by taking as a model the cinnabar red of the halo of the Virgin (the best preserved sample of cinnabar); right: cinnabar red on alabaster, painted in 2019.

alabasters are not monochrome, but systematically provided with ornaments, such as lobes or rays painted in white, these elements have been added to the reconstruction – though without any material traces being preserved.³

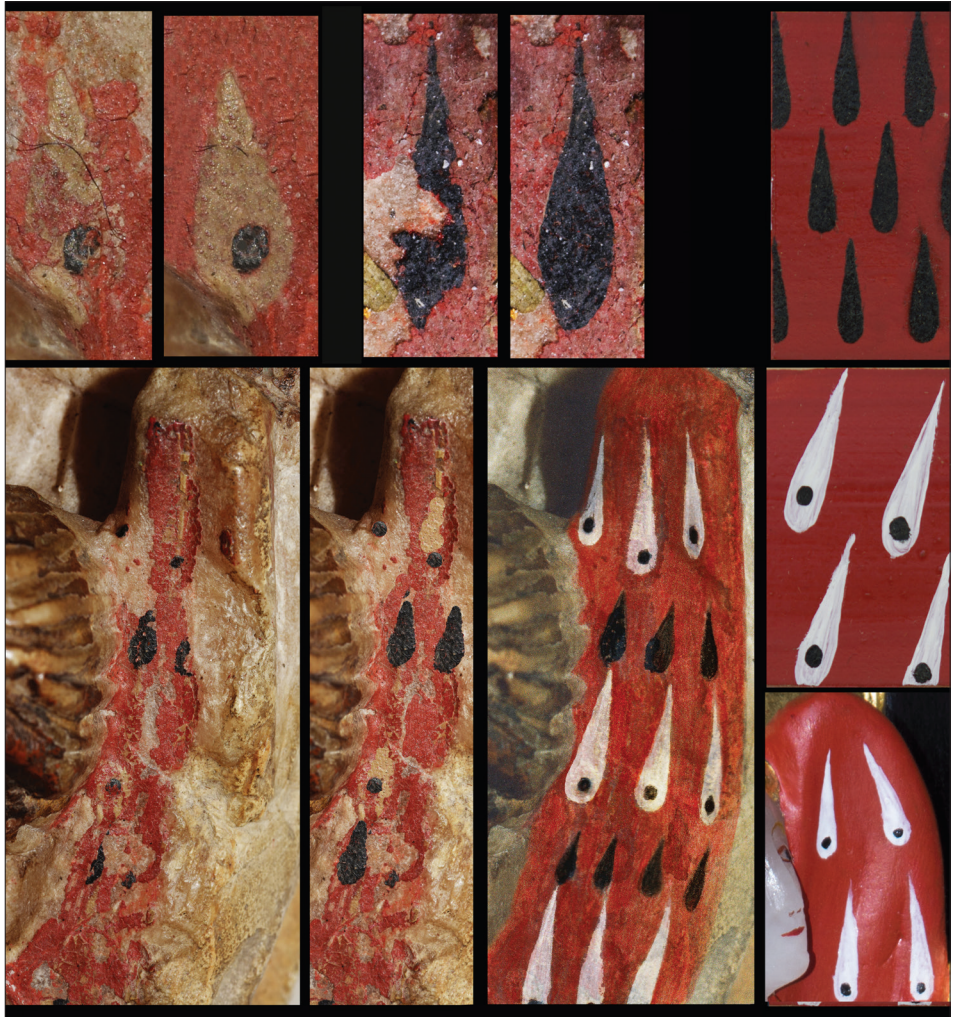


Fig. 45. Steps of the reconstruction of the polychromy of one of the wings of the lower angel to the right of the *Assumption* (from left to right): remains of a white feather with a black dot; filling in of the gaps by photo-retouching. Remains of a black feather; filling in of the gaps with photo-retouching. Right: black feathers on a red background painted in 2019. Below: current state of the left wing; partial filling of the gaps; proposal for the reconstruction (pencilling); painting of white feathers with a black dot in 2019.

3 The design in white is inspired by the red nimbus of the Virgin on the panel of the *Adoration of the Magi* in Lormont (Gironde) and that of the small individual altarpiece superimposing the *Annunciation* and a *Throne of Mercy*, preserved in the V&A Museum in London. The latter, in particular, is one of the earliest well-preserved examples, and may thus be close to the archaic panel in Bordeaux's Musée d'Aquitaine.



Fig. 46. *Assumption*, detail of the Virgin's head with remains of the pink complexion; the hair and crown are covered with a red ochre undercoat.

The middle registers of the panel were also gilded. The absence of circular 'holes' in the gilded areas leads one to believe that they did not contain any nodules. However, these registers contain curious triangular areas carved into the backdrop. The triangles are not gilded, but painted in red (second register of angels, counting from the bottom) and green (first and third registers) respectively (figs. 44 and 47). These coloured triangles may represent 'flames' or rays of light that are meant to emphasise the miraculous nature of the event depicted.⁴

The bands of stylised clouds that subdivide the gilded background into several registers retain some remnants of gold as well as significant quantities of the thick undercoat of the mixture of red ochre and oil that serves as a base and adhesive layer for the gilding. These golden clouds are decorated with small red touches that the painter has placed – only? – in the spherical hollows and incised lines that animate them.

The figures on the panel also show an unusual colouring. For example, the eight angels whose busts emerge from the stylised golden clouds have faces with obvious remnants of a pink complexion and red cheeks. The painted facial features (eyes, eyebrows, nostrils, lips) are not preserved, but they must have existed originally. This is suggested by the remnants of red paint on the lips of the Virgin and St Thomas, as well as by the merely drafted shape of the eyes, which require further painting. The hair of the angels is gilded, with gold-leaf applied over the usual thick undercoat. The robes worn by the angels are painted in green (copper resinate) on a yellow ochre undercoat (or lead white mixed with yellowed oil?) in registers 2 and 4, and left blank for those in registers 1 and 3. As with the vestments, the colouring of the angels' wings alternates from one register to the next. The wings of the pairs in the 1st and 3rd registers show a bright red (cinnabar) polychromy enhanced by white teardrops with black dots. However, the colouring of the wings is not entirely consistent with the usual pattern employed by English painters. The white teardrops with black dots, arranged in registers, alternate with smaller black teardrops, also arranged in registers (fig. 45).⁵ The wings of the angels in registers 2 and 4 are painted in red ochre.⁶ This layer of red ochre seems to have been covered with a layer of oil (?), which has now taken on a brown appearance.

St Thomas's face has small traces of a pink complexion, as well as a mouth painted red. His hair, covered with the red ochre undercoat, reveals tiny traces of gilding. His tunic is painted cinnabar red on the obverse. At the bottom of the tunic, an incision parallel to the border indicates that this piece of clothing was originally decorated with a golden hemline.⁷ The reverse of the coat was also painted bright red (cinnabar). His shoes show minute traces of black.⁸

The Virgin, who constitutes the main element of the panel and is much larger than the other figures, has a pink complexion, the remains of which can be seen on both her face and hands; her cheekbones are highlighted with a fairly bright red tone (fig. 46). The gilding of her hair is well preserved near her neck and on her left shoulder. The crown also contains remnants of gilding

- 4 In view of the presence of these polychrome remains, but also of the careful elaboration of these triangular fields, they cannot be traces of the tearing off of a mandorla, as proposed by Gardelles 1976, 201.
- 5 This manner of painting the angel's wings, which to our knowledge is very rare, can be found on one of the panels of the altarpiece dedicated to St Catherine in Vejrum (Denmark), namely the one representing her funeral.
- 6 Some irregularly shaped whitish lines, difficult to interpret, appear on some of these wings.
- 7 The incisions parallel to the borders of the garments, obviously intended to determine the width of the gilded borders, are quite common in English sculpture. Among the Aquitaine corpus, the panels of Avensan, Génissac, Saint Michel of Bordeaux and the *Assumption* of Bordeaux Cathedral show them alike.
- 8 It is a dark colour that we have not been able to identify. As far as we know, however, all the characters on English alabaster panels have either red (cinnabar) or black (carbon black) shoes.

and large areas of red ochre paint that served as an undercoat to the gold-leaf.⁹ The Virgin's robe is of a cinnabar red colour, which is still clearly visible near the feet, and is decorated with a wide golden edging. Incisions preserved on the mantle, parallel to the hems, show that the borders adorned both the obverse and reverse sides of the mantle. The mantle is white (alabaster) on the obverse and painted in yellow ochre on the reverse. The belt of the Virgin has a buckle that is clearly visible and gilded. The cord, on the other hand, shows only relatively large traces of the thick red ochre undercoat, so it was most certainly gilded. Small traces of intense red appear on the Virgin's shoes.

In contrast to the eight other angels on the side edges of the panel, the angel lifting the Virgin into the heavens appears to have been very largely gilded. There are clear traces of this gilding on the top of the head, *i.e.* on the hair, and on the two wings. It is more difficult to confirm the initial colouring of the robe and hands: while the right arm is completely lost, the left arm is devoid of any traces of colour.

The base of the panel shows a more complex arrangement than most other English panels. It consists of three superimposed registers, at least two of which were originally decorated. The upper register shows a decoration that recalls the bands of clouds that punctuate the golden backdrop of the *Assumption*. In contrast to these clouds, however, this register of the base is not gilded, but appears to have been painted in green on a yellow ochre (?) undercoat. As is the case in the upper parts, the round incisions and indentations of the plinth were apparently underlined with bright red paint, as suggested by the few traces of this colour preserved in these areas (fig. 47).

The middle register of the base is decorated with sawtooths. The sawtooths in the upper row are gilded. The gilding probably also covered the lower row, unless the gold fragments in this area are due to a lack of precision on the part of the painter. The lower row also retains traces of green, and each indentation is further decorated with a floret consisting of five white dots and a central red dot. The decoration seems to have extended to the left between Thomas's feet, as this area still shows fragmentary 'daisies'.

Judging from the few remains of the thick brown undercoat, the lower register of the base was gilded.

AN ANCIENT DECORATIVE SCHEME?

The polychromy of the *Assumption* in the Musée d'Aquitaine thus shows both strong affinities with the practices usually employed by English painters, but also a significant number of specific features that have little or no equivalent in the vast production of alabaster. Among the usual pictorial principles that the painter of the Bordeaux panel also applied, we can mention the high saturation of the colours as well as the limitation of their range, which is even more pronounced than on other panels. In addition to the white of the alabaster and the golden yellow of the gilding, the painter used mainly cinnabar red, green copper resinate and yellow ochre; small areas of red ochre and small touches of white and black appear also. As with other English panels, each surface was usually covered with a single background colour

9 The top of the head, which can be seen through the circular opening in the crown, is painted in the orange tone of lead red, which, like the red ochre, may have served as a preparation for the gilding. By the way, the red-brown undercoat of the crown also covers its finials, which take the form of triplets of large pearls. On other English panels, however, these triplets often appear to be white in colour (alabaster). This is the case with the *Nativity* and the *Adoration of the Magi* in the altarpiece of Saint Michel in Bordeaux, the *Annunciation* in the altarpiece of Saint Nicolas du Bosc, an *Annunciation* in the Burrell Collection in Glasgow and the *Adoration of the Magi* in the Ávila Cathedral Museum.



Fig. 47. Reconstruction of the polychromy of the panel of the Assumption in the Musée d'Aquitaine (digital painting on 3D model).

(which could be overlaid with motifs painted in another colour). Adjoining surfaces have very different chromatic values; typically, a 'dark' colour adjoins or overlaps a 'clear' colour. As usual, the main features of the face have been enhanced with paint. The backgrounds of the upper part are gilded, those of the lower part are painted green and strewn with flowers.

Unusual features include the characters' pink, rather than white, complexions, although these are positive characters. The painting of the obverse of the garments is also unusual. While the Virgin and Thomas wear red garments, four of the eight angels are dressed in green robes. The angels' garments do not have gold edges, not even along the neckline. The hemlines on the tunics of the Virgin and Thomas, on the other hand, are unusually broad. Thomas's red robe is covered by a similarly red-lined cloak; this direct superimposition of two layers of the same colour creates a risk of visual confusion between the two vestments that painters of other panels carefully avoided. The reverse of the Virgin's cloak is painted with yellow ochre, a pigment that does not seem to have been selected elsewhere for colouring clothes. Moreover, the painter of the Assumption apparently made a mistake in applying this colour, as he painted a piece of cloth that is part of the obverse of the cloak, contrary to the usual practice, while leaving two other pieces of cloth belonging to the lining blank; this probable error, visible near the Virgin's right leg, has been reproduced on the polychrome reconstruction of the panel (fig. 47). Sometimes the painter used colours, especially red and green, on a gilded background; although it also exists on the panels preserved in Libourne, this procedure has rarely been used on other English panels. Finally, the gilding on the Bordeaux panel was applied on a particularly thick undercoat of red ochre, which we have not encountered elsewhere.

In the present state of our knowledge, the atypical character of the Bordeaux *Assumption* is probably explained by the work's undoubtedly early date. Jacques Gardelles has proposed a date of around 1340-1380 for this panel, although this is based on criteria that are debatable.¹⁰ In any case, the relatively low relief that characterises the Bordeaux panel is reminiscent of the plastic treatment of other early English alabasters. Like the sculptor of the Bordeaux *Assumption*, for example, the author of the Kettlebaston panels or of the Passion altarpiece from the late fourteenth century (V&A Museum, London) did not detach the limbs of the figures or the objects they are handling from the background. Their colleagues working in the fifteenth century, on the other hand, frequently resorted to this virtuous kind of sculpture worked almost in the round. As for the polychromy, several clues also seem to support this early dating. For example, the chromatic chord of the four colours red, gold, green and white is frequently found on alabaster panels generally considered to be the oldest – although the polychromy is often poorly preserved. Nevertheless, we should mention the reliefs from Kettlebaston, preserved in the British Museum,¹¹ as well as several *Annunciations* and *The Annunciation with the Trinity* (c. 1400), all of which are preserved in the Victoria and Albert Museum in London;¹² the Munkaþverá altarpiece, which is slightly later, bears witness to the predilection for these same colours (fig. 48).¹³ Moreover, the earliest literary works in the vernacular, such as the *Lais* of Marie de France (late twelfth century), make use of this same restricted range of colours.¹⁴ The predilection for white, gold, red and green is accompanied by the absence of the colours blue, purple and grey, which are quite common in fifteenth and sixteenth century panels.

10 Gardelles 1976, 201.

11 The medieval polychromy of these alabasters has recently been analysed and reconstructed by Pereira-Pardo et al. 2018. See also De Beer 2018, 115-116.

12 *Annunciation with the Trinity* in a wooden case, inv. no. A.193-1946.

13 National Museum of Copenhagen; the presence of battlemented canopies at the top of the narrative panels has led scholars to place this altarpiece in the period between 1380 and 1420.

14 See Paupert-Bouchez 1988, § 2: "Apart from green, which only appears in Guignemar, and the 'bis' [grey-beige] of a stoop, wall or tower, gold, white and red, with two different varieties, purple and vermeil, are the only colours mentioned by Marie de France. [...] This choice of colours is not unique [...]. It has many echoes in other contemporary texts..." [trans. is ours].

Pink skin tones, on the other hand, should perhaps be interpreted as reflecting an earlier ideal of beauty, which only later evolved into a predilection for perfectly white skin.¹⁵ This mutation can indeed be observed in French ivories of the thirteenth and fourteenth centuries. The *Coronation of the Virgin* in the Louvre (third quarter of the thirteenth century), for example, features Christ, the Virgin and angels with pink complexions, whereas the figures in ivories generally attributed to fourteenth-century Parisian workshops have immaculate ivory-coloured skin.¹⁶ If this development can be transposed to the field of English alabaster, the Bordeaux panel should be considered a rare witness to the earlier mode of representation.

Finally, some early panels, such as those from Kettlebaston, show, like the Bordeaux *Assumption*, painted obverse sides of garments.¹⁷ This is true of the Virgin's cloak, which is gilded and speckled with small black motifs on the three panels.¹⁸ These few considerations, which should be supported by more in-depth studies, lead us to suggest that the standardised colouring of alabasters was not acquired from the beginning of their production in the fourteenth century, but that it was gradually imposed, perhaps at the end of that century.

15 According to Pastré 1988, § 6, for example, “cette éclatante blancheur du teint [...] est une caractéristique essentielle de la beauté et du plaisir visuel au moyen âge.” [this radiant whiteness of complexion [...] is an essential characteristic of beauty and visual pleasure in the Middle Ages]. This evolution of the ideal of beauty varies from one country to another. While French authors favour pure whiteness of the complexion, the red colour of the cheeks superimposed on the white complexion regularly characterises the portraits of beautiful ladies in German authors (*ibid.*).

16 *Coronation of the Virgin*: Paris, Louvre Museum, inv. no. OA 58-3921 and 3922.

17 The *Flagellation* in the Musée d'Aquitaine in Bordeaux also shows characters wearing cloths painted on their obverse side: while the executioner on the lower right is wearing red shoes and a blue-green *pourpoint*, his companion on the upper right is wearing a red *houppelande* held in place by a golden belt.

18 Pereira-Pardo *et al.* 2018, 10-11, fig. 2 and fig. 6c.





Fig. 48. Altarpiece of the Joys of the Virgin from the monastery of Munkaþverá (Iceland). Copenhagen, National Museum of Denmark.

CARVING AND PAINTING AN ALABASTER PANEL

While in the previous chapters we have studied the pigments and colours used on English alabasters, their standardised use, the aesthetic principles governing their combination and their moral codification, we have not yet considered the properties and visual effects produced by medieval polychromies. What were their surface aspects, their finishes, the intensity of their colours, their interactions with alabaster? How were they created and applied, and what difficulties might the painters have faced? In order to gain a better and more accurate picture of these material issues, an alabaster facsimile of an English panel was carved and then painted. Although its colouring is atypical, the panel of the Assumption in the Musée d'Aquitaine in Bordeaux was chosen for this experimentation.



Fig. 49. Samples of alabaster from Teruel (left) and the vicinity of Nottingham (right). This English sample is very brittle and unsuitable for sculptural work; its pinkish colour is due to the red earth from which it was extracted.

It is indeed thanks to a close collaboration with the staff of the museum, in particular with its stone sculptor, Amandine Bély, that this copy could be realized. The observations made and the results obtained during the creation of the work will be presented in the order of the different stages of the work. They have been dealt with in greater detail in another article, to which we refer the interested reader.¹ Here we will focus on the elements that can inform us about how an alabaster panel was made in the Middle Ages.



Fig. 50. Alabaster outcrop on a hillside in Newton Hills.

THE CARVING

As it was not possible to acquire alabaster of English origin – the quarries are no longer worked – the copy was made using a variety from Puebla de Híjar in Teruel, Aragón (fig. 49-50). The two types of alabaster are comparable in terms of the fineness of their grain, which allows a high gloss polish to be obtained, and their general physical properties, such as their softness and, consequently, the possibility of shaping them without great physical effort. While both are white in colour, it is not sure that their translucency is comparable. Judging from the appearance of recent fractures in medieval panels, the white of Derbyshire stone appears more dense and opaque than that of Spanish alabaster.² Since this possible difference in translucency is most apparent when the two varieties of alabaster are backlit, its visual impact seems relatively limited. Inserted in altarpieces or small cases made of oak boxes devoid of openings at the bottom, medieval alabasters could only be lit from the front or from the side.³

For the carving work, the raw parallelepiped panel was first sawn to match the dimensions of the original panel. When the block was acquired, the surfaces were already flat and smooth,

1 Mulliez *et al.* 2022.

2 The *Throne of Mercy* in Castelnau de Médoc has unfortunately been vandalised twice, in 2018 and 2019, so that the interior of the stone has been exposed in several places. The breakage of a panel representing the *Throne of Mercy*, kept in the Musée Vivenel in Compiègne, also shows a very dense and bright white.

3 The original wooden framework for altarpieces and single panels are rarely preserved. Those containing single panels can still be found in the Burrell Collection in Glasgow (three examples), the V&A Museum in London, the Ashmolean Museum in Oxford, Worcester Cathedral and the National Museum in Reykjavik (from Selardalur Church). See also Nelson 1920, 57. For the wooden frames of altarpieces, too numerous to list here, see for example those of Saint Michel of Bordeaux in New Aquitaine, or elsewhere in France at Saint Nicolas du Bosc and Évreux (from La Selle). Philip Nelson has written a study specifically dedicated to the woodwork of alabaster altarpieces; see *idem* 1920.



Fig. 51. The cutting of the alabaster facsimile of the *Assumption* in the Musée d'Aquitaine: model drawn on transparent film.



Fig. 52. Carving with a gradine and a mallet (A. Bély).



Fig. 53. Sculptor's tools.



Fig. 54. Sculptor's pantograph (foreground) and digging with a riffler.



Fig. 55. Facsimile of the *Assumption*: state of the panel before painting.

but not polished. Once the main lines of the composition had been reproduced on a transparent film, fixing the position of the figures and their attitudes, they were replicated on the blank slab (fig. 51). The sculptor then began to remove material from the areas roughly outlined by the preparatory drawing. As the contours were gradually freed up, the graphic markers used as a guide by the sculptor, drawn with a pencil or a metal point, were renewed regularly. As the carving progressed, these markers can become more and more finely detailed (fig. 52, 54). It seems quite possible that the medieval *alabasterman* proceeded in a similar way.

The alabaster was carved using small straight chisels and gradines (fig. 53). They were propelled by a mallet, sometimes wooden, sometimes metal.⁴ Tight folds and other cramped areas were carved out with riffles (fig. 54). In the Middle Ages, carvers may also have used drill bits – even though it was not necessary to use them for our facsimile – in order to prepare for certain deep cuts.

Once the alabaster had been rough-cut, the final stages of the work were carried out using a sculptor's pantograph (fig. 54). This is an instrument made up of sliding metal rods which, when fixed to the original, allow a stylus to be moved towards the point of the relief to be reproduced. By locking the position of the stylus, the X, Y and Z spatial coordinates are 'registered'. After transferring the pantograph to the blank panel, the tip of the stylus indicates to the sculptor the precise position of the point to be reproduced.

After the actual carving work was completed, the panel was polished. For practical reasons, the polishing was done with very fine-grained pumice paper, not with sand and goatskin, the materials probably used by medieval alabaster sculptors according to Cheetham.⁵

As we had not yet correctly understood the sense of hollowing out the reverse side of the panels, as was commonly done in the Middle Ages, we did not reproduce this detail. Indeed, the lower part of the back of medieval alabasters was almost always cut out (fig. 56-57). This recess was probably not so much meant to reduce the weight of the panel to make it more transportable, as is sometimes said, but to facilitate its handling during the cutting and painting process.⁶ During these phases of work, the *Assumption* facsimile was often laid flat, if only to avoid paint drips.⁷ The recess in the reverse side allows the hand to slip underneath the alabaster, to turn it and thus to have easier access to its various parts, both with the chisel and with the paintbrush.

4 Inferring from the practices of twentieth-century sculptors, Cheetham 2005, 24 assumed that alabaster was carved without a propellant, mainly to limit the risk of breakage.

5 See Cheetham 2005, 24, note 144.

6 See more in detail in Mulliez *et al.* 2022. As Cheetham 1984, 25 has already stated, it is probably appropriate to distinguish between large scone statues and narrative panels. The statues can indeed reach a much lower weight when they are completely hollowed out, as is the case with the Saint Martial of Bordeaux Cathedral or the Pietà of Burghley House, Lincolnshire (inv. no. EWA08599). The panels, on the other hand, are only hollowed out in their lower part, and the resulting lightening is much less significant.

7 In our experiments, for example, the copper resinate, which remains viscous for several days, tended to flow slowly downwards once the panel had been put in the upright position.



Fig. 56. Reverse of an alabaster panel (Libourne, Musée des Beaux Arts).

In the Middle Ages, the reverse side was also pierced with two to four holes made with a drill. In these holes, the alabaster sculptors inserted copper wires, sealed with liquid lead, which were used to attach the panel to the bottom of the wooden case intended to house them⁸ (Fig. 57). Finally, the reverse side of the panel frequently shows engraved marks, which were probably used to identify the panels belonging to the same altarpiece (and not to mix them up with other tables under execution), so that they could be assembled correctly when they were completely finished.⁹

The entire copy of the Assumption panel required about sixty hours' work. However, a medieval sculptor could have made a panel in much less time; according to Amandine Bély's estimate, twenty-five to thirty hours would have been sufficient for an experienced sculptor working in free carving. The length of time required to produce the facsimile is due to the use of the pantograph and the objective of reproducing a medieval model precisely, both of which slow down the work considerably.



Fig. 57. Detail of the reverse of a panel (Musée de Cluny, Cl 19346).
Left: lower part roughly hollowed out to facilitate the handling of the panel;
right: copper wire sealed with lead to fix the panel in the wooden framework of the altarpiece.

8 These looped copper wires were passed through holes in the bottom of the wooden framework. Wooden pegs, passed through the loops in the back of these wooden frames, held the panels in place.

9 See Cheetham 1984, 25. See also Nelson 1920, 60.

THE PAINTING

Before the actual painting, the sculptor applied gesso nodules, made from alabaster dust and glue, to the upper background of the panel (which was to be gilded in a second process).¹⁰ This was a delicate operation, the main difficulty of which lay in ensuring that the nodules adhered well while giving their surface a regular curvature. The sculptor or painter – quite often probably the same person¹¹ – could also carve incisions in his sculptures. Most of these incisions were used to determine the width of the gilded edgings, especially in the case of hems of a certain length, such as the trimmings of a coat or bed sheet.¹² (Fig. 58). The irises of the eyes also seem to have been incised at times. This is the case for the Virgin of the *Nativity* in the altarpiece of Saint Michel in Bordeaux, or the Virgin of the *Annunciation* in Saint Nicolas du Bosc. These incisions made it possible to determine the direction of the gaze beforehand and to ensure that the irises were parallel (fig. 59).

For practical reasons, the gilding was probably done before the paints were applied (Fig. 60). Areas where the paint is not yet completely dry attract the gold-leaf, which inevitably adheres to them. Unless you wait for a long period of time – several weeks – it seems preferable to apply the gilding before the painting, otherwise there is a risk that gold particles will settle in places where this was not intended.¹³



Fig. 58. Incisions parallel to the hemline determining the width of the border and its gilding. Left: *Coronation of the Virgin*, Bordeaux, altarpiece of Saint Michel; right: Avensan, *John the Baptist*.

10 We chose organic glue, in this case rabbit skin glue. For more details, see Mulliez *et al.* 2022.

11 See for example the few remarks on this subject in Schlicht 2019, 190-191. In the case of prestigious works, the commissioner sometimes called in a specialist painter, as was the case for the altarpiece in St George's Chapel, Windsor: William Burdon was paid £40 in 1367-68 to paint a panel for the Great Canons' Chapel and an altarpiece in the upper chapel, the sculpture of which was done by Peter the Mason of Nottingham (Cheetham 1984, 27).

12 It seems unlikely that the incisions are the result of cutting the gold-leaf after it has been applied as the leaf is so thin that the risk of tearing it would have been very high.

13 For more details, see Mulliez *et al.* 2022.



Fig. 59. Top: incised iris of the Virgin of the *Nativity*, Bordeaux, altarpiece of Saint Michel; bottom: incised pupil of the Virgin of the *Annunciation*, altarpiece of Saint Nicolas du Bosc.





Fig. 60. Gilding. Application of the mixture; application of the gold-leaves on the mixture; the facsimile of the *Assumption* with its gilding.

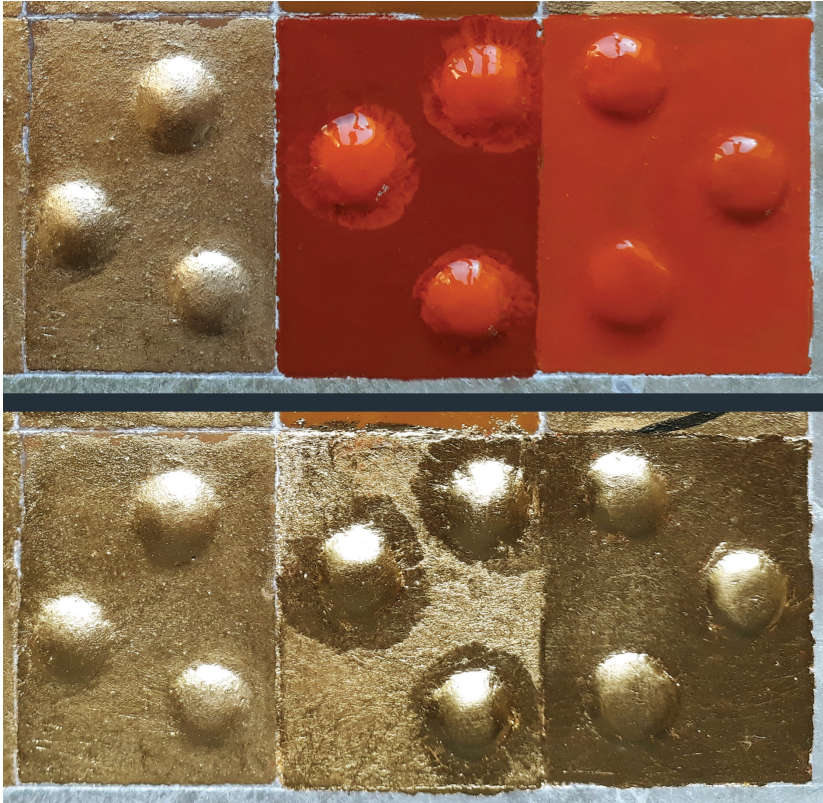


Fig. 61. Model samples showing the impact of the undercoat on the final appearance of the gilding.
Left: gilding on ochre;
centre: red ochre background and red lead-covered gesso nodules;
right: background and gesso nodules covered with red lead.

Gilding, in the case of alabaster, was done with a mixtion, *i.e.* the leaf was fixed to the support by means of an oil-based glue. These mixtions were tinted with yellow or red ochre pigments and red lead (minium). The colour of the pigment used to tint the mixtion influences the shade of the gold. The use of red lead accelerates the drying of the mixtion and thus shortens the waiting time for the gold-leaf to be applied; in addition, the red lead gives the gold-leaf a particularly smooth finish (fig. 61). The leaf is applied as soon as the mixtion is almost dry, after several hours, between two and twelve depending on the environmental conditions (hygrometry, temperature, ventilation, etc.), but also on the quantity of lead (minium) it contains. Placed on a gilding pad, the gold-leaf is then cut to the shape and approximate dimensions of the area to be covered. By means of static electricity, the leaf is picked up with a gilder's tip (a flat brush with long bristles) and layered on the area covered with mixtion. The gold adheres to the surface in an irregular manner. It is then necessary to perfect the adhesion by expelling the air with a special burnishing brush. Unlike water-based gilding techniques, suitable for wooden surfaces, it is not necessary to polish the gilding with an agate. Excess gold, which is deposited beyond the areas covered with mixtion, can be easily removed with a brush.

OBSERVATIONS ON PIGMENTS AND BINDERS

Although alabaster is polished, and therefore seems to offer little adhesion, the paint can be applied without an undercoat.¹⁴ Our own analyses and those of other research teams confirm that this was the norm for medieval English alabaster.¹⁵ As mentioned above, there are at least three exceptions among the alabasters in Aquitaine. The St Peter in the panel of the *Elect entering Paradise* in Libourne wears a cloak with a blue lining painted with azurite. This blue layer is superimposed on a sub-layer of dark grey, which densifies the colour while obscuring it somewhat; the same applies to the nimbus of the Christ of the *Resurrection* of Saint Michel, whose azurite is similarly laid over a blackish undercoat (fig. 62). The green paint (copper resinate)

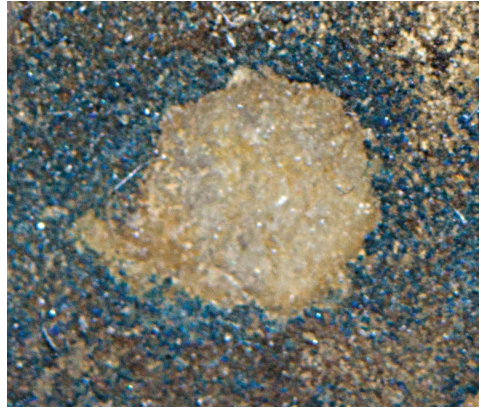


Fig. 62. Azurite on a blackish undercoat (Bordeaux, altarpiece of Saint Michel, *Resurrection*: detail of the nimbus of Christ).

on the robes of the *Assumption* angels in the Musée d'Aquitaine was deposited on a layer of yellow ochre or lead white that would have turned yellow. As the resinate is translucent, the presence of the undercoat creates a yellow-brownish shade.

On the medieval panels, the binder used was oil; for our tests, we used linseed oil. Since these samples showed a rapid yellowing after only a few months, one may wonder whether the medieval painters did not use other varieties of oil, or whether they did not know of procedures to avoid this yellowing.

Not all pigments react in the same way when applied to alabaster. According to the results of physico-chemical analyses, the Aquitaine panel painters mainly used mineral pigments, namely lead white, yellow ochres, red lead (orange), cinnabar (intense red), red ochres (deep red to brown), copper resinate and verdigris (green), and sometimes also azurite (blue). Dyes or lakes, of organic origin, appear much less frequently.¹⁶ Of these, indigo is the most frequently used; an unidentified organic yellow, present on the three Libourne panels, has not been detected elsewhere. According to our experiments, it is much more difficult to obtain homogeneous and covering surfaces by using organic pigments, such as stil de grain or buckthorn (yellow), than by using mineral dyes (fig. 63-64). Since medieval alabaster polychromy has just this uniform finish, which was clearly sought after by English painters, we believe that the different properties of mineral and organic pigments at least partly determined the prevalence of the former over the

14 For a discussion of the physical characteristics that allow paints to adhere to alabaster, see Harris 2020, p. 52-53.

15 See for example Colinart & Klein 1997, 99. See also Pereira-Pardo *et al.* 2018, 5. While confirming the absence of undercoats in most cases, Cheetham 2005, 26 states: "grounds [...] were used [...] sometimes to add depth and hue to the surface coat of a thinner colour such as vermilion glazes, blue smalt or azurite". According to Land 2011, 65-66, the use of azurite requires an undercoat (lead white and/or carbon black).

16 The study conducted by Pereira-Pardo *et al.* 2018 on the Kettlebaston alabasters and the *Virgin and Child* in the British Museum concludes that only one organic pigment is present, in this case kermes (pink), the others being all mineral in nature: cinnabar, red ochre, red lead, verdigris, copper resinate, azurite, lead white and carbon black. Similarly, the colours of the Rouvray altarpiece are composed of mineral pigments, with the sole exception of organic blue (probably indigo; see Colinart & Klein 1997, 99). The English alabasters from the Basque country, especially the Passion Altarpiece from Plentzia, use only mineral pigments (Castro *et al.* 2008, 763).

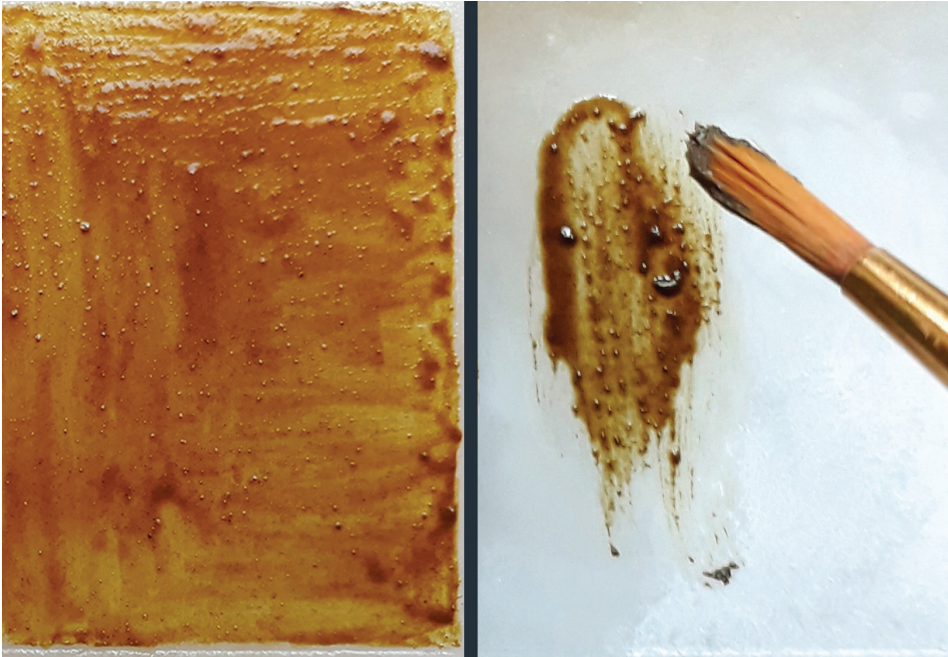


Fig. 63. Yellow organic pigments such as stil de grain (left) or alder buckthorn (right) are difficult to apply to alabaster.



Fig. 64. Red mineral pigments such as ochre (left) and cinnabar (right) form homogeneous, covering layers on alabaster.



Fig. 65. Cinnabar applied in one layer (background) and two layers (around the white 'feather').

latter. It is possible that the greater stability of mineral pigments and their sometimes greater intensity also contributed to their preference.

Even from one mineral pigment to another, the effects produced can vary significantly. This is true of their covering power. A red ochre, for example, forms a covering opaque layer from the first coat, whereas yellow ochres often require a second or even a third coat. Depending on the number of coats, the surface appearance of paints can vary. A single coat often results in a rather matt appearance, which is made more satin-like by the application of a second coat (fig. 65).¹⁷ Given the generally smooth appearance of medieval paint layers, the painters had to grind the grains finely. However, some pigments, such as azurite, should not be ground too finely, otherwise they lose the burst and intensity of their colour.

17 Sometimes the same pigment applied to the same panel can produce different surface effects. For example, the first layer of cinnabar used for the *Assumption* facsimile had a matt appearance in some areas, while others appeared satin. The reasons for this phenomenon could not be clarified: do the respective areas have a different porosity?

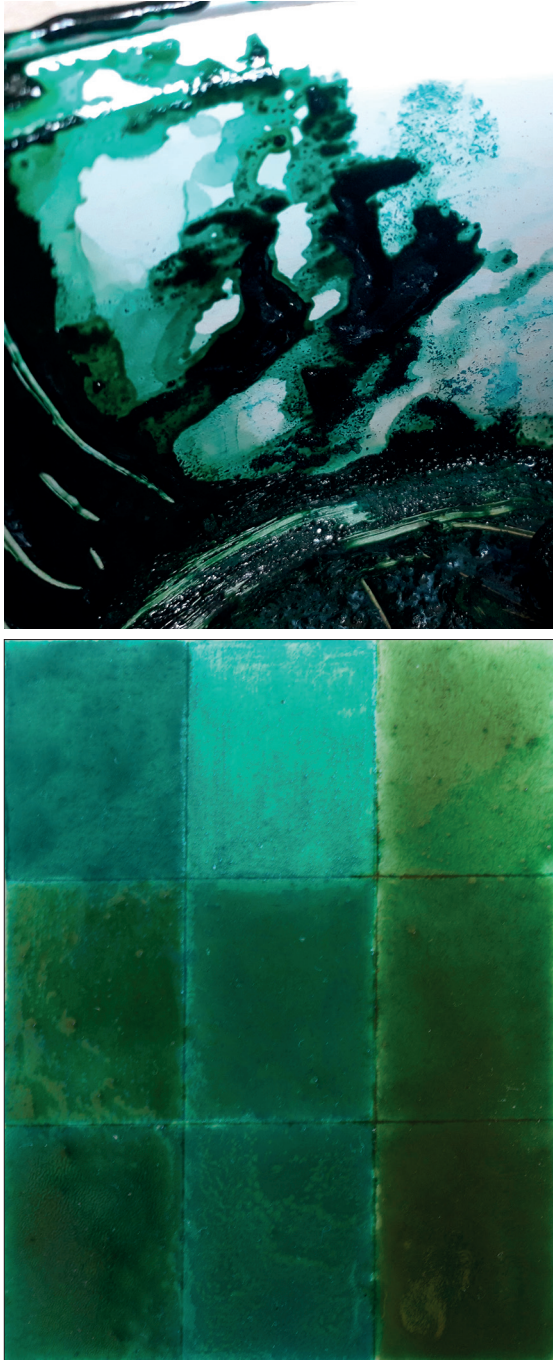


Fig. 66. Cooking copper resinate in a pan.
Different shades appear on the wall of the pan, including a bluish green,
depending on the heating time of the raw materials.
Bottom: copper resinate showing different shades.
From top to bottom: application of one, two and three layers.



Fig. 67. Facsimile with reconstructed polychromy of the Assumption from the Musée d'Aquitaine in Bordeaux.

Copper resinate is a special case among paints based on mineral pigments. It is not a powder but a viscous, translucent liquid.¹⁸ The paint is susceptible to drying, so it has a short storage life and must be produced with this in mind. The colour of copper resinate can vary considerably depending on how long the mixture of Venetian turpentine, oil and verdigris is heated, changing from a bluish shade to green, then to brown (fig. 66). As for its appearance, once applied to the alabaster, it can be seen that, while it becomes darker and denser with an increasing number of layers, it still retains its translucency. It is also distinguished by its very shiny appearance, which is apparent from the first coat. However, this shininess can easily be removed by rubbing. Thus, on the original panels, the glossy appearance of the surfaces in general has not been preserved (fig. 40).

The question arises as to whether gloss was not one of the qualities actively sought after by the *alabastermen*. The glossy finish – even if it is a different type of gloss – characterises not only the green copper resinate, but also the brilliant white of the polished alabaster and the gilding, *i.e.* the materials that colour the most important surfaces of medieval panels. As other physico-chemical studies have shown, the green backdrops of English alabasters were often covered with a glaze, *i.e.* a layer of oil containing a few grains of green pigments.¹⁹ These glazes also gave the surfaces a glossy or satin appearance. Although the physico-chemical analyses carried out within the Aquitaine corpus have not allowed the detection of glazes (whether they were applied to green or other colours), it cannot be excluded that they have disappeared over the course of time; further research should be carried out on this subject. Even if such glazes had not been used for colours other than green, the medieval panels probably had at least a satin (and not a matt) finish, as the painted copy of the *Assumption* in the Musée d'Aquitaine illustrates (fig. 67).

18 The green copper resinate was made according to the instructions given by Mayerne 1620, fol. 31: “*Pour faire le vert transparent qui s’applique sur un fonds d’or ou d’argent. Prenés un petit pot. Thérébentine de Venise 2 onces, huile de thérébenthine 1 once et demie. Vert de gris broyé grossièrement sur le marbre 2 onces. Mettés-le parmy la thérébenthine et huyle sur les cendres chaudes. Prenés une pièce de verre, et en mettés une goutte dessus advisant si la couleur vous plaist. Après mettés y la grosseur d’une noix de terra merita (curcuma). Laissés bouillir doucement, jusques à tant que vous voyés que vostre vert soit fort beau. Passés tout doucement à travers un linge.*” [To make the transparent green which is applied to a gold or silver ground. Take a small pot. Venetian turpentine 2 ounces, oil of turpentine 1 ounce and a half. Verdigris crushed roughly on marble 2 ounces. Put it with the turpentine and the oil on hot ashes. Take a piece of glass, and put a drop of it on it to see if you like the colour. Then put in the size of a nut of terra merita (turmeric). Let it boil gently until you see that your green is very beautiful. Pass it gently through a cloth.]

19 Cheetham 1984, 56-57; Colinart & Klein 1997, 99, about the Rouvray altarpiece; Land 2011, 72.

LOOKING AT AN ENGLISH ALABASTER IN THE LATE MIDDLE AGES

As far as we know, there are no medieval texts that tell us about the reactions of a viewer to an English alabaster. As is often the case, these can only be deduced indirectly by putting into perspective the information gathered from other sources.

THE SPECTATORS: CLIENTS AND COMMISSIONERS

Before asking how a medieval viewer could appreciate the polychromy of alabasters, it seems necessary to better define their typical social profile. In other words: for whom were these works intended? The data we have suggest that their clientele was very broad, drawn from all strands of society and from a large number of European countries.

Indeed, despite the massive losses they suffered during the Anglican Reformation and the Civil Wars, more than 2,400 panels still survive.¹ The large number of surviving works shows that in the Middle Ages this production was probably unrivalled in terms of its success with a very large number of customers, from a fairly broad cross-section of society.

Contrary to what has sometimes been claimed, this success was not limited to those sections of society with modest means.² Among the few known buyers of these works, we find not only middle-class people, but also ecclesiastical dignitaries and members of the aristocracy. The export of three statues from England to Rome in 1382 by the representative in England of Pope Urban VI, Cosmato Gentilis, is well known. Pey Berland (1432-1456) and Arthus de Montauban (1468-1478), both archbishops of Bordeaux, were purchasers of alabaster altarpieces and statues.³ It seems plausible that the panels in the collegiate church of Montpezat de Quercy, which were part of the altarpiece of the main altar, were commissioned by its founder, Cardinal Pierre de Prés.⁴ The altarpiece of the Five Joys of the Virgin, which was once in the Chapel of the Virgin in the Benedictine Abbey of Novalesa (Piedmont), was probably commissioned by abbot Giorgio Provana (before 1478-1502).⁵ In 1442, the prior of Modbury (Devon) commissioned an altarpiece to be sent to his mother house, the abbey of Saint Pierre sur Dives (Calvados).⁶ In 1481, two English *alabastermen* claimed payments from the abbot of St Albans, the prior of Holy

- 1 Nigel Ramsay estimates that their initial number was well over 10,000 panels, perhaps even tens of thousands (*idem* 1997, 53).
- 2 This judgement had already been revised by Ramsay 1997, 62-63: "They [*i.e.* alabaster images] appear only in the wills of the high and low nobility, merchants and, sometimes, parish clergy, since their cost was never less than several shillings – the equivalent of many weeks' work for a peasant." See in the same vein Ramsay 2019, 49-50 ("[...] the rectangular panels cost at least a mark (13s. 4d) each").
- 3 As reported by Millin 1790, vol. 1, 114 and 123, Arthus de Montauban offered the altarpiece of the church of the Célestins in Paris between 1454 and 1478; the altarpiece, which depicted the Passion in five panels, has admittedly been destroyed, but the engraving in the same work (no. III, pl. 22, p. 122) leaves no doubt as to the English origin of the work. For commissions related to Pey Berland, see Schlicht 2017.
- 4 Seven alabaster panels, three of which still exist, are mentioned in an inventory of 1436 and located on the high altar of the collegiate church, which must have existed since its consecration. Pierre de Prés was also vice-chancellor of the Roman Church. See Fau 1993, 190.
- 5 For the remains of this altarpiece and its patron, see Murat 2019c.
- 6 Ramsay 1990, 616.



Fig. 68. Diffusion of English alabaster altarpieces in Europe (after Cheetham 1984, with modifications; French altarpieces are only incompletely recorded)

Trinity in Wallingford and the keeper of the hospital of St Bartholomew in Newbury (Berkshire) for altar panels delivered to them.⁷

Among the clients of the English alabaster sculptors were also noblemen, such as Mary of St Pol, dowager countess of Pembroke,⁸ and the English king Henry VIII, who – in addition to the particularly expensive altarpiece in Windsor Castle commissioned by his predecessor Edward III – also owned an image of St John.⁹ The altarpiece of St Léger in Nouâtre (near Tours) was most probably acquired by Jean du Fou, chamberlain to King Louis XI and patron of the church's construction in the 1480s.¹⁰ The small altarpiece of the Virgin from Castropol was probably commissioned by Diego García de Moldes, a member of an important Spanish family.¹¹ According to the information gathered by Zuleika Murat, several altarpieces in the Italian peninsula belonged to important princely courts, such as that of the Este family in Ferrara, the Anjou-Durazzo dynasty in Naples and the Visconti family in Milan.¹²

Given the considerable financial means available to these elites, their choice of English alabasters cannot be explained by the low price of this production. Since the alabasters acquired by the nobility and the high clergy show the same artistic quality as the other panels, it can be deduced that the entire production, or at least a significant part of it, satisfied the taste of even the most demanding clients.

As the cosmopolitan nature of the clientele mentioned above illustrates, English alabasters were not popular just in the region where they were produced, nor even only in their country of origin. They were bought in almost all the countries of Catholic Europe, from Iceland to Croatia and from Portugal to Poland and Norway (fig. 68).¹³ Their visual appeal has thus clearly freed itself from any local particularism to become an international art form, appreciated more or less everywhere.

It should be noted that most of the alabasters that have come down to us with sufficient documentation – at least in the case of altarpieces comprising several panels – were acquired by commission. It is true that a certain number of them arrived on the Continent in order to escape the destruction carried out in the context of the Anglican Reformation, which may have meant that the works were sold at low prices and acquired under conditions where chance played an important part.¹⁴ However, this phenomenon probably primarily concerned the northern coasts of France from Calais to Brittany, which were easy to reach by boat from England.¹⁵ Works preserved in more distant countries, such as the altarpiece of Santiago de

7 Hope 1904, 239.

8 Mary of St Pol donated the *Virgin and Child* called Our Lady of Westminster to Westminster Abbey. See Ramsay 1991, 36.

9 Ramsay 1997, 62. For the reredos of St George's chapel at Windsor, see for example Hope 1904, 224-225.

10 The alabaster altarpiece of Saint Léger at Nouâtre was situated behind the high altar and flanked by the coats of arms of Jean de Fou, who was also Lord of Nouâtre.

11 De Beer and Speakman 2013, 69.

12 Murat 2016, 409 (altarpiece from the Rocchetta Viscontea in Porta Romana in Milan) and 410 (altarpiece in the Museo Civico di Palazzo Schifanoia from the palatial chapel of the d'Este castle in Ferrara; altarpiece in the Capodimonte Museum from San Giovanni a Carbonara in Naples).

13 See the list of alabaster altarpieces given in Cheetham 1984, 57-59 and updated in *idem*, 2003, 161-177 and *idem*, 2005, 57-59.

14 The collapse of the prices for English alabaster panels is mentioned, among others, by Cheetham 1997, 49.

15 Sir John Mason's well-known letter to the English king's privy council in 1550, which mentions the arrival of "three or four ships [that] have lately arrived from England laden with images" – which according to Edward VI's Act of 1550 should have been destroyed – fits this hypothetical scenario quite well, as it mentions the cities of Paris and Rouen as sales points, in addition to unspecified "other places". See for example Cheetham 1997, 49. The three altars from St Andrew's in Lewes were

Compostela (donated in 1456), that of Mondoñedo (mentioned in 1462),¹⁶ several altarpieces, panels and statues from the Bordeaux region (commissioned in the 1430s or 1440s) or the vast majority of works preserved in Iceland, arrived there before the 1530s.¹⁷ The small altarpiece of the Virgin of Castropol (Asturias) was probably commissioned and shipped around 1461,¹⁸ the panels of Montpezat en Quercy are mentioned as early as 1436, and already in 1390 an English ship carrying alabaster images was bound for Seville.¹⁹ English alabasters were therefore most often selected in preference to other locally produced works, especially when they were commissioned outside England, without competition being distorted since, in the context of Reformation, these works could be purchased at low cost.

The English alabaster painters were thus clearly capable of developing a 'formula' for colouring their works which, it is suggested, was very successful with a wide and diverse clientele. What inferences can be drawn from the specific features of this polychromy about artistic taste at the time? Why was the selection of a small number of tones preferred instead of using multiple and diversified colours? What values did these customers attach to light and dark colours? What might have been their attitude to the surface appearance of colours, especially mattness and gloss?

Only medieval writings can provide answers to these questions. Given that these texts often emanated from the elites, the observation stated above that alabaster panels were also intended for them is important. If it had indeed been a 'popular' art, as some scholars have tended to believe, the appeal to clerical or aristocratic texts that follows would be of little relevance.²⁰



Fig. 69. The main colours of medieval palettes: white (alabaster), yellow (gold), red (cinnabar), green (copper resinate), blue (indigo mixed with lead white); right: pure indigo.

sold in 1548 "to the frenche men" (Hope 1904, 239). In 1554-5 the parishioners of Anglesqueville la Bras Long (Seine Maritime) acquired two altarpieces and probably other English panels for their church. See Flavigny 1997, 81.

16 Hildburgh 1944, 28-33.

17 For Pey Berland's acquisition of a number of alabasters from the Bordeaux region, see Schlicht 2017; to this group of works should be added the altarpiece of the Virgin in the Chapel of Notre Dame de la Rose, which must have been in place at the time of the consecration of the small building in 1444. According to Bera Nordal, Icelandic church inventories from the period 1400-1550 list 15 altarpieces and 61 reliefs or statues in 40 churches. See *eadem* 1985, 93-97.

18 Sold in 2012 by Sotheby's to the National Gallery of Art in Washington, D.C., the small Marian altarpiece had been kept until then in the chapel of Nuestra Señora del Campo in Castropol; this chapel was built in 1461 by order of Diego García de Moldes. See De Beer & Speakman 2013, 69.

19 Hildburgh 1944, 34.

20 The vision of English alabasters as products of a popular culture was developed in particular by Walter Leo Hildburgh. See for example *idem* 1949, 52. See also the historiographical reflections on this scholar detailed by Ramsay 2019, 42-44.

PURITY AND INTENSITY OF COLOUR

Let us first recall that colours were not perceived, classified and appreciated in the Middle Ages in the same way as they are today. As the studies of Brent Berlin and Paul Kay²¹ or Michel Pastoureau, among others, have shown, the way of naming and distinguishing colours can differ greatly from one period to another, and from one culture to another. Without going into detail, which would take us too far from our subject, let us simply point out that in the Middle Ages, colours were not classified according to the spectrum of visible light, which was only discovered by Newton in the seventeenth century, and that white and black were included among the colours in the same way as red or green. A certain number of colour shades, such as orange, were not considered to be colours in their own right, and there is no term to name them.²² These differences should be kept in mind for what follows.

As already mentioned several times, English alabaster painters used only a small number of colours. What these colours had in common was their high degree of saturation, usually obtained from pigments that were not mixed (apart from pink). They mainly comprised red (cinnabar), green (verdigris or copper resinate) and, less frequently, blue (indigo or azurite). The colouring was done not only with pigments, but also with gold, which replaces the yellow colour, and alabaster, which takes the place of white.

This highly restricted range of colours corresponds to what the Middle Ages might have considered the 'primary' or main colours. The chromatic values selected closely resemble the range which, according to Michel Pastoureau, appears most often in medieval treatises on colour, composed of white, yellow, red, green, blue and black (fig. 69).²³ This scale is itself based on Aristotle's reflections on colours (*De Sensu*, 4.442), which medieval authors often quoted explicitly.

What medieval thinkers retained from Aristotle's theories on colour is first of all their very small number. The diversity of colours is not infinite, but is reduced to only six or seven. As Bartholomaeus Anglicus states, "there can be neither more nor less".²⁴ Like those of alabaster, the colours of this palette are distinguished by both their purity and their intensity. The existence of shades is not denied, but they are considered mere 'accidents' (*accidentum colorum*),²⁵ understood in the metaphysical sense of the term, as opposed to their essence, which is pure colour. Or, to put it in other terms, those of medieval neo-Platonism, they are imperfect actualisations of the idea of this or that colour (as pink or orange-red are imperfect actualisations of red).²⁶ In other words colours where the saturation has been decreased or toned down do not reach the degree of perfection of the most intense colour. As Michel Pastoureau has noted in relation to medieval dyes, it is primarily the intensity of the colour

21 Berlin & Kay 1969; Kay *et al.* 2009.

22 Pastoureau 2012, 221. Similarly, according to G. Gros, the term 'marron' [*i.e.* brown] seems to appear only in the eighteenth century; the Middle Ages used instead the term 'tanné' [tanned or, in English heraldry, tenné], connoted in a negative way. See *idem* 1988, § 12.

23 Pastoureau 1998, 151.

24 Quoted from the 1372 French translation by Jean Corbechon (BnF Ms fr. 22531) of Bartholomaeus Anglicus' treatise on colours (*De proprietatibus rerum*, book XIX, chap. VIII), ed. Salvat 1988, § 39.

25 See Hüe 1988, § 24, who refers to the glossary preceding the compilation of recipes for painters by Jean le Bègue (BnF Ms lat. 6741) entitled "*Tabula de vocabulia synonymia et aequivoquia colorum verbumque et accidentum colorum*".

26 See for this interpretation Selosse 2006, 626.

that distinguishes the royal garment from the clothes of the peasant.²⁷ It is therefore the high saturation of colours that was sought and appreciated.

In the Middle Ages, the degree of intensity was a necessary quality for a colour to be considered beautiful, but it was not sufficient. Red lead or red ochre, for example, are as intense and saturated as cinnabar. However, only cinnabar (or almost only cinnabar) is used to colour the visible parts of alabasters; red lead and red ochre, on the other hand, are mostly used in mixtures and are therefore destined to 'disappear' under the gold-leaf. Among the three saturated reds, it is clearly the 'purest', most 'archetypal' shade that has been preferred. Unlike the orange-red of red lead or the brownish-red of ochre, the red of cinnabar has no yellow, violet or brown undertones. In this sense, cinnabar red can be considered as the tone that best embodies the very idea of red (in the Platonic sense) – just as gold perfectly embodies that of yellow and alabaster that of white.²⁸

It should be remembered that in the Middle Ages, mixtures of colours were generally disparaged. As Michel Pastoureau notes, there was an aversion to mixtures, inherited from biblical culture, that permeated the entire medieval sensibility. Mixing, blending, merging, amalgamating were often considered infernal operations because they violated nature and the order of things intended by the Creator.²⁹ According to the herald Sicille, the colour purpura is obtained by mixing all the other (heraldic) colours. The author reports that according to some, it is the least appreciated of the colours, because it has no **particular** virtues, only those conferred on it by the **other** colours.³⁰ The mixing of white, black and red – the colours considered in the Middle Ages to be the most strongly opposed to each other – creates a particularly ugly colour called 'riolé-piolé'.³¹ The disdain for mixtures and the valorisation of the purity of colours by medieval man probably also affected his way of appreciating the polychromies of alabasters, which were essentially composed of pure and 'perfect' colours.

The accumulation of a large number of these pure colours, such as we find on the alabasters, was apparently not scorned; on the contrary, this was not the case at least as long as these colours were not located on the same plane. According to Michel Pastoureau, in fact, "the medieval eye often attached more importance to the thickness of objects and images than to their extent, and never confused these two parameters. In the thirteenth century, for example, wearing a white shirt, a blue tunic, a green dress and a red cloak was not the same as wearing a variegated outfit [because the colours were superimposed]. On the other hand, to wear a tunic or a dress with red, green and yellow stripes is to wear a polychrome, and is therefore an

27 As Michel Pastoureau has pointed out, the blue clothes of Saint Louis have nothing in common with those of the peasants: "Mais il ne s'agit absolument pas du même bleu. Le premier est vif, franc, 'royal' ; le second est délavé, grisâtre, éteint. Pour l'œil du XIII^e siècle il ne s'agit pas du tout de la même couleur." (Pastoureau 2012, 146).

28 See Bartholomaeus Anglicus, who notes the particular shininess of cinnabar (quoted after Salvat 1988, § 88): «Vermeillon est une couleur près de rouge et qui reluit et resplandist comme feu, car ceste couleur a en soy moult de clarté du feu et est sa matiere bien clere, et pour ce est elle si luisant et agüe." [Vermilion is a colour close to red and which shines and glows like fire, because this colour has in itself much of the brightness of fire and is its matter very clear, and for this reason it is so shiny and bright].

29 "...cette aversion pour les mélanges, héritée de la culture biblique [...] imprègne toute la sensibilité médiévale. [...] Mêler, brouiller, fusionner, amalgamer sont souvent des opérations jugées infernales parce qu'elles enfreignent la nature et l'ordre des choses voulus par le Créateur." Pastoureau 2012, 198-199.

30 "Et aulcuns dient que c'est la plus basse [des couleurs], pour ce qu'elle est faite des aultres couleurs. Car elle n'a de vertu fors ce que les aultres luy en donnent." Sicille adds however that others consider the colour purpura as the most noble precisely because it "holds of all the colours" ["tient de toutes les couleurs"]. See Sicille, ed. Cocheris 1860, 47-48.

31 See Hübner 1988, § 6.

ugly, indecent or degrading garment" [because the colours are juxtaposed in the same plane].³² The colouring of the clothes of most of the figures on the alabasters corresponds perfectly to this principle: the red lining of the cloaks is located 'underneath' their white obverse, and is superimposed on the white obverse of the dress, which is itself placed 'on top' of a blue lining (fig. 14, 19, 20). The *semé*, like the daisy flowers on the green backgrounds, should also be 'read' as a foreground superimposed on a plain background. Furthermore, the organisation of the coloured surfaces as *semé* or a pattern of charges on a monochrome field was highly valued in the field of heraldry,³³ the same was probably true of alabaster.

COLOUR AND LIGHT

Let us return to Aristotle's conceptions of colour. In addition to the highly restricted range of colours, the Middle Ages in general and English alabasters in particular inherited the strong correlation between the notions of colour and light from the Greek philosopher. Like medieval thinkers, he understood that green and blue were not as bright as yellow. Following on from Aristotle, medieval classifications form a scale from the brightest to the darkest colour: white is inextricably linked to intense light, while black is nothing other than a total absence of light.³⁴ As the other four or five colours, called 'medium' or 'intermediate', lie between these two poles, they 'necessarily' contain more or less light. If red holds a middle position between the two extremes, the 'pale'³⁵ and yellow, placed near white, are deemed luminous, while green and blue, being near black, are dark, so to speak, by nature.³⁶ Significantly, the most common medieval term for the colour violet – which is sometimes included in this range and then placed between blue and black – is '*subniger*', i.e. 'sub-black' or 'blackish'.³⁷ Similarly, 'pale' is described as a kind of white 'declining a little bit towards obscurity' (*declinans aliquantulum ad obscuritatem*).³⁸ It is therefore more the degree of luminosity that defines the colour – or rather the way in which it

32 "...le regard médiéval attache souvent plus d'importance à l'épaisseur des objets et des images qu'à leur étendue, et ne confond jamais ces deux paramètres. Au XIII^e siècle, par exemple, porter une chemise blanche, une tunique bleue, une robe verte et un manteau rouge, ce n'est pas porter une tenue bariolée. En revanche, porter une tunique ou une robe à rayures rouges, vertes et jaunes, c'est porter un vêtement polychrome, donc laid, indécent ou dégradant." Pastoureau 2012, 149-150, n. 30; see also *ibid.*, 162-163.

33 Pastoureau 1991, 39: "Le *semé* exprime presque toujours quelque chose de solennel, de majestueux, voire de sacré. D'où son emploi sur certains insignes royaux, sur les manteaux de sacre, sur beaucoup d'objets liturgiques et sur de nombreuses images où est mis en scène le divin." [The *semé* almost always expresses something solemn, majestic, even sacred. Hence its use on certain royal insignia, on coronation cloaks, on many liturgical objects and on numerous images where the divine is staged.]

34 Bartholomaeus Anglicus (chap. 8; ed. Salvat 1988, § 43) thus adopts the opinion of Aristotle and Averroes «qui di[s]ent que la couleur noire est privacion de lumiere et blancheur est lumiere pure». [...who say that the black colour is deprivation of light and whiteness is pure light].

35 'Pale' (*pallidus*) is the term by which medieval authors translate the colour that Aristotle had located between white and yellow.

36 See Bartholomaeus Anglicus (chap. 7, ed. Salvat 1988, § 39-40): "Aristote nomme ces .V. couleurs moyennes et dit que la premiere est appelee *palle*, et la seconde *jaune*, et la tierce *rouge*, et la quarte *pourpre* et la cinquieme est *vert*. Entre le blanc et le rouge est *palle*, près du blanc, et le jaune plus près du rouge; entre le rouge et le noir est le *pourpre*, plus près du rouge, et le vert, plus près du noir, sicomme dit Aristote ou livre du *Somme de la Vegille*." [Aristotle calls these five colours 'intermediate' and says that the first is called pale, and the second yellow, and the third red, and the fourth purple, and the fifth is green. Between white and red is pale, nearer to white, and yellow nearer to red; between red and black is purple, nearer to red, and green, nearer to black, as Aristotle says in the book *On Sleep and Sleeplessness*.] See also Salvat 1988, § 11.

37 Pastoureau 2012, 141.

38 This is the definition given in the glossary preceding the compilation of receipts for painters of Jehan le Bègue (Hüe 1988, § 35).

is perceived and categorised – rather than the colour shade itself, which can vary considerably from one ‘*pallidus*’ or ‘*subniger*’ to another.³⁹

The dark or obscure character that, according to this view, is inherent to blue may explain some of the remarks by medieval authors that would otherwise be difficult to understand. Albertus Magnus (c. 1200-1280) described the colour of lapis lazuli as ‘pale blue’,⁴⁰ whereas we would rather speak of a strong, intense blue. Bartholomaeus Anglicus and the herald Sicille, for their part, stated that indigo has a “beautiful sky colour”, whereas to our eyes it looks almost black (fig. 69).⁴¹ Given that the blue colour on alabaster panels is more often generated from indigo pigments than from azurite, one must wonder whether the alabaster sculptors did not consider the shade of the latter to be too light. This idea seems to be supported by the shade of green used on the panels. Although the weathering of the green pigments makes it difficult to determine their original shade, they all have a relatively dark tone.⁴² The tender and light greens of spring or yellowish greens do not seem to have been used.

The great importance given to the brightness of colours (or, on the contrary, to their darkness) allows us to better understand the role played by their brilliance or dullness. In the Middle Ages, brilliance is not so much seen as a reflection of light from an external source, but as a quality inherent to materials and colours.

Albertus Magnus explained that gold had two colours, a yellowish or reddish tone and a particularly brilliant shine.⁴³ According to the eminent scholar and theologian, this brilliance seemed to emanate from the gold itself, as if light were “incorporated into a coloured body”.⁴⁴ Albertus Magnus had made similar reflections about marbles: “...in some marbles it happens that pieces broken out of them sparkle slightly, as if mixed with metal; and this happens because their substance contains something transparent mixed with it, and when this is condensed, its surface gleams or sparkles. And this is one of the reasons why marbles are more noble than other stones”.⁴⁵ It should be remembered that Albertus Magnus classified alabaster amongst marbles and described its colour as “most noble and sparkling”.⁴⁶

39 See the observation in Pastoureau 2012, 172-173 : “Dès le IX^e siècle, le noir, couleur de l’humilité et de la pénitence, semble être devenu la couleur monastique par excellence; si dans la réalité textile il est souvent remplacé par du brun, du bleu, du gris ou par une teinte ‘naturelle’ (*nativus color*), les textes parlent de plus en plus souvent de *monachi nigri*”. [From the ninth century, black, the colour of humility and penitence, seems to have become the monastic colour *par excellence*; if in the reality of textiles it is often replaced by brown, blue, grey or by a ‘natural’ tint, the texts use the term ‘black monks’ more and more often].

40 “Zemec is the stone [also] called lapis lazuli; in it there is a pale blue colour with small golden specks. The pigment azure (*azurium*) is made from it.” Albertus Magnus trans. Wyckoff 1967, 125. Angel 1995, p. 352-353, in his footnote to the chapter 20, ‘Zemec’, proposes however to translate ‘*tenuis*’ by ‘beautiful’ and explains on this behalf: “The colour of the lapis lazuli being of a rather hot blue [bleu chaud], it seemed to us that it was necessary to assign to *tenuis* the meaning of smoothness, preciousness, beauty, and not of paleness.”

41 Bartholomaeus Anglicus, *De proprietatibus rerum*, book XIX, chap. 21 and chap. 32 (see Salvat 1988, § 106 and 122). The herald Sicille (éd. Cocheris 1860, 88) repeats this last passage of Bartholomaeus: “Azur et Inde [i. e. indigo] n’est que ung [...] Azur est de la couleur du ciel, qui est moult belle et a ung peu de couleur de pourpre meslée avec.” [Azur and indigo is the same thing [...] Azur is of the colour of the sky, which is very beautiful and has a little bit of the colour of purple mixed with it.]

42 Kepa Castro’s research team, which examined a series of English alabasters from the Basque country, including the Passion Altarpiece from Plentzia, discovered that carbon black had been added to the green pigments in the background. See Castro *et al.* 2008, 759.

43 Albertus Magnus trans. Wyckoff 1967, 191.

44 *Ibid.*

45 Albertus Magnus trans. Wyckoff 1967, 44.

46 “But among marbles, the white [kind] called alabaster is undoubtedly composed of a great deal of transparent [material...]; and the result is a most noble, sparkling colour in it.” (Albertus Magnus trans. Wyckoff 1967, 44).

The capacity to emit light, attributed by Albertus Magnus to gold and alabaster, among others, was all the more valued in the Middle Ages because it was considered to be God's own faculty. According to Roger Grosseteste (before 1170-1253), for example, God brought the universe into being by the act of creating light (*lux*) on the first day; space and all that it contains came into being through light.⁴⁷ For Grosseteste, it is understood that "light is unquestionably of a more worthy, excellent and noble essence than all other corporeal things".⁴⁸ As Gothic art attests, among many other things, this supreme appreciation of light, of its intensity and brilliance, was not confined to a few theologians, but later spread to be shared by large circles in medieval society. Understood as an active emission of light and as a sensitive image (or *species*) of the nature of God, brilliance, as manifested in the materials gold and alabaster, must therefore have been highly valued by contemporaries.

According to medieval conceptions, light is not only 'contained' in the materials gold and alabaster, it is also contained in colours; it is even its essence. Robert Grosseteste begins his treatise *De colore* with the definition: "Colour is light incorporated in a transparent body".⁴⁹ Similarly, according to Bartholomaeus Anglicus, "some say that light is the substance of colours and that colour is light incorporated in the body in which it is found".⁵⁰ However, he continues, a colour is much more appreciated when it is strongly illuminated: "...when the light is large and clear, the colour shows itself better, and when the light is small, the colour is darker and less pleasant to see."⁵¹ In reality, however, it is not the light (coming from an external source) that makes colours beautiful, but the 'brightness' that is in them. This luminosity of colour is present day and night; sunlight merely reveals it, for without it the human eye cannot perceive it.⁵²

47 See Robert Grosseteste's *De Luce* (Jorland 2016, § 13) : "Ainsi la lumière [...] se démultipliant par elle-même de tous côtés à l'infini, s'étendant de toutes parts également, étira avec elle, à l'origine des temps, sur toute l'étendue de la machine du monde, une masse de matière dont elle ne pouvait pas se dessaisir." [Thus light [...] being multiplied by itself on all sides to infinity, extending itself on all sides equally, stretched with it, at the origin of time, over the whole extent of the world's machine, a mass of matter from which it could not divest itself.]

48 Jorland 2016, § 12.

49 "*Color est lux incorporata perspicuo*". For the critical edition and translation of the *De colore*, see Dinkova-Bruun et al. 2013, 16-19, en part. 16.

50 "Aucunes dient que lumiere est la substance des couleurs et que couleur est une lumiere encorporee ou corps ou elle est." Quoted after Salvat 1988, § 41.

51 *Ibid.*, § 59 : "...quant la lumiere est grande et clere, la couleur se monstre mieulx, et quant la lumiere est petite, la couleur en est plus orbe [dark] et moins plaisant a veoir."

52 *Ibid.*, § 47 : "...comme la presence de la lumiere fait l'air cler et son absence le fait tenebreux, ainsi fait la presance de la clarté les choses blanches et son absence les fait noir/es/ et obscures". ["...as the presence of light makes the air clear and its absence makes it dark, so does the presence of light make things white and its absence makes them black and obscure."]. And *ibid.* § 44 : "Couleur donc est une qualité de liesce [sic] en l'extremité du corps par la nature de la meslee des qualités des elemens qui sont en cellui corps, laquelle couleur est par la lumiere presantee a la veüe pour en jugier; car sans lumiere la couleur ne puet mouvoir la veüe combien que par soy elle soit visible, sicomme dit Aristote ou livre de l'Ame, et n'est pas sa deffaulte se elle n'est pas veue sans lumiere, mais c'est la deffaulte des yeulx qui ne la puent veoir." [Colour therefore is a quality of *liesce* [?] in the extremity of the body by the nature of the mixture of the qualities of the elements which are in the said body, which colour is by the light presented to the eye to judge of it; for without light colour cannot move the eye, even though it is visible, as Aristotle says in the *Book of the Soul*, and this is not its default if it is not seen without light, but it is the default of the eyes which cannot see it.]

The distinction between light and clarity goes back to Aristotle (*De anima* 418b9-10; 419a11). As Richard Sorabji explains, "By light he [Aristotle] means that state of the air or water around us in which we can actually see through to colors at a distance from us. His idea is that when it's dark, we cannot actually see colors through the air or water. So the air and water are only potentially transparent. Light is the state in which they are actually transparent." See Sorabji 1971, 61, note 23.

Clarity and brilliance are therefore important aesthetic qualities of medieval colours. Unfortunately, the degradation of polychromies and the alteration of pigments, as well as the technical limitations of our photographic equipment and the instruments for physico-chemical analyses, do not always allow us to detect data that could give us precise information on these aspects. Was brilliance only found in white (alabaster), yellow (gold) and green (copper resinates, glazes), or did it also appear in elements painted in red (cinnabar) and blue (indigo), or even in black (carbon black)? The discovery of red lake with a glossy finish on the Rouvray altarpiece and on English alabasters from the Basque country, for example, proves that other colours could have had a glossy finish, and that for some panels at least the glossiness could perhaps have extended to the whole of the painted surfaces.⁵³

In any case, since alabaster and gold occupied the most numerous and most extensive surfaces, their brilliance strongly marked the overall appearance of most English panels. It mainly emphasised the sacred figures, with their white complexion and golden hair, as well as their white garments with gold edging. The white complexion and golden hair appear in many medieval literary texts to characterize noble ladies in particular; they thus correspond to an ideal of beauty that was widespread in society.⁵⁴ The most famous text, however, is of religious nature and concerns a man. It is the New Testament account of the Transfiguration of Jesus (Matthew 17:1-9, Mark 9:2-9, Luke 9:28-36). The son of God reveals his divine nature to three disciples, his clothes becoming white as snow and his face shining like the sun.⁵⁵ This text was very much in the minds of people in the late Middle Ages and may have helped determine the representation of the holy figures in bright white and gold – as if they, like Christ, were already appearing in their future glorious bodies. The herald Sicille, for example, recalls that at the Transfiguration, Christ “appeared as bright as the sun, in the colour of gold” and states: “And for that excellence, says the Scripture, [...] the just and holy person resembles gold and the sun”.⁵⁶ Like the use of other pure and ‘perfect’ colours, the abstract use of gold and white could therefore be interpreted as an invitation to the viewer to read the event represented not literally, but as ‘transfigured’. As Peter of Limoges (ca. 1240-1306) and others have pointed out, the Middle Ages considered that there were three kinds of vision, namely the perfect vision of God that the blessed will have after the Resurrection, the vision of the soul separated from the body after death, which allows us to see the divine essence in a less perfect way, and the vision of the human being on earth, which is the least efficient.⁵⁷ In this sense, the English alabasters may have been intended to deliver, through their symbolic and non-mimetic mode of representation, a more perfect vision of the transcendent world, much as the blessed might perceive it.

53 For the red lake on the panels of the Rouvray altarpiece, see Colinart & Klein 1997, 99. For the red lake on several panels from the Basque Country, see X. Martiarena Lasa 2012, 166.

54 See also Pastré 1988.

55 Matthew 17, 2 : “*Et resplendit facies ejus sicut sol, vestimenta autem ejus facta sunt sicut nix*”. Modern translations of the Bible replace the colour ‘snow-white’ of the garments by the term ‘light’.

56 Sicille, ed. Cocheris 1860, 21; the author is probably referring to St Paul’s Epistle to the Philippians, 3, 21.

57 Peter of Limoges, ed. and trans. Newhauser 2012, 12-13.

CONCLUSION

Intimately combining plastic forms and colours, English alabasters can be termed 'three-dimensional paintings'. Both components of the works of art contribute equally to the encoding of the religious message they convey and disseminate. The total or partial loss of their coloured epidermis, which is frequent today, is therefore equivalent to a partial destruction of the works. This loss no longer allows their aesthetic and symbolic qualities to be properly appreciated. Hence the need to reconstruct their medieval polychromy in order to recover this lost data, at least in part. This was the principal objective of the present study: to retrieve the colours of three of these panels preserved in the Bordeaux region.

This ambition is not without its problems, both technical and epistemological. The approach combining the views of specialists from different disciplines seemed to us to be the best way to overcome them.

Firstly, non-invasive physico-chemical analyses, carried out on the entire corpus of narrative panels from the Bordeaux region – some twenty of which still retain remnants of polychromy – made it possible to determine the materials used for the painting. These analyses showed that the painters of the English alabaster panels used lipidic binders (of the linseed oil type) and a limited range of colours, composed of cinnabar red, copper green (resinate or acetate), deep blue (azurite or indigo) and, in small quantities, lead white. This range of colours is completed by the white of alabaster and the brilliant yellow of gilding (layered on mixtures tinted with red or yellow ochre). Alongside this omnipresent pentachromatic palette, other colours and pigments were used more sporadically: carbon black, various red ochres, red lead, organic yellow, etc. The pigments hardly seem to have been mixed with each other – with the exception of pink, which is often composed of cinnabar and lead white – and are characterised by the intensity of their tone.

These results are very much in line with those obtained in other archaeometric studies of English alabaster panels from places as diverse as the Spanish Basque country, Normandy and Gdańsk, or museums in London and Glasgow. Although their number is too small to be representative of the entire corpus of alabasters, these studies nevertheless confirm that English painters regularly used a limited range of highly saturated colours, produced with the same materials and pigments.

In the course of the research project, paints imitating those used in the Middle Ages – based on the results of the physico-chemical analyses – have been reproduced. The different configurations found on the panels led to the creation of over eighty samples. They allow the exploration of the material qualities of the paint, its texture and the surface effects it produces.

The colours were applied directly to the alabaster. The whiteness of the support and the absence of undercoats increased the brightness of the colours, and the lipidic binder (probably linseed oil) provided brilliance. The painted surfaces are homogeneous and opaque. Generally speaking, mineral pigments (ochres, cinnabar, azurite, etc.) adhere more easily to the support and form more homogeneous layers than organic pigments and these properties may have played a role in their being selected. In the end, the painters of the alabaster slabs show a preference for brilliant, or at least satiny, colours: medieval thinkers considered brilliance as an active emission of light and, as such, associated it symbolically with the divine.

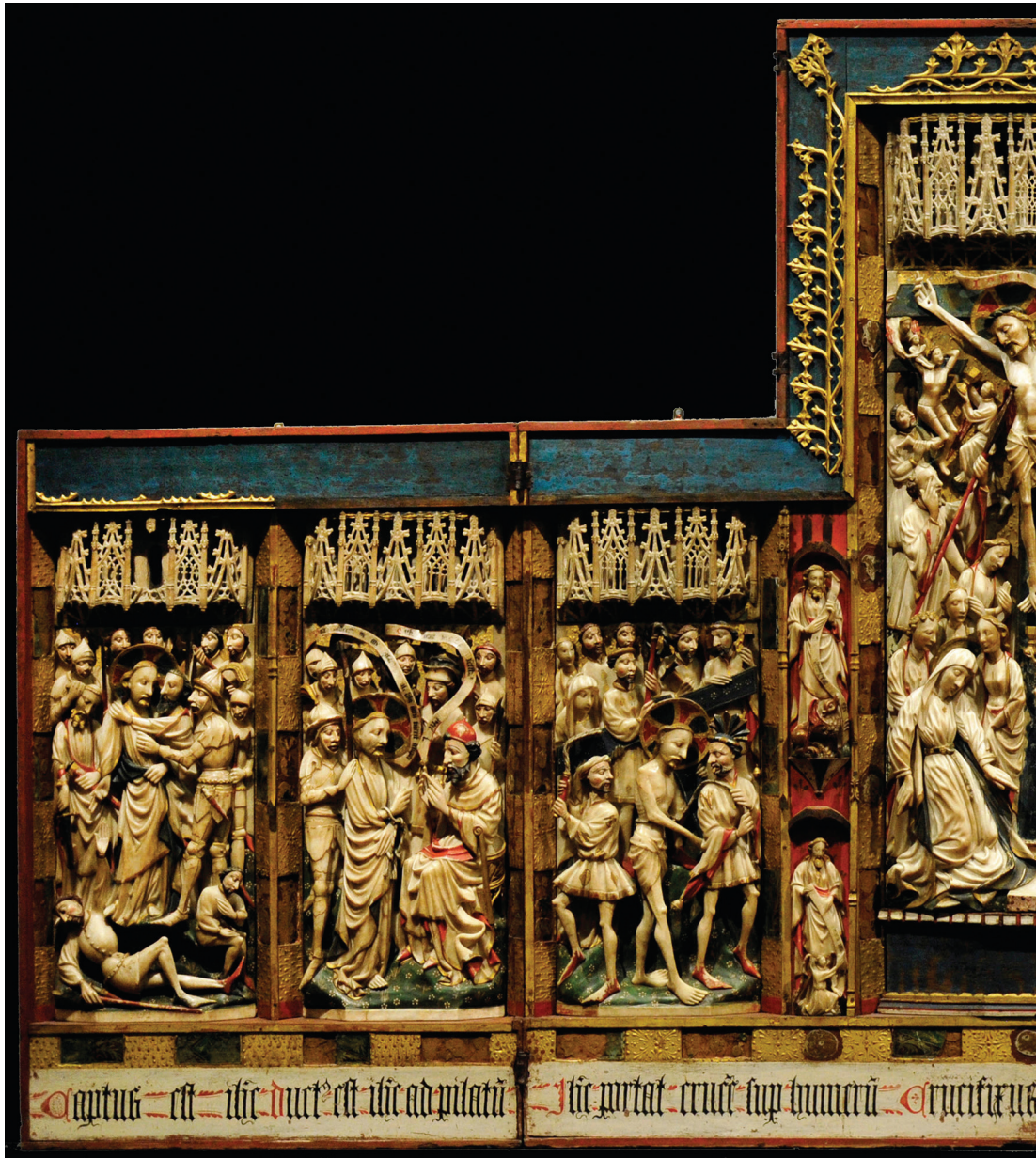




Fig. 70. Passion Altarpiece, Naples, Capodimonte Museum.

In order to better understand the chromatic universe and the organisation of colours within a panel, an alabaster facsimile was carved. During the cutting of the block it became easier to understand the different stages in the creation of the sculpture. It was also possible to grasp how the physical qualities of the stone, especially its fragility, contributed to the subtlety of the modelling.

Once the panel had been cut, the gold-leaf and the various colours determined by the physico-chemical analyses were applied. The coloured surface of the panel is characterised by its organisation into monochrome colour fields, often surrounded by gold borders, and clearly separated from each other; in general, 'light' colours (white and gold) adjoin 'dark' colours (red, green and blue). As Michel Pastoureau has noted, although large monochrome surfaces were appreciated, they are almost non-existent in medieval images and are regularly animated with *semé* or patterns of charges, *i.e.* geometrised and stylised ornamental forms dispersed regularly over a monochrome surface.¹ The 'daisy' florets and other ornamental motifs emerge from the background thanks to a similar contrast between light and dark colours.

The colour scheme of the *Assumption* panel kept in Bordeaux's Musée d'Aquitaine, used as the model for the facsimile, proved to be atypical of that which characterises the polychromy of the vast majority of the English alabaster production. In order to study more representative examples, some supplementary 3D models were produced.

A first model, specifically that of the *Assumption* in the Musée d'Aquitaine, made it possible to compare the digital version with the polychrome facsimile of the panel. The most important differences appear in the rendering of the optical characteristics of alabaster and gold: the translucency and brightness of the former, as well as the brilliance of both materials, are difficult to represent digitally. Within the course of the research project, real progress was made in improving the rendering (fig. 47). New tools, such as shaders based on optical measurements – still under development – will one day allow the optical properties of alabaster and gold to be simulated much more accurately.

Two other 3D models, the first reproducing a panel preserved in Libourne, the second a tablet from Saint Michel in Bordeaux, were intended to replicate the usual chromatic universe of English alabasters dating from the fifteenth century.

Although these two panels are characterised by a colour scheme and aesthetic principles that do not differ fundamentally from those of the *Assumption* panel, the major difference lies in the fact that these principles, applied in a more rigorous manner, are perfectly in line with those used on the vast majority of English panels. To simplify, we could say that they present the typical decorative scheme of fifteenth-century English alabaster: the pentachromatic palette is fully displayed here thanks to the introduction of blue, which is absent from the *Assumption*, but also from most fourteenth-century panels. The obverse sides of the garments are now uniformly white and systematically edged with gilt hemlines. The linings are exclusively painted red or blue. The characters' complexions are now immaculately white; pink (and brown?) skin, on the other hand, is reserved for villains.

As the visual examination of a large number of other panels, whether in museums or churches, in the Aquitaine region or elsewhere, suggests, these aesthetic principles seem to have been observed by all the English painters with such rigour that we might wonder, each time an alabaster panel deviates from these lines, if we are not dealing with a repaint.

1 Pastoureau 1991, 38-40.



Fig. 71. Samples of indigo, diluted indigo (bottom left), azurite and unpainted alabaster. Left: frontal illumination and opaque background; right: the same samples when backlit.

Although the research presented in this book has allowed the reconstruction of the polychromy of three English alabaster panels, much remains to be done. Indeed, these individual panels cannot provide an accurate picture of the appearance of a complete altarpiece, usually composed of seven or nine or even more units. Nor do they take into account all the components of these works, that is to say, the canopies and sometimes the pedestals that frame the panels, the wooden oak chest in which they were housed, also gilded and painted, and finally the inscriptions identifying the scenes depicted. The altarpiece of Munkaþverá (fig. 48), typical of the chromatic aesthetics of the fourteenth century, and that of Naples (fig. 70), representative of that of the fifteenth century, still illustrate quite well what has been lost almost everywhere else.

We also did not address the issue of lighting. It is a fact that English sculptors did not exploit the natural translucency of alabaster. The panels are placed in front of an opaque background, in this case a wooden chest devoid of openings. Although the backlighting would have made the alabaster even brighter, the opaque painted parts would have lost much of their brilliance and would have appeared much darker (fig. 71).

It is also difficult to assess the medieval lighting conditions of these works, which were usually placed on the altar of a church. Although this liturgical piece of furniture is often equipped with candles, they do not play the same role as museum illumination for the attractive highlighting of works of art. They do not serve so much to illuminate the space as to symbolise the presence of God, as St. Jerome explains. Hence, he adds, the custom of lighting churches



Fig. 72. *Virgin and Child in a tabernacle* (detail). Ivory, Paris, second quarter of the 14th century (Paris, Musée du Louvre).

day and night.² Finally, it should be remembered that, apart from certain exceptional cases, the panels were painted in the workshops of the *alabastermen*. If they were exported, the painter was probably unaware of the lighting conditions in the church for which the work was intended. In the last analysis, it is the standardisation of the colour scheme itself that most clearly opposes the idea that it could have been individually adapted to the lighting conditions of their final location: alabaster altarpieces in Iceland and Croatia show the same range of colours and the same manner of distributing them over the panels' surfaces.

As mentioned above, the range of colours used by English painters largely corresponds to the most common medieval classification of colours – white, golden yellow, red, green, blue and black – which in turn is based on Aristotle's texts on this topic. Like heraldry, English panels hardly admit more than this small number of 'primary' colours. However, there is a fundamental difference between the world of alabaster and that of heraldry, namely the exclusion of black. Black, conceived in medieval treatises as a total absence of light, is reserved for the devil and his creatures; in this respect it is opposed to the light that God created on the first day of Genesis. This almost Manichean conception of colours, which the domain of heraldry ignores, shows that the chromatic universe of alabasters is strongly impregnated with clerical culture.

The symbolic use of colours is hardly compatible with *mimesis*, *i.e.* the imitation of nature. And indeed, on many occasions, the polychromy creates a chromatic universe far removed from reality. The figures in the panels act in a world where the skies are always golden and strewn with gesso nodules, and where the ground is eternally in bloom – even if the scene takes place inside a dwelling. The same stylised florets as those on the soil also adorn objects such as the cross of Christ. The hair shows the metallic glitter of gold, and in the fifteenth century, the complexions of positive figures are immaculately white. But the use of colour is not always governed by this Manichean conception. For example, the armour of the soldiers, who are considered to be vile creatures, is as white and adorned with golden 'hemlines' as are the vestments of the saints. Would aesthetic considerations have prevailed here?

The colour schemes of English alabasters, even though they are very particular, are not specific to these works of art. As mentioned above, many of the principles governing their colouring also apply to heraldry. The aesthetic of bright white and gold is also characteristic of fourteenth-century ivory and marble sculpture; one might consider the many sculptures of the *Virgin and Child* from this period, which combine this white and gold universe with some intense red, blue and green accents (fig. 72). The same aesthetics, taken to the extreme, are embodied in the French enamels in the round from the period around 1400, which combine the bright and brilliant colours – red, green and blue – with the yellow of gold and the particularly pure and unctuous white of enamel. They also feature white complexions, golden hair and golden trims on clothing. It is worth noting that all of these sculptures are distinguished by the bright and shiny whiteness of their material and by their small size; no doubt this particular quality of white and this miniaturisation added to the attractiveness of the works in the eyes of the medieval spectator.

2 See for instance Dow 1957, 266: "As early as the fourth century Vigilantius ridiculed the burning of lamps in churches during the full light of day, but Jerome justified the practice through its symbolic associations: 'Throughout the churches of the East when the Gospel is read candles are lighted, although the sun is shining, not for the purpose of driving away darkness, but as an outward sign of gladness... that under the type of an artificial illumination that light may be symbolized of which we read in the Psalter, "Thy Word, O Lord, is a lantern unto my feet, and a light unto my paths."' St. Isidore, Amalarius and Hrabanus Maurus all used this same justification." For the Catholic Church, this symbolic meaning still holds true: candles, lamps or sparklers express the light of God that enlightens humanity and are, in this sense, symbols of the revealed truth. [online] <https://eglise.catholique.fr/glossaire/cierges-lampes-bougies/> [last accessed on 27 may 2021].

The specificity of English alabaster does not lie in its aesthetic bias, but in the longevity with which it was applied. Indeed, it does not seem to have been modified throughout the fifteenth century, nor probably during the first third of the sixteenth century.³ Even in 1550, this astonishing conservatism clearly did not prevent French clients from buying these works 'eagerly', as the English ambassador Sir John Mason noted. In some Italian princely courts, English altarpieces were able to assert themselves in the fifteenth century in the face of potential competition from Renaissance artists, as in the case of the d'Este family in Ferrara, who endowed the private chapel of their palace with an English alabaster altarpiece⁴. Further research would be necessary to understand the reasons for such choices. In any case, these facts underline the need to place English alabaster panels, despite their singularities, in the wider context of late medieval European art, just as the most recent studies have begun to do.⁵

- 3 The Bordeaux region does not seem to have preserved any panels from the sixteenth century, which are characterised by the introduction of clothing details typical of the Renaissance, such as the toques with upturned edges or the square-toed shoes worn by the men, or the voluminous headdresses reminiscent of turbans worn by certain female figures. We have therefore not been able to verify in detail whether the chromatic universe of the alabasters underwent any changes during this last phase of alabaster production.
- 4 See Murat 2016, 410, who refers to eighteenth-century texts according to which the altarpiece now on display in the Palazzo Schifanoia in Ferrara was originally "*the altarpiece of the domestic altar of the Estensi marquis, rulers of Ferrara*", which is to say that it was the altarpiece of the palatine chapel of the Este family, inside their castle in the city centre of Ferrara."
- 5 Woods 2018; De Beer 2018; Murat ed. 2019; Brantley *et al.* ed. 2020.

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