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## THE VERMEILLONNER, AN ORIGINAL SEVENTEENTH CENTURY FRENCH GILDING TECHNIQUE, ALSO USED IN SPAIN (*BRONCEADO*) AND PORTUGAL (*FOSCADO*) DURING THE EIGHTEENTH CENTURY

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### Abstract

*This paper aims to present a typical matte finish coating made with a tinted glaze applied to gilding found on late Baroque and Rococo polychrome altarpieces in Spain and Portugal dating from the mid eighteenth century. This practice is poorly studied in Portuguese historiography. In order to characterize this particular technique, it was necessary to consult earlier baroque treatises on art, as well as numerous contemporary gilding contracts signed during the eighteenth century in Spain and Portugal. This technique is known as 'Vermeillonner', which consists of applying a transparent glaze of 'vermeil' over gold leaf. This term is popularized in France in the eighteenth century, though 'Bronceado' ('bronzed', because of having a bronze-like color) is used in Spanish or 'Foscado' ('matted', because the surface layer provides a matte appearance to the gilding) in Portuguese. New researches have allowed establishing the origins of the technique in a French treatise of 1679.*

**Keywords:** Vermeil; Vermeillonner; Bronceado; Foscado; Matting; Cross-Sections; Gum Arabic; Dragon's Blood

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### Introduction

The 'vermeillonner' with the 'vermeil' is a finishing technique which played a double role: matting and tinting water gilding areas by applying a coat of reddish-colored hue, which then provides a matte orange hue to the gold leaf. The layer, which sometimes is a water-based coating and other times a finishing varnish, is brushed over the gilding in order to create areas of contrast with the burnished gold. Both expressions began to be popular in France during the 18<sup>th</sup> century.

It seems more resembling with the "mecca gilding" because it is done with colorants dissolved completely in a medium. The "mecca gilding", known in Spanish as '*Corladura*', is a technique simulating gold quite largely used in the Medieval period in Europe a varnish or aqueous yellow-orange coating over silver or tin, frequently made with an direct diluted coloring agent (dye), such as saffron, Dragon's blood or Gamboge lake.

This technique was used by gilders in Spain, Portugal and France during the late Baroque and Rococo époque, with different decorative versions in the case of '*bronceado*' and '*foscado*'. It is inspired by the process of gilding by applying a fine red glaze over the gold in the 17<sup>th</sup> century.

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In order to support the historical findings, a scientific study was carried out on a selection of samples of unadulterated, original '*Bronceados*', taken from altarpieces that seem to have never been restored, from different churches located in Asturias, Spain.

### 'VERMEIL'

Recently, a historical research, carried out in the context of a grant from the *Maria Cristina Masaveu Foundation* to study polychrome altarpieces of the North of Spain has revealed new information<sup>1</sup>. The origins of the technique were found documented in a French treaty from the second half of the seventeenth century: the Claude Boutet's *Ecole de la miniature*, published in Lyon in 1679 [1]. The author explains this technique 'to matting gold' as being '*vermeil*', an aqueous glaze of egg white, sanguine and vermilion: '*Pour matter l'or: Faites un Vermeil avec de la Sanguine, un peu de vermillon & du blanc d'oeuf bien battu, broyez le tout ensemble sur le marbre, & mettez-en dans les renforcemens avec un pinceau fort délié*' (pp. 154-155). The work is translated and published in Spain by Orellana in 1755 [2], annexed to the re-edition of *Tratado de barnices y charoles* by Cantelli (1735).

A similar technique is also mentioned a decade after in an English publication, the Stalker & Parker's *Treatise of Japanning and Varnishing* (1688) [3], as a practice used for matting the backgrounds of the carving with reddish hue to emphasize the burnished areas, through a colored varnish ('*lacquer*') made with colorants:

*Having burnisht so much of your work as you design, leave the ground of your Carving untoucht, and some other parts as you think best, wick being rough in respect of the other, sets off and beautifies the burnishing; that wick is not burnisht, must be matted or secured with Size, Seed-lac-varnish, or Lacker, if you desire it deep-colour'd ... then the work must be set off or repossed with Lacker, mixt in a gallipot with Dragons-blood an Saffron, or a colour called, Ornator. [p. 60]*

Later, William Salmon repeats a similar description in one of the last editions of *Polygraphice-Or, The Arts of Drawing, Engraving...* (London, 1701) [4]. In the Dossie's *Handmaid to the Arts*, (London, 1758) the recipe is also found [5].

The term '*vermeil*' appears again in Diderot's *Encyclopédie* (1751-1772) [6] in two new and different recipes: a colored resinous varnish composed of Gamboge, vermilion, red and brown pigments mixed together, a varnish and turpentine; or an aqueous layer, with carmine or Dragons' blood in tempera or water alone:

*Vermeil, s. m. (terme de Doreur en détempre.) c'est une composition faite de gomme gute, de vermillon & peu de brun-rouge mêlés ensemble, & broyés avec du vernis de Venise & de l'huile de térébentine; quelquefois ce vermeil se fait avec la seule lacque fine ou le seul sang de dragon appliqué en détempre, ou même à léau seule. Les Doureurs s'en servent pour jeter un éclat dorfeverrie sur leurs ouvrages; c'est la dernière façon qu'ils leur donnent (XVII:73).*

The novelty in Diderot's text is that the technique is described as not being performed with the purpose of turning the surface matte, but to imitate the aspect of goldsmith work. This idea is similar to what Watin has written and to the '*bronceado*' and '*foscado*' techniques to coat sculptured relieves.

Watin's *L'art du peintre, doreur, vernisseur* (Paris, 1773) [7], consecrates definitively the term '*vermeil*', which is repeated in 19<sup>th</sup> century treatises or later, as the Portuguese treatise written by Francisco Liberato Telles de Castro (Lisboa, 1900). Additionally, the French author is responsible for using the term '*vermeillonner*': '*to give the work the reflex and color of gold pigment*'. The recipe he published seems similar to the one of '*bronceado*' because it includes Arabic gum and Dragon's blood, although it also refers other dyes as Gamboge, saffron and orlean (annatto).

*Le vermeil est un liquide qui donne du reflet et du feu à l'or, et qui fait paraître l'ouvrage vermeillonné, comme s'il était doré d'or moulu; on le compose avec une partie de sang de dragon, de rocou, de gomme-gutte, de beau safran et de cendres gravelées, qu'on fait bouillir ensemble dans de l'eau, en consistance d'une liqueur qu'on passe par un tamis de soie ou de mousseline. On y introduit, quand on l'emploie, de l'eau de gomme arabique, qui se compose avec un quarteron de gomme fondue dans une pinte d'eau*

*Vermeillonner. C'est coucher de vermeil, pour donner à l'ouvrage du reflet et une couleur d'or moulu. Trempez dans votre vermeil un pinceau très fin et vermeillonnez tous les refends, les carrés et les petites épaisseurs, ayant grand soin de n'en point mettre trop à nage, ce qui formerait des noirs: il faut passer légèrement avec goût et propreté, ne faire que glisser simplement sur l'or (1823 9<sup>a</sup> ed., 206 & 219).*

### **'BRONCEADO'**

#### **Origin and terminology**

'Bronceado' was first introduced in gilded altarpieces in the final stage of the baroque at the end of the first third of XVIII century, becoming generalized in rococo polychromy between the middle and the end of the same century.

This technique doesn't seem to have been previously used in Spain, which can explain why it is not referred in any baroque treatise, as the famous ones from Palomino (1715-24) or the recipe book from Montón (1734). Curiously, it is also not quoted in the artistic dictionaries of Rejón (1788), Martínez (1788) or even in the Spanish translation of Watin's work (1793), in which the term 'vermeil' is translated as a coating/bath ('baño'), and 'vermeillonner' as applying a coating/bath ('bañar').

The term 'bronceado' seems to have been used for the first time in *Panegyrico Funeral*, a non artistic book written in honor of Zaragoza archbishop, and published in 1730 by the churchman Soler and García, which reveals the rapidly expanding interest that this new technique had raised among the ecclesiastic clients. García used this expression while describing an altarpiece: '*altarpiece of precious woodcarving, gilding and "bronceado"*' (ch. III). The expression then becomes popular and starts appearing several times in gilding contracts. The name of the technique is owed to the fact that painter-gilders associated the visual results of the technique with the color of bronze: '*imitating as far as possible bronze properties*'<sup>2</sup>.

In a contract dating of 1723 from the north of Spain, there are some evidences which seem to relate the origins of 'bronceado' with the French 'vermeil' technique, although the Spanish term is not used. The contract for the polychromy of the altarpiece of church Santiago de Medina de Rioseco stated the following: '*the rays between the clouds and the hair of seraphins and their wings must be gilded imitating gold pigment, being the background with dragon's blood to enhance these areas*'<sup>3</sup>. The application of this technique in the background to enhance the reliefs reminds us of Boutet writings, while the idea of imitating the "gold pigment" reminds Watin texts, which are not referred in any contract of Northern Spain.

The foreign origin of the technique is noticeable in several legal contracts of the time. In 1745, a gilder from Burgos, pointed to the fact: '*the flat friezes must be "bronceados", emulating foreign gilding*'. He also stated that, '*although it was practiced in his days, he didn't like it very much because it aged the gold and he preferred the major splendor of burnishing*'<sup>4</sup>. In this document is also clear that the process had some detractors.

#### **Technique and materials**

'Bronceado' consists in the application by brush of a thin colored coating on top of gold leaf. The coating should be an aqueous based glaze of a reddish tone. Some contracts remit to the use of Arabic gum and Dragon's blood to execute this technique, as one of Segovia, from

1764: ‘*Dragon’s blood and gum for the bronceado: thirty reales*’<sup>5</sup>; or another from Cantabria (1792): ‘*it shall “broncear”... prepared its color, it shall be dissolved with Arabic gum for greater luster and brilliance*’<sup>6</sup>.

Instead of the usual red bole, in the areas that would be ‘*bronceadas*’ a lower quality yellow clay was used, as the ‘*ocher calamoche*’, or even a layer with a yellow pigment, as ‘*ocher of Flanders*’. Some craftsmen, however, refused it: ‘*without using Calamocho ocher which can be very harmful ... can be the cause for defective work... it shall not be used Calamocho, but bole of Llanes, with which the bronceado will be more vivid and glossy*’<sup>7</sup>. The technique of using two types of colored bole was a common practice used in the same altarpiece.

***Uses/decorative purposes:***

As the use of color in Rococo period is increasingly abandoned in carved altarpieces in Spain, imposing completely gilded works to imitate goldsmith solid pieces, ‘*bronceado*’ technique became common. The ‘*bronceado*’ was the perfect technique to enrich the gold surface providing different shades, reflections and hues. Gesso ground engraved decorations became generalized, depicting *rocaille* or geometric shapes in plane areas. In these, in order to highlight the designs, it was usual to alternate between burnished gold and matte gold, where ‘*bronceado*’ reaches its maximum development. To achieve matte surfaces, gilders could exploit four options: alternate between burnish and not burnished gold leaf, coating with ‘*bronceado*’ technique; incising previously the ground, or using various types of punching tools on top of the gold leaf.

‘*Bronceado*’ could also be used with other decorative purposes:

- In the background of engraved gesso decorations, to enhance the drawings (Fig. 1&2)
- In the plane or concave backgrounds of some sculptured relieves of the altarpiece, as *rocailles* or capitels of columns, to enhance the volumes or just provide different hues to the gold (Fig. 3)
- Complete coating of plane areas in the architectural elements of the altarpiece (Fig. 4)
- Complete coating of some sculptured figures of the altarpiece, as masks or human figures



**Fig. 1.** Lateral altarpiece from Pontedeume’s parish church, Coruña



**Fig. 2.** Major altarpiece from Saint Mary’s church, Becerril de Campos-Palencia



Fig. 3. Lateral altarpiece from Saint Andrew's church, Carrión de los Condes-Palencia



Fig. 4. Niche ambulatory from Oviedo's cathedral

### 'FOSCADO'

Although less employed, in northern Portugal a similar process to 'bronceado' can also be seen in some altarpieces, a technique which appears to have been called at the time 'fosco' or 'enfoscado' (meaning "matte"), according to Carlos Nodal [8]. These words appear in several Portuguese contracts [8], although most of the times it is not clear how this matte effect was obtained. It is not certain whether "fosco" always refers to the application of a colored finishing, or just to the execution of matte gilding (not burnished, perhaps mordant gilding) or even to the application of a transparent layer on top of the gold (as an animal glue or gum) which could also diminish its brilliance.

In a recipe book called "Prendas da Adolescência", written by José Baptista de Almada [9], the term "douradura fosca", matte gilding, seems related to the appliance of a colored layer, because it says the matte effect is made with dragoons-blood, gamboge and vermilion, dissolved in a skin glue:

*Da douradura fosca: Se entre o ouro burnido sobredito se quizer dourar de fosco alguma cousa, esta se não burnirá, mas tomar-se-ha huma agoa muyto liquida de colla de luvas, e nella se lançará huma parte de guta gamba, bem moída, outra de sangue de Drago, e outra de vermelhão, e tudo muyto bem mexido, e quente em huma panella, (mas pouco) deste licor com hum pincel se dará hua mão bem estendida sobre o ouro, sem mais cousa alguma.*

One of the most representative cases is the contract (1746) of the altarpiece of São Paio church, in Guimarães, in which the 'fosco' technique seems directly related to the application of a colored layer on top of the gold: 'must be gilded with gold of good quality with its "foscas" of several colors, some more colored and other less... and the seraphim and children shall be red or gilded and "foscados" as it is usual'<sup>8</sup>.

However, 'fosco' appears mostly without any reference on how the matte effect should be achieved, as in these two other contracts: the one for the collateral altars of Lavra church, dated from 1750, which states: 'All the boys and figures of the altarpiece must be gilded and "foscas", ...or in any other place where the "fosco" is needed'<sup>9</sup>; and the other contract (1751) related to the main altarpiece of St. Ildefonso church, in Oporto, referring that 'all figures and seraphim shall be gilded and "infoscados" and will have "foscas" where needed'<sup>10</sup>.

Decorations in engraved grounds are rarely applied in Portuguese rococo, and the 'foscado' technique has been mostly used for a coating in sculptural elements of altarpieces, as atlantes, puttis or birds (Carmelitas and São João da Foz's churches of Oporto, church from

Vila do Conde, Misericórdia of Braga) (Fig. 5.). This technique can also be found providing contours in some relieves, as it is the case of Miragaia church, in Oporto; or in flat areas of niches, combined with decorations made with brush or punched work (São Bento da Vitoria de Oporto; Santísimo Sacramento chapel from the Viana do Castelo's cathedral) (Fig. 6.)



**Fig. 5.** Carmelita's church altarpiece, Porto



**Fig. 6.** Santísimo Sacramento Chapel's altarpiece, Viana de Castelo's cathedral

### Scientific Study of ‘Bronceado’ Technique From Different Altarpieces of Asturias - North of Spain

The extreme thin layers of areas where the ‘Bronceado’ technique has been used and their composition based on dyes dissolved directly in an aqueous binder, without the use of pigments, make its identification quite difficult. The few scientific studies based on stratigraphical analysis published in Spain, could not precisely identify the materials used for this technique. The study of the polychromy made by IPHE in the main retablo of the church of San Mateo de Lucena (Córdoba) reveals the use of two types of ‘bronceado’: one thick and dark as a glaze, made with egg and a dark pigment; another one very thin, easily soluble, that was not chemically identified [10]. The study is also rendered difficult by the fact that is not an easy task to find intact, original layers of ‘bronceado’.

#### Analytical protocol

Within the Gilt-Teller project [11] few samples from Spanish altarpieces were studied using a multi-technique complementary protocol. To the purpose of studying the original ‘bronceado’ technique, the altarpieces of Saint Bartholomew and Deposition of Christ in the Oviedo’s Cathedral (Asturias), and the left altarpiece from the Villazón church (Asturias) (Figure 7) were chosen for the analytical study, sampling being performed in areas where this decoration was visually identified. The collected samples were embedded in the form of cross-sections and analyzed under optical microscope, in visible and fluorescent light and under scanning electron microscope coupled with energy dispersive X-ray spectrometry.



Fig. 7. The three altarpieces – overall views

The cross-sections were observed at different magnifications (from 50x to 500x), using an Axioplan Zeiss 2 imaging binocular microscope. The images were acquired using a Nikon DXM1200F digital camera, coupled to the microscope. The filter blocks used for observing the fluorescence were f8 (G 365, FT 395 and LP 420) and f6 (BP 450-490, FT 510 and LP 515). Visual light observations (dark field observation, abbreviated as f2) were performed in reflection geometry.

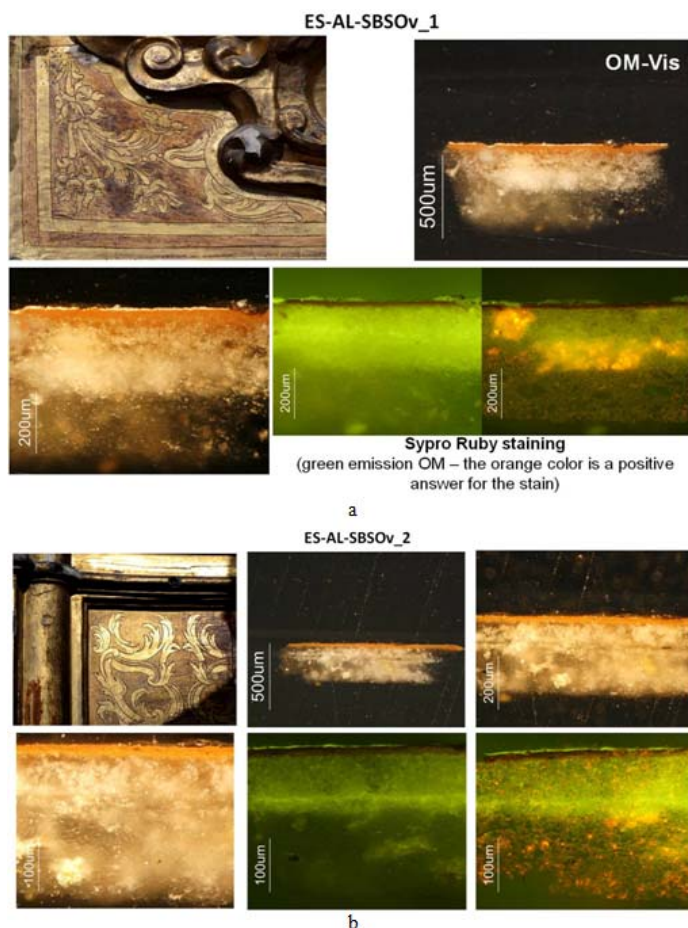
A fluorescent stain, Sypro Ruby, specific for the identification of proteins [12-13], was applied on the cross-sections in order to assess the distribution of proteinaceous materials (mainly glues) in the polychrome composite and also to confirm or not the presence of a protein-based material in the coating layer over the gold leaf.

The morphological observation of the cross-sections at different magnifications (from 70x to 1500x) and the elemental mapping was performed using a SEM – VEGA II LSH Scanning Electron Microscope (TESCAN - Czech Republic), coupled with EDX – QUANTAX

QX2 (ROENTEC – Germany) spectrometer. Quantax QX2 uses detector of third generation Xflash, that does not need cooling with nitrogen and is 10 times faster than traditional detector based on Si(Li). The EDS spectra have been acquired in the following conditions: 20 kV voltage; 1x10<sup>-3</sup> Pa; 5000 nA; working distance 11–20 mm (16.6 mm for EDX), scanning speed: 200 ns; magnification: 78x and 1000x. The cross-sections were covered with a fine layer of graphite using a specific “sputter coater”.

## Results and discussion

As the figure 8 shows, the stratigraphy of two samples (1 and 2) from the St. Bartholomew altarpiece decoration with ‘*bronceado*’ is made of a simple sequence: thick ground layer of white color (varying from 500 to 1200 μm), orange bole layer (around 15–20 μm), metal leaf and an organic coating that is almost invisible under Vis light but becomes visible under fluorescent light. The gesso ground (Ca S, O) is made of the sequence of *gesso grosso* and *gesso fino* as the traditional recipes mention and this differentiation is visible in the SEM images (Figure 9). The bole layers are made of clay minerals (Fe, Al, Si were detected as main elements – Figure 10a), while the composition of the leaf (an alloy of Au, Ag and Cu) is variable, from 19 to 22 karats (an average value of 21 was calculated for most of the analyzed samples in both altarpieces - Figure 10b).



**Fig. 8.** Sampling area and cross-sections observed under OM with the Sypro staining results for: a) sample 1; b) sample 2 from the St. Bartholomew altarpiece (credit Irina Sandu)



The Sypro Ruby stain maps the presence of protein-based binder in the ground layer (probably animal glue) and also in the bole (as a specific bright orange coloration) but do not stain the surface coating that maintains a grey-blue fluorescence under UV and a light green-yellow one under filter set 6. This observation together with the literature assessment on the identification of organic materials/coatings based on their inner fluorescence (e.g. orange color of fluorescence under UV for shellac coating; grey-blue hues for proteins; strong yellow hues for aged oils and resins etc.) led to the conclusion that the surface layer is not a proteinaceous material but of other nature that should be further investigated using more appropriate analytical techniques (gas-chromatography, mass spectrometry, etc.).

The solubility tests done “in situ” on the studied altarpieces showed the presence of a coating, soluble in water, which advances the hypothesis that the surface layer observed in sample 1 (Figure 8), might be based on Arabic gum, as the Spanish historical documents pointed to.

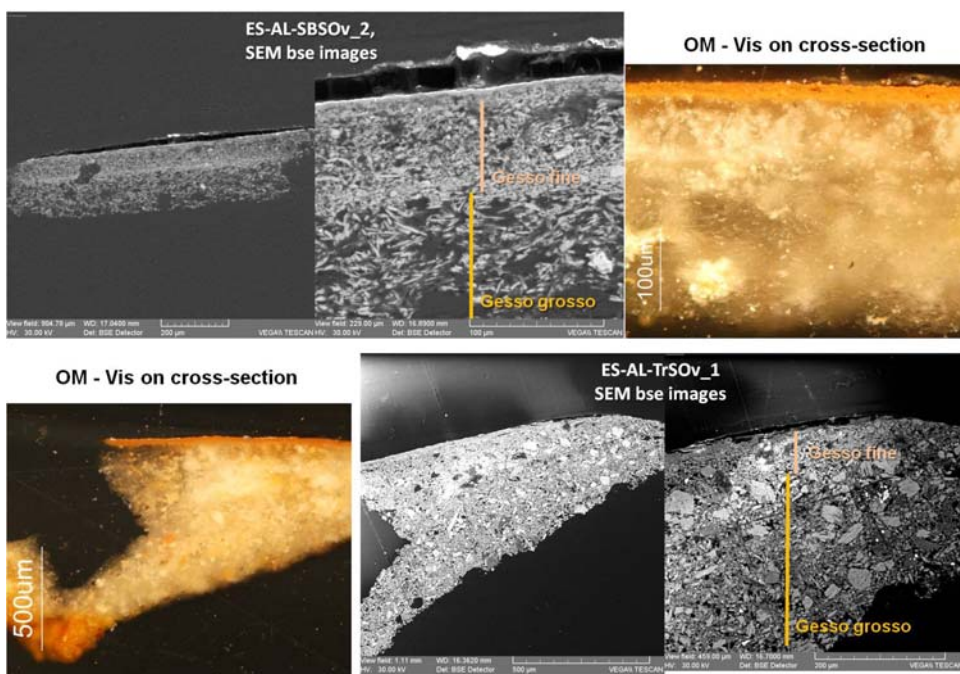
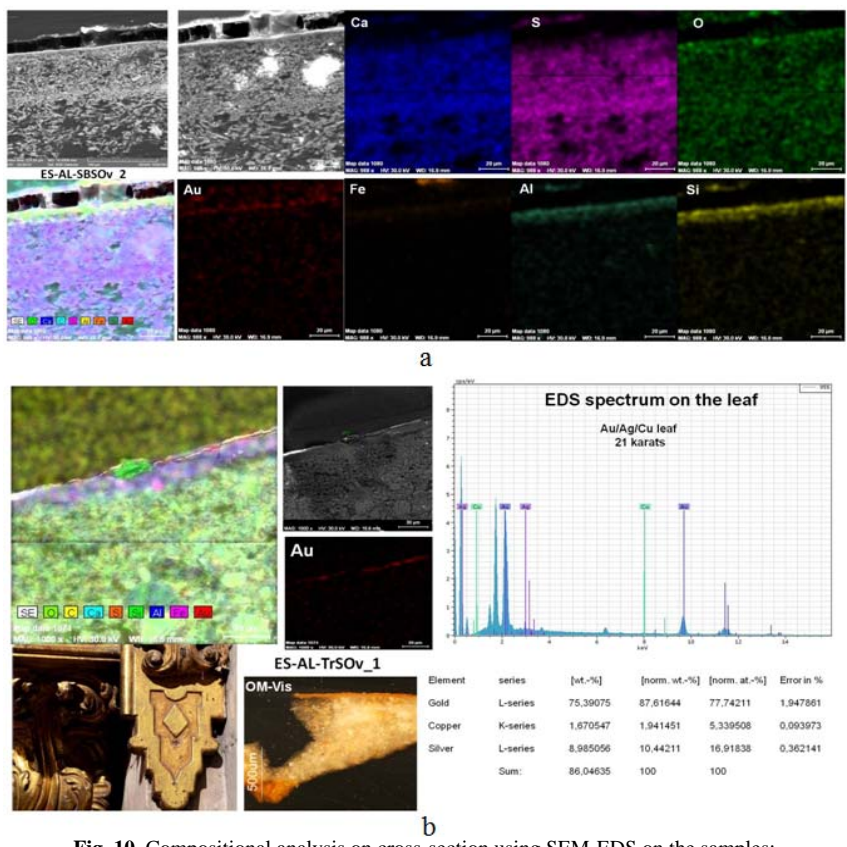
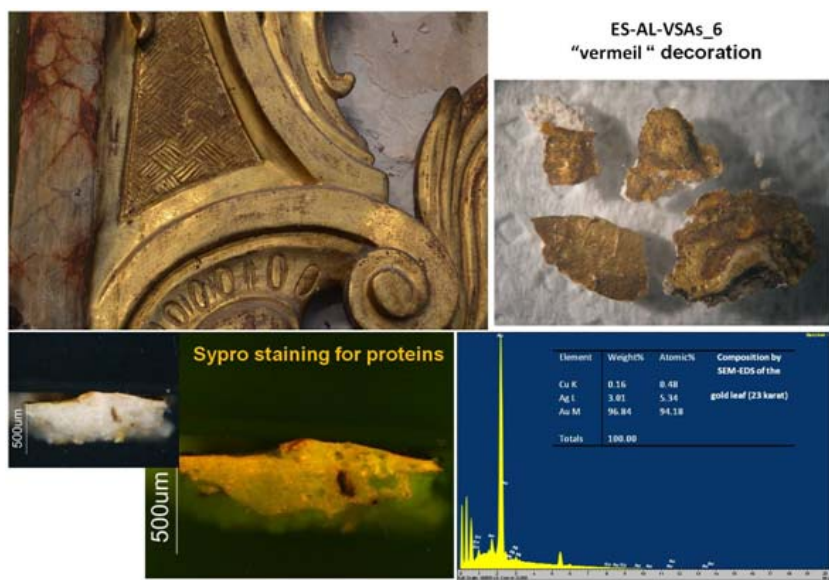


Fig. 9. The gesso grounds observed in cross-sections under OM and SEM for two sample from the altarpieces in Oviedo Cathedral (credit Irina Sandu)

In the samples collected from the altarpiece in the Villazón Church, the bole’s color is different in the areas with “bronceado” (light yellow color) from the burnished gilded areas (reddish color). A sample taken from the “vermeil” (“bronceado”) decoration (Figure 11) displays a thick white ground (Ca, S, O and clay mineral elements, Mg, Si, Al, K - more than 250µm) containing proteinaceous binding medium, an yellow bole layer (Al, Si, K, around 50 µm), a leaf made of a high content of gold (23 karat) and a dark, thin layer over it (“vermeil”?), without fluorescence.



**Fig. 10.** Compositional analysis on cross-section using SEM-EDS on the samples: a) AL-SBSOv\_2; b) AL-TrSOv\_1



**Fig. 11.** Sample of "vermeil" decoration from the lateral altarpiece in Villazon, analyzed under OM (with Sypro staining) and SEM

## Conclusion

This paper presents new information concerning the French ‘*vermeil*’, a technique of finishing the gilding, which has not been the object of intense study until now. Information about the materials used and the visual purpose of this technique is presented, according to historical treatises and contracts for the gilding of altarpieces. The Portuguese terms ‘*fosco*’ and ‘*infoscado*’, present in some gilding contracts, arise the question on how the matte effect was obtained. The Spanish ‘*bronceado*’ technique seems similar to ‘*vermeil*’ and the preliminary analytical results obtained on samples from altarpieces of Asturias region advance the hypothesis of the use of a non-proteinaceous coating on the top of the gold leaf (probably Arabic gum, to be confirmed by further analysis).

This research is an ongoing work and aims at a better characterization of the materials used in the ‘*bronceado*’ technique in different Spanish and Portuguese altarpieces.

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## ENDNOTES

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