

## FRESCO WORK PLAN IN THE PAINTINGS OF THE SAINT MICHAEL'S CELL AT PEDRALBES MONASTERY

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“... intendo quella che dovrebbe sempre essere considerata la fonte storica di partenza per lo studio di un'opera d'arte: la sua materia. E con questa affermazione mi riferisco alla lettura di tutte le possibili tracce lasciate appunto sulla materia da qui questa ha composto in immagine: e alle conseguenti deduzioni.”

Bruno Zanardi (ZANARDI. 2002: 29)

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<sup>1</sup> Jordi Pradell, Eduard Porta, Antoni Palet and Josep Maria Xarrié carried out some previous researches. In 1976, Eduard Porta and Antoni Palet extracted samples and analyzed the pigments; in 1991 the conservation status and the cohesion of the *intonaco* and *arriccio* was measured; in 1992 samples were taken and analyzed by the Centre de Restauració of the Generalitat of Catalonia; in 1993 pictures were taken with different wavelength lights and samples were taken to determine the *intonaco* composition; in 1998-1999 the lower part of the figure of Saint Alexis was cleaned. The series of research were compiled in the Report of the Servei de Béns Mobles of the Generalitat from February 23rd, 1990.

### Introduction

The wall paintings decorating Saint Michael's cell at the Royal Monastery of Pedralbes, attributed to the painter Ferrer Bassa, are a remarkable set and show exceptional evidence of the Catalan Gothic painting scene. Due to its importance, the Museu d'Història de la Ciutat of Barcelona (MHCB), in charge of the conservation and restoration of the monastery's cultural goods since 1999, considered the appraisal of the conservation status of this work as an ineludibly responsibility. Thus, the Conservation and Restoration Department of the MHCB had started out the project "Diagnosis and Proposal to the conservation-restoration of the wall paintings at Saint Michael's cell", creating a research team with a great budgetary investment.

The general objective of the project is to gather and contrast the inputs from a wide range of disciplines, from history and art history to physics, chemistry, geology, biology, architecture and conservation-restoration. From all these different views we will extract the knowledge necessary about the particular characteristics of the painting and the comprehension of the phenomena leading to its alterations, in order to define the optimum conservation conditions as well as the treatment to grant murals a long life cycle.

The first phase of the project was focused on the technological exam and the conservation status. It was carried out by a team composed by conservators-restorers and an architect. This allowed the technical development process of these paintings and the distinction of its special features<sup>1</sup> to be addressed as it was never done before. Other analysis and complementary studies were carried out in parallel, like gathering all published articles and documents concerning Ferrer Bassa and the wall paintings in Saint Michael's cell; performing the geophysical prospecting of the ground of the chapel and surrounding area with radar; inspecting thermographically the walls of the cell; and researching possible xylophages attacks in the coffered ceiling. A climatic survey based on temperature and humidity measures that have been gathered over the last three years is also in process.

In this article we will reveal the outcomes referring to a very specific aspect inside the material culture research: *fresco* work planning.

## Methodology

The wall paintings in Saint Michael's cell are a documentary legacy from the 14th century, original and material evidence preserved almost untouched and complete. It talks about the organization and planning of the work, the selection of materials, the pictorial technique and many other issues concerning the economic, artistic, social and religious transaction which took place in 1346. Although it is not always easily noticeable, these data are preserved in the very material composing the painting and in the preserved traces and marks, so they can be identified and analyzed.

The work carried out by the conservation-restoration team began by bringing the painting under the expert observation of the restorer, with raking light, binocular loupe glass and a microscope<sup>2</sup>. In this first stage of the research it was decided to rule out other analysis techniques, only to use them when possible options of observation of the work were exhausted.

The outcomes of systematic inspection of the painting were reflected in a digital photography of each scene printed on DIN-A-4. Then, following pre-established codes and legends, each observation was written on a plastic film placed over the image.

Planimetric mapping was carried out by means of *in situ* measurements -architectural measurements were taken using triangulation and painting data were taken by measuring geometric lines articulating the scenes: panels, friezes, etc. The photographs of each scene were adjusted to these maps. With this metric and formal adjustment the typical lack of topographic correction of the photography was rectified, reducing the margin of error because accuracy is essential when trying to locate an alteration affecting the archi-

<sup>2</sup> A 5x KS binocular loupe by ZEISS and a portable microscope were used: 60x PEAK Wide Stand Microscope. Also occasionally an OPMI. Pico 22x technoscope was used with integrated TV-Video by ZEISS.

ture on which the painting is placed. (Sacco, 2003: 122-126).

The tracing of the painting to map was ruled out because in some areas the superposition of a film and the pressing, needed to trace the painting, as well as the joining points between the film and the wall, could threaten the painting. On the other hand photogrammetry presented some problems due to the limited space of the chapel. Orthophotography (calibrated and straightened photomosaic) was also rejected because placing reference points (target) over the pictorial surface could jeopardize it.

The graphic transposition of the registered data was made with AutoCad, which gives perfectly limited information, essential to the following interpretation planning. Further on the photographic image will be changed to a drawing in order to ease the reading of the information transferred to the maps.

The data gathering was carried out systematically, beginning with the *arriccio* analysis and finishing with the pictorial layer analysis. The fieldwork was developed by a single technician, which provided a great rate of homogeneity and accuracy as it eases the data gathering standardization.

## Characteristics of the cell and the pictorial space

Saint Michael's cell has an irregular ground because it is placed between two buttresses of the monastery church apse, facing South-west, the last of the central nave and the first of the apse. Its maximum size is 4.58 m (15.13 feet) height, 5.87 m (19.26 feet) width and 4 m (13.12 feet) depth.

The pictorial space is divided in three registers. The upper and central registers depict the Passion of Christ and the Joys of the Virgin. These two cycles are closed by the walls with the figures of the Saints. In the lower register we find the wainscot, nowadays completely repainted but with traces of an underlying decoration of painted panels imitating marble. The

entrance wall is not divided in registers but in a decoration of medallions and small figures referring to the Final Judgement and the Salvation of the Souls.

## Fresco work plan: joints, *pentimenti*, size and organization of the *giornate*.

As it is well known, *fresco* painting execution is based on spreading the plaster to paint during one day, that is why it is called *giornata* (day-work). Once the work is finished, the result is a *giornate* mosaic with perfectly concealed joints, invisible to the spectator but visible in a close observation.

In the pictorial cycle of Pedralbes, the identification of each *giornata* confirms the fresco execution. We would like to highlight this aspect because the painter's contract states that it had to be oil painted «pinte de bones colors ab oli...»<sup>3</sup>. This often led to oil painting references. With the new released data one must talk about a combined technique, a planned conception of the execution in which some areas must be fresh painted and other areas subsequently painted *à secco*.

## Joints between *giornate*

Two ways of joining *giornate* were observed. The most frequently used is by carefully drawing the outline of the *giornata* to get an adjusted finish and a clean cut. In this case it is cut on the bias creating a similar effect to that of a bevel. This way of finishing a *giornata* is typical in Italian wall paintings from the *Trecento* on (Mora, 2001: 149) and allows the mortar superposition to be minimised because the new *intonaco* can be juxtaposed along the beveled section.

This will to obtain a perfect welding is reinforced by a subsequent scraping of the joints which helps to compact the fresh mortar levelling any prominence. But sometimes the polishing trowel pressure is so intense that we get an undesired result: the *intonaco* of the new *giornata* gets under the desired level. This could seem to be a joint consolidation fault but it comes to be very helpful in the visual analysis because it reveals the joints and sometimes helps with reading the chronological sequence of the work.

In some specific cases the joint mortar is clearly superimposed on the previous *giornata*. This suggests a less evolved, less accurate technique that may be caused by a hurried execution. This working method is also seen in the inserted *giornate*<sup>4</sup> and the *pentimenti* executed once the painting is finished.

## Size of the *giornate* decorated with figures

There are different sized *giornate* in the cell. There are two separate ways of dividing the work sessions of each scene: one for the figures of the Saints and other for the scenes of the Passion of Christ and The Joys of the Virgin.

The *giornate* of the Saints' scenes are not adapted to each figure outline but divide the monochrome background between them according to a straight vertical line. This division may be due to a functional issue in which it was foreseen that most of the *giornata* line would be concealed under an *à secco* painting layer -the blue painting which forms the backgrounds for the figures. These kinds of *giornate* are the biggest in the figure program of the chapel. The average area is 1 sq. m (10.76 sq. ft)

On the other hand, in the representation of the Passion and the Joys the size and shape of the *giornate* are clearly different. Each scene is divided in smaller and more irregular *giornate* in a number ranging from two to seven. Usually they are carried out in three or four sessions, maybe more depending on the number of figures or the complexity of the theme. In general they have an average area of 0.5 sq. m (5.38 sq. feet), half of the area filled with the saints' figures.

The joints of the *giornate* of these two cycles usually divide the space by grouping the number of characters that the painter can finish in one single day. Rarely the

<sup>3</sup> The job contracts clearly state that the paintings must be done with «bones colors ab oli». The first contract is from August 1343; the second from 8th March 1346. Pedralbes Archives, four-faced addenda, n. 184; Manual de Guillem Turell, 1342-1348, f. 70v.

<sup>4</sup> As we will see further on «inserted *giornata*» is the area inside a *giornata* reserved to be painted independently from it.

*giornate* adapt to the lines of the preparatory drawing: and when they do, they follow the line of some architectural element (scenes of the Annunciation, the Impropria and the Holy Sepulchre). But most of the times they cut the composition space in a more or less rectilinear way or follow the outline of one or more figures. Despite what is mentioned above, there are two significant scenes, the Triumph of the Virgin and the Coronation, where faces and hands were kept aside to be painted in a separated *giornata*. In each of these *giornate* two faces or two hands were painted at the same time.

Finally we must note the special case of the inserted *giornate*. These are the smaller *giornate* and they are painted once the scene is completed *à fresco*. The average area is between 0.02 - 0.08 sq. m (0.22-0.86 sq. ft). Usually they were foreseen from the beginning and were set aside for important or much detailed zones in which the painter thought the mortar could cure before finishing.

The area for the inserted *giornata* is set aside in white, non painted *intonaco*. In the moment of painting, the *intonaco* is cut and removed and a new mortar is placed to paint the motif on it. In this mural set the surface polish of the inserted *giornate* is lighter or does not exist at all due to its limited size. This lack of integration with the adjacent mortar is especially evident in the perimeter edges overlapping the general *giornata*. In most of the cases the inserted area is at a slightly higher level to the rest, between 1-2 mm (0.04-0.08 in). This could indicate that the previous mortar was not completely removed but only scratched, as can be seen in the scales of Saint Michael archangel.

### Size of the *giornate* with ornaments: faux marble, vegetal motifs and painted friezes.

Faux marble, friezes and vegetal motifs organize spaces between scenes. The *giornate* joints of these

areas are much more rectilinear than the rest because either they adapt to architectural elements of the chapel (beams, arch and intrados) or follow the regular shape of the friezes and quadrangular panels. Its area varies depending on the void space to be covered, from 0.50 to 1.56 sq. m (5.38-16.79 sq. feet). Friezes framing the top zone of the figure panels are previously painted, normally in a different *giornata*, except in the *giornate* of Saint Eulalia, Saint Catherine and Saint Agnes, where they are painted at the same time as the figure.

The wainscot *giornate* were not exactly individualized because the joints were damaged and the whole area was under a thick layer of overlapped repaints. But comparing it with other zones with faux marbled panels, one can deduce that its size would not be much different than the standard.

### Pentimenti in the execution phase of the preparatory drawing

Rectifications were detected inside the areas of some *giornate*, probably undergone after applying the preparatory drawing pigments. In accordance with chapter LXVII of *Il Libro dell'Arte* (Cennini, 1982: 77)<sup>5</sup> the *intonaco* is scrubbed with a bristle brush soaked in water to rub out the wrong drawing. In Saint Michael's cell one can see a rougher textured mortar in some areas of the paintings, normally in faces or motifs of complex composition. This textured *intonaco*, placed after the general polishing of the area, could either belong to a modification undertaken during the preparatory drawing phase, as Cennini states, or to a partial scratching of the *intonaco* in a later moment.

Observing some little losses of the pictorial layer under the microscope we can check the existence of a very thin layer of *intonaco* covering the ochre pigments corresponding to a first preparatory drawing. It can be a bonding agent-rich layer, applied by brush (probably a *scialbo*), over which the painter redrew the needed corrections. This can be observed in the hands of the angel carrying

two flutes, at the top of the Coronation of the Virgin scene and also in the hands of the offering angels placed at the centre-right part of the scene of the Triumph of the Virgin. We would like to highlight that this *pentimenti* are basically found in the two scenes dedicated to the Virgin.

### Pentimenti during painting.

Once an area is painted, the artist decides it needs to be corrected. This rectification usually implies partial or total destruction of the non-desired painted area, so one can identify it by the cutting mark.

One can see the marks of a neat cut of the mortar, probably done with chisel and hammer, in the different height of the line dividing the central and upper register between the scenes of the Pietà and the Holy Sepulchre. This last scene sets the lower part. This sudden drop suggests that the previously painted scenes had a different height, which forced the painter to destroy the lower parts of the scenes to carry out the rectification.

This shows the possibility that some of those considered to be inserted *giornate* were *pentimenti* instead. It is very difficult to distinguish beforehand between the inserted *giornate* foreseen at the beginning and the later *pentimenti* because its final appearance is very similar.

### Advancement in the work by *giornate*

The *giornate* application sequence was defined for each scene. Then the possible correlation between scenes was studied to approach the general order followed in the execution: the second layer over the first, the third over the second and so on until 113 *giornate*. This was the final recount, but it will probably increase once the wainscot has been studied.

Nevertheless, the numbers of the maps is not an accurate order indicator because it refers to the relationship between adjoining *giornate* as if it was

only possible to paint one per day and as if the work showed a linear and correlative execution without the possibility of doubled or non correlative *giornate*. Since more than one *giornata* can be carried out during one day, our assigned values can not express a real and accurate sequential order. Even so, this is a rough orientation about the progress of the execution of the painting which allows reaching interesting conclusions as we explain below.

From the gathered data we deduce that the *à fresco* work began at the counter-façade, specifically at the left spandrel at the entrance of the chapel. Then the panels near the ceiling and after that, from left to right, the upper register was completed. Then, from the centre to both sides, they carried out the geometrical frieze dividing the two cycles and the central register was painted following the opposite direction for the figures of the saints, i.e. from right to left. Finally they painted the geometric frieze dividing the central register and the wainscot, always left to right and then, changing direction again, they finished with the figures of the saints.

The execution of the lower register finishing the painting could not be specified precisely. On the other hand, the joining between the central and lower register execution with the entrance wall was difficult to specify because the latter is very affected by previous reforms in which windows were opened and big areas surrounding the door were scratched. This partition was also repainted in several occasions.

To obtain an approximation for the number of *giornate* painted at a time it was taken into account the separation space needed for the painters to work without obstructing each other, ruling out the work done in adjoining *giornate* or close scenes placed in a corner.

Taking all this into account, the scenes of the saints (F and G) allowed only the working of a single *giornate*

<sup>5</sup> ... .Quando hai dato la forma del tuo viso, se ti paresse, o in le misure o come si fosse, che non rispondesse secondo che a te paresse, col penello grosso di setole intinto nell'aqua, fregando su per lo detto *intonaco*, poi uastarlo e rimendarlo.

*nata* per day. This is valid either in the upper and the central register. A similar thing happens at the piece of the wall placed on the left as one enters the chapel (B), even if the upper register could allow more than one single *giornata*. On the contrary, the two remaining walls (C and D) allow more than a *giornata* at the same time: the upper register a maximum of two, corresponding to the linking of *giornate* 20 and 24; and the central a maximum of three, from *giornata* 63, 66 and 80. So if all the walls of the same registers would have been painted at a time, it could have been possible to paint four or even five *giornate* simultaneously. But we think this situation would imply an excessive number of painters, so we tend to think of a more reduced number of three *giornate* per day.

The linking of several *giornate* reinforces this hypothesis. Even if the scenes of the Saints can be carried out independently from the rest, the work that can be carried out in parallel to the central wall is determined by the order and development from left to right. Therefore it was not always possible to work at a time in all areas where it was feasible in theory.

### Scaffold use hypothesis

The mortar joints used to divide the three registers composing the cell decoration are the clearest evidence of the different heights of the scaffolding used to carry out the *giornate*.

The upper and central registers are approx. the height of a human and the lower register or wainscot is not more than 1.20 m (3.94 feet).

### Upper register

Here the scaffolding was probably mounted as a common platform to give access not only to the walls but also to the coffered ceiling painted at the same time. The scaffolding average height was very likely 1.80 m (5.91 feet) from the ceiling. As the ceiling is sloped, the height at the lower point would

be 1.55 m (5.09 feet) and at the higher point would be 2.05 m (6.73 feet). Presumably, they would use small provisional mobile structures to reach the higher parts.

This general platform allowed them to paint the following areas:

- The whole coffered ceiling polychromy.
- Spandrels, intrados and tympanum of the entrance arch.
- Upper register Scenes from The Passion of Christ and the Saints, geometric friezes and faux marbles framing the upper parts of the scenes.

### Central register

After dismantling the upper platform, the scaffolding height was changed to 1.20 m (3.94 feet) from the chapel groundfloor. This allowed having a similar height as in the upper floor to carry out a series of scenes of similar characteristics. This elevation also helped the access to the lower parts of the upper register for retouching.

It is unknown if this scaffolding was a common platform or one or several scaffolds circling the walls, leaving the central space of the chapel free. Possibly they used smaller mobile scaffoldings which would not have covered all the cell. This second hypothesis will allow the accessibility to the cell and a best mobility.

The hypothesis of an independent scaffold for each cycle (Joys of Mary and Saints) would allow a third simpler scaffolding arranged at a higher level than the others to prevent the way to the chapel entrance from being completely obstructed. This third scaffolding would help to carry out the *giornata* placed underneath the tympanum and the figures of Saint Steve and Saint Elisabeth of Hungary, which are exceptionally placed at an intermediate level between the two registers.

Under these possible circumstances the following *giornate* would be carried out:

- Area underneath the tympanum.
- Separation between registers: horizontal geometric frieze.
- Central register with the stories of the Joys of the Virgin and the Saints.
- Figures between the upper and central registers.

### Lower register

Once the central register and appropriate final retouches were finished, the three scaffoldings would be dismantled and the work would proceed at ground level to begin with the lower register. This level is basically the wainscot, but also some figures between registers in which some structure was needed to work at such level.

To finish off the entrance wall painting it was not necessary to construct a long-boards scaffolding because it would have obstructed the way to the entrance. They could easily work with two small scaffoldings, one at each side of the door.

The *giornate* belonging to these elements were carried out in the lower register:

- Division between the central register and the wainscot.
- Figures flanking the entrance door between the central register and the wainscot.
- Wainscot.
- Two parts of the wall, at each side of the entrance door.

This planning of the work, essential to the preparation of such a painting technique, was only possible in a workshop where the master would organise all operations and watch over the execution to obtain a neat and uniform final result.

### Conclusions

Executing a wall painting requires an accurate plan of the work by a workshop of several artists and craftsmen. In this framework the master becomes the standards setter, leading a complex structure of many members. This is the case of

Saint Michael's cell, where the complexity of the entrusted work demands a good director capable to manage all necessary operations to carry out a fresco work (preparation and application of the mortars, transfer of the preparatory drawing, elaboration of pigments, painting of the backgrounds, the architectures, the figures, etc) The analysis of the planning of the *giornate* reveals this complex organization. We have proved that it points out the participation of a great number of painters, as it was feasible to prepare and paint more than a single *giornata* per day.

The research also proved that there are different ways of dividing the composition space when executing the *giornate*, which could reflect the transition period corresponding to this painting. We found *giornate* with regular shape and size (all the figures of the Saints) and *giornate* with smaller divisions and adapted to the composition shape (Passion of Christ and Joys of the Virgin cycles) with some rare examples of *intonaco* put aside for faces and hands.

These are the obtained data from the morphologic and organizational analysis only, considering the *giornate* as areas without decoration. Once the analysis of the characteristics and application technique of the paint were finished, the data could be crossed to specify the outcomes. The research progresses from the inner to the superficial layers of the painting so an essential part of the analysis is still missing.

Finally we must mention the benefits of previous researches in the development of a conservation-restoration treatment plan of the pictorial set.

Some almost imperceptible details preserved in the pictorial matter are a source of essential knowledge to define the method of restoration intervention to be carried in the future.

From the outcomes already checked, the restorer will have, for instance, a map to proceed with caution when working near the limits of the *giornate*. But the research also brings in knowledge of the work surpassing the strict conservation-restoration interest because it is very significant for the Art world.

#### Nota of authors:

We have employed the Italian expression to define the elements of the pictorial layers. This is due to the great diffusion in the conservation sector of this terminology.

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