

TECHNICAL AND SCIENTIFIC RESEARCH AS AN AID TO ART HISTORIANS IN THE ATTRIBUTION OF ART WORKS

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1. Objective evaluation in the study of cultural artifacts

Interest in cultural heritage has always pushed academics to search for criteria and methodologies that would help determine its nature and provide a comprehensive definition. Contemporary art, with its artistic forms that are difficult to classify, has certainly made the task of defining the “limits” of what an art work is, quite arduous.

It is useful to remember the considerable progress made in legislative matters, during the last century, when national and international laws regarding cultural goods already regulated aspects regarding the conservation and valorization of historical-artistic heritage.

Within this vast and complex subject, we find the problem of the attribution of works of art, a rather delicate issue, considering the considerable economic interests, which might constitute a risk of strong bias. However, regardless of the commercial reasons, personal interest in knowledge and learning often plays a far more “noble” role in the debate on authentication and attribution.

In the past, the “attribution” of a painting lacking authentic signatures or recognized documents meant basing a proposed name exclusively on the preparation and sensitivity of the scholar and stylistically comparing it with similar art pieces, namely on *qualitative* criteria. Today, the evolution of art-historical studies has led to greater caution in hypothesizing attributions and especially in defining essential parameters that increase reliability: typology of the artifact, dating, subject, symbolic and iconographic meaning, style, commissioning, provenance, format and dimensions, uniqueness, conservation status, history, etc.

Nevertheless, there is a certain difficulty, if not a lack of unity, in the identifying criteria of art objects, especially because of the considerable number of similarities between the main masters and their followers, the existence of copies, replicas and even fakes and the inevitable uncertainty regarding sources and archival documents.

In this regard, it is useful to remember the most commonly used terminology in the classification of art objects and the basic criteria for attribution [1, 2].

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Terminology	Definition
Authentic	Art piece belonging to the author and indicated period
Original or autographed	Art piece by a certain artist which contains all the stylistic characteristics
Replica or variant	Repetition or re-edition of an original prototype by the same artist; can contain differences in format, technique or some iconographic particulars
Copy	Reproduction (more or less) true to the original, done by a different artist from the one recognized as the author of the prototype
Fake	Total replacement, imitation and forgery of an art object with the intent of committing fraud
Reproduction	Art object made using printing, photography or computer media different from the original technique; often entails reduction in size and substantial modification of visual-perceptual effects
Attributed to	Indication referring to an art object belonging to the same period as the named artist who is most probably the author
Signed by	Artifact that bears the signature of the artist in question, which needs to be authenticated
School of	Art piece made by a student of the cited master or an artist from his circle
Follower of	Artifact by one artist with stylistic traits that can be traced to the indicated master
Seriality	Concept associated with contemporary art, first and foremost linked to <i>industrial design</i> , which indicates serial production of a prototype or <i>forerunner</i> through the use of machines

It immediately appears evident that subjective interpretations, by definition dubious even when authoritative, still hold great significance. For a better standardization of terminology concerning scientific methodologies, more emphasis must be put on the study of constituent materials, namely *quantitative* parameters. This type of analysis, in fact, focuses its attention on certain technological aspects, which in turn are characteristic of a specified period and a known artist or a school and can thus be distinctive in the case of attribution.

In this sense, the process of restoration, and especially related studies, offers a unique opportunity to examine the artifact through close observation, to characterize the constituent materials and the way they have been employed, to detect any additions and identify any other kind of intervention.

In this context, it is also important to consider evaluating the state of conservation, since deterioration can contribute to identifying a work of art. In most cases, in fact, the form of alteration can be connected to the constituent materials and execution techniques, as well as the environment and the cause of deterioration.

The analysis of a painting from a stylistic point of view, accompanied by accurate research on the relevant literature, undoubtedly offers essential information for an initial historical and geographical contextualization, narrowing down the number of probable authors.

This type of observation is limited solely to the exterior image, so it is very useful to note that the aesthetics of an art work can be difficult to read, if not actually compromised, due to the presence of yellowed varnish or repainting that has altered its formal quality.

Scientific analysis effectively makes it possible to elaborate research beyond the mere visible, as in the case of X-rays and reflectograms, which highlight the internal structures of materials, underdrawings and *pentimenti*. Also as regards the chemical characterization of materials, the benefits of scientific contribution are indisputable, because, for example, the discovery of White Lead or Titanium White on a white background can place an art object within a specific time span.

There are other limits, as in the case of non-invasive and microdestructive analyses, since they only obtain information on certain areas, which even if representative, remain limited. Furthermore, acquired data may appear insufficient for the purpose of attribution if they are not supported by other evaluations. If we return to the example of the White Lead (the concept can be applied to other pigments), it is evident that its use over the centuries by a vast number of artists does not allow for it to be considered a distinctive element. Similarly, some non-invasive methods represent an advantage in that they can be applied to the whole artifact, but can be ineffective if not interpreted correctly. It is not sufficient to find an underdrawing on a medieval panel painting, because one needs to verify the way in which it was created in order to associate it with a specific artist.

These considerations highlight the importance of technical observations and the amount of information the diagnostician and the restorer can provide. In common language the *signature* on a painting is the writing of a name, a pseudonym or the artist's initials. However, there are other types of "signatures", almost always involuntary, that constitute a sort of "digital fingerprint". This is the case of the stratigraphic sequence of backgrounds and overlaying, the gradual way the image is constructed, from the first creative act of drawing to definition of the final details, the way the brushstrokes are oriented and the ability to render shapes realistically through the use of shadows and highlighting. In simple terms, this is a set of distinctive traits that can be defined "the artist's hand", which even the most able of students, copyists and forgers are not able to imitate exactly, because they are, by nature, individual and highly personal characteristics.

Ultimately, it is clear how the technical and conservational reading of the art object is a synthesis between the analysis of the visible (historical and artistic) and the analysis of the *invisible* (scientific) able to offer new arguments and often corroborate or disprove hypotheses regarding possible authorship.

Naturally, technical evaluation of an art object should not be understood as replacing a historical, artistic and scientific approach, even though from what has been stated previously, it clearly plays a fundamental role in removing any doubts regarding authentication of an artifact. A technical study must therefore be integrated with stylistic comparisons and information obtained from antique sources and/or archival documents including, when possible, the results of any diagnostic analyses. Only convergence of the qualitative and quantitative data and synergy between different analytical perspectives can effectively provide a degree of accuracy in the proposed attribution¹ [3, 4].

This study constitutes a practical application of the afore-mentioned arguments and is centered on the Sicilian painter Pietro Novelli, also known as *Il Monrealese* (Mon-

reale, March 2nd 1603 – Palermo, August 27th 1647). Novelli is a symbol of the local artistic culture and a significant example in terms of attribution due to the large number of important artists revolving around this charismatic figure during the 1600s and the evidence obtained in the following centuries.

Novelli, moreover, offers numerous opportunities for study and insight on a technical level, which is why two paintings from the 1600s will be discussed here. A methodology for their analysis was defined on the occasion of their restoration: the unpublished and anonymous canvas representing *David with the Head of Goliath and Our Lady of Sorrows*, historically indicated as belonging to “the school of Pietro Novelli”.

In the first case, an indication of the artifact as being a piece by Novelli comes from the art historian V. Abbate, who led the research from the first stages. Afterwards, technical observations were conducted and supported by analytical research that effectively proved the peculiarities attributable to the artist in question. In particular, the research was based on technical comparisons with another version already identified as belonging to Monrealese and with numerous other recognized paintings. At the same time, art-historical examinations were conducted which supported this hypothesis to the point where the painting was definitively attributed to Novelli.

For the second artifact, the starting point was the historical reference to the school of Novelli offered by an ancient inventory. Therefore, the aim of the methodology of the technical examinations applied during restoration was to verify the veracity of said attribution. In this case, the results of the research not only confirmed the context in which Monrealese worked, it also allowed a direct reference to be proposed in favor of the famous painter.

2. Pietro Novelli: the eclectic emblem of 17th century Sicilian painting

The “royal painter” and architect Pietro Novelli is certainly the most significant artist of Sicilian painting in the 1600s. The lively local intellectual environment in Monreale and Palermo, between the late 1500s and the early 1600s, fueled by aristocrats, academics and *litterati* and their interest in poetry, figurative art, collections and antiques, certainly contributed to Novelli’s education.

There is an evident influence in his work from Genoese art, references to great Italian painters like Michelangelo Merisi da Caravaggio and traits similar to Spanish painters like Jusepe de Ribera, also known as *Lo Spagnoletto*, or Flemish painters like Pieter Paul Rubens, Geronimo Gerardo and especially Anton van Dyck. In addition to the direct or mediated contact with these masters, Monrealese’s personal life and artistic career were marked by his journeys to Rome and Naples, during which he approached the Renaissance culture and the Naturalism of Neapolitan painting [5-7].

The results of these experiences combined with his innate creative instinct marked a stylistic evolution that brought Novelli considerable success compared to his peers². Monrealese, who in his early days took inspiration from copying his main role models, as an adult was one of the most influential artists of his day and much sought after by the Sicilian nobility.

His fame grew locally and remained unchanged in the centuries to come. This led to numerous followers producing an infinite number of variants, more or less true to the canons matured by Monrealese, among them his children Pietro Antonio and Rosalia.

The latter, in particular, adopted a style that was so close to her father's, in fact, that attributing a work to one or the other is a challenge³.

However, it was above all during the 19th century that great fortune arrived at an artistic level and in terms of critical acclaim. In fact, A. Gallo wrote a biography and produced the first comprehensive study of the painter, while other scholars emphasized his skill to the point where it became a true celebration of his talent [8]. It is therefore not surprising that, contextually, Novelli's work became a model for many 19th century painters to use in response to the ever growing requests of clients to copy pieces by the famous master, or be inspired by them to create new iconographic works⁴ [9].

It is also necessary to consider that the 1800s represented the Neoclassical era in Sicily, a nostalgic revival of things "ancient" and a growing taste for antiques. In the case of figurative art, the presence of the Academy of Fine Arts in Palermo starting from the second half of the 18th century certainly accentuated the phenomenon of copies of the great masters, especially those of Novelli, even if S. Riccobono relates this aspect more to the individual inclinations of artists and clients, than to precise academic movements.

Amongst the names of artists that devoted themselves to Novelli copies, also for "conservation" reasons, it is useful to note Giuseppe Velasco, Salvatore Lo Forte and especially Giuseppe Patania with his numerous drawings, and Giuseppe Patricolo⁵. It should be remembered that these artists, for example Velasco, at times, were called upon to intervene on Novelli's paintings which were in desperate need of restoration. Nevertheless, in line with the practice at the time, the work often mutated into a sort of gaudy makeover, as in the frescoes of the church of Saint Anthony of Padua in Palermo.

An interesting case is constituted by the late 18th century drawings made by some copyists of Novelli's works, mostly frescoes, most of them lost or presumed lost. These graphic depictions not only allow for the "catalogue" of Monrealese to be reconstructed, but also to enquire into the technical procedures used during copying.

Of some relevance is the case regarding a pencil drawing painted over with black ink by an unknown painter from the second half of the 18th century. In 1990, S. Riccobono described it as the copy of a Novelli fresco depicting the *Triumph of David* from the church of Saint John of Origlione in Albergheria, in Palermo, presumed lost after the bombing in 1943, due to the fact it had been covered with a thick layer of plaster in the 1950s. Today the fresco has returned to our attention after its discovery during the restoration of the building in 2011⁶.

Just as interesting is the brown ink and watercolor drawing by Matteo Mauro, a copy of the Novelli fresco in Monreale with *Saint Benedict Distributing Bread*, which is also a restoration by Velasco and was also inspected by Patania. In order to repeat the exact composition of Monrealese, the copyist used *quadrettatura*, even if on a reduced scale. Also, in correspondence with finer details, one can note a double subdivision into smaller squares, in order to guarantee a greater resemblance to the original image [10].

Therefore, such a conspicuous number of copies (paintings on canvas or drawings) makes Novelli an emblematic example of an artist where the problem of attribution is of primary importance, especially when one considers its value and relevance in Sicilian painting, not only for the 1600s, but for all periods in time.

The following two art pieces were subsequently examined: *David with the Head of Goliath* and *Our Lady of Sorrows*.

3. The replica of *David with the Head of Goliath*

3.1. Introduction

When a request was made to restore the oil painting on canvas, part of a private collection in Villa Sant'Isidoro de Cordova in Bagheria (PA), it was presented as an unpublished piece without attribution or archival references (Figure 1). From the first formal, technical and stylistic observation, it was clearly dated to the 17th century. Despite the bad state of conservation, which made it hard to read certain details, it was found that the procedure used closely resembled that of the Sicilian painter Pietro Novelli. Starting with recognition of the iconographic subject, *David with the Head of Goliath*, preliminary research led to an identical version kept at the J. Paul Getty Museum in Malibu, identified as an authentic work by Monrealese (Figure 2).

This painting, dated to circa 1630, came from a former private collection and was acquired by the museum in 1972 at a Sotheby's auction sale, and today corresponds to inventory number 72.PA.16 [11]. In the registers of Sicilian collections there is no mention of this composition by the artist from Monreale. It has therefore been hypothesized the painting was executed in Rome and dated to around 1631 [12].

From the bibliographical research, what seems significant is the attribution to Novelli, which until now has been based solely on stylistic comparisons and in particular the existence of three other versions of the painting, conserved in the Musée D'Art et D'Histoire in Geneva, the Musée des Beaux Arts in Marseille and in the collection of Count Toreno in Madrid.

The attribution of each of the pieces is still dubious, since the paintings have been recognized as replicas of the work in the Paul Getty Museum and as copies, contemporary to this piece, even though scholars seem to converge on the name of Novelli. In any case, the artifacts testify to the positive feedback the subject experienced by the many commissions it obtained during that period. Nevertheless, the importance of an in-depth study from a technical point of view is evident in order to reveal some of Monrealese's particular characteristics and consequently achieve a better definition of the above-mentioned art pieces.

Bearing this in mind, an interdisciplinary line of research was developed which changed the first impressions regarding the analogies between Sicilian painting and Novelli's *modus operandi*, into the hypothesis of another **replica** of *David with the Head of Goliath*. In addition to the restoration work, a synergy between historical-artistic evaluations and those of a technical nature was formed and supported by appropriate diagnostic analyses⁷. Specifically, an accurate comparison was made between the numerous pieces by Novelli, conserved in churches, oratories and museums spread throughout Sicily; it was thus possible to examine them at close range.

3.2. Technical examination and analytical diagnostics

In the comparison with the American version, we have to underline similarities in the constituent materials and the techniques of execution. Both paintings were produced with oil on canvas and present a vertically rectangular format, the exhibit from Malibu measuring 129.5 x 102.2 cm and the Sicilian replica 128 x 103 cm. The version in Bagheria has the original hardwood frame with a central rectangular horizontal cross section and four perimeters held together by corner joints in *capitello* style, one of the typical features of 17th century Sicily⁸ [13].



Figure 1. Pietro Novelli (attr.), *David with the Head of Goliath*, first half of the 17th century, oil on canvas, 128 x 103 cm, private collection, Villa Sant'Isidoro de Cordova, Bagheria (PA), recto before restoration (left), recto after restoration (right).



Figure 2. Pietro Novelli, *David with the Head of Goliath*, ca. 1630s, oil on canvas, 129.5 x 102.2 cm, recto, The J. Paul Getty Museum, Malibu.

From the direct observation of the art pieces and consultation of bibliographic references, it has emerged that Novelli usually used single canvases in linen and/or hemp in *plain weave* (ratio 1:1) and *sparse density* (on average 7 x 8 threads per square centimeter) [14]. The examined painting is quite consistent with the techniques of Monrealese, in that a support consisting of a single canvas in linen fiber in *plain weave* and a sparse density of 8 (warp) x 9 (weft) threads per square centimeter was discovered, with a *normal* or Z-twist of the yarn. Similarly, *David with the Head of Goliath* in the Paul Getty Museum seems to represent a single canvas with orthogonal weaving.

Using a brush, the artist has applied a preparatory layer on the canvas in reddish tones made from calcium carbonate and pigments (silicates and yellow and red earths) mixed with oily binder *medium* and an *imprimatura* similar in content, but thinner and lighter due to the presence of small amounts of White Lead⁹. The application appears thick and irregular, unlike the *imprimatura*, which is more uniform and compact. The latter was also used by the painter in both versions of *David with the Head of Goliath* to accentuate the depth of image. On the shadows of the flesh tones and on the background in fact, the colors used for filling in are thin in order to let the light brown color emerge from the underlying layer¹⁰.

The most significant data, however, relates to the technique used for the painted layer, where the pigments diluted in oil have been applied by alternating fine, fluid brushstrokes for the background, the drapery and the flesh tones, with substantial background filling for the highlights.

A careful analysis was made using diffuse and raking light which showed the *modus operandi* of the Sicilian master, highlighting the peculiar traits of his personal style especially in the technical rendering of the composition. The general shape of the figures comes from a first application of transparent coatings to obtain a sketch. The scene is, however, already defined and the particular drawing ability is recognizable in the essential lines and graceful shapes. The following phase is the most characteristic, and it is here that Novelli uses his paints to render the volumes realistic, emphasizing the details, in particular, of the faces.

On the whole, the art pieces present well-organized regular painted layers which perfectly follow the profiles of the anatomies and drapes, showing great awareness and confidence in the construction of the image, in contrast to the speed of the brushstrokes. In the material and almost plastic rendition of the humans, Novelli expresses one of his "signature" characteristics. A diffuse use of fluid background filling was used to confer a pearly aspect to the female and young faces, whereas for the adult male figures, Monrealese uses a dense color, ideal for simulating the roughness of the skin. On the faces and the hands in particular, the painter uses pale-colored tones that are illuminated by the light by applying several layers. Furthermore, he employed brushes of a smaller dimension to define profiles and details, orienting them in a way which faithfully followed the outline of the sketch, thus limiting *pentimenti* and overlaying¹¹.

These characteristics common to many of Novelli's artworks, can also be identified in the two compositions of *David with the Head of Goliath*. The artist has first executed the dark background with two layers of Earth Colors (Umber and Sienna) which are almost transparent and exploit the tonality of the layer below; he then continued with the drapery (with a base of Cinnabar, Earth Colors and White Lead for the red part) and the basic shapes of the humans (White Lead and Earth Colors), maintaining minimal thickness in the areas with dark shadows¹². This characteristic was found on the head of Goliath and the figure representing David, and is evidenced by the craquelure of mechanical origin,

which is more pronounced on the dark colors. Subsequently, the painter strengthened the lighter fuller tones for the flesh colors and defined the details and highlights with crisscrossing touches of full-bodied color using small flat-tipped paintbrushes.

The stratigraphic analysis of the painting from Bagheria, together with the analysis of the materials and techniques, in particular focused on the highlighting. Following comparisons with the American version and other masterpieces historically referred to Monrealese, it was found that these details constituted the most distinctive element of the Sicilian master and therefore have the same value as a signature.

In the case of the examined subject, the anatomical particulars of the hands and the face of David, not to mention the identical highlights on the left eye, the lower lip and the extremities of the nose, are significant. These details appear as touches of pure white, probably White Lead, applied with a fine-tipped brush in the areas of maximum light (Figure 3). The recurring signs are not only found in *David with the Head of Goliath*, but also in other pieces by Novelli appearing as linear traits in correspondence to the drapery and especially the eyes, where they follow the shape of the lower eyelid and accentuate the anatomical similarity thanks to the brilliance of the pure white (Figure 4)¹³. On the extremities of the nose and fingers, the touches of white form an almost circular outline that emphasizes the three-dimensionality of the volumes, constituting a constant in all the figures (Figure 5).



Figure 3. Pietro Novelli (attr.), *David with the Head of Goliath*, first half of the 17th century, oil on canvas, 128 x 103 cm, private collection, Villa Sant'Isidoro de Cordova, Bagheria (PA), detail of David's hand. It is possible to observe the direction of the brushstrokes that neatly follow the outlines of the forms, as well as the characteristic white highlights.



Figure 4. Pietro Novelli (attr.), *David with the Head of Goliath*, first half of the 17th century, oil on canvas, 128 x 103 cm, private collection, Villa Sant'Isidoro de Cordova, Bagheria (PA), detail of David's eye in raking light. The image shows the linear white highlight that is one of the distinctive characteristics of Novelli's painting technique.



Figure 5. Pietro Novelli, *Saint Francis of Paola*, 1635, oil on canvas, 215 x 152 cm, Museo Diocesano, Palermo, detail of Saint Francis' eye in raking light. For this detail too, the painter "has signed" the painting with a brushstroke that defines the lower eyelid.

3.3. Conclusions

During its restoration, the anonymous painting from Bagheria representing *David with the Head of Goliath* was accurately analyzed in order to confirm the first hypothesis of its possible attribution to Novelli.

Following the interdisciplinary research, technical and scientific on the one hand, and art-historical on the other, the artifact was carefully examined through in-depth visual and technical observations (analyses with diffuse and raking light, ultraviolet, infrared, micro and macro photography). Where deemed necessary, the research was supported by analytical techniques (SEM-EDS).

Detailed art-historical research was conducted at the same time, aimed at comparing the artifact with works already attributed to Monrealese.

The discovery of numerous common elements between the examined canvas and the other Novelli paintings, not to mention the more characteristic traits of the famous master, have strengthened the hypothesis of attribution. These conditions allowed the art historian V. Abbate to present *David with the Head of Goliath* from Bagheria as a **replica** by Novelli himself on the occasion of his exhibition *Capolavori ritrovati*, organized by the Museo Mandralisca in Cefalù (PA) from April 25th to May 31st 2015.

4. The attribution of *Our Lady of Sorrows*

4.1. Artistic and historical research

The oil painting on canvas featuring *Our Lady of Sorrows*, dated to the 17th century from the Collezione Alliata of Palazzo Alliata di Villafranca in Palermo, constitutes further evidence of the value of technical analysis in the attribution of a work of art¹⁴.

In this case, the research conducted before the restoration procedure resulted in the discovery of an indication in an old inventory.

Historically, the canvas had in fact been referred to a School of Novelli in generic terms and for this reason could be included among the many paintings inspired by the style of Monrealese. More precisely, the wording in the inventory of the art pieces in Palazzo Alliata reads as follows: *Oil on canvas 17th century cm 65x51 "L'Addolorata" already attributed to the School of Pietro Novelli with antique frame 18th century in carved and gilded wood £ 4,000,000.*

On the other hand, as has been demonstrated, there are numerous artifacts realized by followers with aspects similar to the technical and artistic aspects of the great master which reaffirm how influential he was on the local art scene in the 1600s. Moreover, the similarities are sometimes so evident that scholars have doubted the possible authenticity of the art pieces to the point where they have hypothesized about the explicit recognition of Novelli himself. However, in the majority of cases, it is a question of intuition that risks remaining unexpressed or erroneously enriching the Monrealese catalogue in the absence of any scientific support based on technical evaluations and the appropriate analytical research.

During the restoration of the *Our Lady of Sorrows*, the first impressions of a technical character led to sustaining the veracity of the historical attribution. However, certain visible characteristics suggested a possible direct reference to the painter from Monreale. However, due to the bad state of conservation and the presence of overpainting,

additional technical investigations were necessary which had to be executed during the restoration (Figures 6, 7).



Figure 6. Pietro Novelli (attr.), *Our Lady of Sorrows*, first half of the 17th century, oil on canvas, 63.3 x 50 cm, Palazzo Alliata di Villafranca, Palermo, recto before restoration.

In this case, the objective of the research was to confirm or eventually disprove the former attribution to the school of Novelli, without overlooking the hypothesis of an explicit attribution to the Sicilian master.

The study methodology followed the same lines as those for the *David with the Head of Goliath*, and was based mainly on identification of the constituent materials, especially on the technique of execution, with the help of scientific research. Yet again, it became evident how essential the comparison with recognized Novelli artifacts was, in order to verify the possible presence of similarities and overlapping traits.



Figure 7. Pietro Novelli (attr.), *Our Lady of Sorrows*, first half of the 17th century, oil on canvas, 63.3 x 50 cm, Palazzo Alliata di Villafranca, Palermo, recto after restoration.

4.2. Technical examination and analytical diagnostics

The painting presents a vertical rectangular format and measures 63.3 x 50 cm. The artifact has a wooden frame, which is not original and was therefore not examined any further during this procedure¹⁵.

From a technical executive point of view, the item from Palazzo Alliata showed numerous characteristics common to the Novelli pieces of recognized attribution. The support is a single linen canvas in *plain* weave and sparse density of 8 x 8 threads per square centimeter, with a *normal* or Z-twist yarn and greater thickness in the warp.

In this case too, a preparatory brown colored layer was identified in the cross-sections, applied thickly with a brush over the whole surface, followed by a compact and uniform two-layered *imprimatura* in reddish brown. The SEM-EDS analyses and the laboratory spot tests highlighted a chalk-based composition, with marine aggregates and animal glue for the preparation, additionally pigmented with Earth Colors. For the *imprimatura* Red Ochre and Minium or Red Lead were identified in different quantities for the two layers, using an oily *medium* for the binder¹⁶ [15].

Infrared photography did not reveal any well-defined underdrawing, probably because it was done by brush and with materials that are undetectable with this kind of investigation. The negative result of the analysis, however, corroborates the art piece's reference to Novelli's techniques who, as mentioned earlier, used a preliminary sketch linked to the painting phase. Moreover, this procedure is quite conceivable for a painting with such a small format as the examined one.

From the scientific analyses (XRF and SEM-EDS), it was possible to determine the palette, consisting of Brown Earths, Ochre, White Lead and a small quantity of Cinnabar¹⁷. The ruddiness of the complexion is a mixture of White Lead and Ochre while the red of the lips and robe is mostly composed of Cinnabar; the greyish green drapes and the dark background were obtained with a mix of Earth Colors, while the blue of the mantle consists of a first dark full-bodied layer of Earth and Ochre-based colors, probably in reference to the sketch, followed by a second blue and transparent layer, obtained with Ultramarine blue¹⁸.

The identified pigments are typical for the referenced period and are consistent with those found on other paintings by Monrealese, characterized by vibrant colors rich in reds, greens and blues. In fact, the skin tones are generally a result of the traditional mix of Earth Colors, with minimal percentages of Cinnabar and White Lead. For the red background filler, Cinnabar was found mixed with Earth Colors combined with small quantities of White Lead in the green layers. The blues are visible, mainly, on the Virgin's mantle, enriched using valuable Lapislazuli.

In the compositional sequence, the figure of the Virgin emerges from the background as a first base through transparent coatings in correspondence with the shadows and middle tones, which gradually become full-bodied strokes in the light colors, on the drapes and in the anatomical details¹⁹. On the latter, the artist has dedicated more time as witnessed by the marks left by the brush that accompany the outline of the face. Particular interest is directed towards the pure white traits (White Lead) applied with rather fuller brushstrokes, visible on the nose and the forehead in the areas of maximal light. These details correlate perfectly with the typical "signature" highlights found on the numerous Sicilian art pieces by Novelli that were researched in order to make fitting comparisons (Figures 8-10).



Figure 8. Pietro Novelli (attr.), *Our Lady of Sorrows*, first half of the 17th century, oil on canvas, 63,3 x 50 cm, Palazzo Alliata di Villafranca, Palermo, detail of the nose and the mouth. Novelli's characteristic highlights can be clearly observed.



Figure 9. Pietro Novelli, *The Annunciation*, ca. 1641-1642, oil on canvas, 306 x 220 cm, Galleria Interdisciplinare Regionale della Sicilia - Palazzo Abatellis, Palermo, detail of Archangel's nose and mouth.



Figure 10. Pietro Novelli, *The Last Communion of Saint Mary Magdalene*, 1641-1642, oil on canvas, 306 x 220 cm, Galleria Interdisciplinare Regionale della Sicilia - Palazzo Abatellis, Palermo, detail of Mary Magdalene's nose and mouth.

4.3. Conclusions

As described above, it follows that the *Our Lady of Sorrows* conforms perfectly to 17th century traditions, which favored the medium of linen fibers in *plain* weave and *sparse* density, with preparatory layers and *imprimatura* applied in reddish brown tones. The composition of these layers indicates an extensive use of Earth Colors to be exploited in the successive paint layers, using typical 17th century materials as a base diluted with oil as a binding *medium*.

The identification of the constituent materials together with the stylistic evaluation have allowed the original attribution to the school of Novelli to be maintained.

However, the technical observations subsequently led to further detailed research, involving the recovery, in particular, of the artifact's peculiar details when carrying out the restoration procedure.

Yet again, the accurate examination of the execution procedure and the compositional sequence has enabled the painting to be associated not only to a school, but also to a specific artist, namely Novelli, since the distinctive traits of the famous painter were accurately identified.

The information that emerged during the restoration process also found support in the favorable positions taken by Professor M. C. Di Natale and Professor M. Vitella, who followed the various phases of the restoration work to then confirm the evident similarities between the examined painting and Novelli's other works.

Therefore, it is suggested that the painting of *Our Lady of Sorrows* in Palazzo Alliata di Villafranca may be **attributed** to the painter Pietro Novelli, even if said attribution is still waiting further verification and cultural and art-historic research.

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Notes

¹ Particularly interesting is the comparative evaluation of the well-known *Mona Lisa* by Leonardo da Vinci and its copies which includes the historical anamneses and technical comparisons supported by specific non-invasive diagnostic investigations. As proof of the importance of the technical and scientific evaluations, an example is given here. Results of the infrared investigations of

the version kept at the Museo Nacional del Prado of Madrid revealed the procedure of execution of the copyist, who produced his work by following each phase of the original model starting from the underdrawing; this fact was proved by the presence of the same corrections and small changes as those on the Louvre *Mona Lisa* in Paris and its copy.

² In the last few years of his life Pietro Novelli was appointed architect of the Senate of Palermo and engineer of the Kingdom and was also compared to Apelles and Michelangelo.

³ Amongst the documented apprentices of Pietro Novelli are Francesco Gysello and Giacomo Lo Verde who, in 1625, were appointed respectively as workshop apprentice and assistant, as well as Francesco Munti summoned by Monrealese in 1645.

⁴ A recent study was carried out on the *Christ Falling on the way to Calvary* of Raffaello (Raphael) Sanzio, also known as *Lo Spasimo di Sicilia* (dated 1517) and today kept at the Museo Nacional del Prado of Madrid. The study shows how the phenomenon of accurate copies or free interpretations inspired by a prototype had been established from as early as the 16th century. Indeed, the fortune of Raphael's model produced a wide diffusion of versions made at the same time as the artist from Urbino's work, above all in Sicily, that continued in the following years. They include engravings, drawings, tapestries, paintings on canvas, frescoes, polychrome majolicas and of course copies on wood. There are also examples of plastic art such as low-reliefs, stuccoes or sculptural compositions found throughout Sicily.

⁵ Mention should also be made of the engravings by C. De Bernardis from the late 18th century, the copies of E. Lo Presti and A. Licata from the end of the 19th century and those by R. Gurrieri from the mid-20th century.

⁶ During restoration of the church, a portion of the fresco of approximately 1 m² was discovered; the precious artwork is still waiting for the necessary recovery work to be completed.

⁷ The study and investigation of the technical and conservative characteristics of *David with the Head of Goliath* of Bagheria were carried out during the restoration designed and performed by Dr. Mauro Sebastianelli in the period September 2013 - February 2014.

⁸ An anchoring system employing cane nails with a triangular section fixed along the edge of the frame was found: this procedure is characteristic of the 17th century and assesses the originality of the painting, validated moreover by the absence of holes caused by later nails.

⁹ This aspect was verified by visual analysis of the painting layers' lacunae and observation of the cross-sections under optical microscope. Afterward, the data was confirmed by the chemical characterization of the materials with scanning electron microscopy and energy dispersive X-ray spectroscopy (SEM-EDS): the use of calcium carbonate, silicates and earth pigments for the preparatory layer was evidenced by the presence of high amounts of Ca and of Mg, Al and Fe; in additions to these components, for the *imprimatura*, small amounts of Pb were found. SEM-EDS analysis was carried out by Dr. Claudia Pellerito, Researcher at the Dipartimento di Fisica e Chimica (DiFC), Scuola delle Scienze di Base e Applicate, of the University of Palermo. A Philips Quanta FEI 200 Environmental Scanning Electron Microscope (ESEM) equipped with an energy dispersive X-ray spectrometer (EDS) by Link Analytical Oxford (Link, UK), model 6103, was used.

¹⁰ In the Malibu version too, the finer lines of the background filling of the shadows provide glimpses of the preparatory layers that have the same colors as those of the Sicilian painting and other studied artworks.

¹¹ Two representative examples of Novelli's singular procedure are the paintings on canvas representing *Saint Francis of Paola* (1635) and *The Last Communion of Saint Mary Magdalene* (1641-1642) respectively kept at the Museo Diocesano and the Galleria Interdisciplinare Regionale della Sicilia - Palazzo Abatellis of Palermo. In the first case the thickness of the layers emphasizes the wrinkles of the saint and the skillfully oriented small linear brushstrokes make the beard appear real. In the same way on the second painting the single brushstrokes of subtle color, applied with the tip of the paintbrush, mimic perfectly the eyelashes and the eyebrows of Mary Magdalene.

¹² The SEM-EDS identification of pigments was carried out due to the presence of peaks corresponding to the following elements: Si, Mg, Al, Fe and Mn (Umber or Sienna) for the brown background; Hg (Cinnabar) mixed with Si, Mg, Al and Fe (Earth Colors) and small quantities of Pb (White Lead) for the red drapery; Pb (White Lead) mixed with Si, Mg, Al and Fe (Earth Colors) for the skin tone.

¹³ This feature is particularly pronounced in the aforementioned *The Last Communion of Saint*

Mary Magdalene, where the highlights of the main figure's eyes are more evident and lend realism to the tears running down her cheeks.

¹⁴ The restoration and the technical studies were designed and performed by Dr. Mauro Sebastianelli in the period January - April 2016. The research was also the subject of a thesis for a five-year degree, entitled *Studio e restauro della Madonna Addolorata di Palazzo Alliata di Villafranca: prime considerazioni sulla tecnica esecutiva di Pietro Novelli per una possibile attribuzione*: student, Edoardo La Francesca, restorer, Mauro Sebastianelli, supervisor, Maurizio Vitella, representatives, Claudia Pellerito, Cosimo Di Stefano, for the Corso di Laurea Magistrale a Ciclo Unico in Conservazione e Restauro dei Beni Culturali LMR/02, University of Palermo, A.Y. 2014/2015.

¹⁵ During the restoration and in particular, during the cleaning phase the observation in raking light highlighted the imprint of an ancient frame along the perimeter of the painting which coincided with some lacunae in the paint layers. However, the absence of any other marks does not enable us to establish if the signs are actually related to the original frame.

¹⁶ SEM-EDS analyses were also carried out for the *Our Lady of Sorrows* by Dr. Claudia Pellerito of the University of Palermo. The following results were obtained: peaks of Ca and S (calcium sulphate) with the presence of Si, Mg and Fe (Earth Colors) for the preparatory layer; silicates and oxides for the first layer of *imprimatura* because of the presence of high amounts of Pb (Minium or Red Lead), traces of Fe (Red Ochre) and orange-colored granules; same composition for the second layer with smaller percentages of Pb (Minium or Red Lead) and higher Fe (Red Ochre and Umber). The spot tests for the identification of the binding *media* were performed at the Restoration Laboratory of the Archdiocese of Palermo. The results of the analytical test revealed that the preparatory layer has a proteinaceous binding *medium*, while the *imprimatura* is composed of an oily binding *medium*. The scientific analyses, extended to other artworks by Novelli, revealed the presence of aggregates from marine environments, such as sand and ground shells in the composition of the preparatory layers. The use of these materials is quite common among other painters working in Sicily between the late 16th century and the first half of the 17th century. Although not Sicilian, some of these artists showed a preference for these aggregates during their activity in Sicily.

¹⁷ The X-ray fluorescence (XRF) analysis was carried out by Dr. Cosimo Di Stefano, Accountable Manager of the Laboratorio di chimica (S9.5 - Unità Operativa 5) of the Centro Regionale per la Progettazione e per il Restauro e per le Scienze Naturali ed Applicate ai Beni Culturali (CRPR) of Palermo. The portable instrument ASSING Lithos 3000 was used.

¹⁸ The SEM-EDS analysis identified the following peaks: Pb, Mg and Fe for the complexion; Hg for the lips and the red sleeves; Si, Mg and Fe for the grayish-green drapes and the brown background; Si, Mn and Fe for the first layer of the blue mantle; Fe and S for the second layer.

¹⁹ The abrasions of the surface at times highlighted the sequence of the layers: the dark blue mantle, for example, is superimposed on the grayish-green drapes while the red sleeves of the tunic have been painted over the flesh tones. Moreover, visual observation allowed the hypothesis of a *pentimento* in correspondence with the neck to be formulated in which the green drapery was probably modified by a downward repositioning through an additional layer of flesh tones.

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Biographical notes

Mauro Sebastianelli is a restorer who trained at the ICR in Rome (today ISCR); he graduated with a degree in Tecnologie per la Conservazione e il Restauro dei Beni Culturali, at the University of Tuscia in Viterbo. He has worked in conservation and restoration of art-historical artifacts since 1993. Since 2004 he has been responsible for the Conservation and Restoration of the works of art connected to the Archdiocese and the collections of the Museo Diocesano in Palermo. He is a contracted Professor of Restoration Theory and Techniques at the University of Urbino "Carlo Bo", and has lectured on the Corso di Laurea Magistrale a ciclo unico in Conservazione e Restauro dei Beni Culturali at the University of Palermo since 2007. He is the author of numerous scientific publications and articles, a keynote speaker and thesis supervisor. He is the creator and curator of the series *Storia, tecnica e conservazione in Sicilia*.