

PARMIGIANINO. THE ENCHANTMENT OF MATTER

Fontanellato, Rocca Sanvitale, September 21st – December 31st

Exhibition curated by Gianluca Poldi

5. PARMIGIANINO'S DOGS

Among the self-portraits that have survived, this one in particular (**fig. A**) offers an insight into an aspect that is rarely noted: Parmigianino's love of dogs, overlooked by sources, but seemingly evident not only from this drawing, but also from the Fontanellato series in which they feature as protagonists.

A total of sixteen dogs appear, mostly greyhounds, not merely as filler figures between the major scenes, but also as characters in the story.

In the stunning *Autoritratto con cagna gravida* [Self-portrait with pregnant dog] probably painted in the final decade of his life, the painter is depicted on a stool, in a room, lifting up his pregnant dog to display her swollen belly and nipples (**fig. A**). He holds her upright, in an anthropomorphic pose, seemingly to show her something in the direction which he, too, faces.

Another female dog (**fig. C**), very similar to that in the drawing (perhaps the same?), interrogates the viewer, in the southern corner, facing one of the current doorways to the room.

A detailed preparatory drawing in red pencil of the head of this animal, lacking a collar, that is not involved in tearing Actaeon to shreds, has been preserved (**fig. B**). Reflectographic analysis of the painting (**fig. D**) has revealed a similar shading structure on the dog as seen on the sheet, and a confident stroke, without revisions except for the nipples, which are not included on the sheet. The picture on the wall originally featured four nipples, but one was painted over in white for perspective reasons (one was too long and not properly spaced from the others), demonstrating an excellent grasp of anatomy.

The dog beside it, meanwhile, shows signs of revisions to the profile of the ear, and resizing of the head.

The painter devoted particular attention to the detail of the collars of the Fontanellato greyhounds. That of Actaeon's own hound stands out in particular due to its purple collar apparently made from leather, and featuring half a shell at either end (the bivalve shell symbol was associated with the client, Galeazzo Sanvitale); it is fastened with a twisted chain to the leash, consisting of a gold leaf-plated cord, as seen on at the back of the northern wall, where Actaeon appears in female form, leading the hunt (**fig. E-a**). This is the same dog then that, freed from its leash, mauls the neck of his master, who has been transformed into a stag (**fig. E-b**).

6. EARLIER IDEAS?

A sheet preserved in Berlin, with drawings on both sides, is considered to hold the initial idea for the iconography of the Fontanellato room: indeed, a number of nude women are depicted on one wall (**fig. A**), slightly off centre, drawn in pen; these may be interpreted as nymphs bathing against a backdrop of lush foliage, but neither Actaeon nor a specific divine figure is included (none of the women are wearing Diana's characteristic crescent moon headpiece). To the left, set apart, a slender figure is depicted in red pencil in a niche, while a frieze above features putti surrounding a cow, and a lion's head holding back a curtain opening onto the scene of the bathing nymphs. To the right in this frieze, a seated female figure appears to support a smaller female figure, who is standing (**fig. A**, top right): perhaps this is the same idea developed in more detail in the Cincinnati sheet, which features a counterpart of a seated woman holding a small winged figure (**fig. B**).

On the other side of the Berlin sheet (**fig. C**), other putti in the frieze are presented on another wall, around a crest, while the larger picture features two women and two cattle, with one of the women seated on one of the cattle: this is likely a depiction of the rape of Europa, with Jupiter in the shape of a bull. Finally, a nude child is depicted in a seated pose halfway up the sheet on the left, without any clear relationship to the rest of the elements.

Might this have been the initial proposal for the Camera Picta at Fontanellato, with scenes from Ovid's *Metamorphoses* featuring Diana and Jupiter, with no apparent development? Perhaps the other two walls were intended to feature a development of these myths, or others?

We come, then, to a final drawing (**fig. D**), square, in black chalk, which better fits into the structure of the room as it appears today, representing a portion of the vault above the sails, which now features motifs of putti among trellises of foliage. On the sheet, Parmigianino captures the moment of the encounter between an elegantly dressed Actaeon and the naked goddess – very close up, almost head to head – from whose hands a number of lines seemingly represent droplets of water (though we cannot be certain, as they may also be part of the latticework of the trellises). A nymph can just be made out behind Diana, while a dog is sketched on the sail below. Actaeon is depicted as a young man, and not a woman as he appears in the scene preceding the transformation in the fresco. He appears to be wearing a high-necked blouse, though the collar could be mistaken for a close-fitting necklace.

7. WHAT WE SEE

The painter sets the scene beneath a lattice pergola, covered with foliage, culminating at the sky with white and pink roses in bloom. An octagon of sky features a round mirror at the centre.

A number of decorative putti, most with wings, appear among the foliage, engaged in various acts that do not appear directly related to the story below.

The sails below feature a faux gold mosaic, decorated with ribbons, where oculi open up to the sky; at the corners of the room, strings of white and red pearls hang from the oculi. A faux garden pavilion structure, part building, part foliage.

At the base of the sails are the corbels with their enigmatic three-dimensional head shape, apparently representing Medusa, eyes wide open, one identical to the other.

Finally, in the lower register, the myth unfolds across 14 lunettes, essentially focusing, however, on three main scenes: the hunt, the theophany, and the death.

According to the inscription (western side), the female figure Ceres is followed, in cinematic sequence, by a hunt scene, which begins with the greyhounds. In front of them (northern wall), two hunters are running almost side by side; one is turned towards the other who, in turn, is pointing to the figure ahead who guides them. The figure in question is a woman (**fig. A**) who carries the hunting horn on her belt; we know however, that this must be Actaeon, because the figure holds the lead dog on a leash, and the clothing is identical to that in the subsequent scene of the theophany (eastern wall). Theophany and the heart of the story: the goddess is caught bathing, naked, with two servant nymphs, and poor Actaeon, who saw her, immediately has his head transformed into that of a stag.

The sad epilogue of agony follows on the southern wall: a hunter blows the horn for the stag hunt, but it is in fact Actaeon who is attacked by his own dogs. The final lunette on the wall depicts a boy, his face still rounded, a young boy, running into the centre of the hunt alongside an old man with a white beard.

Just before the capture of the stag, in the upper register, two winged putti (**fig. B**) are perhaps symbolically linked to the meaning of the scene, as some scholars have suggested. Wrapped in a cover too similar to Actaeon's cloak to be a coincidence, a young female angel with large earrings embraces a baby angel, who holds a cherry twig and wears a necklace of alternating pearls and red beads, perhaps coral. On the opposite wall, two putti-angels argue over something, perhaps an earthenware vase.

Cherry and coral, symbols of blood: in a Christian context, they represent the blood shed by Christ for the salvation of mankind, but here it is Actaeon's blood, or perhaps also that of a possible child, dead or in danger of death, of Paola Gonzaga and her husband Gian Galeazzo.

There are various hypotheses as to the function of this ground-floor room, originally probably lit by a smaller window: it was said to be a bathroom ("stufetta"), a small study, a *boudoir*, a private shrine. It was probably a private room, perhaps within Paola's apartments.

8. INSCRIPTIONS AS A GUIDE - THE MIRROR

A long written inscription contextualises the depiction of the famous "fable" of Diana and Actaeon, emphasising the cruelty of deities, or of fate.

The letters have been produced on a coat of white lead, a technique used when painting on panel, in brown pigment coated with a thin layer of gold, only partially worn. Infrared analysis reveals the thin lines used to draw the characters, probably in black pencil (**fig. A**).

AD DIANAM / DIC DEA SI MISERVM SORS HVC ACTEONA DVXIT A TE CUR CANIBVS /
TRADITUR ESCA SVIS. NON NISI MORTALES ALIQVO / PRO CRIMINE PENAS FERRE LICET.
TALIS NEC DECET IRA / DEAS.

It reads: "Diana. Tell us, oh Goddess, why make him food for his dogs if it is fate that led the wretched Actaeon here? It is not right that mortals suffer punishment, except for some fault or other. Such rage is unbecoming of a Goddess".

Ovid himself prefaced his account of the incident to Actaeon's grandfather Cadmus as follows: "but if you seek the truth, you will find in this a fault of fortune, not a crime; for what crime is there in a misstep?".

Just as Actaeon is not at fault for having accidentally – or by fate – encountered the beautiful and powerful Goddess of the hunt naked, nor is Galeazzo Sanvitale and Paola Gonzaga's baby, or Gonzaga herself, at fault. This is a potential, persuasive reading, tied to the clients' personal story, that may shed light on the underlying significance of the series.

Curiously, Actaeon is referred to in the text as "Acteona", using the Greek accusative, rather than "Acteonem", which is the correct Latin version.

The frame of the mirror at the top of the room reads RESPICE FINEM, produced using engravings, again in gold on a white lead background. The inscription translates as "Look to the end" – suggestive of a *Vanitas*, a *Memento mori* message, so popular in Renaissance tradition – but also: look to "the objective" (**fig. B a-b**).

The mirror, its surface now obscured and no longer reflecting, consists of a sheet of copper coated with a layer of tin, as shown by the XRF analyses (**fig. C**).

The connection between the inscription on the base and that on the mirror is not, however, immediately obvious. Considering the end and/or the goal means reassessing one's life, one's decisions, and the mirror invites one to consider oneself – evoking the maxim to "knowing thyself" inscribed on the temple of Apollo in Delphi – involving recognising one's limits and finiteness (including in the face of the gods and of fate), and also one's potential to rebuild.

On one hand, Apollo reminds Poseidon that men are merely "wretched mortals who, like leaves, flourish for a time, enjoying the fruit of the land, then lifelessly pass away". On the other, in *Prometheus Bound* attributed to Aeschylus, Oceanus advises Prometheus that "You must always know thyself and adapt to the new rules: because this tyrant that dominates the gods is new. If you hurl [...] arrogant and cutting [...] words, then the volume of suffering you are currently experiencing will seem to you like child's play".

This theme of reassessing oneself and looking within, the motif of the mirror, is associated with the introspection of melancholy, and also with a state of inescapable self-awareness that fuels alchemical knowledge.

9. WHAT WE DON'T SEE – THE ALCHEMICAL INTERPRETATION

According to Vasari, the painter became interested in alchemy while working on the commission at the church of Santa Maria della Steccata in Parma, a project that moved "very slowly" because "having begun studying alchemical matters, he entirely neglected painting, believing that he would soon become rich from freezing mercury" (Vasari, 1568).

In the light of his pupil's testimony, as reported by Dolce [panel 1], it seems rather improbable that the painter began exploring alchemy with the aim of getting rich. Parmigianino had little regard for money and was more drawn to philosophical research. And indeed, in such culturally open contexts as the Fontanellato court and others he frequented, it is not surprising that a bright mind might also take an interest in materials and their transformation, as well as exploration of the self, and thus attempt to draw all these various layers of stimuli together. It was an eclectic Renaissance, influenced in those areas by Pico della Mirandola, with various members of the learned classes drawn in new cultural directions, inspired by the rediscovery of classical texts, and a Christian faith that had not yet assumed its post-conciliar orthodoxy.

Painters, in particular, experimented not only with recipes for painting, some jealously guarded by the workshops, but were also familiar with chemical (alchemical) recipes for producing or purifying certain pigments, though most went to "vendecolori" (colour-sellers) to acquire pre-prepared materials. For example, verdigris – copper acetate – was made by exposing copper sheets to acetic acid; lead white – basic lead carbonate – involved systematically exposing lead foil to acid, oxygen and carbon dioxide; synthetic cinnabar (vermillion), meanwhile, was produced by heating a mix of mercury and sulphur.

Furthermore, certain drawings suggest that Parmigianino was of a melancholy, anxious temperament, as is associated with alchemists; it is likely that he dedicated an etching (also known as *Saint Thais*) to *Melancholy*, featuring a woman sitting on the ground with a contemplative expression (fig. A), similar to Dürer's *Melencolia I* (1514). The subject sits in front of an amphora, an object the painter often included in his works, together with vases.

Alchemical knowledge was not codified into scholarly teachings and was generally passed on without manuals from teacher to pupil in an individual, esoteric context, largely based on individual talent. We know that Parma was home to a number of natural philosophers (physicians, anatomists, scholars of science and of symbolism, and perhaps also alchemists of both a chemical and philosophical-esoteric persuasion). These included a physician, Giovanni Andrea Bianchi known as Janus Andreas Albio, for whom Parmigianino painted "a Conversion of Saint Paul [...] which was a very rare thing" (Vasari, 1568), now in Vienna.

It was in those areas of the Po Valley, furthermore, that Giovanni Francesco Pico della Mirandola, nephew of the better-known Giovanni Pico, wrote his *Opus aureum* in around 1515, though it was printed much later.

The idea that strong alchemical influences are also evident in the Fontanellato series, a theory proposed by Maurizio Fagiolo dell'Arco around 1970, is open to debate; nevertheless, it is worth reflecting on, if only to consider the density of the imaginative references, associations, almost hermetic meanings of this *camera picta* (painted room), so abundant that it is hard to imagine the work derives exclusively from the "fable" of Ovid.

The Berlin sheet [panel 6] suggests that the initial concept for the room involved the specific depiction of two deities, Diana and Jupiter, consistent – if the interpretation is correct – with the numbers 7 and 2 on the medal in the portrait of Galeazzo Sanvitale [panel 3].

A late (1620) summation of alchemical thinking features both Jupiter with the sun and Diana with the moon, held by her and an Actaeon bearing high, six-pointed antlers (fig. B). It states that "the goddess purified by bathing represents alchemical volatilization, the sixth stage of the *opus*, silver. In the alchemical world, meanwhile, the deer symbolises the soul, and is usually depicted in the hermetic forest of initiates" (Fagiolo dell'Arco, 1969).

If the room really was conceived as a bath, as has also been hypothesized (Ghidiglia Quintavalle), this might be a further reference to the immersion of the married couple in the *balneum nuptiale* for the *coniunctio* between first male and female. And the mirror referring to the end ("respice finem") conjures the notion of the sublimation of matter. Might Actaeon, depicted only in female, rather than male, form, be a reference to the androgynous human in Plato's *Symposium* – familiar in the context of the neoplatonism of Marsilio Ficino –, an archetype of *coincidentia oppositorum*? Or, more simply, might the figure of Actaeon represent Paola Gonzaga, tormented by the pain of a mother losing her son?

Having identified the potential hermetic and symbolic aspects, which may have only been familiar to a small number of members of the court, it must also be noted that numerous references one might expect to find in support of the alchemical theory – from fire and alchemical vessels, to colours representing the stages of the Great Work of alchemy, from *nigredo* to *rubedo* – are absent here.

10. THE MEDUSA-HEAD CORBELS

The enigmatic corbels made of stucco, at the base of the sails, take the form of Medusa heads (**fig. A a**), as indicated by the garland of two snakes arranged to form a symmetrical knot, with the pair of small heads in the centre. This is a variation on the iconography associated with Medusa, sometimes considered a very beautiful woman with a head of snakes and a gaze that turns people to stone, sometimes as a hideous monster with bright eyes, boar-like tusks, bronze hands and golden wings.

This headpiece and the band that fastens it under the chin with a tassel are golden in colour, featuring gold leaf, now somewhat worn and incomplete, on a brown preparation layer. The overall gold colouring makes it difficult to clearly distinguish between the headpiece and the band that comes down behind the ears (a band, or perhaps locks of hair?), extending the ear lobes.

The ears are visible, the mouth slightly open as though in speech, eyes wide open but without irises or pupils. As though to emphasise listening, speaking, and seeing, except they are blind as if turned to stone; or perhaps the intention was to represent the petrifying gaze of this Gorgon that Perseus succeeded in evading using his mirrored shield. Another oblique reference to the mirror.

They are adolescent Medusa figures.

An inspection of the heads using UV radiation (**fig. A b-d**) revealed a number of non-uniformities, seemingly the result of residue from polychromy that has been entirely removed by drastic cleaning operations long ago, and perhaps also covered over, to make them appear like ancient sculptures.

Under the microscope, in fact (**fig. B a-d**), traces of pinkish red pigment can be identified, covered at points in a layer of beige made up of larger fragments, which may indicate that the section was repainted at a later point: on one eye (**fig. B c**), the layer covers certain pinkish strokes (which, unfortunately, are transparent in IR reflectography), perhaps depicting eyelids that are partially lowered, though not closed.

The appearance of the red and brown pigments, light and dark, is consistent with ochre pigments, in keeping with the findings of the spectroscopic analyses that indicate the presence of iron and manganese; but also lead, the latter most likely due to the presence of lead white, used as a white, similar to a polychromy on wood. In at least one instance, traces of green were detected in the mouth, which were however covered with a reddish layer (**fig. B d**). A sheet featuring a red pencil sketch by Parmigianino of a male head with no pupils (**fig. C**), may evoke the effect of these heads, in drawings produced by the painter before moulding them (or tasking a sculptor with moulding them?).

One drawing from that period, on the front of which is a study for the portrait of Sanvitale [**panel 3**], seems to be linked to our series and is of particular interest (**fig. D**). It is a pen and ink sketch of four options for the end of the corbels – relatively flowery or leafy, while the final option is a bucranium with a sort of bow on its head, of the sort sometimes found in grotesque contexts. These are bucrania recently and otherwise used by the painter at San Giovanni Evangelista in Parma.

Superimposed on these, in red chalk, is a female head depicted front facing and in profile; in one of the two cases, her eyelids are lowered and her mouth partially open. These are probably the initial sketches that would later become the Medusa.

The lower section features two studies of a winged lion, an iconography sometimes associated with alchemical themes.

11. DIANA – PROFILES, MOUTHS, GESTURES

Diana, revered by the ancient Romans above all as a birth-helper on a par with Juno, was generally regarded as the protector of women. She ruled the woodlands and oversaw the lives of wild animals, and the woods were her primary place of worship. In Roman culture, the figure of Diana came to be identified – including in terms of iconography – with that of Artemis, goddess of the hunt, characterised by chastity, a virtue she shared with the nymphs that accompanied her, and later with that of Selene, goddess of the moon.

In the frescoes, the goddess appears naked (**fig. C**), in profile, with the characteristic crescent moon evident on her head, immersed up to her buttocks in the pool with red chalk edges. The figure is neither slender nor particularly graceful – a stylistic indicator that helps contextualise the series in a period prior to the artist's time in Rome.

The painting is a little worn: in addition to blurring in the profile and some repainting of the foliage that it was decided not to remove in the last restoration, a portion of the finishing hatching on the body – a defining feature of Parmigianino's *modus operandi* when working on walls – has been lost. Only small corrections are evident, along the back and shoulder (**fig. D**).

An interesting detail, also confirmed via IR imaging (**fig. D**), is that the hands are just below the surface of the water, as indicated by the edges of the water above the wrists and the bubbles. Therefore, either the magic had already taken place, and she had already splashed "the hero's face" (Ovid) and hair to turn him into a stag, before putting her hands back under the water; or she was able to keep her hands under the water, and the water lifted by magic. The splash – now hardly visible at all, probably painted using the *secco* or *mezzo-fresco* technique – can just be made out in the preceding lunette, in which a number of whitish diagonal lines remain, ideally originating from the hands of the deity and travelling towards Actaeon, who seeks to protect himself with his left hand.

A series of works, from the same period as the Fontanellato cycle [**panel 2, fig. A**] or later, attest to the painter's predilection for female profiles like Diana's, with lips barely closed or partially open, as in the two sheets in the Uffizi: the quick pen and black chalk sketch just below, in which the artist marks a slight depression in the forehead (**fig. B**), and what is probably the finished study, in red chalk, in which the forehead is smooth and the complexion and hair are well-finished (**fig. A**).

12. PREPARATORY STUDIES

As well as those previously discussed [**panels 3 and 6**], a number of drawings on paper that we can – with certainty or reasonable confidence – consider to be preparatory studies for the Fontanellato series have, fortunately, survived.

One is the wonderful study of a greyhound in sanguine at the Getty; the subject, quickly sketched from a live model, with his exquisite collar, is Actaeon's hound (**fig. D**).

The sheets at the Louvre and the Morgan Library certainly pertain to Diana's room. The Louvre drawing, in pen with wash (**fig. E**), features winged putti holding leafy branches. The first of these, already positioned in the pendentive shape, is the same figure that appears between Diana and the nymphs in the fresco. The pose displayed by the putto further to the right is a variation on that of the figure on the sails of the wall depicting the agony: the positioning of the portion above the bust is the same. It is interesting to see the first version of the upper register, which shows that, in place of the green hedge, Parmigianino had originally envisaged a series of putti spread out in various positions, suspended among the plants and probably standing out against the sky.

The New York sheet, featuring a mix of techniques (**fig. A**), is perhaps attributable to a later stage in the developmental process, with the putti in the top section having been replaced by the foliage border with the diamond-shaped trellis. The solution proposed for the top of the lunettes is different, however: in place of the faux mosaic with oculi and ribbons is a lighter structure of linked circles, reminiscent of Mantegna's style, and possibly rejected as it would have required too much work. As for the putti, all of whom are winged, the one on the left holding a slender leafy branch in its right hand has the same pose as the putto depicted between Actaeon and Diana on the western wall, though in the latter case the painter modified the gesture by depicting the figure holding a long palm leaf that extends over its shoulder. The transparent garment closed over the stomach has, however, been retained.

A square grid in black pencil can be seen superimposed on that putto on the sheet; this may have served as an aid for enlarging the figure on another sheet in order to then arrange it while working on the scaffolding at the painting stage (no grid marks can be seen on the wall).

The putto in the centre, with superimposed strokes in ink and red chalk, is the same figure that opens the scene on the northern wall among the greyhounds and hunters. The positioning of the right arm is different; it is raised in the final painting to accommodate the edge of the pendentive. The solution with the two rabbits is elegant but was not retained.

A sheet at the Uffizi features a putto standing up with its right arm raised, foliage at its feet, the bare outline of a ribbon across its chest, and strokes suggestive of wings at its shoulders (**fig. C**): this figure can be identified as the winged putto on the northern wall (**fig. B**).

As a number of scholars have noted, the small pen sketch at the British Museum (**fig. F**) may also be regarded as a study for the series; it too features fragments of text written in three different inks, and therefore at different times.

With reference to the series of putti, a sheet, delicately blended in red pencil, but perhaps made later, depicts another pose, with arms raised to hold up a load (a globe?), and an abdomen that does not much resemble that of a child (**fig. G**).

13. SCIENTIFIC INVESTIGATIONS

The non-invasive analyses were performed in two stages:

1. the first involving multispectral imaging in visible light (under scattered and, insofar as possible, raking light conditions), IR and UV of the whole painted surface, which is useful to obtain information on both painting techniques and the state of conservation;
2. the second involving digital optical microscopy, combined with x-ray fluorescence (XRF) and reflectance (vis-RS) spectroscopy techniques, to identify the pigments and materials used in numerous significant areas of the decoration. These kinds of examinations allow to avoid invasive or micro-invasive analysis techniques involving extraction of samples of the painting, of the sort performed during restoration projects in the 1990s.

UV fluorescence (UVF) consists of illuminating the surfaces using ultraviolet light sources (maximum emission of 365 nm in this case) and taking photographs in visible light. The various colourations of the areas analysed are the result of both the original materials used and those added during restoration work, including those used to consolidate and protect, allowing areas that have been subject to conservative work to be identified.

IR reflectography (IRR) only allows the infrared component of radiation (emitted in this case using halogen lamps) to be captured, using appropriate imaging systems operating at different wavelengths. Modified cameras and appropriate filters were used, as well as remote scanning systems (Osiris), making it possible to work at three bands in the 850-1700 nm range. Because some pigments are transparent to IR radiation, this methodology makes it possible – with certain limitations, particularly when applied to wall surfaces – to identify the underlying drawings and revisions, particularly in areas where the secco technique has been used. The utility of this approach for examining wall paintings is, perhaps, under-appreciated.

False colour infrared (IRC) imaging involves combining the two RGB bands of a visible light photo with the near-visible IR band. Even at a great distance, IRC images can be useful for determining the uniformity of preservation of the surface and certain paints, provided that these take on different diagnostic colours under this method. This technique is significant in complementing spectroscopic analyses, and in our case enabled us to identify the distribution of azurite and smalt blue, as the former appears bluish under false colour IR, while the latter appears pinkish red, as shown in **figure B a-b**.

The **microscopic analyses** performed using a digital microscope (DM) across hundreds of areas of the painting, magnified by 50 to 230 times, allowed us to identify a series of pigments and clarify certain layering techniques and mixtures used by the painter.

Reflectance spectroscopy technique, performed at close range across dozens of points using equipment that operates in the 360-740 nm band (vis-RS), enables the identification of numerous categories of pigments thanks to the specific absorption bands or other characteristics of the spectra acquired. For example, it permits easy differentiation between several types of blue pigments – in our case azurite and smalt blue – and recognizes modern pigments.

X-ray fluorescence (ED-XRF, **fig. A**) spectrometry technique, meanwhile – performed on certain parts selected for vis-RS and MD analyses – makes it possible to identify a large number of chemical elements present in the area investigated, which are characteristic of the pigments used (but in this case also associated with the plaster materials). XRF techniques are particularly useful for detecting the presence of metals such as gold, lead, copper, tin, etc.

14. MAKING THE PAINTING: SINOPIA AND DRAWING

When embarking upon a large-scale mural painting such as this, it was standard practice to first do an initial, summary drawing of the composition directly on the first layer of plaster, usually a rough layer, known as "arriccio". This was referred to as the sinopia, and served to outline the composition and mark out the areas where the final layer of plaster, the "intonachino", would be applied little by little. Finer and smoother, and relatively thin, this layer served as the base for the colour to be applied with a brush. Once the intonachino has been applied, it is impossible to make out the sinopia underneath, even using scientific methods. As such, it is usually only discovered when the intonachino comes away from the wall along with the painting, or is detached for conservation purposes and applied to a new support.

It is only by chance, then, that we know that Parmigianino used a sinopia, thanks to the gap in the plaster in the lower part of the scene with the two nymphs behind Diana. This damage was not present in 1794-1796, when Antonio Bresciani engraved the series on copper to be reproduced in print, unless it had already been retouched. We learn a number of interesting things of a technical nature from the section where the plaster fell away (**fig. B a-d**), and specifically that there was a double layer of plaster above the arriccio: an initial, rather thick, layer of around one centimetre, followed by the thin intonachino, measuring around one millimetre, to which the colour was applied, as detected using the side light technique. The sinopia was produced in black, with a wide brush, and consists of a very rough sketch to determine where to place the figures. As the carbon-based pigment remains visible under IR analysis, it is possible to make out the edge of the pool (almost invisible to the naked eye) that, according to Bresciani's etching, the nymph appears to be climbing over. More so than the outline of the nymph's stomach, a number of oblique lines appear to depict the folds of a peplos, which would have been partially wrapped around her, as she had not yet entered the water: traces of red are, indeed, evident on the edge of the missing section, against the stomach of the nymph to the right. It is only using UV light analysis that it is also possible to identify spots or strokes on the arriccio that may be interpreted as traces of colour, the decoration of a garment, perhaps used by the painter in part of the sinopia.

Furthermore, a yellow garment, belonging to the goddess or her servants, is placed on a raised section of the parapet of the red chalk pool but, curiously, this is absent in Bresciani's depiction, perhaps as it was repainted in that period, or could not be made out. We do know that in 1836, when Parma-born Giovanni Batista Borghesi was hired to restore the series, he found the nymph already "repainted in oil [...] from the lower back down".

Having finished the sinopia, whether across the whole room or just certain sections, the painter moved on to the final plaster stage. This was not done on the basis of individual figures or groups of figures, as was normally the case, transferring the drawings from 1:1 scale cartoons to the wall, or using pouncing (perforating the paper along the edges of the figures and the salient details) or tracing by incision techniques. Indeed, neither the tiny dots associated with the pouncing method, nor any outline incisions, are evident in this case, even when the painting is examined using IRR and raking light techniques. Only direct, thin, engravings, assisted by a ruler, are used to trace a section of the wooden structure of the rose trellis, up high in the sky.

And so how did Parmigianino work? Confident in his drawing abilities, and referring to sketches on paper – which we imagine were many and detailed, and perhaps large in scale – it seems that he worked freehand, directly on the intonachino, wet-on-wet, but very carefully, mainly with a brush and a greyish or black colour, though a thin piece of charcoal was also sometimes used as is evident along certain outlines.

This approach has resulted in a number of corrections, albeit minor, to certain outlines, for example in the lunette with the female dog [**panel 5, fig. D**], or as revealed by IRR along the nose of the hunter on the left in the second lunette on the northern wall (**fig. A a-b**), initially smaller and then extended, lending him a more pronounced profile, as with his brow. The final touches to the curly black hair above the sky are almost entirely lost.

In the preceding lunette the cords of the greyhounds' leashes remain unpainted, despite being held tightly in the hands of Actaeon's hunting companions, and depicted in full in brushstrokes beneath the painting. Why? I do not believe it is the loss of details that were painted a secco, because if it is true that the leashes were present in old prints and old photographs prior to the 20th century restoration, they were later removed being evidently considered non-original.

Perhaps the painter did not wish to interrupt that arresting sky – the highest section of landscape in the series, with oblique prominent clouds passing through the scene – awash with reds and yellows, the clouds illuminated from below, as at sunset.

15. MAKING THE PAINTING: CERES

Among the images on which the analyses shed light is that of the figure with the ears of corn, which can be identified with Ceres (**fig. A**).

Ceres, Roman goddess of crops, corresponding to the Greek goddess Demeter, is generally portrayed as a severe and majestic matron, beautiful and affable, with ears of wheat in her hand or worn as a crown on her head. Sometimes she holds a torch, to symbolise the search for Persephone, her daughter, abducted by Hades, and a basket or cornucopia full of cereal and fruit.

In the fresco, the goddess-woman is positioned at the beginning of the series and at the epilogue, and so between the incipit and the end of the long inscription on the base almost as though inviting the viewer to read it. Her hair is wavy – tied with a ribbon that has not survived, perhaps because it was painted using the secco technique – her bosom partially exposed, she sits on the edge of a sill/parapet, as though at a window, looking down. One knee is raised, her right hand rests on a sort of two-handled cup, the base of which (no longer visible) would, in keeping with the perspective, have been resting on the sill. In her left hand she holds two ears of grain. The stem of the lower ear is bent as though just broken, possibly a reference to the life of Paola Gonzaga's baby cut short; the ear above, meanwhile, is now rather worn, but IR analysis has revealed its preparatory outline, featuring a high arc (**fig. B**). No torch is included, but there are two sources of light, one external, from the left, and one internal to the lunette, originating from the bottom of the niche, in the centre, and possibly symbolic. The yellow-orange colour of the niche is not, in fact, the same used to simulate gold in the faux mosaics on the sails above the lunettes.

The elegant face has been interpreted as a portrait of Paola Gonzaga, but this remains a mere hypothesis in the absence of comparative evidence. Indeed, the face type is similar to others in the painter's repertoire including, for example, that featured in the small panel of the *Virgin and child with an angel (Saint Catherine of Alexandria?)* now in Frankfurt (Städelsches Kunstinstitut, inv. 1496), a small oil on panel which in fact has been dated as 1523-1524. A sheet at the Louvre (INV 6445, back) is considered to be a study for the feminine face on this panel, though the background includes a chiaroscuro niche and a sketch of a halo.

Very similar to the fresco is the bust drawn in sanguine on a circular sheet of paper (**fig. C**), probably a preparatory study. The head in this version is tilted to the left rather than to the right as in the painting – a more interesting arrangement as it accentuates the circularity of the movement – and the garment is similarly floaty and light, with a cloak behind the neck.

As clearly shown by the reflectography (**fig. B**), the fresco also features a few confident grey-black strokes outlining the edge of the cloak above the shoulders, more visible today due to the partial loss of the smalt blue finish. The whole cloak has been sketched wet-on-wet with a wide brush and great agility.

16. DAYS OF WORK AND PIGMENTS

Not all pigments are suited to buon fresco. Indeed, the technique requires pigments such as clays and ochres, vine black, "Bianco di San Giovanni" – a white pigment derived from lime using specific procedures – and smalt blue. When diluted with water, these pigments are involved in a carbonatation reaction upon drying, and are captured in the crystalline lattice of the calcium carbonate that forms, thus bonding firmly to the intonachino.

In order for this phenomenon to occur, the pigment must be spread onto the plaster before the latter dries. This involves dividing the wall into sections to which the intonachino is applied when the painter is ready to paint them (each section is thus referred to as a "giornata" – a "day's work"); usually, the more detailed the work, the smaller the "giornata".

The series in question has been estimated as consisting of approximately 40 "giornate": one alone devoted to the sky, one for the pergola, ten for the plumes, fourteen for the sails, fourteen for the lunettes. The painter began with the sky, before moving on to the foliage on the vault, followed by each of the lunettes as a single giornata, progressing from left to right, or beginning with the one of Ceres on the right (in which the sky now has significant sections missing), with the greyhound behind her, turning towards the viewer. A giornata did not necessarily correspond to a calendar day's work, and multiple giornate could be completed in a single calendar day, depending on the complexity of the task at hand.

In any case, such a small number of giornate suggests that Parmigianino worked quickly, presumably not during the winter when conditions precluded optimal drying of plaster and pigments. The series is likely to have been painted, then, over the course of the autumn of 1523 or, more likely, if an association with the birth of Paola and Gian Galeazzo's son in September is correct, in the spring and summer of 1524, allowing more time to research and prepare for the job before going to Rome.

The artist worked with speed and great skill, preferring the fresco technique with mezzo-fresco finishes to the tempera method. Having drawn the figures and the various elements, he moved quickly on to applying colour with brushstrokes, reserving the mezzo-fresco approach, using lime water, for certain finishing details. He typically worked with short parallel strokes of colour, similar to his drawing style.

Scientific analyses performed on this occasion have revealed the almost exclusive use of pigments suited to buon fresco, and specifically a wide range of ochres and earths (yellow, orange, red, various tones of brown, green), black pigment and smalt blue.

Smalt blue was made from potassium glass coloured with cobalt oxide, offering a low-cost imitation of the very expensive natural alternative available overseas: it was widely used in mural painting, particularly from 1500 onwards. The painter used it coarsely ground and mixed with Bianco di San Giovanni white, and black granules (**fig. A**).

Used in addition to these pigments were a copper-based green, malachite, and a copper-based blue, azurite, which however required dry application, typically using the tempera technique.

Azurite (**fig. B**) is used at the edges of the lunettes, for the ribbons superimposed on the yellow ochre, and on the black of the faux mosaic, produced in fresco.

The painter used malachite, including mixed with green clay (**fig. C**) to adjust its bright tone, for the foliage of the pergola, applying it to a black base (**fig. D**), probably to make it stand out. The same method would be used by Pordenone at Santa Maria di Campagna in Piacenza a few years later. To achieve certain shades of green or specific tones, malachite and azurite were used together (**fig. E**).

Notable among the ochres, ground quite finely, are the intense colour of the yellow (goethite) used for the sky at sunset (**fig. F**), and the reddish purple of some garments (morellone) (**fig. G**). We suspect that for small number of the roses, the red ochre (hematite) would have been enhanced with strokes of lake, an organic pigment applied dry, almost entirely worn away and lost (**fig. H**). The complexions were achieved using variable mixtures of ochres and earths (**figg. I-K**).

Lead white and gold leaf were used for the inscriptions [**panel 8**], but gold is also found on the Medusa heads, gilded on a reddish-brown bole base, and in certain details such as Actaeon's greyhound's leash [**panel 5**] and the pergola, where the points of intersection between the sticks painted in yellow and brown ochres are finished with small gold diamonds, with the gold leaf applied over tin leaf and then attached to the wall using an adhesive gilding process (**fig. L**).

17. CONSERVATION

As seen now, the series has benefited from restoration work by the Opificio delle Pietre Dure workshop in 1997-1998, under the supervision of Giorgio Bonsanti, Cristina Danti and Lucia Fornari Schianchi. It was an extremely delicate task, involving removing the old fixatives and almost all previous retouching work – restoring the sky, for example, which at the time was in a poor state of repair, and cleaning the foliage to remove most of the old touch-ups. The process also involved consolidating the plaster and the painting in areas where it was at risk of being lost, and performing re-carbonatation of pigments applied dry using barium hydroxide packs, based on the method developed by chemist Enzo Ferroni in Tuscany in the 1960s. The necessary retouching work was then performed in watercolours, using ammonium caseinate, adopting the "velatura" (glazing) technique or, where larger sections were missing, the "rigatino" (dashing) technique, performing colour matching and making sure that all work can be reversed.

One head-corbel (located between Actaeon and Diana) was missing; this was recreated using plaster cast, and installed in place.

The removal of the central mirror revealed the original tones of the sky painted with smalt blue, allowing to remove the modern repainting of the other part of the sky and restore it properly.

Almost half a century later, the restoration work is holding up well from a colour perspective. Up close or under bright light conditions, the sections that have been supplemented can be identified. The areas where consolidation work has been performed, in the distant past and more recently, can be detected under UV light (UVF), as well as more mimetic interventions, such as the mouth of the figure blowing the horn, which has been reconstructed by restorers (**fig. A**).

The lunette depicting the agony of the stag Actaeon (**fig. B**) is striking under UV fluorescence. The technique reveals extensive supplementary work and numerous consolidation interventions, pointing towards a difficult conservation journey, due to the static instability of the masonry. Indeed, a previous intervention involved partial removal of the painted intonachino, lining the fragment with a thin layer of cotton, and then reattaching it to the plaster using calcium caseinate and resin. The portion removed – easier to identify under UVF conditions due to various divisions in the areas of colour – included the head of the stag, but not the horns, the head of the dog at its shoulders, and a section of the greyhound on the right. Under scattered light (**fig. C**), the issues are partially evident, particularly up close, while under IR reflectography (IRR) the areas that have been fully reconstructed through retouching (**fig. D**) emerge clearly as marks, and side light conditions reveal the unevenness of the surface (**fig. E**).