

Outside and Inside the Surface. A Statue of Apollo from Villa Corsini in Castello (Florence)

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Abstract. This paper focuses on a marble statue representing the god Apollo as an archer, from the collections of the National Archaeological Museum of Florence (MAF), now exhibited at Villa Corsini in Castello (Florence). The larger-than-life-size statue has been considered a Roman pastiche: a head derived from a 4th century BCE (Before Common Era) prototype was joined to a body inspired by models from the beginning of the 5th century BCE. In this perspective, it would be important to define whether this pastiche is a Roman or a Modern work. Having no information about the provenance of this unique sculpture, this research sheds new light on its biography through the investigation of its materiality. Specifically, 3D Ultrasonic Tomography is employed to examine marble characteristics. The obtained velocity model shows interesting results, highlighting areas of obvious integrations and possible metal pins, to join parts of the statue. The analysis of these results leads to the idea that the statue was probably reassembled in modern times, in a way that is not entirely consistent with its original appearance.

Keywords: Roman marble sculpture · diagnosis · 3D ultrasonic tomography

1 The Statue of Apollo: Roman or Modern *Pastiche*?

A marble statue representing the god Apollo as an archer, from the collections of the National Archaeological Museum of Florence (MAF) is the object of this paper (MAF, inv. n. 13719). The statue has been investigated within the project "BIO-SCULT: Per una 'bio-grafia' delle sculture all'aperto: dalle collezioni fiorentine al Regio Museo di Luigi Adriano Milani, all'alluvione del 1966", carried out by the Scuola Normale Superiore of Pisa (supervisor: Gianfranco Adornato) in partnership with the MAF. The purpose of the project is retracing the history, or rather the "biography", of a selection of pieces belonging to the museum's collection of Classical Sculptures, currently housed at Villa Corsini in Castello, near Florence.

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The statue is larger-than-life-size (H. 186 cm; H. head, from the top to the chin: c. 25 cm). It is composed of a head derived from a 4th century BCE prototype, joined to a body inspired by models from the beginning of the 5th century BCE (Fig. 1). It would be then important to define whether this pastiche is a Roman or a Modern work. Having no information about the provenance of this unique sculpture, this research sheds new light on its biography through the investigation of its materiality. Specifically, 3D Ultrasonic Tomography is employed to examine marble characteristics.

In order to trace out the "life stages" of the statue of Apollo, the present contribution is structured into two sections: the first is devoted to an essential historical-artistic study of the sculpture, while in the second part the results of 3D Ultrasonic Tomography conducted on the marble are provided.



Fig. 1. The statue of Apollo (MAF, 13719). Courtesy of the MAF.

2 History and Art

Today we can admire the Apollo on the Orchestra Balcony of Villa Corsini, an elegant late-Baroque villa in Castello, donated to the Italian State in 1968 and later becoming the new location for the collection of ancient sculptures of the MAF. The statue was in fact moved there from the Archaeological Museum of Florence, located in the heart of the city, during the eighties, along with the other ancient marbles of the MAF, because of the damage done to the museum in the catastrophic 1966 flood [1].

Before the flood, in the early twentieth century the sculpture was placed under the fourth arch of the Archaeological Museum's Garden, according to the project designed by Luigi Adriano Milani, who was the Director of the *Regio Museo Archeologico* of Florence from the beginning of the twentieth century until his death in 1914 and acquired the statue of Apollo along with other ancient marbles in order to form the first museum's collection of Classical sculpture [2].

Unfortunately, as with almost all the other pieces in this collection, Milani did not give any information on the circumstances of the acquisition of the Apollo, and, due to the lack of documentation, the provenance of the statue still remains unknown.

The director provided only a brief description of the sculpture, in which he presented it as an original (Roman) statue depicting Apollo as an archer, without questioning whether the head belonged to the body: "*Statua di Apollo gradiente e saettante, con clamide e faretra. La testa, sua propria, con bocca semiaperta, ha i capelli discriminati annodati all'occipite. Marmo pario. Di restauro il braccio e la mano d. Corrisponde all'Apollo saettante i Niobidi dei sarcofagi romani, tipo del sec. IV a.C.*" [3].

This overall interpretation is still considered pretty valid today, as we can read in the most recent guide of the collection housed at Villa Corsini, edited by Fabrizio Paolucci and Antonella Romualdi, which until now has offered the only published description of the statue [4]. Here Paolucci states that "the head is almost certainly original because, besides being compatible with the rest of the figure in terms of its size and type of marble, it reveals an irregular fracture line at the base of the neck that coincides perfectly with the one on the bust". However, in our opinion, the hypothesis that the head belonged to this statue from its origin is not yet totally convincing, because of some aspects explained here below.

Looking at the sculpture, the first thing we notice is that the head bears evident traces of polychromy, while the body does not preserve any trace of color. Moreover, although one of the last restorations of the sculpture made all the original fractures no longer visible, it is particularly interesting to note that, among these hidden fractures, the one at the base of the neck is clearly recognizable in some historical photographs from the Archives of the MAF (Fig. 2). It is noteworthy that, observing the original fracture, the head is slightly tilted towards the left, even though today we gain a different perception of it.



Fig. 2. Head of the statue of Apollo, MAF 13719. Right: photograph of the statue, early 20th century (MAF Photographic Archive, detail of neg. n. 1350). Courtesy of the MAF.

After these initial observations, we can now take a look at the body of the statue. It represents a walking naked male figure, with the left leg stepping forward, with the foot resting on the ground, and the right leg set back with the heel raised. His arms are bent at the elbows and his forearms are stretched forward, in a gesture interpreted as

that of an archer ready to shoot an arrow. The bow would be held with the left hand, while the dart would be shot with the right. The torso, stiffly upright and frontal, does not follow the movement of the arms and it also looks independent from the legs. A short cloak, fastened on the right shoulder, covers part of his chest; it drapes - in a somewhat unnatural way - around the shoulder and the upper part of the left arm, and then it falls backwards, moved by the archer's impetus. A strap is above the cloak: it is visible both on the chest and on the back. So, we would expect to see the quiver of the archer at his back, but surprisingly there is no quiver at all, even if its volume seems to be suggested by a mass of folds. As previously stated by Milani in his description of the statue, the pose of the body is typical of Apollo shooting arrows against the Niobids. This representation, already known from vase paintings of the first half of the 5th century BCE, is also reproduced on some Roman sarcophagi and is the prototype of the famous bronze Apollo from Pompeii (Naples, Museo Archeologico Nazionale, inv. n. 5629).

With reference to this last piece, it should be noted that it is the best comparison for the Apollo of the *MAF*. Moreover, by comparing this Apollo from Pompeii with that of Florence, we can see that this latter has been wrongly positioned in its last arrangement at Villa Corsini: it is clear, in fact, that the left foot is incorrectly raised, altering the original posture of the whole statue. Thanks to the 3D model, we can finally position the statue correctly and discover that the head is actually turned to the left, as previously already noted looking at the historical photographs (Fig. 3a). Apollo, therefore, is turning his gaze in a different direction from the one suggested by the body (and the lost arch); in other words, the head is divergent from the torso.

At this point, what can we say about the chronology of the statue? Unfortunately, we have to admit that the dating of the body is very challenging, also because of its restoration, which made the marble surfaces conspicuously flattened and smooth. Because of this, there are no reliable diagnostic elements indicating an almost certain chronology. Concerning this point, Paolucci has already observed that "no stylistic or formal indication can be inferred from the body, whose original surface, which survives at only a few points, has been reduced by a few millimeters" [4]. However, in our view, some formal inconsistencies, such as the strap without the quiver and the unnatural way in which the cloak drapes around the upper part of the left arm, could make the ancient origin of the body questionable.

Regarding the head, its chronology is simpler to define. Unlike the body, the drill-marks for the rendering of the hair point to the middle of the 2nd century CE. Its typology is also evident: as its hairstyle clearly shows, it derives from the Apollo Lykeios, representing the god with his right arm raised and the hand resting on his head, which is normally turned to the left.

The combination of different models in one sculpture is known for the Roman Age. Accordingly, accepting the idea that the head has belonged to the body since the origin of the Florentine Apollo, it has been assumed that the statue could be "a singular and very interesting *pastiche* from the Roman era which joined an image of the god derived from a 4th-century BCE prototype, to the body of an Apollo as an archer that, because of its frozen movement and the unavoidable lateral view imposed on the onlooker, seems to have been inspired by models and sculptures from the Severan period" [4]. But surprisingly, a further new element could definitively overturn this interpretation. The

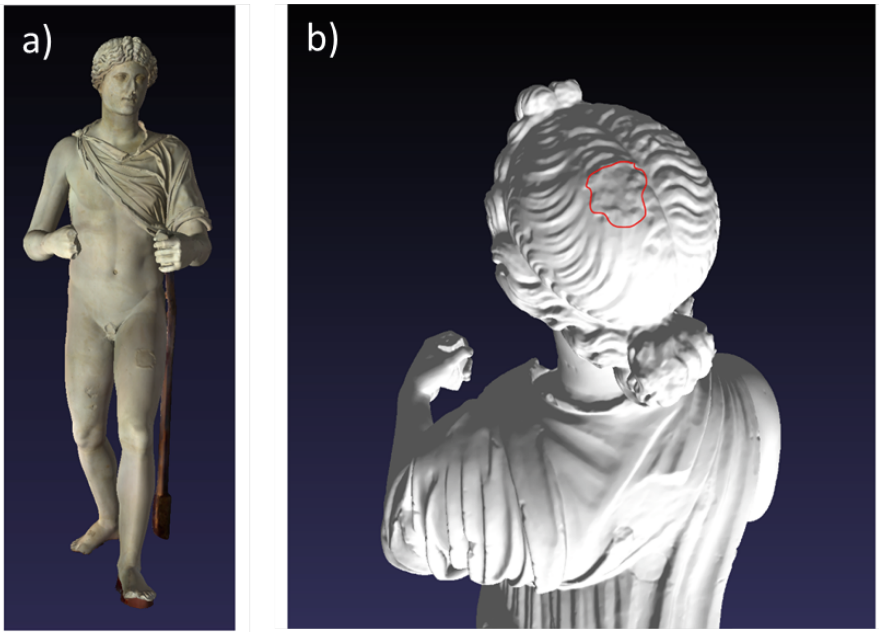

Fig. 3. 3D image of the statue of Apollo (a) and of the statue head (b), MAF 13719 (Elab. Martina Borroni).

3D model actually reveals the presence of an interesting *lacuna* on the top left side of the head that could be the print of the hand originally put on the top of the head (Fig. 3b). An interesting comparison of this trace is offered by the head of an Apollo Lykeios today on display at Palazzo Massimo alle Terme (Rome, Museo Nazionale Romano, inv. n. 55336), which presents the print of the now lost hand on the top of the head [5]. If this were the case, we should think that the head was originally created for a statue depicting the Apollo Lykeios and that only in a later phase of its "life" it was placed on the body of an archer Apollo.

3 Ultrasound Investigations

Ultrasound tomography is a non-invasive technique, increasingly used in cultural heritage applications [6–10]. This technique allows to investigate beyond the surface and to analyze the mechanical and structural characteristics of the material. The transmission velocity of ultrasound is measured by a transmitting probe to a receiver, placed at a known distance. The propagation velocity of ultrasound changes based on the characteristics of the material being investigated, allowing to identify inhomogeneities, linked to the presence of voids or structural defects.

3D ultrasound tomography was used to investigate the state of conservation of the statue of Apollo and to evaluate the presence of parts of the statue that may not have originally belonged to the statue. The data were acquired using the TDAS 16 instrumentation produced by Boviar (with 16 channels). The receiving and transmitting probes have a central frequency of 55 kHz. For precise measurements, as in this case, the probes were equipped with special cone-shaped aluminum supports that allowed a more accurate positioning of the sensor. 400 measurement points were used, distributed homogeneously on the surface of the statue, used as transmitting and alternatively receiving points. In this way it was possible to obtain inversion cells with the dimensions of 5 cm x 5 cm. The final velocity model was then interpolated and smoothed.

The use of a 3D survey of the statue (Fig. 3) allowed to obtain a 3D tomographic image of the velocity of the ultrasonic waves (Fig. 4).

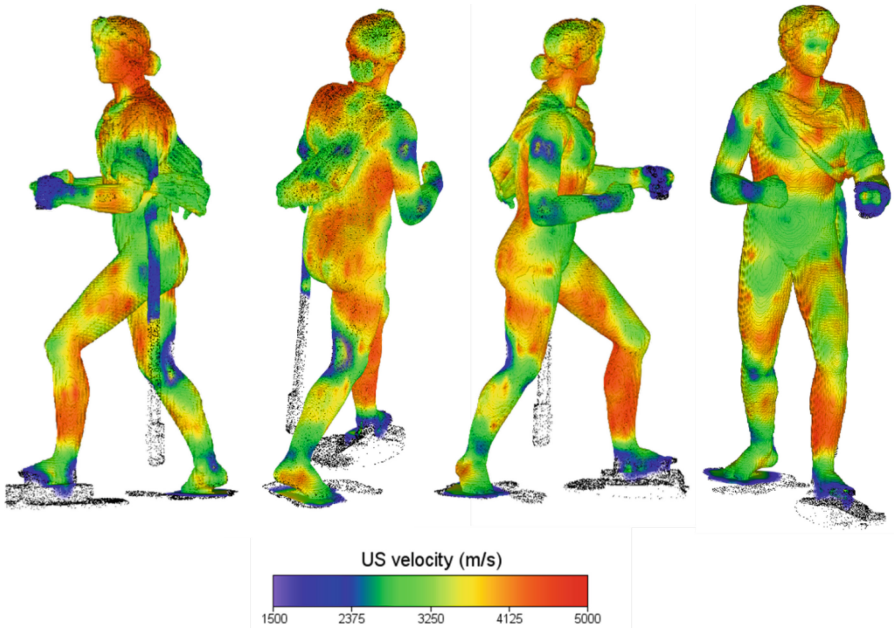

Fig. 4. 3D ultrasound tomography of the statue.

In order not to damage the surface, the statue was protected by a layer of transparent film that also allowed to position the markers used as transmission and reception points. These points allowed to record the signals that pass through the entire body of the object. The velocity model is obtained through an iterative process, starting from a rectilinear path between source and receiver. The subsequent iterations, instead, provide for the refraction of the rays for each cell, taking into account its velocity. The process stops when the calculated path times are close to the measured ones. The GeoTomCG software version 18.1 [11] was used for data inversion, while 3D rendering was performed using Voxler software version 4.3 [12].

The resulting images of the Apollo tomography show values of the propagation velocities varying from 1500 m/s to 5000 m/s.

The study of these results allowed to identify the position and the extension of the numerous fractures covered by additions of plaster. The lowest velocity corresponds to the area where there is a material with different characteristics, in this case plaster, less compact than marble, and therefore the ultrasound takes longer to pass through it. These areas have been correlated to areas of possible fractures and injuries (Fig. 5). These additions, during one of the last restorations, were camouflaged with a pictorial technique that makes their identification difficult. For example, on the right shoulder there is an evident low-velocity area that corresponds to an integration (Fig. 6). Particular attention should be paid to the left foot which seems to be made entirely of a different material, at least from the point of view of velocity.

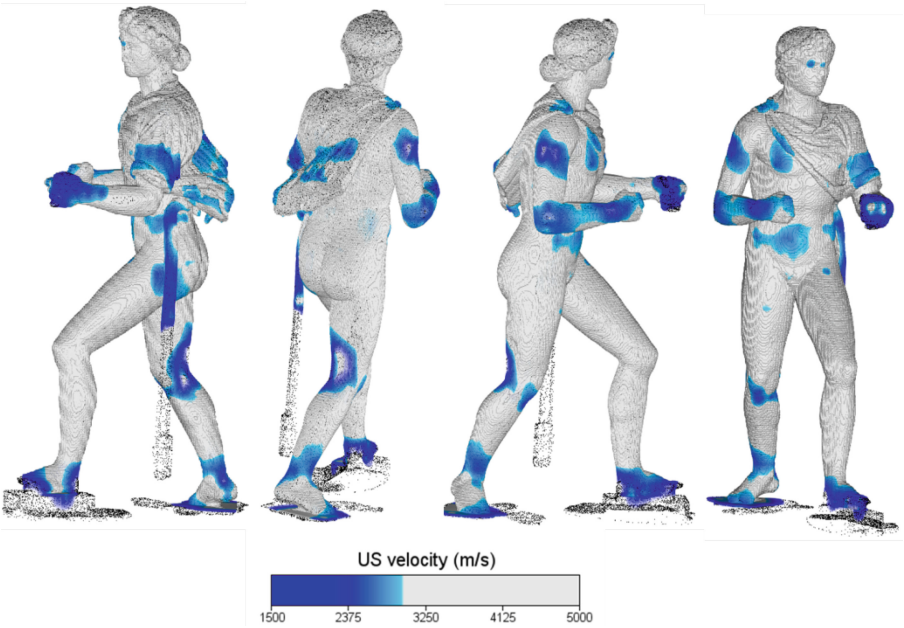

Fig. 5. 3D ultrasound tomography of the statue: low-velocity areas.

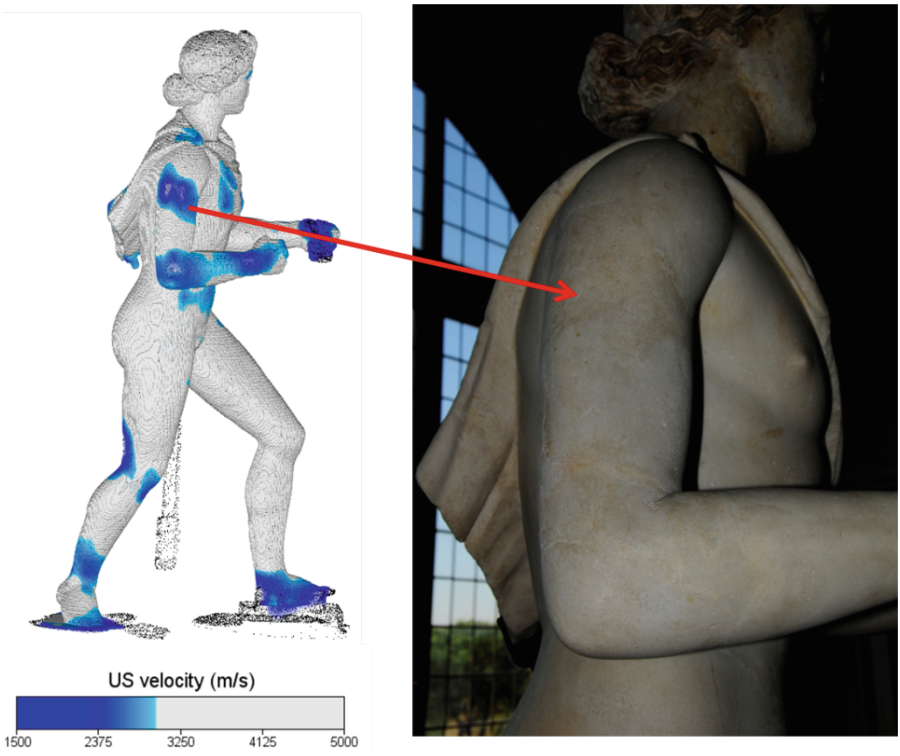

Fig. 6. Low-velocity area in the right shoulder corresponding to an integration.

Inside the statue, the velocity model instead shows some areas with a series of high-velocity zones, with values greater than 4500 m/s (Fig. 7). The hypothesis, also supported by their position, is that these are the areas where there are metal pins for the relocation of the fractured parts. In fact, the metal allows the ultrasound to propagate very quickly. These hypotheses are supported by evidence of body parts that appear to be reattached to each other. Of interest is the shape we see between the head and the neck that seems to correspond to two pins. This would confirm the hypothesis that the head was added to the body at a later stage, most likely in the modern era.



Fig. 7. 3D image of the statue with high-velocity zones in red, probably due to the metal inserts presence.

4 Conclusions

Thanks to the combined historical-artistic and technical-scientific approach, some unexpected results were attained by this preliminary research study on the statue of Apollo.

In spite of the initial opinion, according to which the head could be compatible with the body of the figure because of its size, type of marble and correspondence between the fracture line at the base of the neck and the one on the bust, several elements would now seem to reveal a different biography of this unique piece.

Starting from the analysis of the historical photographs of the statue, we discovered that the fracture at the base of the neck, now hidden because of a more recent restoration of the statue, does not perfectly correspond with the one of the torso, since a visible Modern integration was inserted between these two parts. Moreover, the current positioning of the statue, which is clearly incorrect, as the comparison with the Apollo from Pompeii

shows, has altered our perception of the piece and, in particular, it has disguised the original pose of the head, which is actually turned to the left. As a result, it becomes evident that the head and the body are not in harmony from the point of view of the action performed, since the Apollo is turning his gaze in a different direction from the one suggested by the body and the lost arch. Last but not least, as everyone knows, all the evidence shows that the body belongs to an archer figure while the head derives from the Apollo Lykeios. Consequently, if the interpretation of a lacuna discovered by us on the top of the head is correct, the head was certainly not created to be on this body, but on a statue depicting the Apollo Lykeios with the hand resting on the head.

The results of the 3D ultrasound tomography interestingly revealed the probable presence of internal pins, connecting parts of the statue. Near the neck of the statue, two metal pins are probably evident, which could confirm the hypothesis that the head was added to the body in modern times. Some low-velocity areas were also identified that seem to be linked to the presence of modern plaster additions, which were camouflaged with painting techniques. Therefore, the statue we see today, in its last phase of life, could very likely be a modern pastiche, composed of an ancient head of Apollo and a body that is very difficult to date, although the possibility that it could have been made (or heavily reworked) by modern sculptors should not be excluded.

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