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THE 'PENELOPE' FROM PERSEPOLIS AND ITS MARBLE
A MULTIDISCIPLINARY RESEARCH

Nota di Lorenzo Lazzarini e Alessandro Poggio
presentata [*] dal Socio Nazionale S. Settis

Riassunto. – La statua in marmo bianco interpretata come Penelope (Museo Nazionale dell'Iran, Teheran) è una scultura riferibile al mondo greco per iconografia, stile e materiale, databile verso la metà del V secolo a.C. Il suo ritrovamento nella Tesoreria di Persepoli ha sollevato numerosi quesiti sul suo luogo di produzione e sulle ragioni del suo arrivo nel cuore dell'Impero Achemenide.

Questo studio si propone di presentare i risultati della prima analisi archeometrica mai effettuata sul materiale della scultura. I risultati dell'analisi minero-petrografica e del rapporto degli isotopi stabili del C & O consentono di identificare il materiale come marmo tasio dolomitico di Capo Vathy, un'ipotesi già avanzata su base autoptica.

Generalmente, si pensa che all'epoca di produzione della Penelope questo marmo fosse usato principalmente a Taso e sulla vicina terraferma. Questo studio, invece, raccoglie casi dal Mediterraneo e dal Mar Nero che evidenziano l'esportazione di marmo tasio dolomitico di lungo raggio a partire dall'età arcaica. Pertanto, è possibile ipotizzare che la scultura di Penelope fosse giunta a Persepoli non necessariamente da Taso, ma anche dall'Asia Minore o da altre aree.

1. Introduction [**]

The statue known as the 'Penelope from Persepolis' that is on display today in the National Museum of Iran in Tehran (inv. no. 1538) is one of the most intriguing finds of the twentieth century in terms of Greek sculpture (Plates 1a-b). In 1930s archaeologists excavated in the south-eastern part of

[*] Nell'adunanza del 10 febbraio 2017.

[**] L. Lazzarini and A. Poggio: chapters 1 and 5; L. Lazzarini: chapters 2 and 3; A. Poggio: chapter 4.

Pl. 1a – Front view of the statue of 'Penelope' from Persepolis.
Tehran, National Museum of Iran (after Razmjou 2015b, p. 93).

the terrace of Persepolis a huge rectangular building which was called the 'Treasury', a space interpreted mainly as a royal storehouse. Here were preserved a number of objects such as ritual vessels, sculptures, and clay tablets linked not only to Persia, but also to both earlier and contemporary civilizations in the territories controlled by the Achaemenid rulers.[1] Among these finds archaeologists uncovered the remains of a sculpture in two fragments in the debris of this building, a headless torso in Corridor 31, and a part of one hand in Hall 38. Carved out of a medium-grain white marble of particular brilliance, the statue is identifiable as an original Greek work dating to the mid-fifth century BCE. Stylistically it can be linked to artists of Cycladic workshops, with comparisons with Parian sculpture.[2] A discovery of this nature therefore in the heart of the Persian Empire was surprising.

The only certain fact in the biography of the sculpture is that it disappeared in 330 BCE, when the troops of Alexander the Great destroyed Persepolis.[3] Interpreting its material and style, it is possible to state that the

[1] Schmidt 1939; 1957; Razmjou 2010, p. 242-243; 2015a, p. 126; Mousavi 2012, p. 19-21; Callieri 2016, p. 50-52.

[2] Poggio 2015.

[3] Cereti 2016, p. 42.

Pl. 1b – Side view of the statue of 'Penelope' from Persepolis.
Tehran, National Museum of Iran (after Razmjou 2015b, p. 92).

sculpture was produced in the Aegean region around 450 BCE and transported to Persepolis some time after its creation but before the destruction of the citadel. The existence of Roman copies representing the same prototype, which has been interpreted as Penelope seated in a meditative attitude, has led scholars to speculate on the existence of another exemplar of the sculpture – either a replica or a second original – carved before 330 BCE, a chronology that would have allowed for the copying process in Roman times. (4)

Up to now scholars have had to base their theories regarding the origin of the marble of the 'Penelope' from Persepolis on autoptic observations, as archaeometric analyses of the marble had not yet been carried out. Cleta Margaret Olmstead, who was the first to undertake a comprehensive study of the

(4) Hölscher 2011; 2015; Razmjou 2015a; see also the various contributions in Razmjou 2015b.

sculpture, proposed as its provenance one of the Aegean islands, a conclusion that was shared by Felix Eckstein.[5] Ernst Langlotz instead narrowed the focus to a very precise area in Asia Minor lying between Izmir and Ephesos.[6] Finally, Olga Palagia identified the material used as dolomitic marble from Cape Vathy, which lies on the northeastern coast of the island of Thasos, on the basis of its macroscopic features. This represents the only case in the scholarship on the 'Penelope' in which the identification of the material used has directly contributed to the reconstruction of the history of the work.[7]

The definitive identification of the source of any specimen of white marble must be confirmed archaeometrically through laboratory analyses.[8] Therefore, following the debate triggered by the exhibitions "Serial Classic" (Milan, 9 May – 24 August 2015)[9] and "A Statue for Peace: the Penelope Sculptures from Persepolis to Rome" (Tehran, 28 September – 31 December 2015)[10], the Iranian authorities generously made possible the analysis of the stone of the Persepolis 'Penelope' by providing a sample carefully taken by one of the museum's expert restorers under the supervision of Dr. Mahnaz Gorji, Director of the Restoration Department at the National Museum of Iran. Both the minero-petrographic and the isotopic analyses, which were carried out by the Laboratorio di Analisi dei Materiali Antichi of the Università IUAV of Venice, Italy, were compared with the information available in the most up-to-date reference databases.[11] The results suggest that the marble used for the 'Penelope' from Persepolis is indeed dolomitic marble from the ancient quarry area of Cape Vathy-Saliara, thus confirming Palagia's identification.

In this paper the authors will present the data from the archaeometric studies of the material of the statue and explore the use of Thasian dolomitic marble in the Archaic and Classical periods.

2. The Laboratory Study Protocol

As already noted, the sampling of the marble used for the 'Penelope' of Persepolis was carried out in Tehran by a restorer working at the National Museum of Iran. This sample was then forwarded to the Laboratorio di Ana-

[5] Olmstead 1950, p. 10; Eckstein 1959, p. 145.
[6] Langlotz 1961, p. 72.
[7] Palagia 2008; see below.
[8] Gorgoni *et al*. 2002.
[9] Settis *et al.* 2015.
[10] Razmjou 2015b.
[11] Antonelli, Lazzarini 2015.

lisi dei Materiali Antichi of the Università IUAV of Venice, where it underwent minero-petrographic and isotopic analysis as described below.

Minero-petrographic analyses

Minero-petrographic analyses are of fundamental importance to characterise marbles and determine their genesis, e.g. type (burial, contact, regional) and grade (low, medium, high) of metamorphism. While a more or less complete characterization is theoretically possible for any piece of marble (whether raw samples from quarries or worked stone from artefacts), petrological determinations on quarry samples require correlated field studies by a geologist of different marble outcrops and quarries. The limitation to the analysis of marble from artefacts is the small size of the samples that can be taken from them.

For the present study, all determinations were made on a single fragment measuring ca. 1 x 0.5 x 0.5 cm. A part of the sample was finely ground and the powder was subjected to diffractometric (X-radiation CuKα/Ni at 40KV, 20mA) and isotopic analyses (see below). A thin section was cut from the remaining part and examined using a polarizing microscope in order to determine the fabric of the stone and any accessory and secondary minerals present in addition to the carbonate minerals calcite and/or dolomite that are the principal constituents of all types of marble.

More specifically, the following parameters were studied:

– the type of fabric (homeoblastic: with roughly isodiametric grains, or heteroblastic: with grains of various dimensions) in direct relationship with the type of metamorphism (equilibrium, non-equilibrium, retrograde metamorphism, polymetamorphism);

– the boundary shapes of the calcite/dolomite grains, another parameter connected with the type of metamorphic event/s that generated the marble;

– maximum grain size, which is of diagnostic significance because it is correlated to the metamorphic grade of the marble;

– the presence of accessory minerals (qualitative and semi-quantitative analyses), which can sometimes be of diagnostic value.

For the petrographic description, earlier studies of the most important ancient marbles,[12] as well as archaeometric studies of minor marbles and "classical" treatises on petrotectonics, where available, were taken into consideration.[13]

[12] Lazzarini *et al.* 1980; Gorgoni *et al.* 2002; Antonelli, Lazzarini 2015.

[13] Spry 1986; Barker 1990.

Isotopic analyses

Isotopic characterisation has proved to be very useful in the identification of the marble used in ancient artefacts[14]. It is being employed more and more widely due to its high sensitivity, the small quantity of material necessary for the analysis, and the availability of a rapidly expanding database, much of whose content is cross-linked to data from other laboratory tests.[15] All of this permits increasingly reliable comparisons, especially if the isotopic data is evaluated together with minero-petrographic results from the same samples, as in the present study.

We conducted isotopic analyses on the carbon dioxide released from small portions (20-30 mg) of the powdered sample after chemical attack with 100% phosphoric acid at 25° in a special vacuum line, following the procedure suggested by McCrea and Craig. The CO_2 produced was analysed using a mass spectrometer equipped with a triple collector that permits the measurement of more than one isotopic ratio at a time (in this case both $^{13}C/^{12}C$ and $^{18}O/^{16}O$).

Our results are expressed in conventional δ units (parts per thousand):

$\delta_{sample} = (R_{sample} / R_{std} - 1) \times 1000$

in which R_{sample} and $R_{std.}$ represent the isotopic ratios of oxygen and carbon in the sample and the reference standard, respectively. The standard adopted for both oxygen and carbon was the PDB [the PDB standard being the rostrum of *Belemnitella americana* from the Cretaceous Pee Dee Formation of South Carolina].

The identification of the provenance of the marble of the 'Penelope' was made by comparing its minero-petrographic and isotopic data with the results of analyses of quarry samples and data in the literature.[16]

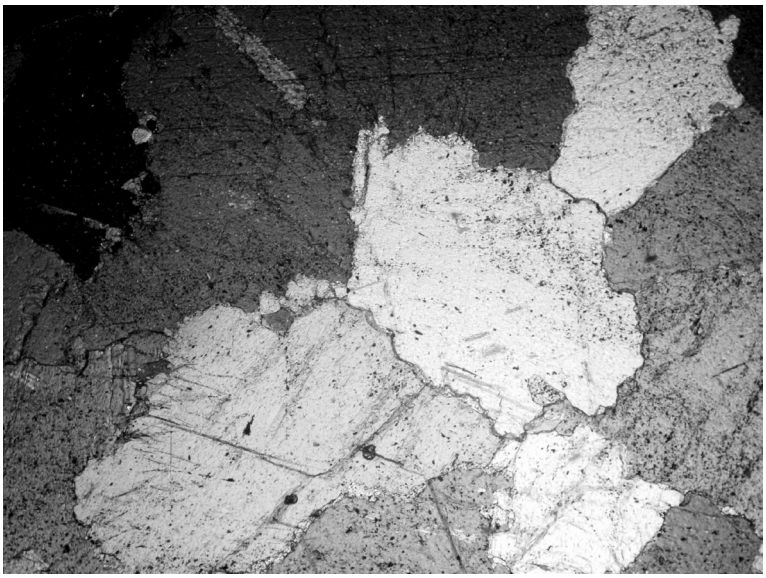
3. Results and discussion

X-ray diffractometric analysis of the marble used for the sculpture from Persepolis found that it was composed of dolomite. Microscopic study of the thin section revealed the following features:

– a heteroblastic fabric formed of a mosaic of closely interlocking dolomite crystals that exhibited sutured boundary shapes (Pl. 2);

– a maximum grain size of 2.02 mm;

[14] McCrea 1950; Craig 1957.
[15] Gorgoni *et al.* 2002; Attanasio *et al.* 2006.
[16] Antonelli, Lazzarini 2015.



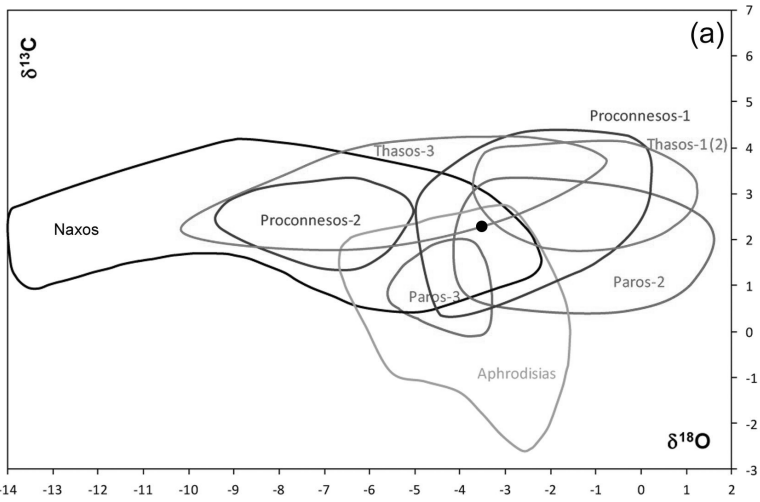
Pl. 2 – Photomicrograph of the thin section of the Penelope's marble showing the typical fabric of Thasian marble of Cape Vathy: a mosaic of well interlocked dolomite crystals with sutured boundaries.
N +. long side of the photo = 2.35 mm.

– the other minerals detected were K-mica (one small flake) and abundant amounts of graphite in the form of very fine intracrystalline particles.

These minero-petrographic features definitely pointed to the identification of this stone as Thasian dolomitic marble from Cape Vathy, a conclusion that was confirmed by isotopic analyses (table 1). The results plotted using the most up-to-date reference isotopic diagram (Pl. 3) fall into the region of the graph characterising Thasian calcitic and dolomitic marbles and Proconnesian marbles. Since among these possibilities only the Thasian dolomitic matches the minero-petrographic and isotopic features of the stone used for the statue of 'Penelope', there can be no doubt as to its identification.

Two types of marble were quarried on the island of Thasos in Antiquity – calcitic stone from Aliki, which was softer and easier to carve, and dolomitic marble from Cape Vathy-Saliara.[17] Both were exploited by sculptors and architects from the Archaic to the Late Byzantine periods, and dolomitic stone is still being extracted at Murghena, not far from the ancient quarries.

[17] Bruno *et al.* 2002.



Pl. 3 – Plot of the isotopic values for the marbles with an average-to-coarse grain size most widely used in Antiquity, based on the most up-to-date reference diagram available (Antonelli, Lazzarini 2015).

Dolomitic and calcitic marbles from Thasos have specific features. Dolomitic marble is a harder stone to work; indeed, modern Roman *marmorari* (stonecutters) refer to it as *marmo grechetto duro* ('hard Greek marble'). Moreover, dolomitic marble exhibits notable macroscopic features such as the remarkable brilliance of its crystals (clearly visible in fractures and in the polished stone) and its homogeneous medium-size grain (ca. 2-3 mm), which facilitates its identification by the experienced eye. The finer grain of dolomitic marble allows for a higher degree of detail in its carving. Probably for this reason Thasian dolomitic marble was much preferred by sculptors over the calcitic marble of Aliki, and the latter was employed primarily to make stone blocks and other construction elements.

A study of the archaeometric data – the isotopic signature – of other sculptures carved out of Thasian dolomitic marble shows clearly that this marble was both used locally and exported to other Greek sites (Tab. 1).[18] Dolomitic remains dating to the Archaic period have been found in places as far away as Morgantina in Sicily, as shown by the isotopic data on the sculptures known as the 'Ludovisi Throne' and the 'Boston Throne', two famous artefacts discovered in Rome that are contemporaneous to or slightly pre-date our 'Penelope'.

[18] Tykot *et al.* 2002.

Table 1 – *Compared isotopic signature of Thasian dolomitic marble sculptures.*

OBJECT	LOCATION	δ ^{13}C (+)	δ ^{18}O (-)	REFERENCE
'Penelope'	National Museum of Iran, Tehran	2.09	3.51	This study
'Boston Throne'	Museum of Fine Arts, Boston (inv. no. 08.205)	3.48	3.06	Tykot *et al.* 2002, 191
'Ludovisi Throne'	National Roman Museum, Palazzo Altemps, Rome (inv. no. 8570)			Cordischi *et al.* 1983, 75
Demetra's head (acrolith)	Regional Arch. Museum, Aidone (Sicily)	3.24	3.04	Lazzarini, unpublished data
Demetra's foot (acrolith)	Regional Arch. Museum, Aidone (Sicily)	3.29	3.65	Lazzarini, unpublished data
Persephone's head (acrolith)	Regional Arch. Museum, Aidone (Sicily)	3.32	3.19	Lazzarini, unpublished data

4. The use of Thasian dolomitic marble in the archaic and classical periods

Once the provenance of the marble used for the statue of 'Penelope' had been established based on minero-petrographic and isotopic analyses, one of the most important points to be explored was the place of the statue within the context of the production of sculpture in Thasian dolomitic marble during the Archaic and Classical periods. The statue of 'Penelope' raises fascinating issues. For example, while Persepolis appears to have been the final destination of the statue, there is no evident link between the process of its creation and the Achaemenid capital. What is more, although the marble came from Thasos, the statue was not necessarily carved there either.

Archeological remains show that Thasian marble had been used since the Archaic period for free-standing sculptures, reliefs and architectonic elements.[19] In recent decades important studies have been conducted; in particular, Holtzmann investigated the sculptural tradition on the island of Thasos in the Archaic period, from the Pythion reliefs (Paris, Musée du Louvre, inv. nos. MA 704 and 705)[20] to the Sphinx, now divided between the Archaeological Museum of Thasos (body; inv. no. 3807) and the Ny Carlsberg Glyptotek in Copenhagen (head; inv. no. 2823).[21] Among the sculpted works

[19] *Guide* 1968, *passim*; Grandjean, Salviat 2000, p. 158, 167-168, 180. See Plin. *HN* 36.44

[20] Holtzmann 1986.

[21] Holtzmann 1991. The results of the analysis of the marble of the head are now available: http://www.trackingcolour.com/objects/1 12 (2nd November 2017).

from the late Archaic and the early Classical periods, various monumental reliefs are worth noting, such as those from the Silenus Gate[22] and the Passage of the Theoroi (Paris, Musée du Louvre, inv. no. Ma 696 A, B, C).[23] Thasian marble was also used on the mainland opposite Thasos, for example in the construction of the threshold for the temple at Thermi (Thessaloniki Museum, inv. no. A.E. 6738.742).[24] Recent studies of the fragmentary stele from Maroneia dating to the fourth century BCE (Museum of Komotini, inv. no. ΑΓΚ 935) have shown that it also was sculpted out of Thasian dolomitic marble.[25]

The possibility that dolomitic marble was being exported from Thasos well before the Roman period had already been suggested by non-invasive laboratory analyses, but the lack of minero-petrographic and isotopic analyses to confirm this hypothesis posed an obstacle to the full understanding of the phenomenon. Since the exportation of Thasian marble further than the coast opposite the island was not certain, and in any case was not significant in volume during the Archaic and Classical periods, Palagia concluded that the 'Penelope' of Persepolis was produced in a Thasian workshop and must have been presented as a gift to the Great King by the Thasians themselves, since there are no records of any Persian raids in these areas during the period when the sculpture was presumably created.[26]

Now, however, the picture regarding the use of dolomitic marble outside of Thasos and its immediate sphere of influence is becoming clearer. In the same year that Palagia published her paper, John Herrmann conducted an archaeometric analysis of Acrolith A from Morgantina, whose art historical aspects have been analysed by Clemente Marconi.[27] Herrmann's analysis confirmed that this sculpture was made of Thasian dolomitic marble, a conclusion that was reinforced by Lorenzo Lazzarini's supplementary analyses of Acrolith B and other pieces from the same statue (Tab. 1). This means that Thasian dolomitic marble was being exported to Sicily as early as the end of the sixth century BCE, a fact that leads to revise the history of the movement of Thasian marble in the Mediterranean, and in particular the diffusion of dolomitic marble, the material used for the statue from Persepolis.

These considerations also lead to a reassessment of the 'Ludovisi' and 'Boston Thrones', for which laboratory analyses have revealed the use of

[22] Rolley 1994, p. 225-226.
[23] Holtzmann 1994, p. 29-59 nos. 6-8
[24] Herrmann 1999, p. 58-59.
[25] Andrianou, Lazzarini 2013, p. 394.
[26] Palagia 2008, p. 229-230.
[27] Marconi 2008, p. 15.

Thasian dolomitic marble.[28] While doubts have been raised concerning the chronology and authenticity of the 'Boston Throne', there is almost unanimous agreement – despite the lack of definitive data – that the 'Ludovisi Throne' was produced during the first half of the fifth century BCE in Magna Graecia and then transported to Rome.[29] Since archaeometric analysis of the acroliths from Morgantina has proven that Thasian dolomitic marble was being exported towards the Western Mediterranean at the end of the sixth century BCE, it becomes plausible that other fifth-century artefacts in Thasian dolomitic marble such as the 'Ludovisi Throne' (and perhaps also the 'Boston Throne') may have originally come from Magna Graecia or Sicily.[30]

Non-invasive analyses led Herrmann to identify as Thasian marble the material used for Archaic and Classical sculptures that come – more or less certainly – from the Eastern Mediterranean. For example, he found that a sculpted head believed to come from Philadelphia in Lydia (Harvard University Art Museums, Sackler Museum, inv. no. 1969.175) was made of the same marble as the 'Penelope' from Persepolis.[31] Scholars have hypothesized that this fragment formed part of a *columna caelata* modeled on those of the Ephesian Artemision.[32] Interestingly Vitruvius – probably drawing on a Greek source – wrote in *De architectura* (10.2.15) that when the Ephesians decided to build their Artemision out of marble they considered Thasian marble as a possible material.[33] This testimony by the Roman architect, combined with the evidence of the fragmentary head cited above, points to the existence of a connection between Thasos and Asia Minor, which would have been fostered by such important projects as the building of the Ephesian Artemision.[34] By the Hellenistic period this connection was well consoli-

[28] Cordischi *et al*. 1983; Herrmann 1990, p. 79-80.

[29] The link in provenance between the 'Boston Throne' and the 'Ludovisi Throne' is still contested. The first scholar to propose a connection with Locri Epizephyrii for both 'Thrones' was Ashmole 1922. Recently, the hypothesis first put forward by Colin in 1946 that the 'Ludovisi Throne' may have been transported from Sicily was revived by Torelli (2011). For more on the debate over the authenticity of the 'Boston Throne', see Newman, Herrmann 1995; Beraudo di Pralormo 1997. For an overview of studies on the "Thrones" up to 2000, see Soleti 2003.

[30] See also the head acquired in Rome and now in Copenhagen (Copenhagen, Ny Carlsberg Glyptotek, inv. no. 1724. Fischer-Hansen 1992, p. 32 no. 4). For a discussion of other Thasian marble sculptures found in southern Italy and Sicily, see Herrmann 1999, p. 59 and recently Cirucci, Lazzarini 2015, p. 51.

[31] Herrmann 1990, pp. 78-79, fig. 1. More generically from Turkey, according to Herrmann 1999, p. 59.

[32] Hoffmann 1971, p. 8 fig. 10; Vermeule 1981, no. 10.

[33] Ferri 2002, *ad loc*.

[34] Herrmann 1999, p. 59.

dated, as is confirmed by the use of dolomitic marble in Ephesos[35] and by the presence of calcitic marble quarried in Aliki in the second century BCE in Pergamon[36] and Didyma.[37] The fact that dolomitic and calcitic marble from Thasos can be found in Hellenistic Asia Minor could suggest that the transport of building materials along these routes began much earlier.

The finding through sample analysis that a fifth-century sphinx in Olbia (Odessa, Archaeological Museum, inv. no. II b/281) was made of Thasian dolomitic marble offers a clue to another possible trajectory for the long-distance movement of this material eastwards.[38] Beyond the importance of the information per se, such routes draw attention to the area lying between the Aegean and the Black Sea. The movement of Thasian marble towards the Black Sea raises the issue of the role of settlements along the Sea of Marmara and the Bosphorus Strait between the Archaic and Classical periods. In this context the head of a *kouros* dating to the mid-sixth century and – according to Nikolaos Kaltsas – made of Thasian marble (Archaeological Museum of Athens, inv. no. 4871) is significant.[39] The provenance of this sculpture - it had been acquired in Istanbul in the nineteenth century - should be considered with caution, however, since Istanbul formed the crossroads of a vast market in antiquities during the Ottoman period and Thasos itself was under Ottoman control until 1912.[40]

This evidence concerning the use of the dolomitic marble outside of Thasos is based in part on archaeometric testing, but primarily on autoptic or non-invasive analyses. Nevertheless, the evidence collected thus far allows us to affirm that Thasian dolomitic marble was already being exported westward, and probably also eastward, in the Archaic and Classical periods.

What do such considerations regarding the material used suggest about the provenance of our sculpture from Persepolis?

The first candidate is naturally Thasos or the coast opposite the island, these being the main sites where Thasian marble was used in the Archaic and Classical periods. The hypothesis of local production based on a local source is consistent with the stylistic features of the statue, which can be linked to Cycladic workshops. Thasos was a Parian colony and an artistic connection with the mother city can be seen in the Archaic sculptures found on the

[35] Herrmann, Newman 1999, p. 296.

[36] Herrmann, Barbin 1993, p. 93.

[37] Borg *et al.* 2000; Borg, Borg 2002, p. 273.

[38] Herrmann, *et al.* 2002, p. 357-358. On the sculpture see also Oksmann 1928, cols. 88, figs. 6-8; Ridgway 1977, p. 158.

[39] Kaltsas 2002, p. 45 no. 35.

[40] Some sculptures from Thasos are conserved today in the Istanbul Archaeological Museums (*Guide* 1968, p. 106).

island in the northern Aegean.[41] However, this hypothesis does not offer a solution that explains the presence of the 'Penelope' in Persepolis, since there is no evidence of direct contacts between the Aegean island and the heart of the Persian Empire from the middle of the fifth century BCE onwards (indeed, the chronology of the statue of 'Penelope' represents a *terminus post quem*). No useful evidence regarding the coast opposite Thasos has yet been uncovered.

However, our analysis reaffirms the possibility that the sculpture could have been produced at a site far from Thasos as well. In a recent paper Hölscher proposed Athens as a possible site, elaborating a hypothesis involving the production of two identical sculptures of 'Penelope', one of which was exhibited on the Acropolis and provided the model for subsequent Roman copies, and the other of which was presented to the Great King by Callias during his diplomatic mission to Persia.[42] To date, however, no significant evidence of the use of Thasian dolomitic marble in this period in mainland Greece has come to light, although further archaeometric analysis and new findings could fill the gaps in this picture in the future.[43]

On the other hand, Magna Graecia and Sicily appear to present an important cluster of late Archaic – early Classical sculptures in Thasian dolomitic marble with stylistic features linking them to Cycladic workshops. Although contact between the Persians and the western Greeks is not unknown (see, for instance, Her. 3.136-138), a transfer of the 'Penelope' from southern Italy to Persepolis is difficult to postulate.

The eastern rim of the Aegean, notably Asia Minor, remains to be considered. Here Thasian dolomitic marble was probably being used from the Archaic period onward and stylistic features from Cycladic workshops can be seen in works dating to the fifth century BCE. Sanctuaries in Asia Minor – such as the aforementioned Artemision of Ephesos - played an important role in stimulating the mobility of artists and materials, allowing the reception of different artistic influences such as Parian.[44] Indeed, the marble *peplophoroi* from Xanthos in the British Museum (Sculptures B316-318) could represent evidence of such a link, since it bears stylistic similarities to the statue of 'Penelope' and was produced in the same period.[45] Because Asia Minor formed

[41] See Marconi 2008 for a critical overview of the scholarship on Thasian Archaic sculpture.

[42] Hölscher 2011; 2015.

[43] «Glittering Thasian marble […] occurred in Athens only in works of the Roman period» (Grossman 2003, p. 68). A Thasian-Macedonian atelier was possibly active in Argos in the sixth century BCE (Herrmann 1999, p. 59; Herrmann, Newman 1999, p. 294).

[44] Prost 2015. On mobility of sculptors, see also Marconi 2008, p. 17-18, and the contributions in Adornato 2010.

[45] Poggio 2015.

part of the Persian Empire at the time, the hypothesis that the 'Penelope' was produced there would place its subsequent transfer to Persepolis within the wide-ranging network of ties – both conflictual and pacific - between the 'centre' and the 'periphery' of the vast territories under Persian control.

5. Conclusions

The archaeometric analysis of the 'Penelope' from Persepolis presented in this paper enlarges the corpus of Archaic and Classical sculptures made of Thasian dolomitic marble that have been found in sites located far from the northern Aegean island and its area of influence. Indeed, Persepolis probably constitutes the easternmost site thus far for such a discovery. However, the Persian capital appears to have been no more than the final destination of an artefact that was actually carved somewhere else along the rim of the Mediterranean.

There is ample evidence confirming the use of Thasian dolomitic marble during the Archaic period on Thasos and on the mainland opposite the island. Moreover, although it will be essential to conduct archaeometric investigations on a broader sample of marble sculptures from the Archaic and Classical periods, the data gathered so far shows that the export of Thasian dolomitic marble westwards to Sicily and perhaps to Magna Graecia, and eastwards as far as the Black Sea was a well-established practice that continued into Hellenistic times, before spreading even further during the Roman period.

The hypothesis that the statue may have been carved on the island of Thasos itself cannot be excluded *a priori*, but based on the evidence of a long-distance trade in Thasian marble, the possibility that the 'Penelope' was not produced on Thasos but at a different site must be taken into serious consideration. Among the various possibilities, Asia Minor stands out as a likely candidate for the provenance of this statue, based on its stylistic features and historical context.

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