The Use of White Marble in the Central and Upper Adriatic Between Greece and Rome: Hellenistic Stelae from the Necropolis of Ancona (Italy)

Fabrizio Antonelli & Lorenzo Lazzarini

Sixteen Hellenistic stelae from the central and upper Adriatic region have been examined minero-petrographically and isotopically in order to determine the provenance of their constituent materials. On stylistic and epigraphic grounds all the stelae date from the third to first century BC *and have been related by archaeologists to Greek Delian workshops and/or to local Adriatic ateliers. Laboratory analyses showed a local provenance for the limestone stele (Mount Conero, Ancona), the prevailing use of Parian marble from Lakkoi (10 out of 15 stelae) and the minor exploitation of three other marbles (Lunense from Carrara, Proconnesian from the island of Marmara, and Lesbian from Moria). The results confirm contacts between the Adriatic and central Aegean areas in the Hellenistic period, indicating more than one possible origin for the marble stelae: they may have been imported as finished pieces from the Aegean-Attic region, and/or worked locally — imitating the 'Greek style' – from small blocks of marble imported from Greece. In addition, the results provide new evidence for the use of Italic marble from Carrara.*

One of the most remarkable features of Greek civilization is the pervasive influence of Greek culture, not just as a result of the diaspora of the eighth and seventh centuries, which created a large number of colonies in the east (Asia Minor, Black Sea coast, Levant) and west (northeast Spain, France and Italy), but as part of a process of cultural diffusion which deeply affected the history of the entire Mediterranean region (Lomas 1995). Hellenism and Hellenization were complex phenomena (Whitehouse & Wilkins 1989), but nevertheless included a huge diversity of local political systems and socio-economic cultures within a framework which remained for centuries recognizably Greek (Lomas 1995). This cultural unity and the cultural interactions between Greek and non-Greek cultures are central to our understanding of ancient Mediterranean history.

On the borders of the Hellenic world, Greek and 'indigenous' communities exchanged population and cultural influences: a perfect example of the complexities of these interactions is provided by the Greek colonies of southern Italy (Whitehouse & Wilkins 1985; 1989; Herring 1991; Burgers 1998; Owen 2005). On the periphery of both Greek and Italic worlds, they had a central role in mediating between the two, a role which was to take on increased cultural and political importance with the expansion of Roman power in both Italy and the eastern Mediterranean. There is increasing evidence that despite the hostilities which dominate most ancient accounts of Graeco-Italic relations, cross-cultural exchanges were an important feature of the development of the region (Lomas 1995). It is also evident that acculturation was a reciprocal process: there can be little doubt that Italic culture modified the development and the behaviour of the Greek *poleis*, just as the Greeks did those of their Italian neighbours, both participating in the formation of a cultural *koiné* (Nava 1990). Furthermore, there is the important question of Rome and its relationship with the Greeks. In central Italy, Greek contacts were evident from an early date, but from the third century BC their influence on the development of

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Rome became more important and pervasive. By the end of the second/beginning of the first century BC, Rome itself was exposed on a large scale to Greek culture, and there was a strong tendency among the Roman élite to accord a privileged status to all things Greek (Lomas 1995; Colivicchi 2008). Although the main phase of Hellenization in Rome was triggered by the conquest of the eastern Mediterranean in the second century and was the result of direct contacts with Greece, there were senses in which the cities of *Magna Graecia* and, probably, central Italy acted as cultural mediators between the Greek and Roman worlds. The preference for Greek culture over other cultures encountered by Rome (e.g. Sanniitic, Bruttian, Messapian, Picene, etc.) within Italy (and beyond), also provided a means by which Italiote Greeks could reconcile the political realities of conquest and, ultimately, incorporation into the Roman body politic, with civic and cultural traditions. Greek elements were sometimes an important part of civic identity for Italiote cities (e.g. for Rhegium and Tarentum) for several centuries after their conquest by Rome, and also served to smooth relations with the ruling Roman élite (Gruen 1992; Colivicchi 2008).

The distribution of Greek or Greek-influenced artefacts (particularly pottery) suggests that a wide social range of people must have come into contact with Greek culture in its most material aspect. In this context, the archaeometric study of imported artefacts may give us interesting additional information about trade networks, exchanges of goods and effects of acculturation. Furthermore, it may help us to a better understanding of why and under what circumstances Greek culture was adopted as well as what it was used for.

By contrast with the numerous studies dealing with the Greek colonization of southern Italy and Sicily (Whitehouse & Wilkins 1985; 1989; Herring 1991; Pugliese Caratelli 1996; Burgers 1998; Owen 2005), which also include the aspect of marble imports into those regions (Gorgoni & Pallante 2000), the details of the penetration of Greek people and culture in the Adriatic area are much less known. After the fundamental studies of Braccesi (1977), and of some followers of his school, very little progress has been made in recent years.

Greek presence in the Adriatic region

Since Braccesi's studies (1977) on the Greek presence and influence in the Adriatic area, it has been clear that the old Italico-centred perspective — which attributed only marginal importance to the existence of Greek trading contacts and routes in the Middle-to-Upper Adriatic from the Archaic age, despite the widespread presence of imported Hellenic artefacts not only along both the eastern and western coasts but also at numerous places in their hinterlands — is now outdated. These contacts, which we know were already underway in the late Mycenaean Age, continued off and on throughout the Archaic period and were maintained especially by sailors from Rhodes and Phocaea (Braccesi 1977) and maybe also from Knidos (Mastrocinque 1988). They became more frequent in the Classical Age with the involvement of merchants from Attica and Aegina and most importantly gave rise to the foundation of *apoikiai* with the arrival of Cycladic and Syracusan colonizers. Small *poleis* were established in the Dalmatian islands, including Issa, Pharos and the not-yet-located Heraclea, and centres, very likely emporia (trading posts), such as Numana and Ancona in the Marche, and Spina and Adria in Emilia-Veneto, grew in size and importance (Fig. 1).

The evidence of Greek presence in all these places is now considerable and significant (Pugliese Caratelli 1996; Braccesi & Luni 2002; 2004), but attention should also be paid to finds of Greek artefacts, admittedly sporadic but extremely important in that they may well testify to direct contacts, in Marzabotto, Bologna, Este, Abano, Padua, Altino, etc., i.e. in areas inhabited by Etruscan and ancient Veneto peoples. The direct and indirect evidence includes finds of a number of Greek sculptures, more than is generally thought, dating especially from the late Hellenistic Period when the movement of Greeks from both east and west increased considerably: the presence of these sculptures also raises the question of whether they were imported or whether they may also have involved the work of itinerant Hellenic craftsmen (stonecutters and sculptors) in the initial period of Romanization in northeastern Italy (Di Filippo Balestrazzi 1989).

Currently, the study of the Greek marble objects found in the Adriatic region has been limited to the Archaic and Classical ages, namely to the study of funerary chests, tomb markers and sarcophagi imported into the Po Valley area (Sassatelli 1977) and to the well-known Milani *kouroi* (Luni 2007). An overall picture of the phenomenon in the Hellenistic period has not yet been fully attempted, especially from an archaeometric point of view. The presence of marble artefacts in northern Etrurian settlements opens up the possibility of the use and export of Apuan marbles that so far has been proved only for northwest Italy (Paribeni 2003). The import of pottery (Landolfi 1987) and marble (Mercando 1976) into the middle Adriatic coastal Picene sites in any case constitutes evidence of close relationships with the Attic-Aegean areas.

Figure 1. *Map of the central to eastern Mediterranean region showing the location of Ancona and other sites mentioned in the text.*

This study aims to explore precisely this issue, starting from objective material data for identification based on laboratory analysis of the marble used in a series of Greek (or presumed Greek) sculptures found in some of the places mentioned above and on visual examination of other sculptures found in ancient Dalmatian centres. Of the material subjected to laboratory analysis particular importance is attached to the remarkably uniform group of stelae from Ancona, probably the most significant *corpus* of the entire Picene area. Because of its geographical position and land forms this region is known to have been recognized and used as an excellent place for trading activities from the early historical period. The many easy landing places along its Adriatic coast, the rivers that cut across the region from west to east, the reasonably low and accessible Appennine passes (between 600 and 900 metres a.s.l.) have always constituted exploitable trade routes by which goods could be carried into the hinterland and beyond to other regions; these goods included ceramic and, in some cases, marble artefacts shipped there by Greek sailors (Mercando 1976; Luni 1999) or by other traders. Between the sixth and the beginning of the third century BC the local communities, hitherto rather limited to agricultural-pastoral types of activity, gradually became receptive to an effective system of commercial exchange, with consequent social and cultural development that led to their importing and processing not only crafted products but also, very likely, ideas and behavioural models. This now open and dynamic context probably resulted in Greek and Levantine merchants and craftsmen becoming part of the early historical Picene communities, bringing with them new working and production techniques and skills that could increase the output of distinctive prestige items (Luni 1999; 2003).

Our understanding of these commercial relationships has improved considerably over the last few decades, thanks in particular to finds of imported material during excavations of burial grounds. This was the case, for example, with the necropolis, dated to between the end of the fourth century BC and the first century AD, discovered in Ancona on the south-

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Figure 2. *The S1–S12 Anconitan stelae and the three Veneto reliefs MMVR, MANV1, MANV2 described in Table 1.*

western slopes of the Colle dei Cappuccini at a height of 106 metres a.s.l. at the southernmost point of the promontory occupied by the city. The items unearthed included a considerable amount of imported material, especially of Hellenistic artefacts from the eastern Mediterranean area (Mercando 1976). Of particular interest were 15 funerary stelae bearing inscriptions in Greek (Mercando 1976; Colivicchi 2000; 2002), 14 of them in marble (though three have since been lost)[1] and one made of limestone. Some are shrine-shaped, with Corinthian columns and Doric entablature, while others are tapered slabs bearing a marked typological and stylistic resemblance to eastern Hellenistic production. They constitute a small *corpus* that can be dated, on the basis of parallels from the Greek world and the palaeographic evidence of the inscriptions, to between the second half of the second and the early decades of the first centuries BC. They are remarkably similar to the contemporary Cycladic production of Delos, the typical features of which have long been established through analysis of architectural structure (the frequent presence of the characteristic arch: see Couilloud 1970; 1974), iconography (reliefs with individual figures or groups) and general stylistic

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Table 1. *Petrographic characteristics and isotopic composition of the sampled sculptures. Key: He = heteroblastic; Ho = Homeoblastic; +++ = very abundant; ++ = abundant; + = present; ± = traces; Qtz = quartz; Km = potassic mica; Gr = graphite; Ap = apatite; Pl = plagioclase; Chl = chlorite; OpM = opaque minerals; *Dol = dolomite; MGS = maximum grain size. * The presence of the dolomite was detected by means of XRD analysis.*

Reliefs	Location & inventory number	Accessory minerals								MGS (mm)	Boundary shape of the carbonate crystals	Fabric	Remarks about the kind of fabric	$\delta^{18}O$ (PDB)	$\delta^{13}C$ (PDB)	Origins of the stone
		Qtz	Km	Gr	Ap	Pl	Chl	OpM	*Dol							
S1	Nat. Arch. Museum Ancona - n. 8	±		+						2.08	curved	He	mosaic	–1.33	2.07	Paros-2 (Lakkoi)
S2	Nat. Arch. Museum Ancona - n. 11	±						±		2.15	curved	He	mosaic	–1.53	2.15	Paros-2 (Lakkoi)
S3	Nat. Arch. Museum Ancona - n. 10	±		+						3.04	curved	He	mosaic	–1.10	2.10	Paros-2 (Lakkoi)
S4	Nat. Arch. Museum Ancona - n. 31325	+	+			±		+		0.68	curved/ embayed	He	lineated	–1.43	3.34	Lunense (Carrara)
S5	Library Oliveriana of Pesaro - n. 3		+							0.96	curved	He	weakly lineated	–2.07	3.15	Lunense (Carrara)
S7	Nat. Arch. Museum Ancona - n. 7	+	±	+	+		±	+		2.80	embayed	He	mosaic, slightly stained	–1.60	2.20	Paros-2 (Lakkoi)
S8	Nat. Arch. Museum Ancona - n. 31324	±		+	±					2.88	embayed/ curved	He	mosaic	–1.20	2.03	Paros-2 (Lakkoi)
S9	Nat. Arch. Museum Ancona - n. 19	+	±	±	+			±		2.08	curved/ embayed	He	mosaic	–1.40	2.10	Paros-2 (Lakkoi)
S10	Nat. Arch. Museum Ancona - n. 32323	±		±	±			±		2.20	curved	He	mosaic	–0.59	2.14	Paros-2 (Lakkoi)
S11	Nat. Arch. Museum Ancona - n. 9			++				+	±	2.90	sutured	He	mortar	–1.90	4.00	Proconnesian (Marmara)
S12	Library Oliveriana of Pesaro - n. 6	±		±	±					3.74	curved/ embayed	He	mosaic, local mortar	–1.20	2.06	Paros-2 (Lakkoi)
MB4	Arch. Museum Marzabotto			++						0.72	curved	Ho	mosaic	–3.96	2.53	Lunense (Carrara)
MANV1	Nat. Arch. Museum Venice - n. 367	±	±	+	+					2.96	embayed	He	mosaic	–1.60	2.08	Paros-2 (Lakkoi)
MANV2	Nat. Arch. Museum Venice - n. 368			+++						4.20	sutured	He	strongly lineated	–2.86	1.83	Lesbos Island (Moria)
MMVR	Nat. Arch. Museum Verona - n. 28655			++	±			±		2.35	curved/ embayed	He	mosaic, slightly tensioned	–0.93	2.06	Paros-2 (Lakkoi)
S6	Nat. Arch. Museum Ancona - n. 40654	±								Biomicrite with planctonic Foraminifera referring to the local 'Scaglia Rossa' Formation (Upper Cretaceous–Lower Eocene)						Monte Conero (Ancona)

treatment of the classic scenes of farewell, meeting and the funeral meal that they depict (Fig. 2). This makes them practically unique in Italy (Mercando 1976; Colivicchi 2000), apart from a small number of Neapolitan reliefs, which in any case are later and feature fewer stylistic affinities (Papadopoulos 1985).

Although both Mercando (1976), on the occasion of the first presentation of this group of stelae, and later Colivicchi (2002), in his wide-ranging study of the burial grounds of Ancona, suggested repeatedly that the marble was probably imported from one of the islands of the Aegean Sea, no archaeometric study of the stone material of this important group of reliefs has so far been published, so its provenance has still not been conclusively established. In this connection, it is perhaps worth remembering that, although the generic attribution of 'Aegean' excludes Attica, northern Greece and Asia Minor, it covers more than ten islands, some a long way from others, whose quarries yielded around 20 often quite distinct types of crystalline marble in the Archaic-Hellenistic period (Attanasio 2003; Lazzarini & Antonelli 2003; Varti Matarangas *et al*. 2009).

There is also the more general point that in the absence of specific studies that examine how the various kinds of marble were used at different times, in different places and for different classes of sculpture, many interpretations concerning sculptures from museum collections will lack reliable indicators of the origin of the material used. Such appears tellingly to be the case with this small group of funerary stelae from Ancona, which have been used as evidence in support of two contrasting theories: on the one hand that Hellenistic culture lasted for a long time in Ancona (for example Braccesi 1977; Bacchielli 1985), beginning with the foundation of the city in the fourth century BC by Syracusan colonists fleeing from the tyranny of Diogenes I (Strabo, V, 4, 2); on the other that the city was not typically Hellenic but was rather one of the well-established coastal centres of the Middle and Upper Adriatic, like Adria, Spina and Numana, that maintained many different commercial contacts, especially with Greeks and Etrus-

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cans, but which remained substantially Picene (Baldelli 1996; Colivicchi 2000; 2002; 2008).

Fifth-century BC marbles found in other parts of the northwestern Adriatic area were treated in two in-depth studies by Sassatelli (1977; 1979). He draws attention to the direct influence of Etruria itself (Orvieto, Chiusi and Volterra) on the marble memorial stones found in Etruscan settlements in the Po Valley. However, he also points out that some of them show an obvious Hellenic influence and uses albeit entirely inadequate archaeometric investigations to prove their generic Greek provenance (Del Monte *et al*. 1977). No such investigations were made on the later marble artefacts, however, though some of them, even from a cursory visual examination, appear to have been imported. He considers these to include a fragment of a male sculpture found at Marzabotto (now in the local State Archaeological Museum), a funerary stele found at Abano Terme (Padua), now in the Museo Maffeiano in Verona, and two other funerary stelae, previously kept in the Garden of the Patriarchal Seminary at the Salute in Venice and now in the city's State Archaeological Musuem. The Abano stele, made of white marble and dated to the second–first century BC, is famous for the inscription that identifies it as a commemoration of Herakleia (inv. 28655): it depicts a frontal view of a female figure, her head turned to the left and with a servant beside her on the right (Fig. 2). Of the two Venetian stelae one is in white marble and commemorates a woman named Reina (inv. 368); it is dated to the second century BC and is attributed to a Delian workshop (Fig. 2). It seems to be documented as having belonged to a collection of antique items, most of which came from Crete, but the eighteenth-century source is not absolutely sure. The other, dated to the first century BC (Sperti 1988), depicts a scene of the *Dexiosis* (inv. 367) and is in greyish marble; it may have been made in Attica but its provenance is unknown (Fig. 2). We know that most of the ancient stone materials gathered in the garden and beneath the arcade around the cloister of the Patriarchal Seminary in Venice in the nineteenth century came from erratic finds and from old excavations in the important Roman centre of Altino, the 'mother-city' of Venice, which stood very near the lagoon (Tirelli 2011).

Materials and methods

Samples were taken from sixteen relief carvings, including twelve from the Ancona necropolis, one from the excavations at Marzabotto, one from the Museo Maffeiano in Verona (but originally found at Abano Terme) and two from the collections of the Patriarchal Seminary in Venice (Table 1). Sampling was limited to taking a single small fragment just a few millimetres long from the back or an otherwise hidden part of each stele. Each of these small splinters was used to make a thin section, which was studied under the optical microscope in order to determine its specific petrographic characteristics, and the powder required for analysis of the stable carbon and oxygen isotopes (McCrea 1950). A Finnigan MAT Delta E mass spectrometer was used to analyse all the samples except the one from the limestone stele S6, which was only studied under a microscope. The results of the isotopic analyses were expressed in δ (‰) values according to the international PDB standard (Craig 1957) and compared, via *ad hoc* isotopic diagrams, with the latest data bank (Gorgoni *et al.* 2002, with supplementary data from Lazzarini & Antonelli 2003), consisting of over a thousand samples taken from the principal Mediterranean marble quarries of antiquity and from artefacts of known provenance.

In the same way, the main petrographic characteristics of the marble samples (structure; outline shape of the carbonate crystals; maximum dimension of the largest calcite/dolomite crystal expressed in mm — MGS; presence and quantity of accessory minerals: cf. Moens *et al*. 1988; Gorgoni *et al*. 2002 and the bibliography listed) were also compared with the most recent literature data (Germann *et al.* 1988; Matthews *et al.* 1992; Gorgoni *et al.* 2002; Lazzarini & Antonelli 2003) and with reference samples taken from ancient quarries (the L.A.M.A. Collection, Venice). The X-ray diffraction (XRD) technique, using a PANalytical EMPYREAN diffractometer (CuKα/Ni: 40 KV & 40 mA), was employed to detect the possible presence of a dolomite component of the marble. Given that the combination of petrographic and isotopic information did not lead to the establishment of the origin of the marble from reliefs S4 and S5 (both from the Ancona group of stelae) with any certainty, the relevant samples were also subjected to analysis via cathodoluminescence (bombarding time: ten seconds) aimed directly at the thin section (Barbin *et al*. 1992 and the bibliography therein) in the laboratory of the History of Science Museum in Geneva.

Results and discussion

The results of the petrographic examinations and the isotopic analyses are summarized in Table 1 and in Figures 3–5. Though they make no claim to providing final answers, the archaeometric data presented here constitute a useful contribution, especially in the case of Ancona, to the still unresolved archaeological and historical debates about the possible implications for

connections with Greece, the mobility of craftsmen, and the copying of Hellenic styles. For Ancona, as for many other places in the Greek Adriatic area, one *vexata questio* concerns the type, extent and nature of local craftsmanship and its relation to that of the Aegean (or of other great Hellenistic centres); the other revolves around the extent to which the city had direct or mediated contact with the great centres of Asia Minor.

All the marbles analysed proved to be essentially calcitic, and in ten of the fifteen cases the stone was found to be Parian marble from the opencast quarries at Lakkoi, in the Chorodaki valley, not far from the ancient city of Paros (present-day Paroikià), on the island of the same name in the Cyclades. The marble in question is much the most commonly used variety of those found on the island (Herz 2000), though Paros is better known for *lychnites* marble, extracted from the tunnel quarries of Stefani, near the village of Marathi. *Lychnites* is more beautiful and more highly valued (fine, homogeneous grain, uniform white colour) but more difficult to quarry than the marble under examination, which is generally of a less pure white colour and is sometimes very light grey with greyish spots. This made it more suitable for architectural uses than for high-quality sculpture, though it was also extensively employed for statuary from the Archaic period in the areas of Magna Graecia, Sicily and the Mediterranean in general (Gorgoni & Pallante 2000; Lazzarini & Luni 2010). When examined under the microscope, the marble used for the stelae always features a maximum grain size (MGS) over 2 mm and heteroblastic texture made of a mosaic of crystals which are often characterized by deformed polysynthetic twins and curved boundary shapes (Fig. 4a).

The prevalent use of Parian marble constitutes an indirect confirmation of the previously proposed hypothesis that most of the reliefs came originally from Delos. It is certainly true that Athens and Delos were the main centres for the working of marble and the trading of art works during the late Hellenistic period (Marcadé 1969; Coarelli 1996; Damaskos 1999), with many active workshops producing eclectic or classical-style sculptures, decorative pieces, copies of classical masterworks, etc. (Cain 1985; Grassinger 1991; Bartman 1992). But while Attic marbles (especially Pentelic) were the main materials used in Athens, almost all the work produced on Delos in this period made use of marble from the Cyclades (Agnoli 2002), also because of its convenient proximity. However, though it is true that from 166 BC the fact that Delos was a free port gave it enormous commercial advantages, it should also be kept in mind that the production of works of art and other artefacts did not necessarily all take place on Delos

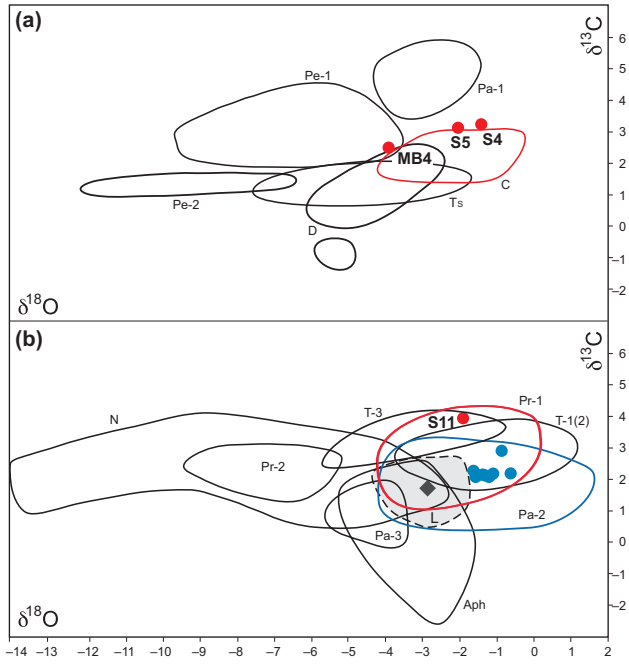

Figure 3. *The isotopic composition of the marble sculptures compared with the white marble data bank proposed by Gorgoni* et al. *(2002), supplemented with data from Lazzarini & Antonelli (2003). The isotopic field defined by Lazzarini* et al. *(1999) for the Lesbian marble (grey area with dotted line) is also reported: (a) fine-grained marbles; (b) medium- to coarse-grained marbles. N = Naxos; T-1(2) = Thasos Aliki; T-3 = Thasos Cape Vathy; Pr-1 and Pr-2 = Proconnesos; Aph = Aphrodisias; Pa-2 = Paros Lakkoi; Pa-3 = Paros Karavos; Pa-1 = Paros Stephani; D = Dokimeion; Pe-1 and Pe-2 = Mount Pentelikon; C = Carrara; Ts = Tinos; L = Lesbos.*

itself; works could be produced on other islands and then be transported to Delos for exportation. Rhodes, in particular, continued to be an important cultural and artistic centre around the end of the second and the beginning of the first century BC (Laurenzi 1941; Mattusch 1998; Damaskos 1999) and was very similar to Delos as regards the choice of artistic subjects and their interpretation. It was also very receptive to the contribution of artists and craftsmen from Asia Minor (Marcadé 1969; Fraser 1977). Thus, in the case of stelae S11 and S12 (cf. Fig. 2), which feature a distinctive microasiatic component[2] within an architectural structure clearly derived from the production of Delos and the other islands of the Cyclades (Colivicchi 2000), we can perhaps venture the suggestion that they were made in Rhodes, an expression of the *koinè* of the island-microasiatic culture. Support for such a theory is to be found both

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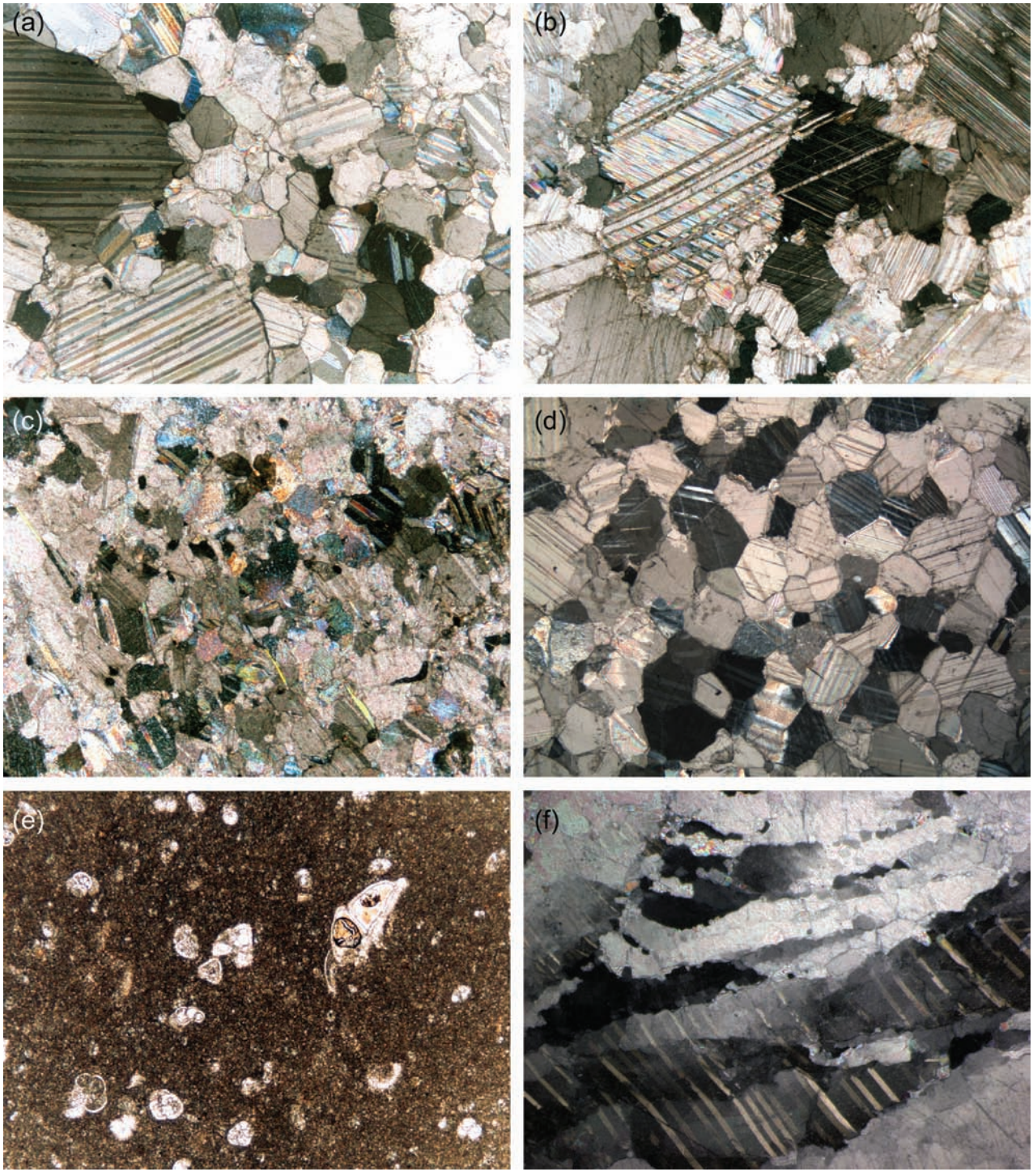

Figure 4. *Micrographs of thin sections of some of the stelae studied. (a) Heteroblastic mosaic formed by calcite crystals with mainly curved boundary shape: stele S3, Parian marble. (b) The typical mortar texture of Proconnesian marble made of calcite crystals with sutured and embayed boundary shapes: stele S1. (c) Atypical microfacies of Carrara marble showing a heteroblastic lineated texture and including some iso-oriented K-mica needles: stele S4. (d) The typical homeoblastic mosaic texture of Carrara marble: stele MB4. (e) The local biomicrite rich in Foraminifera belonging to the so-called 'pietra del Conero' (Scaglia Rossa Formation): stele S6. (f) Medium- to coarse-grained marble rich in graphite showing a strongly lineated and stressed heteroblastic texture: stele MMVR, Lesbian marble. Cross-polarized light; the long side of the images is 2.45 mm except for (b) which is 4.9 mm.*

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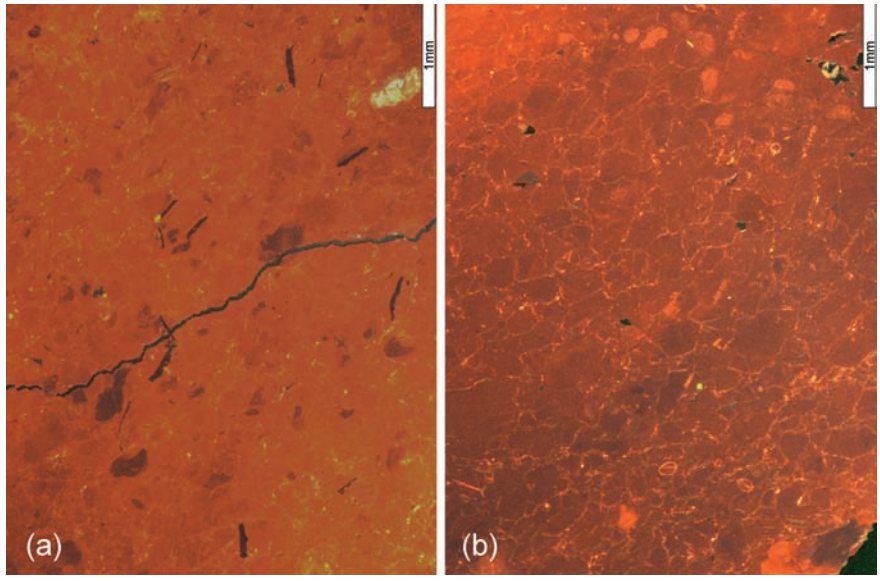

Figure 5. *Results of the cathodoluminescence analysis carried out on samples S4 (a) and S5 (b). (a) Cathodomicrofacies characterized by brown-orange luminescence, heterogeneous distribution and weak to average intensity; some areas without luminescence are present. These features fit well with those recorded for anomalous facies of Carrara marble from the Serravezza region (Barbin* et al. *1992; D. Decrouez, unpublished data: pers. comm.). (b) Cathodomicrofacies characterized by brown-orange luminescence, homogeneous distribution and average intensity. These features fit closely with those recorded for Carrara marble (Barbin* et al. *1992).*

in the presence of amphorae from Rhodes amongst the Hellenistic material found in the burial grounds where the stelae were unearthed in Ancona and also in the archaeometric evidence (Table 1, Figs. 3b & 4b), given that the marble used for S11 (the one featuring the closest iconographic and stylistic similarities to artefacts produced in the Byzantine area: Colivicchi 2000) proves to have come from the Island of Marmara, the ancient *Prokonnesos*, in the Propontis or the Sea of Marmara in present-day Turkey, which communicates directly with the Aegean Sea through the Dardanelles. Given the nature of the marble and considering that funerary relief carvings in Rhodes generally feature different characteristics, stele S11 could originally have come directly from Byzantium. It should, however, be kept in mind that at this time the centres of production were Greek and it was towards Greece that craftsmen and materials were drawn at this time, not Asia Minor (as happened later). Proconnesian marble has been used almost uninterruptedly since the archaic period. It has a medium-sized grain and generally features grey spots and schistosity parallel to the axial plane both caused by the presence and iso-orientation of carbonaceous/graphite substances. The variety used for stele S11 is of a basically whitish colour and, when examined under the microscope, presents the mortar-type structure typical of marble from *Prokonnesos*, formed by calcite crystals with sutured or embayed boundaries (Fig. 4b) and maximum grain size of more than 2 mm. Stele S12 proved to be sculpted not from Proconnesian but from Parian marble quarried at Lakkoi.

As for the remaining four marble stelae, the results for three of them (S4 and S5 from Ancona, and MB4 from Marzabotto) show that they were made from the statuary variety of *lunense* marble (Table 1, Figs. 3a, 4c–d & 5). In point of fact, in the case of reliefs S4 and S5 the results of the isotopic analysis suggest that the marble was of Italic origin, but this conflicts with the result of the microscopic study of the thin section. Observation of the textural characteristics of the marble suggests rather an Attic origin, from Mount Penteli. In order to resolve the question, samples S4 and S5 were also subjected to cathodoluminescence analysis at the History of Science Museum in Geneva. Comparison of the cathodomicrofacies obtained (appraisal of colour, repartition and the intensity of induced luminescence) with those in the reference data bank (Barbin *et al*. 1992, and the bibliography therein) confirmed their provenance as the Apuan Alps (Fig. 5). The marble in question is white, fine-grained (generally less than 1 mm) and of excellent quality. It was already being used for the production of funerary stelae by the Etruscans in the fifth century BC (Paribeni 2003). Then, from the first century BC (Dolci 1980), the Romans used it in many Italic cities and, on a smaller scale, in the western provinces (Pensabene 2002) and those of North Africa (Antonelli *et al.* 2009; Dessandier *et al.* 2012), especially for sculptures and carved architectural elements. By contrast, it was practically never used in the eastern provinces.

Given that the provenance of the marble was Italic, the reliefs were clearly not carved in the *ateliers* of Delos; it does, however, make it perfectly possible to interpret

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them as copies of Greek artists' work produced locally by native craftsmen. And, especially in the case of Ancona, it cannot be excluded that the carving was done *in situ* by itinerant craftsmen working from currently circulating Cycladic patterns. Native craftsmen worked mainly with soft local stone and quickly mastered the processing techniques. This would seem to be confirmed by the fact that studies of the small *corpus* of works from Ancona suggest that stele S6, the only one indisputably to have been produced by a local workshop operating in the same period (Mercando 1976; Colivicchi 2002), is different from the others not only because it is a product of inferior quality, simplified and impoverished in architectural structure and stylistic accomplishment (cf. Fig. 2), but also because it is the only one to have been carved in the so-called 'Pietra del Conero'. This is a limestone — specifically a biomicrite rich in planktonic Foraminifera (in our case mainly the muricate *Morzovella* and *Acarinina* genera dating the rock to Upper Palaeocene/Lower Eocene: Fig. 4e) — belonging to the 'Scaglia Rossa' Apenninic Formation (Late Cretaceous/Early Eocene). It was widely quarried and used throughout the region in antiquity and it is especially common all over the Monte Conero promontory (Coccioni *et al.* 1997) which encloses the natural harbour of Ancona.

Finally, it can be reported that unlike the other two 'Veneto' Hellenistic stelae (the one that was certainly found at Abano Terme and the one from Reina at the Archaeological Museum in Venice), both of which were sculpted in Parian marble from Lakkoi, the results show that the Venetian stele from the Collection of the Patriarchal Seminary (MANV2; Table 1) was made of marble from Lesbos (Figs. 3b & 4f). This is a medium-grain, dull grey marble from a large quarry at Moria about 2 km from Mytilene, the main town on the island. Used for architectural elements from the Archaic Age, it was increasingly employed up to the Late Hellenistic period (locally) and in the Early Imperial period, when it was exported to all the Roman provinces of the eastern and central Mediterranean (Pensabene 1998; Lazzarini *et al*. 1999).

In general, it is very probable that most of the marble stelae analysed here were imported, already finished, from (and via) Delos. This would appear even more likely in the case of those from Ancona in that there is evidence — funerary and dedicatory epigraphs (Couilloud 1974) — of the presence of rich individuals from Ancona having been resident on the island in the Hellenistic period. This demonstrates the existence of a direct, consolidated and possibly special relationship between Ancona and Delos and raises the possibility that orders might have been placed with specialist *ateliers* on the island and of *ad hoc* transport arrangements. It obviously remains possible that the stelae might have been imported in a semi-finished state and completed in Ancona by immigrant Greek island craftsmen but this, also in the light of the archaeometric data presented here, appears less probable. In this connection, contrary to the assumption made by Colivicchi (2002) in support of this latter theory — that all the crafted aspects of stele S3 were of Delian origin while the material used was local — the archaeometric data show that the stone is Parian marble from Lakkoi (Table 1, Figs. 3b & 4a) so S3 cannot be cited as evidence that artefacts identical to those produced on Delos could have been reproduced in Ancona.

As regards the three reliefs carved in *lunense* marble, in support of the suggestions made above and drawing attention to parallel features in different typologies from different geographical contexts, we would point to the case of a number of marble portraits of the same period as our reliefs, found at *Praeneste* and now at the State Archaeological Museum in Palestrina (Lazio); these pieces are clearly Hellenistic in style and are obviously influenced by the carved portrait tradition of Delos, but since they are made of *lunense* marble they have been attributed either to a Greek artist working in Praeneste or to an acculturated local stone mason imitating the style of portrait-sculpture from Delos (Agnoli 2002).

Conclusions

In the context of historical research into the Picene communities, there has been ongoing debate about the possible Greek origin of Ancona (*Ankon*). According to Strabo (V, 4, 2;), the city was settled by Greeks from Syracuse but so far there is very little archaeological evidence to support this or the subsequent establishment of a proper Greek *polis* (Colivicchi 2008). It is certain, however, that thanks to its large natural harbour with its distinctive elbow shape (*ankon*) and its barycentric location in the Adriatic, the city (like other centres along the coast of the Middle and Upper Adriatic such as Numana, Spina and Adria) for many centuries enjoyed frequent contact with Greece, Magna Graecia and Sicily. As a result of its harbour facilities, Ancona appears to have been fully and organically integrated into the great Roman economic system in the Late Republican period and therefore open to a vast range of contacts with the fully conquered Hellenistic east (D'Andria 2001; Colivicchi 2002; 2008). It does, however, remain possible, if not probable, that the above-mentioned exodus of Greeks from Syracuse led to reinforcement of an existing Greek emporium and that this, on the evidence of burial accoutrements

found in excavated graves (Mercando 1976) and of the archaeometric data discussed here, continued to have direct contact with the Greek coast for the following three centuries.

One particularly important result is the identification of *lunense* marble for the Marzabotto sculpture fragment and for the two stelae from Ancona in that for the first time it provides incontrovertible evidence of this marble being exported from Etruria towards outlying Etruscan territories. *Lunense* marble was much more commonly used in pre-Roman times than is generally thought, though much more work remains to be done on chronology and its geographical distribution. Its use in the present cases testifies to the great prestige enjoyed by imported Greek marble artefacts in the Adriatic area, a status which they must already have acquired in the Archaic period with the first importations of *kouroi* (Luni 2003) and which continued through the Classical age and increased considerably in the Hellenistic period when marble became more easily obtainable. But it also (and most importantly) testifies to the fact that this Italic marble was being worked by Greek sculptors present in northern Italy, or by local craftsmen carving in the Greek style. Indeed, the marble stelae found in the Veneto widen this particular sphere of influence exerted by late Hellenic plastic arts, from the lower-central Adriatic to the Upper Adriatic, and confirm historical and archaeological theories hitherto supported only by occasional finds of white and coloured marbles (Di Filippo Balestrazzi 1989 and Antonetti 1996, respectively). Contacts with the central Aegean area are not only confirmed for Delos, but also extended to the island of Lesbos, from where the marble for the stele depicting the *Dexiosis* analysed here probably came.

Notes

1. The surviving twelve stelae are kept at three different museums: nine are in the State Archaeological Museum in Ancona, one at the Ancona 'City Museum' and two at the Oliveriana Library in Pesaro. In the interests of reliable and easy identification, Table 1 keeps the numbering given them by Colivicchi (2002) in his study of ancient burial grounds in Ancona (to which reference should be made for a detailed description of their stylistic and iconographic characteristics) and also quotes their inventory numbers.
2. This is a depiction of a banquet scene, which rarely occurs in work produced in the Cyclades in the late-Hellenistic age but is one of the most frequently treated subjects in Asia Minor in this period.
3. The incorrect indication of origin given for the material used for this stele was provided by P. Pallecchi, of the Restoration Centre of the Soprintendenza per i Beni Archeologici of Tuscany, on the basis of flawed chemical data, which remain unpublished. Colivicchi (2002) merely referred to the attribution on the assumption that it was valid.

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