

Analysis of classical marble sculptures in the Toledo Museum of Art

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Abstract Carbon and oxygen isotope ratios of seven sculptures in the Toledo Museum of Art (and one sculpture in the Museum of Fine Arts, Boston) were studied in an attempt to determine the quarry sources. The results are reported, based on comparison with several isotope databases for Mediterranean marble quarries to suggest source attributions, and discussed.

PROCEDURE

Chip samples were taken by Clifford Craine using a small steel mason's point. Powder samples were taken with a common twist hand drill with a $\frac{3}{32}$ -inch carbon steel bit. The initial millimeters of powder were discarded.

The samples were analyzed by Robert H. Tykot. Carbon and oxygen stable isotope ratios ($\delta^{13}\text{C}/^{12}\text{C}$ and $\delta^{18}\text{O}/^{16}\text{O}$) were measured on an isotope ratio mass spectrometer, using an individual acid bath auto-sampler. The marble samples react with 100% phosphoric acid to produce CO_2 gas, which is trapped and transferred to the ion source of the mass spectrometer. Carbon and oxygen isotope ratios are measured simultaneously by comparison with a standard CO_2 gas

of known isotopic composition. The results are provided in delta notation ($\delta^{13}\text{C}$ and $\delta^{18}\text{O}$) relative to the PDB marine limestone standard, with a precision of ± 0.1 ‰ for carbon and ± 0.2 ‰ for oxygen.

ISOTOPIC ANALYSIS

Isotopic matches for the Toledo marble sculptures were identified by Robert H. Tykot by comparison with the quarry database produced by Moens *et al.* (1992), supplemented by several more recent studies (Fig. 1). Since the individual quarry sample data are not available, it is

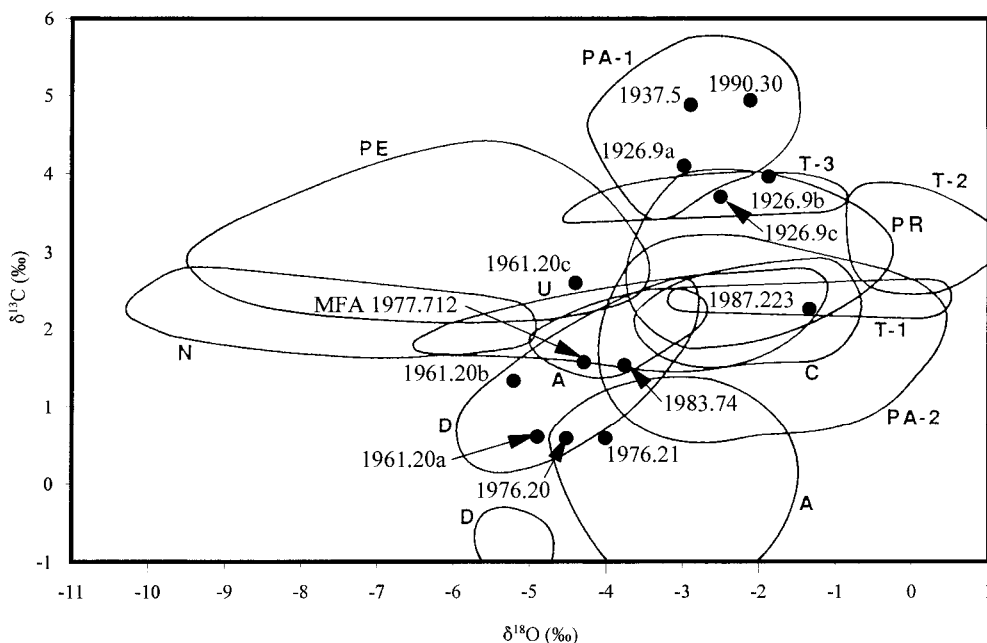


Figure 1 Carbon and oxygen isotope ratios of marble sculptures in the Toledo Museum of Art, superimposed on the database of Moens *et al.* (1992).

Table 1 Carbon and oxygen isotope ratios of seven classical marble sculptures from the Toledo Museum of Art and one sculpture in the Museum of Fine Arts, Boston. The results are compared with several isotope databases for Mediterranean marble quarries to suggest source attributions. Key to marble quarries: A-1 (Aphrodisias 1); A-2 (Aphrodisias 2); C (Carrara); Ch-1 (Chemtou 1); De-1 (Denizli 1); D (Dokimeion=Afyon); Dol-2 (Doliana 2); E-1 (Ephesos 1); E-2 (Ephesos 2); He (Heracleia); Hy (Hymettos); Ia (Iasos); M (Mani); My (Mylasa); N (Naxos); N-M (Naxos-Melanes); PA-1 (Paros 1); PA-2 (Paros 2); PE (Pentelikon); PR (Prokonnesos=Marmara); S (Sounion); Sa (Sardis); Th (T-1, T-2, T-3) (Thasos-Cape Phaneri & Thasos-Aliki); Th-CV (Thasos-Cape Vathy); U (Usak)

Acc. no.	Title	Previously published description	Sample source	$\delta^{13}\text{C}$ (‰)	$\delta^{18}\text{O}$ (‰)	Isotopic quarry matches	Attribution	Justification
1926.9(A)	Ram (ancient: body, most of legs, possibly parts of horns, ears, and muzzle)	"Best Parian marble" (Bieber, 1943, p. 380)	Old loss at proper left side of chest about 48 cm from the top of the base	+4.10	-2.98	Sa, Th-CV, PA-1, PR, E-1	PA-1	Cream-colored medium-grained marble with brown surface weathering
1926.9(B)	Ram (restoration)	"Coarse island marble" (Bieber, 1943, p. 380)	Inside of proper left front leg at proper right rear side of the leg about 7.5 cm down from underside of the body	+3.96	-1.87	Ia?, Th-CV, PA-1??, PR, De-1	Unknown	Cream-colored, medium-grained marble (coarser than the body)
1926.9(C)	Ram (restoration?)	"Coarse island marble" (Bieber, 1943, p. 380)	Top of V-shaped gouge on top of proper left horn	+3.7	-2.5	Th-CV, PA-1, PR	Unknown	Cream-colored medium-grained marble (finer than the body)
1937.5	Fragment of statue: head and shoulders of a woman	"Greek island marble" (Godwin, 1938)	Old loss proper right rear corner	+4.88	-2.89	PA-1, E-1	PA-1	White fine-grained marble with fairly small crystals
1961.20 (A)	Statue of a young god (probably Apollo)	"White Italian marble"	From old repair cut in outside of proper right arm	+0.6	-4.9	D, A-1, Th-CV, PR	D	Ivory-colored fine-grained marble, slightly rosy in hue, with darker veins (surface much weathered)
1961.20(B)	Ditto		Chip from back of tree trunk at the edge of the old loss 18 cm from the top of the base at the center of the back	+1.34	-5.21	D, Ch-1, N, M?, U, E-2	Unknown	Ivory-colored marble, larger grained than the torso
1961.20(C)	Ditto		From old break, underside of proper left ankle	+2.6	-4.4	D, PE, Th-CV, Pr	Unknown	White fine-grained marble
1976.20	Fragment of a statue or bust: head of Lucius Verus	"White fine-grained marble" (Gazda <i>et al.</i> , 1977, p. 24)	Edge of old loss at back of neck	+0.58	-4.52	D, My, A-1, M?, E-2	D	Fine-grained ivory-colored marble with low translucency (almost matte) and slight more-translucent, darker mottling
1976.21	Fragment of a statue: head of a woman (Aphrodite?)	"White fine-grained marble" (Gazda <i>et al.</i> , 1977, p. 22)	Edge of old loss at back of head	+0.58	-4.01	D, My, A-1, M?, E-2	D	Fine-grained ivory-colored marble with low translucency and some more-translucent, darker mottling
MFA1977.712	Fragment of a statue: helmeted head of Ares	"White crystalline marble, probably from SW Asia Minor" (Vermeule <i>et al.</i> , 1988)		+1.58	-4.29	A-2, D, PA-2, U, E-2, He, M, My, N-M?	D (van der Merwe <i>et al.</i> , 1995, p. 193)	Fine-grained marble
1983.74	Statue of an officer	"White marble perhaps from the quarry at Aphrodisias"	Chip taken from the back of the base, below the tree trunk, 10 cm from proper right side and 11 cm from bottom of base	+1.54	-3.76	D, My, A-2, PA-2, N-M, M, Hy, U, E-2, He	A-2	Matte, chalky, medium grained with some coarser mottling
1987.223	Strigilar sarcophagus with lions	"Pale gray marble with darker blue-gray streaks from the quarries on the island of Prokonnesos" ... with reddish and gray surface accretions (A. Claridge, pers. comm., 1988)	Chip taken from unfinished back at the proper left side about 30 cm from top edge and 15 cm from the proper left side	+2.26	-1.34	C, Ia, Th, PA-2, Dol-2, M, Hy, S, Pr, U, De-1	PR	Pale gray, medium-grained marble with darker blue-gray veins
1990.30	Bust of Domitian	Off-white/ivory-colored, fine-grained translucent Italian marble (Toledo Treasures, 46-7)	Broken edge of drapery about 2 cm above center section at back	+4.94	-2.11	PA-1?, PR??, E-1?	PA-1	Rather fine-grained white translucent marble of very high quality

impossible to assess probabilities for sculpture samples falling near field boundaries defined by a modest number of quarry samples.

ATTRIBUTION

Probable attributions of the Toledo sculptures were ultimately made on the basis of the isotopic results; the color, grain size, and other attributes of the marble (visual inspection alone); and art historical knowledge of the style and recent provenance of the individual sculptures.

RESULTS AND DISCUSSION

Table 1 summarizes the information about the objects and their analysis. The discussion here focuses on what isotopic analysis may have added to the existing body of knowledge about each object.



Figure 2 (a) Ram. Gift of Clement O. Miniger, 1926.9; (b) Belly of the ram in Figure 2a disassembled in 1926 during restoration. Note the remains of the ancient palm tree support and the removed testicles.

1. Ram (Figs 2a–b)¹

1st century BC–1st century AD

H (at head) 1.143 m; L 1.346 m

Gift of Clement O. Miniger, 1926.9

Provenance: Janiello Collection (sold, Vente Janiello, Rome, April 21, 1911, pl. 28); sold, Anderson Galleries, New York, January 26–29, 1921, pp. ix, 141, lot 792, illus.; [H. Kevorkian, New York].

This over-lifesize sculpture has been reconstructed from numerous fragments. Three samples were tested in order to discover the sources of the original core of the statue (the chest) and of two restored areas (the left front leg and the left horn).

It was anticipated that the ram would prove to be of Carrara marble, which would support an Imperial date. However, the isotopic analyses revealed something more interesting. The sample from the chest tests firmly as Paros 1 (Lychnites, from the subterranean quarries), which corresponds to the appearance as creamy, medium-grained marble. The two restored areas (left front leg and left horn) test as unknown but not Italian; probably marbles imported in ancient times from the Greek islands. The restorations match the original marble closely in color but are somewhat larger in grain size. Sample C from the horn is a now-separate piece of inserted marble, but Paros seems to be a possible match using Herz's data; conversely, using Moens *et al.* (1992) data, the sample seems not to be from Paros, while sample B could be. All of the samples fall into the Thasian and Prokonnesian fields as well. The conclusion points toward repair in an Italian workshop before 1900, and likely before 1800, to restore the ram with fragments of other ancient marbles, chosen to match the color and grain size.

Two samples (A and B, from the chest and the restored front left leg) were specifically determined to be calcite marble. A preliminary acid test was positive for both samples, i.e., the vigorous reaction indicated that the material was calcium carbonate. Both samples were also tested by X-ray diffraction (XRD) (using a Rigaku Mini-Flex X-ray Diffractometer located at USF), which confirmed that they are calcite rather than dolomite.

Long believed to have been part of the Hope collection, it is now recognized that this provenance was a misunderstanding, based on the ram's presence in the 1921 Anderson Galleries auction that was comprised mostly of sculptures from Deepdene. The Janiello association supports an Italian provenance. It has been hypothesized that the brownish patina could correspond to the "bel montone antico di marmo bruno" described by Ulisse Aldroandi in the house of Curtio Frangipane in Rome about 1550, but there is no firm evidence (P. Bober, pers. comm. 1964, citing L. Mauro, *Le antichità della città di Roma*, c. 1556: 262).

The surviving original surfaces are carved to resemble crisp waves of wool. M. Bieber attempted to explain the ram as part of a group representing Odysseus and Polyphemus, suggesting that there were traces where a Greek might have clung (Bieber, 1943). In fact, examination of the belly (Fig. 2b) makes it clear that the original sculpture included a

palm-stump support, carved from the same block of marble. The size and formality of the pose argue against a narrative group; E. Richardson suggested a connection with Zeus Ammon, citing a relief on Samos with a dignified ram standing in front of the legs of the god (pers. comm. 1954).

2. Fragment of a statue: head and shoulders of a woman (Fig. 3)²

Late 2nd to early 1st century BC

H 0.332 m

Purchased with funds from the Libbey Endowment, Gift of Edward Drummond Libbey, 1937.5

Provenance: Barsanti, Rome (until 1914); Henry Goldman, New York (1914–1937; purchased from Barsanti by Paul J. Sachs for his uncle Henry Goldman).

The Toledo Museum acquired this statue as a Praxitelean “bust” of the 4th century BC, believed to be carved of Greek island marble. It was hoped that analysis would confirm this. In fact, the isotopic field is quite uncrowded in this region, and the date and appearance support an attribution to Paros (Lychnites).

The “fragment” is incomplete not because of damage but because it was made by careful piecing, in keeping with Hellenistic practice in the late 2nd and early 1st centuries BC. Ridgway associates the way in which the cranium was pieced with a head from the Letoon at Xanthos (Antalya 2.18.77) and the piecing of the bust with the similarly assembled statue of a girl from Antium (Ridgway, 2000: 260).



Figure 3 Fragment of a statue: head and shoulders of a woman. Purchased with funds from the Libbey Endowment, Gift of Edward Drummond Libbey, 1937.5.

3. Statue of a young god (probably Apollo) (Fig. 4)³

About AD 130

H 1.49 m (from break at lower left ankle to neckline)

Purchased with funds from the Libbey Endowment, Gift of Edward Drummond Libbey, 1961.20

Provenance: Cardinal Ludovico Ludovisi (1595–1632), Rome; Villa Ludovisi, Rome (to about 1880; the torso stood against the west wall of the Villa Borioni on the east side of the villa grounds, near the Porta Salaria); Baron de Somzée, Brussels (sold, Brussels, May 24, 1904, lot 5); Swiss private collection (sold, Münzen und Medaillen A.G., Basel, May 13, 1961, lot 18, illus.).

Probably because of its early appearance in the Ludovisi collection and the fine grain of the ivory-colored marble, the stone had been consistently identified as Italian – Carrara – marble. Visual examination suggested that not only the modern plinth but also the support in the form of a tree stump covered by a mantle and also the lower left leg were restorations. The stump is of slightly coarser grained marble with a gray tint. The left leg below the knee, which preserves traces of a boot on the back of the ankle, is white rather than ivory in hue, disproportionately large in size compared with the slender thigh, and bears tool marks that suggest the contours were reduced, particularly along the

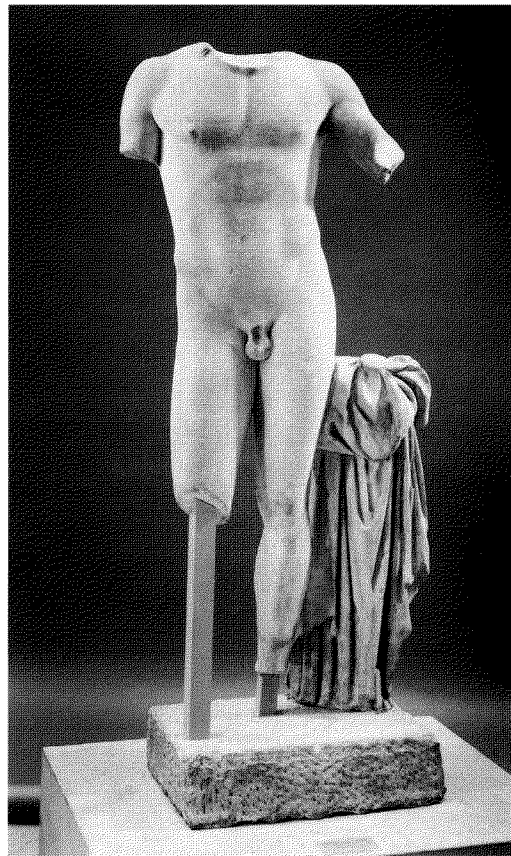


Figure 4 Statue of a young god (probably Apollo). Purchased with funds from the Libbey Endowment, Gift of Edward Drummond Libbey, 1961.20.

sides. Samples were taken from the torso and from both questioned parts. Isotopic analysis and the fine grain suggest Dokimeion as the quarry for the torso. The lower leg and the stump test within the range for Dokimeion marble, but so far from the isotopic value for the torso that they must be from different quarry sources. Both must have been recycled from other ancient statues.

The lock of hair on the left shoulder indicates the figure represents a young god rather than an athlete. The pose associates the statue with the Tiber Apollo type, a popular Roman creation of the early empire in the Classicizing style (Palma *et al.*, 1979: 60; Ridgway, 1981: 238).

4. Fragment of a statue or bust: head of Lucius Verus (Fig. 5)⁴

About AD 161–169 or later

H 0.363 m; H (chin to hairline) about 0.165 m; H (bottom of beard to hairline) 0.215 m

Purchased with funds from the Libbey Endowment, Gift of Edward Drummond Libbey, 1976.20

Provenance: Wilhelm Flender, Siegen, Germany (reported to have been acquired in Lebanon in the 1940s); G. Luther Flender, Siegen, Germany (–1976).

This head was offered for sale with the head of a woman/Aphrodite and the Museum of Fine Arts's helmeted head of Ares described below (nos. 5 and 6). All three are said to have come from the same site and were carved of fine-grained off-white marble. The question for isotopic analysis was whether they came from the same quarry. Analysis reveals that the two heads in Toledo almost certainly came

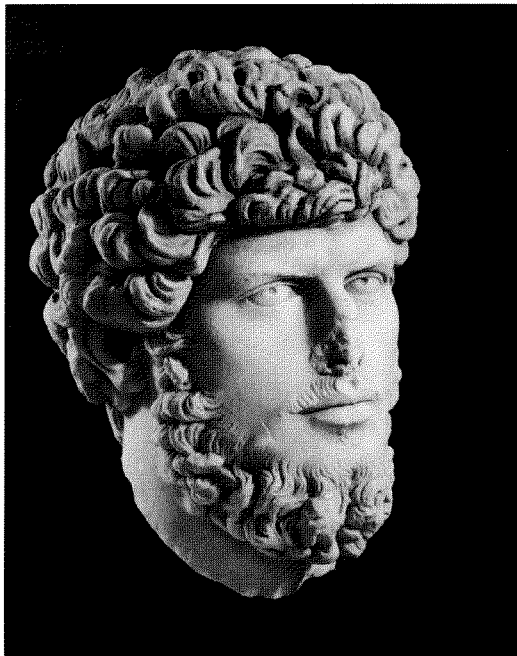


Figure 5 Fragment of a statue or bust: head of Lucius Verus. Purchased with funds from the Libbey Endowment, Gift of Edward Drummond Libbey, 1976.20.

not only from the same quarry – Dokimeion – but the same quarry area. The head of Ares was previously associated with the Dokimeion quarry (van der Merwe *et al.*, 1995: 193), but significant differences in isotopic ratios indicate that it is not possible to assign to the same quarry area as the heads of Lucius Verus and Aphrodite.

It is worth noting that the styles of the three heads are so distinctive that they appear to date as much as a quarter of a century apart. Under the dramatic helmet, Ares's face is lifesize, in contrast with the larger-than-life images of Verus and Aphrodite. The Ares has been described as “a Hadrianic copy, probably after the colossal fourth-century BC cult image attributed to Leochares or Timotheos in the temple of Ares at Halikarnassos” (Vermeule, 1981), in which “it is possible to see Hadrian's features very idealized” (Vermeule and Comstock, 1988: 34). The portrait of Lucius Verus with its regular pattern of drill channels to articulate the billowing curls of hair is Antonine. The iconography corresponds to the type introduced in 161, at the time he and Marcus Aurelius became co-rulers (Wegner, 1939: 64–5); the type continued to be reproduced posthumously. The head of Aphrodite, with its dramatic turn, idealized features, and irregularly drilled hair channels appears to be late Antonine or even Severan (Gazda, 1977: 24; Gazda, 1978: 55).

The eyes are equally distinctive. The eyes of the Ares are not articulated. Lucius Verus has single drill holes to represent the pupils and incised irises. Aphrodite has double-drilled lentil-shaped pupils and no indication of irises.

All three heads have neck supports, characteristic of workshops in southwest Asia Minor, particularly Pisidia and Pamphylia (Inan and Alföldi-Rosenbaum, 1979: 10), but they are handled very differently. The splendid helmet plume of the Ares is supported by marble fill in the negative space (Fig. 7). The mass of hair on the nape of the Aphrodite is large and roughly finished (Fig. 6). Verus's neck is broken along a line rising from about 3 cm below the beard in front to just below the hairline in back, so that almost no nape is preserved. A rounded section of stone rises about 2 cm high by 7.5 cm wide to touch the curls of hair; it is flattened on the back with chisel strokes, perhaps disguising a support as drapery.

The alleged common provenance – supported by the shared marble source of the two Toledo heads – may reflect a monument erected by a workshop whose sculptors were variously trained, or accustomed to applying different styles (contemporary for a portrait, appropriately old-fashioned for images based on Classical prototypes), or continued to make components over a period of time.

5. Fragment of a statue: head of a woman (Aphrodite) (Fig. 6)⁵

About AD 161–169 or later

H 0.416 m; h (chin to hairline) 0.18 m

Purchased with funds from the Libbey Endowment, Gift of Edward Drummond Libbey, 1976.21

Provenance: See no. 4.

See no. 4.



Figure 6 Fragment of a statue: head of a woman (Aphrodite?). Purchased with funds from the Libbey Endowment, Gift of Edward Drummond Libbey, 1976.21.



Figure 7 Fragment of a statue: helmeted head of Ares. Photo: Courtesy, Museum of Fine Arts, Boston, Gift of Mr. and Mrs. Cornelius C. Vermeule III by exchange, 1977.712.

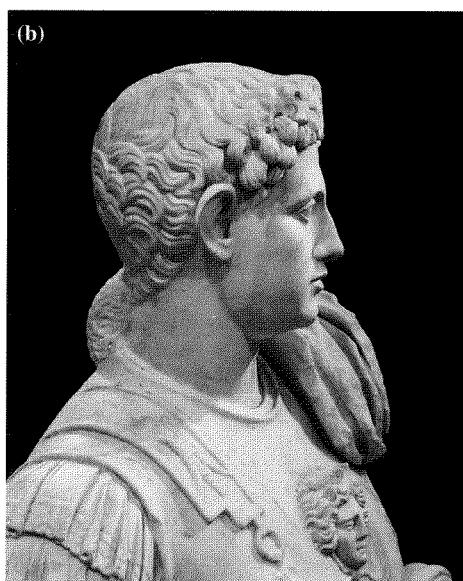


Figure 8 (a) Statue of an officer. Purchased with funds from the Libbey Endowment, Gift of Edward Drummond Libbey, 1983.74; (b) Detail of a.

6. Fragment of a statue: head of Ares (Fig. 7)⁶

About AD 130 or later

H (max.) 0.44 m; H (chin to hairline) 0.15 m

Museum of Fine Arts, Boston, Gift of Mr. and Mrs. Cornelius C. Vermeule III, by exchange 1977.712

This helmeted head was offered for sale with the heads of Lucius Verus and Aphrodite (nos. 4 and 5) and was reported to come from the same site. The question was whether isotopic analysis would support this allegation or possibly suggest that the Ares and Aphrodite were created as a pair. The Museum of Fine Arts (MFA) head was carved of “crystalline white marble, probably from southwestern Asia Minor” (Vermeule and Comstock, 1988). A sample was tested as part of an ASMOSIA-inspired collaboration, published in 1995 (van der Merwe *et al.*, 1995: 193 [HI-245]), and the data suggested the probable quarry source as Dokimeion. This is the same quarry suggested for the Lucius Verus and Aphrodite, but the significant differences in isotopic ratios indicate that it is not possible to assign this head to the same quarrying area. The MFA records that the skin areas of the face were “cleaned aggressively to remove a brown encrustation” (Vermeule and Comstock, 1988: 34). No record of similar cleaning exists at the Toledo Museum of Art (TMA), but the softened surfaces, around the hairline of Aphrodite in particular, suggest modern abrasion.

7. Statue of an officer (Figs 8a,b)⁷

About AD 130

H 2.216 m

Purchased with funds from the Libbey Endowment, Gift of Edward Drummond Libbey, 1983.74

Technical and stylistic details – notably the mass of stone on the back of the intact neck (Fig. 8b) – suggest this over-lifesize statue was probably carved in southwest Asia Minor. The back is less finished than the front. The question was whether isotopic analysis could support an association with southwest Asia Minor. The analysis fits within the data fields for both Dokimeion and Aphrodisias; the medium grain size and rather chalky appearance suggest that Aphrodisias is more likely than Dokimeion.

Pose, armor, and carving parallels are strong with an over-lifesize cuirass statue of Hadrian wearing the *corona civica* excavated at Perge (Antalya 13730 and 3875; Inan and Alföldi-Rosenbaum, 1979: 97–8, no. 46). Similarities with this Hadrian support a date in the later part of that emperor’s reign, but it has not yet been possible to propose an identity for the young man, whose clean-shaven face suggests either extreme youth, a posthumous dedication, or an unusual resistance to the fashion for beards.

8. Sarcophagus with lions and prey (Fig. 9)⁸

About AD 240

H (front) 0.631 m; H (back) 0.584 m; L 2.056 m; D 0.749 m
Purchased with funds from the Florence Scott Libbey Bequest in Memory of her Father, Maurice A. Scott, 1987.223

Provenance: Garden of Venus, Tivoli (until 1803, when acquired by Lord Valentine Cloncurry); Lyons House, Celbridge, County Kildare, Ireland (1803–1962); G. Mark Winn, Aldby Place, Yorkshire, Great Britain (1962–1986); Sotheby’s, London, December 8–9, 1986, lot 339.

It has long been recognized that this sarcophagus was carved of marble from Prokonnesos because of the pale gray tint with darker blue-gray streaks. Samples were taken for analysis more to confirm the identification than to suggest a quarry source. The range of possible quarry matches suggested by the data fields corresponds with the conclusions of Kane (1988) and of Asgari and Matthews (1995) that Prokonnesian marble has a very large isotopic range and that stable isotope analysis alone is not capable of distinguishing marbles from this source.

The shape and decoration of this *lenos* strengthen the attribution to Prokonnesos (Walker, 1985: 62).

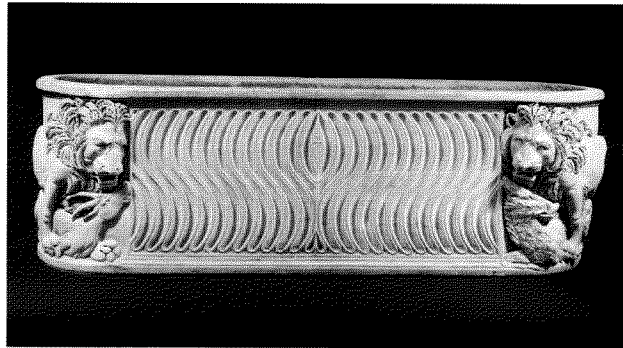


Figure 9 Sarcophagus with lions and prey. Purchased with funds from the Florence Scott Libbey Bequest in Memory of her Father, Maurice A. Scott, 1987.223.

9. Bust of the emperor Domitian (Fig. 10)⁹

About AD 90

H (with tenon) 0.596 m; H (chin to hairline) 0.192 m

Purchased with funds from the Libbey Endowment, Gift of Edward Drummond Libbey, and with funds from the Florence Scott Libbey Bequest in Memory of her Father, Maurice A. Scott, 1990.30

Provenance: Art market.

It was hoped isotopic analysis would shed light on the origins of this well-preserved portrait. The quarry match with Paros accords with the translucency of the medium-grained marble.

The source also agrees with Domitian’s preference for Greek marbles. Suetonius (*Dom.* 8.5) notes that he ordered



Figure 10 Bust of Domitian. Purchased with funds from the Libbey Endowment, Gift of Edward Drummond Libbey, and from the Florence Scott Libbey Bequest in Memory of her Father, Maurice A. Scott, 1990.30.

Pentelic marble for major Flavian architectural commissions, including the Temple of the Deified Vespasian, the Arch of Titus, the Temple of Jupiter Optimus Maximus, and the Templum Gentis Flaviae (Orlandos, 1968; Gazda and Haackl, 1996: 17).

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1. Publications: Reinach, *RSGR* V (1924): 447, 2 (Janiello); idem, 1927; Godwin, 1928; Reinach, *RSGR* VI (1930): 161, I (Deepdene); Bieber, 1943; *EA* XVII B (Munich, 1947): no. 5100; Godwin, 1952; Bieber, 1961; Fellmann, 1972; Vermeule, 1980: 99, 137, fig. 140; idem, 1981: 155, no. 122, illus.; Waywell, 1986.
2. Publications: *Bulletin of the Metropolitan Museum of Art* 12.4 (1917): 99; Richter, 1917; Valentiner, 1922; *TMA Museum News* 79 (June, 1937): n.p. [3–8], illus.; Pach, 1948; *TMA*, 1966; Ridgway, 2000: 260, n. 31, pl. 69a-b.
3. Publications: "Inventory of the Villa Ludovisi, Boschetto," January 28, 1633; Schreiber, 1880; Furtwängler, 1897: "white marble figure formerly in the Villa Ludovisi where I saw it in 1877 with a restored right arm and head of the Apollo Belvedere type. Now nothing is restored except the leg (?) and plinth"; Reinach, *RSGR* II.1 (1908): 97, 4; II.2 (1909): 817, 7; Muthmann, 1951; *TMA Museum News*, n.s. 7.4 (1964): 82; Wittmann, 1965; *TMA* 1966; Palma et al., 1979: 60–61, no. II, 24 ("gia collezione Somzée, oggi dispersa").
4. Publications: *TMA*, 1976; *TMA Museum News* 19.2–3 (1976): 51, illus.; *Gazette des Beaux-Arts* 89.1298 (March 1977): 39, no. 160, illus.; E.K. Gazda, in eadem, 1977: 22, no. 7, illus.; eadem, 1978: 43–55, illus.; *Gazette des Beaux-Arts* 91.1318 (November 1978) 13, fig. 18; Vermeule, 1981, 335, no. 287, illus.; Albertson, 1983; Ramage and Ramage, 1991; Brilliant, 1993; idem, 1994; Broucke, 1996: 73–4, no. 29; Quenemoen, 1997.
5. Publications: *TMA*, 1976; *TMA Museum News* 19.2–3 (1976): 51, illus.; *Gazette des Beaux-Arts* 89.1298 (March 1977): 39, no. 161, illus.; E.K. Gazda, in eadem, 1977: 24, no. 8, illus.; eadem, 1978: 43–55, illus.; Vermeule, 1981, 334, no. 286, 2 illus.; Broucke, 1996: 73–74, no. 28, as Lucilla.
6. Publications: *Museum year: 1977–1978* (Boston, 1978): 40; *Art in Bloom* (exhib. cat., Museum of Fine Arts, Boston, 1979): 46, illus.; Vermeule, 1978; idem, 1980: 19, 25, 119, fig. 22C; idem, 1981: 218, no. 183; Vermeule and Comstock, 1988.
7. Publications: *TMA 1984 Annual Report* (Toledo, 1985): 9, 16, illus.; *Gazette des Beaux-Arts* 105.1394 (1985): 27, illus.
8. Publications: *Burlington Magazine* 131.1031 (February 1989), 184, illus.; *Minerva* 1.2 (February 1990): 41, illus.
9. Publications: *Gazette des Beaux-Arts* 119.1478 (March 1992): 55, illus.; *Minerva* 2.4 (July–August 1991): 35, illus.; *TMA 1989–90 Annual Report* (Toledo, 1990): illus.; *Toledo Treasures*: 46, illus.; Southern, 1997; Berkowitz and Nichols, 2001: 258, fig. III.

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