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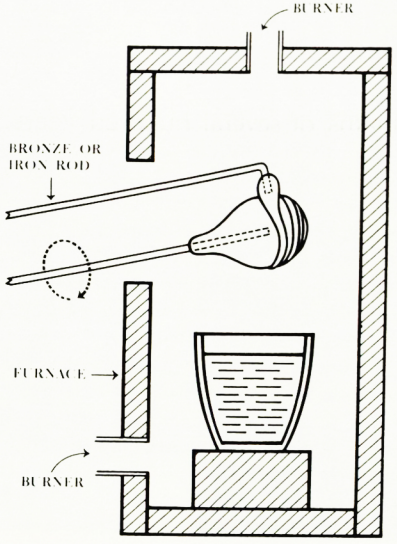
Ancient Glass Perfume Vases: The Collection of the Museum of Art and Archaeology

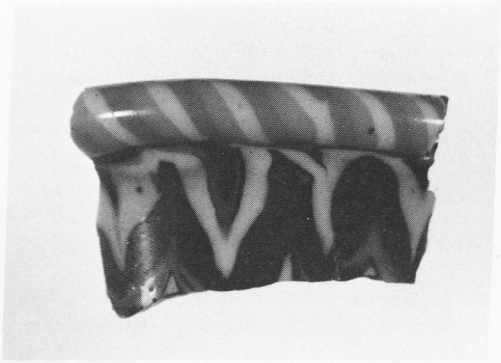
From about 1500 B.C. until the invention of glass blowing not long before the time of Christ, a series of small, brightly colored vessels, intended as containers for precious perfumed oils, was produced at a number of centers in the Near East and the eastern Mediterranean region. These vessels were made by the technique known as "core-forming." This laborious process involved taking a lump of hot glass from a furnace with a metal rod, and wrapping it around a core made of clay and sand, often with an organic binder, which was attached to the end of a second metal rod (Fig. 1).[1] The technique is thought to have been invented in Mesopotamia, not long before the middle of the second millennium B.C. It was soon adopted in Egypt, where it flourished in the Eighteenth, Nineteenth and Twentieth Dynasties (ca. 1500-1100 B.C.).

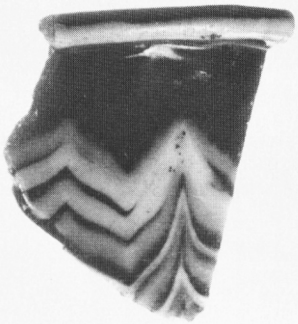


1. Drawing illustrating the core-form method. From Labino, 1966, 125, courtesy of the *Journal of Glass Studies*.

Then came a hiatus of several hundred years, during which no such vessels seem to have been made. Once again, in the eighth century B.C., the technique was employed in Mesopotamia and the production of core-formed glass vessels spread westward into the eastern Mediterranean region. Here, from the late sixth century B.C. until the first decades of the first century A.D., large numbers of these attractive vessels were created at several workshops.

Each core-formed vessel is unique because the core had to be removed, and hence destroyed, after the vessel had cooled. As a result, most of these vessels have a rather rough, sandy interior. Since the production was extremely time-consuming, core-formed vessels were used exclusively by those few who could afford such luxuries. After the invention of free-blowing and mold-blowing techniques at the beginning of the Roman Empire, the situation changed drastically, since these methods allowed for the mass production of glass vessels, which became cheap enough to be available to almost everyone.





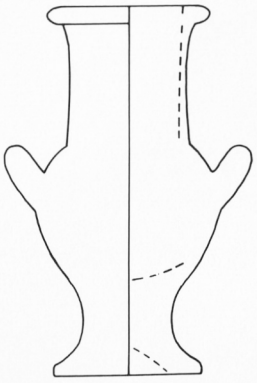
2. Top. Acc. no. 77.453. Rim from a krateriskos. Egyptian, 18th Dynasty (ca. 1400-1350 B.C.).
2. Lower left. Acc. no. 82.428. Rim from a krateriskos. Egyptian, 18th Dynasty (ca. 1400-1350 B.C.).
2. Lower right. Acc. no. 82.429. Fragment from a closed vessel. Egyptian, 18th Dynasty (ca. 1400-1350 B.C.).

The finest core-formed glass ever made was that produced in the royal factories of New Kingdom Egypt, such as those at Amarna, Malkata and Lisht.[2] The Egyptian vessels are usually made of a translucent dark blue glass and have decorative elements—usually glass trails—of opaque white, yellow and light blue glass, added while the body of the vase was still hot. (The glass had to be reheated from time to time during the application of the decoration.) These trails were manipulated with tools, either being pulled up and down to form a zigzag pattern (Fig. 2, lower left),[3] or pulled in a single direction to form a festoon pattern (Fig. 2, lower right).[4] Rarely, some vessels are decorated with pre-formed rods, such as the opaque white, yellow and light blue twist preserved on the rim of a fragment shown here (Fig. 2, top).[5] The three fragments of Egyptian core-formed glass in the museum's collection (Fig. 2) can be dated to the end of the Eighteenth Dynasty, c. 1400-1350 B.C.

While the technically finest core-formed vessels had been produced in the Late Bronze Age workshops of the Egyptians, it was the Greek glass artisans, working from the late sixth century B.C. until the beginning of the fourth, who were the most prolific producers of these vessels.

Hundreds upon hundreds of examples of this industry are preserved in museums and collections throughout the world. The Greek core-formed vessels are easily distinguished from the Egyptian examples by their shapes and decoration.

As with the earlier Egyptian core-formed glass, the Greek vessels are usually dark blue, with white, yellow and light blue glass trail decoration. Many of the vessels are intact, indicating that they were originally placed in tombs, where they were protected from breakage. All these vases, with their small, constricted openings, were designed to hold valuable perfumed oils, which were used by both men and women.[6] Perfume also played a large role in the burial practices of the Greeks and their neighbors, in part for the practical reason of disguising unpleasant odors. Perfume containers of both pottery and glass were frequently placed next to the body as offerings to the deceased. Core-formed perfume vases have also been found in a number of Greek sanctuaries, where they would have been left as dedications to the god or goddess. Those found in sanctuaries and in settlements are usually fragmentary since, over the centuries, they tended to become broken and the pieces scattered. The Greek vessels, like the earlier Egyptian ones, were luxury items, used only by the upper classes of the Greeks and their trading partners.

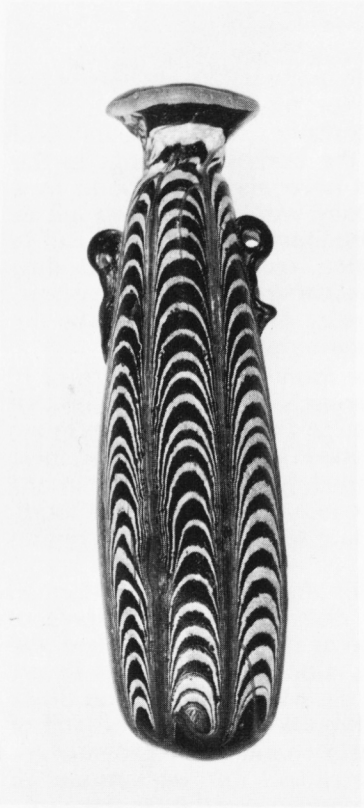


Krateriskos, a type of vessel made by the core-formed method in the Eighteenth Dynasty (adapted from Nolte).

When core-formed glass vessels are found in tomb groups or in stratified contexts, together with objects such as pottery or coins that can be closely dated, it is possible to assign fairly precise dates to the various types. As the studies of Fossing and Harden have shown, there were three main periods of core-formed glass production in the Mediterranean: the late sixth and fifth centuries B.C., the late fourth and early third centuries B.C. and the late second and first centuries B.C.[7]

Although no actual remains of a factory for producing core-formed glass have yet been uncovered, the distribution of find-spots of core-formed vessels shows clear patterns that suggest where the manufacturing centers may have been. Core-formed vessels of ca. 525-400 B.C., while found throughout the Mediterranean and Black Sea regions, are most densely clustered in the Aegean. The island of Rhodes has been suggested as the main manufacturing center for vessels of this period, not only on account of the large amount of core-formed vessels found there but also because of the presence in a Rhodian cemetery of one vessel whose defects would have made it an unlikely import.[8] In any case, both the distribution pattern and the shapes employed indicate that the core-formed vessels of ca. 525-400 B.C. were made somewhere within the confines of the Greek world.

Almost no core-formed vessels have yet been uncovered in archaeological contexts that can be dated to the period 400-350 B.C. Production seems to have resumed near the end of the fourth century and to have continued into the third. During this time the distribution of find-spots presents no clear pattern. Apparently the Rhodian or East Greek core-formed glass industry ceased production by the beginning of the Hellenistic period (336-31 B.C.) and a number of different manufacturing centers began operation, perhaps both in Macedonia and in Italy. During the final phase of core-formed glass production, the last two centuries before Christ, a new center of manufacture existed on the island of Cyprus, again as demonstrated by the distribution of find-spots.



3. Left. Acc. no. 81.130. Alabastron. 525-475 B.C.

4. Right. Acc. no. 62.64.1. Amphoriskos, upper part preserved. 530-500 B.C.

Two pieces in the collection of the Museum of Art and Archaeology represent the work of the first generation of Greek core-formed glass artisans. The first, an alabastron (Fig. 3), is decorated with an opaque white trail pulled into an inverted festoon pattern.[9] The inward sloping rim and the two ring handles with knobs at the end were added after the trail had been applied and the surface marvered smooth (rolled on a hard surface). This alabastron can be dated by comparison with others to the years 525-475 B.C.[10]

The other early Greek vessel is an amphoriskos (Fig. 4) of opaque white glass. The body is partly covered with translucent purple glass and decorated with a trail pulled into a wavy zigzag pattern.[11] The tall handles and fluted (i.e., unmarvered) body of this vessel are typical of late sixth-century core-formed amphoriskoi.[12]

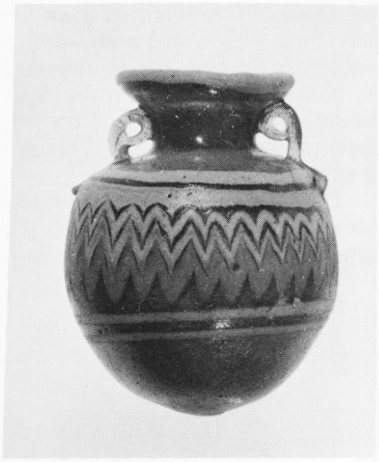
The types of core-formed glass vessels that were made in Greece in the fifth century B.C. are well illustrated by Figures 5-9. Figure 5 shows an alabastron that has the straight-sided body and flat rim-disc characteristic of the mid-fifth century B.C.[13] The yellow and light blue trails around the lower part of the vessel, added after the other trails had been pulled into a neat zigzag pattern, are also hallmarks of Greek glass of this period.

The amphoriskoi of the mid-fifth century B.C. have smaller, more compact bodies than those of their predecessors and their handles extend from the shoulder to the neck (Figs. 6 and 7).[14]

5. Left. Acc. no. 85.44. Alabastron. 500-450 B.C.

6. Upper right. Acc. no. 61.16. Amphoriskos. 480-425 B.C.

7. Lower right. Acc. no. 85.43. Amphoriskos. 480-425 B.C.



8. Left. Acc. no. 85.42. Aryballos. 500-475 B.C.

9. Right. Acc. no. 85.41. Aryballos. 475-425 B.C.

Another shape, the aryballos, became popular during the fifth century B.C. These vessels, with rounded bottoms, could not stand unsupported, and either had to be suspended by their handles or placed upon stands. Gold, glass and rock crystal examples of such stands are known. Aryballoi with sloping shoulders and wavy zigzag decoration (Fig. 8)[15] may be slightly earlier than those with flatter shoulders and neater zigzag patterns (Fig. 9),[16] to judge from the few examples that come from independently datable contexts.

10. Left. Acc. no. 71.27. Fusiform Unguentarium. 250-150 B.C.

11. Right. Acc. no. 66.351. Fusiform Unguentarium. 250-150 B.C.

One new shape of core-formed perfume container appeared in the Hellenistic period — the fusiform unguentarium. Its spindle-shaped body, without handles, imitates the shape of a common pottery vessel. The two examples of these vessels in the Museum of Art and Archaeology (Figs. 10, 11)[17] both have rather careless zigzags and short fluting on the upper part of the body. This type of unguentarium can be dated to 250-150 B.C.[18]

12. Acc. no. 81.131. Piriform Alabastron. 100-50 B.C.

The last phase of core-formed production is represented in the museum by an alabastron of a shape quite distinct from those of earlier periods (Fig. 12).[19] Its pear-shaped body, small lug handles and careful feather pattern decoration are typical of a class of vessels most often found on the island of Cyprus and the adjacent mainland. This vase belongs to the period 100-50 B.C., just before the invention of glass-blowing. By the end of the first century B.C., Levantine glass workers had fully utilized the new technique of manipulating glass with the blow-pipe and, with their cheap blown perfume bottles, had driven core-formed glass vessels off the market.

All the elegant glass perfume containers in the collection of the Museum of Art and Archaeology were created at a time when glass was a rare and expensive commodity. Filled with perfumed oil, they would have been as welcome a gift in antiquity as any bottle of Halston or Chanel No. 5 would be today.

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[1]The ancient core-forming technique has been successfully reproduced in recent years; see D. Labino, "The Egyptian Sand-Core Technique: A New Interpretation," *Journal of Glass Studies* 8 (1966) 124-127. Labino's work showed that earlier suggestions of how core-formed vessels were fashioned were incorrect, e.g., F. Schuler, "Ancient Glassmaking Techniques: The Egyptian Core Vessel Process," *Archaeology* 15 (1962) 32-37. The studies of Bimson and Werner have demonstrated that an organic binder was used, at least in the cores of second millennium B.C. vessels; see M. Bimson and A. Werner, "Problems in Egyptian Core Glasses," *Studies in Glass History and Design. Papers Read to Committee B, Session of the 8th International Congress on Glass* (London 1968) 121-124.

[2]See Birgit Nolte, *Die Glasgefasse in alten Agypten* (Berlin 1968) 22-25. See also C.A. Keller, "Problems in Dating Glass Industries of the Egyptian New Kingdom: Examples from Malkata and Lisht," *Journal of Glass Studies* 25 (1983) 19-28.

[3]Acc. no. 82.428. P.H. 2.6 cm.; Est. D. rim 5 cm.; Th. 0.7-0.3 cm. Rim from a krateriskos. Blue glass with yellow and white trails on neck pulled into a zigzag pattern. Yellow trail on outside of rim.

[4]Acc. no. 82.429. P.H. 2.6 cm.; Th. 0.31-0.2 cm. Fragment from a closed vessel (no edge preserved). Very dark blue glass with yellow, white and light blue trails pulled into a festoon pattern.

[5]Acc. no. 77.453. P.H. 2.4 cm.; Est. D. rim 5 cm.; Th. 0.9-0.35 cm. Rim from a krateriskos. Dark blue glass with white, yellow and light blue trails on neck pulled into a zigzag pattern. White, yellow and light blue twist on rim.

[6]See R.J. Forbes, *Studies in Ancient Technology*, Vol. III (Leiden 1965) 27.

[7]P. Fossing, *Glass Vessels Before Glass-Blowing* (Copenhagen 1940). D.B. Harden, *Catalogue of Greek and Roman Glass in the British Museum*, Vol. I: *Core- and Rod-Formed Vessels and Pendants and Mycenean Cast Objects* (British Museum 1981). Cf. also M.C. McClellan, *Core-Formed Glass from Dated Contexts*, unpublished dissertation (University of Pennsylvania 1984).

[8]G.D. Weinberg, "Evidence for Glassmaking in Ancient Rhodes," *Melanges offerts a K. Michalowski* (Warsaw 1966) 709-712.

[9]Acc. no. 81.130. H. 12.3 cm.; D. rim 2.8 cm.; D. mouth 1.1 cm. Alabastron. Intact. Slightly weathered. Dark blue glass, yellow trail around the rim, white trail starting at neck and wound down to bottom pulled into inverted festoon pattern. Dark blue handles with end-knobs. Tool marks on both surfaces of rim. From Anatolia. Weinberg Fund purchase.

[10]See McClellan, *Core-formed Glass*, 37-39.

[11]Acc. no. 62.64.1. P.H. 7.9 cm.; D. rim 3.2 cm.; D. mouth 1.2 cm. Amphoriskos, upper part and one handle preserved. Thick weathering crust in places. White glass with wide purple trail on rim and thick purple and white trail on body, pulled into a wavy zigzag pattern. White handles from shoulder to below rim. Gift of Mrs. H.A. Metzger.

[12]See McClellan, *Core-formed Glass*, 51-52, 329.

[13]Acc. no. 85.44. H. 10.7 cm.; D. rim 2.9 cm.; D. mouth 1 cm. Alabastron. Intact. Dark blue glass with light blue trail on rim; yellow trail from neck to mid-body, joined by light blue trail, both pulled into zigzag pattern on lower body. Yellow and light blue trails on lower body. Dark blue handles with end-knobs. Tool marks on upper surface of rim. From Anatolia. Weinberg Fund purchase.

[14]Acc. no. 61.16. H. 7.8 cm.; D. rim 2.9 cm.; D. mouth 1 cm.; D. base 1.2 cm. Amphoriskos. Intact. Surface weathered with much of the yellow glass decayed. Dark blue glass with light blue trail around rim, yellow trail drawn from shoulder to mid-body, joined by light blue trail, both pulled into a zigzag pattern. Thin yellow and light blue trails on lower body. Body slightly fluted. Dark blue handles from shoulder to mid-neck.

Acc. no. 85.43. H. 7.9 cm.; D. rim 2.7 cm.; D. mouth 0.7 cm.; D. base 1.5 cm. Amphoriskos. Intact. Dark blue glass with yellow and light blue trail on rim, yellow trail from shoulder to mid-body, joined by light blue trail, both pulled into zigzag pattern. Thin light blue and yellow trails on lower body;

thin light blue trail on outside of base. Dark blue handles from shoulder to mid-neck. From Anatolia. Weinberg Fund purchase.

[15]Acc. no. 85.42. H. 5.5 cm.; D. rim 2.9 cm.; D. mouth 1.2 cm. Aryballos. Intact. Dark blue glass with yellow trail on rim, yellow and light blue trails from upper to mid-body, both pulled into wavy zigzag pattern. Body fluted. Yellow trail near bottom. Dark blue handles with end knobs. From Anatolia. Weinberg Fund purchase.

[16]Acc. no. 85.41. H. 5.5 cm.; D. rim 2.3 cm.; D. mouth 1 cm. Aryballos. Intact. Blue glass with yellow trail on rim, yellow trail from upper to mid-body, joined by light blue trail, both pulled into zigzag pattern. Two yellow trails on lower body. Dark blue handles with end-knobs. From Anatolia. Weinberg Fund purchase.

[17]Acc. no. 71.27. H. 9 cm.; D. rim 2.3 cm.; D. mouth 1.3 cm.; Max. D. body 3.6 cm.; D. base 2 cm. Fusiform unguentarium. Intact. Scalloped yellow trail around rim, another yellow trail wound from beneath rim almost to the foot, pulled into irregular zigzag pattern at mid-body. Fluted body. Dark blue foot added separately.

Acc. no. 66.351. H. 7.5 cm.; D. rim 2.4 cm.; D. mouth 1.25 cm.; Max. D. body 2.9 cm.; D. base 2.35 cm. Fusiform unguentarium. Intact. Dark blue glass with yellow trail from beneath rim to foot, pulled into irregular zigzag pattern at mid-body. Fluted body. Gift of Mr. B. Zoumboulakis.

[18]See McClellan, *Core-formed Glass,* 160-162.

[19]Acc. no. 81.131. H. 13.1 cm.; D. rim 3 cm.; D. mouth 1 cm.; Max. D. body 4 cm. Piriform alabastron. Surface weathered. Dark blue glass with white trail wound around rim and continuing on to body, pulled into feather pattern on upper and mid-body. Second trail starting at bottom and winding upward to meet feather pattern trail. Dark blue lug handles at junction of neck and body. Interior slightly rough. From Anatolia. Weinberg Fund purchase.

about the authors

Ronald M. Bernier, a specialist in the arts of the Himalayan region, is professor of art history and chair of the Asian studies program at the University of Colorado in Boulder. He is the author of *Temples of Nepal; The Nepalese Pagoda: Origins and Style;* and *Temple Arts of Kerala.* He regularly lectures for American Museum of Natural History study tours in Asia and is currently preparing a video series on Asian arts for public television.

Richard Daniel De Puma teaches classical archaeology at the University of Iowa's School of Art and Art History. He is a research associate of the Field Museum of Natural History, Chicago, and a member of the Advisory Board for the *American Journal of Archaeology.* He holds a B.A. from Swarthmore College and an M.A. and Ph.D. from Bryn Mawr College. His recent publications include *Etruscan Tomb Groups* and the *Corpus Speculorum Etruscorum-U.S.A. 1.*

Richard C. Jensen received a B.A. from the University of Arizona, and a Ph.D. from the University of North Carolina. He has taught classics at the University of Arizona since 1961. Among Dr. Jensen's many publications are two articles on Kourion, in Cyprus, a site familiar to *Muse* readers.

Murray C. McClellan received a B.A. in Greek from Oberlin College and a Ph.D. in classical archaeology from the University of Pennsylvania. His dissertation was titled "Core-Formed Glass from Dated Contexts." He has been the coordinator of the outreach lecture program at the University Museum of the University of Pennsylvania and is now Fulbright fellow in Cyprus. Dr. McClellan is an active field archaeologist, having excavated in Israel, Jordan, Libya, Greece, Cyprus, and Egypt. A former secretary of the American School of Classical Studies at Athens, Dr. McClellan is now actively working on several archaeological projects in Cyprus and is the field director of the University Museum's excavations in Marsa Matruh, Egypt.