



Ancient Glass

by Benton Kidd, Curator of Ancient Art

Although the elder Pliny reported that glassmaking had been discovered by Phoenician sailors cooking on the beach (which caused sand to become molten), the actual circumstances under which glass was first produced remains a mystery. Pliny could not have known that ancient craftsman were already producing glass beads and other small glass objects 1,500 years before he wrote. Glass in antiquity was composed of silica (sand or crushed quartz), lime (a hardener), and ashes of various plants (for soda, an essential binding element). When heated to a molten state, these components alone produced a green or greenish-blue glass, but the addition of metallic oxides and other ingredients produced a wide spectrum of colors, as would be discovered over time.

The first glass vessels appeared around 1500 BCE as a result of *core-forming*, a technique in which molten glass was built up around a core (of clay and sand) attached to a metal rod. Withdrawn from the furnace on the rod, the glass was rolled or *marvered* on a flat surface to smooth it. In addition to other refinements, *trailing* of multi-colored threads of glass might be added for decoration. These could be marvered flat, or left in relief. The clay core was dug out once the vessel was complete; handles, rims, bases, etc., could then be added. The core-forming technique eventually spread to Egypt, Greece, and elsewhere in the Mediterranean, dominating glass vessel production for the following 1,500 years.

By the mid-2nd century BCE, glass production increased rapidly as new techniques evolved, such as heating a disc of glass over a mold until it sagged and took the form of the mold. Conical and hemispherical “bowls,” which also served as drinking vessels, proliferated and were rapidly produced from prefabricated discs of

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Core-formed Alabastron (perfume vessel)
Greek, 100–150 BCE
From Turkey
Glass
Weinberg Fund (81.131)



Ribbed Bowl
Roman, 1st century BCE–1st century CE
Probably from Palestine
Glass
Gift of Mr. Leon Pomerance (73.220)



Mold-blown Perfume Bottle with Head Base
Roman, 3rd century CE
Glass

Museum purchase (62.5)

The seam up the side of the vessel shows that it was blown into a two-part mold.



MUSEUM FRIDAY FEATURE

glass. The discs could be shipped flat and fashioned into vessels at almost any location. This made glass tableware a common component of everyday life in the Graeco-Roman world.

Glassmaking was revolutionized once again with the invention of *blowing* on the Levantine coast around 50 BCE. Initially vessels were free-blown but later blown into two-part molds. By the first century CE, both mold-blown and cast tableware was common, after techniques had spread westward from production centers such as Alexandria and the Levant. In spite of mass production of common forms, glassmaking also reached unprecedented sophistication under Hellenistic Greek and Roman craftsman. *Mosaic*, *cameo*, and *gold-sandwich* glass easily competed with other luxury arts. Mosaic glass required the fusion of multiple pieces or canes of glass that were blown or slumped into shape. The luxurious cameo glass was formed by blowing a blue gather (a mass of molten glass on the end of a rod) that had been dipped into molten white glass. Once the vessel had been inflated and cooled, the exterior white layer of glass was delicately ground away in varying degrees to produce designs of astounding complexity. Glassmakers fashioned gold-sandwich glass by first producing a clear glass vessel, which they then covered in gold leaf. Portions of the gold leaf were then cut away with a sharp tool to produce intricate designs. A clear vessel was then blown over the original bowl to encase and preserve the delicate gold leaf.

Just as forms and techniques became more sophisticated as time progressed, so did knowledge of color additives. We might surmise that exact formulas varied from place to place, and “recipes” were guarded as they were in the Middle Ages, when the great stained-glass windows were being produced. Though furnace conditions also played a role in coloration, we can provide some general rules about colors. The addition of copper produced red, but oxidized copper could also yield deep green. Adding gold produced the magnificent “gold-ruby,” but examples of this are extremely rare from antiquity.

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Bottle with Wheel-Cut Bands
Roman, Late 1st century–2nd century CE
Glass
Museum purchase (68.156)

The bubble shape of this vessel indicates it was free-blown as opposed to being blown into a mold.



Mosaic Glass Perfume Bottle
Roman, 1st century BCE–1st century CE
Perhaps from Italy
Glass
Gladys D. Weinberg Memorial Fund and Weinberg Fund (2002.11)

Though free-blown, this vessel was begun by heating and fusing prefabricated canes together.



Fragments of a Cameo Glass Cup
Roman, early 1st century CE
From Italy, Orvieto
Glass

Gift of John and Elsbeth Dusenbery in honor of Gladys and Saul Weinberg (87.86 a & b)



MUSEUM FRIDAY FEATURE



Gold Leaf Sandwich-Glass Bowl
Greek, Hellenistic
3rd century BCE–2nd century BCE
From Turkey
Glass and gold leaf (with partial resin restoration)
Museum purchase (77.198)

For yellow or amber glass, silver was added; for white, tin. Manganese and antimony were decolorants, yielding clear glass. Doubling the amount of manganese, however, produced a deep purple often called *aubergine*. Iron could produce pale blue, while cobalt produced a stunning, brilliant blue. Too much of any one element made opaque, black glass. Surface iridescence is produced from chemical reactions that took place as a result of aging, weathering, and contaminants in soil; though attractive, it is not original to the color.

Gladys Davidson Weinberg is remembered today as one of the Museum's founders, but we are also indebted to her for the bulk of the ancient glass collection, numbering some 200 pieces. Weinberg first began studying ancient glass in the mid-1930s, when she excavated at the ancient Greek city of Corinth. She led the excavation of Jalame, a joint venture of the University of Missouri and the Corning Museum of Art, which revealed a prolific Roman glass factory of the 5th century CE in northern Israel. Weinberg went on to become the foremost authority of her day on the subject of Graeco-Roman glass. ■



Gladys Weinberg at Jalame excavation, late 1960s.