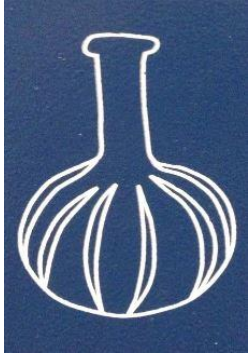
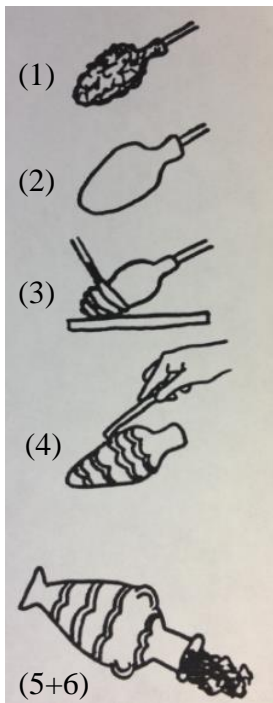


## Innovation in Roman Technology



Although glassmaking was invented around 3000 B.C. in the eastern Mediterranean region, glass was not widely available until the Roman period. Glass is made by melting a mixture of *sand*, *soda* or *potash*, and *lime* at approximately 700°C (1292°F). Liquid, or molten, glass is difficult to work with because it is so hot. Glassmakers use an assortment of tools but never touch their work directly. Roman glassmakers tried to find quicker, easier, and cheaper methods of creating glass objects, and they developed a variety of techniques that are still used today.

### Core-Forming



Core-formed vessels are usually small and most often held perfume. This method was most expensive because it was very time-consuming and complex. The technique was first developed around 1500 B.C., though abandoned by 150 B.C.

- (1) In core-forming, a mixture of clay, sand, water, and organic materials (leaves, horse dung) is shaped around the tip of an iron rod to create a core.
- (2) This core is evenly coated with molten glass from the furnace.
- (3) Threads of soft glass in various colors are wound around the surface of the vessel in a spiral pattern.
- (4) These threads are combed with a pointed instrument into zigzag patterns. The pattern is then embedded into the surface of the vessel by rolling it over a smooth stone, a process called *marvering*.
- (5) The shoulder, neck, rim, handles, and foot are shaped by manipulating the vessel with tools or by adding more glass threads. The vessel is reheated before each of these manipulations or additions.
- (6) Finally, when the vessel has cooled, the iron rod is removed from the center of the vessel and the core is scraped out.



*Various glass creations from the Ancient Roman gallery*

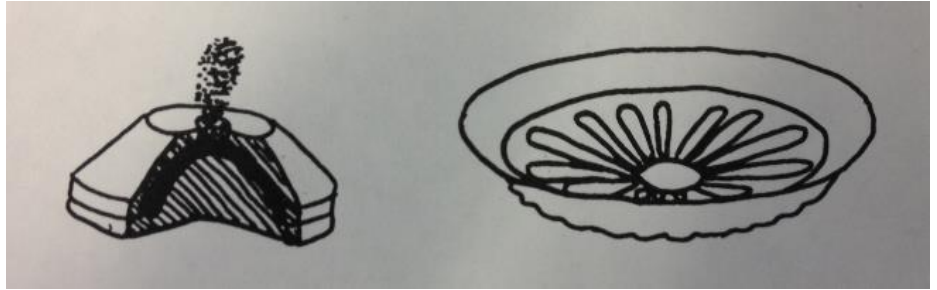


# Ancient Roman Art

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## Glass Casting

Glass casting, like core-forming, was a process developed before the Roman period. It was invented around 1400 B.C. In this process, powdered glass is placed into a hollow mold and heated in the furnace until it fuses together.



After cooling, the mold is opened and an object in the shape of the mold emerges. The Romans used this technique to create ribbed bowls. These were the first mass-produced tableware.



## Glassblowing

The invention of glassblowing in about 40 B.C. was the most important innovation in Roman glassmaking technology. The technique was quick and easy compared to earlier processes, and glass became cheaper and more commonplace.

- (1) The blow-iron is dipped into the melted glass and a *gather* of glass is collected. Air is blown through the blow-iron to inflate a bubble of glass to the desired size of the vessel.
- (2) The bubble of glass is manipulated during repeated heating processes to create different shapes. More glass is added to form stems, handles, and bases.

## Mold-Blown Glass

Shortly after the invention of glassblowing, the Romans realized that if they inflated a glass bubble directly into a wooden or clay mold, vessels could be shaped and decorated in a single step. This technique allowed for a range of figural decoration.

