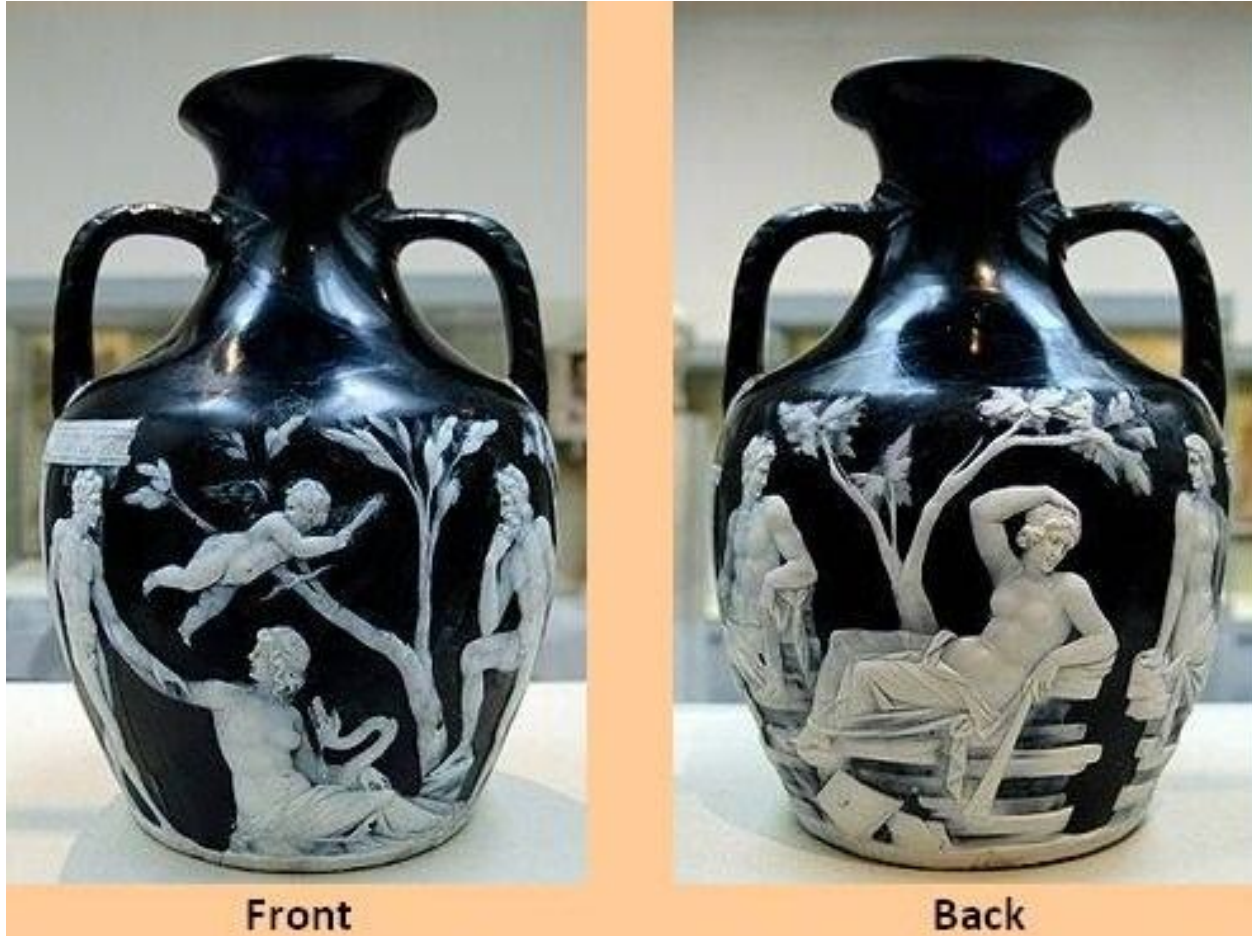


Glassware in the Roman Empire



The Famous Blue Vase made when Christ was about 10 years old

Isn't it beautiful? Some amazing examples of art glass have survived the vicissitudes of the centuries, such as the "Blue Vase" shown above, an amphora decorated with figures, animals and foliage. It was produced early in the First Century. And all this time I thought Mr. Wedgewood invented Cameo Glass.

In my book *Disciple*, I describe the blue glass dinnerware at the home of a wealthy Roman officer. Some people have found this surprising. Hard to imagine Christ and his apostles sitting around at the Last Supper eating off of glass plates and sipping their wine from glass tumblers, isn't it? As we will see, glass manufacturing, glass blowing and even window glass were well known throughout the Roman Empire by the start of the first century.

Pliny the Elder credits the Phoenicians with discovering glass. Sailors stopped along the beach and wanted to build a fire. There were no rocks around, so they went onto the ship and brought out some of chunks of nitrate they were carrying. The heat of the fire melted their "rocks" and fused it with the silica in the sand. The rest, as they say, is history. By about 700 BC the Phoenicians (who were very good at glass working) made core-formed glass perfume bottles by creating a solid bottle-shaped core out of clay and wrapping strings of glass around it. When it

cooled, they scraped out the clay to make the bottle.



A lidded bowl from the First Century

employing a tube. Almost overnight, glass became the most miraculously malleable, adaptable, multipurpose material. It's effect was much like plastics transformed the 20th century. The Romans saw the potential almost immediately, and began to make massive investments in its development.

Almost every technique and process employed in glassmaking today was adopted or experimented with by the Romans over a period of less than a century. The special Roman genius for organization and the peace established by the Augustan emperors led to the rapid diffusion of glass and spread sites for its manufacture to the farthest corners of the empire. It has now been calculated that, by the second century, at least a million pieces of glass were being produced each year.

Just as bronze sculpture from antiquity is rare in comparison with that made in stone, because the more expensive material was later ruthlessly recycled for other purposes, the fragility of glass has meant that only a tiny proportion of that produced in ancient times has survived. This lack of tangible evidence has distorted our understanding of the revolutionary effect that the

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Over the last few years, thanks to the coming together of experts in different fields, the history of glass has been reappraised. The benefits of this interdisciplinary approach led to an exhibit several years ago entitled, "Vitrum: Glass Between Art and Science in the Roman World." The show contained more than 400 pieces of ancient glass, some of extraordinary beauty and nearly all of exceptional interest.

Glassmaking originated between 3000 and 2000 B.C. in Mesopotamia and spread to Egypt. But the most significant technological revolution occurred in the first century B.C. in the area of Syria and Palestine: glass blowing

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A Roman cut glass decanter from the First Century

to make it, Caesar ordered the man put to death, since “if this invention should become widely known, gold would become worth less than stones.”

The great advantage of glass for drinking and eating from and for storing food in was that, being inert, it lent no flavor of its own to the contents. This quality was not lost on the ancient world. Expensive wines that benefited from aging were kept in glass bottles. As Pliny the Elder wrote in the mid-first century: “The use of glass containers has truly supplanted those made of gold and silver.”

Petronius in “The Satyricon” relates a strange story of a glassmaker who invented an unbreakable jug, which he demonstrates before Caesar by hurling it down on the marble floor and hitting it with a hammer, from which it emerges unscathed. On learning that the glassmaker is the sole repository of the secret of how



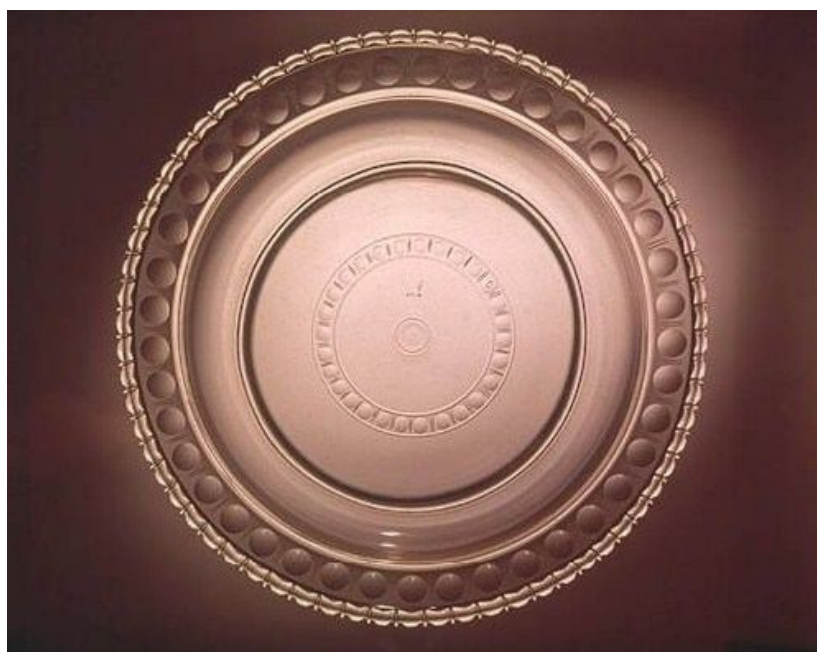
Miscellaneous glassware from the Roman era

Fanciful though this tale sounds, there is now evidence that the Romans did indeed produce toughened, “unbreakable” glass by adding elements such as aluminum, and examples, although distorted by the intense heat of the volcanic eruption, have been found at Pompeii. Archaeology has also turned up evidence of a full-blown Roman glass-recycling industry, which might also have been threatened by the new wonder product.

Like us, the ancient Romans used

glass for other things as well. There is evidence of the wide use of glass windowpanes, some quite large, in houses and public buildings. Greenhouses with glass windows also seem to have been popular, the tougher and more translucent glass planes replacing the sheets of mica that the likes of the Emperor Tiberius used for his greenhouses on Capri to protect his cucumber plants.

Even double glazing was not unknown. Pagan Roman expertise in coloring glass panes paved the way for the great stained-glass windows of European Christendom. At the same time, the development of glass windowpanes coincided with the invention of glass mosaic, another means by which light and color was spread throughout the Roman and Byzantine worlds.



Glass plate from the Cave of Letters in the Judean Desert

many of the glass instruments used in the ancient world would look right at home in a modern laboratory.

Although they mastered almost every aspect of glass manufacture and use, the ancients never worked out the mechanism that created glass in the first place. To them it was a primary substance, like copper or lead, that was extractable from sand, just as metals could be drawn from rock, rather than the result of a chemical reaction. (Curiously enough, in English the term in art for glass in its molten form is still “metal.”)

The notion that you could obtain a valuable material like glass (used by the Romans to imitate precious stones) from a common material, sand, undoubtedly encouraged alchemists in their quest to make gold and silver from base elements and encouraged experimentation. So, the ancients’ misunderstanding of the origins of glass helped lay the foundations of the modern chemistry.

The implications of glass for medicine and science were no less far reaching. The examination of urine was the primary medical diagnostic tool, and the invention of clear glass made it possible to carry out this investigation with new exactitude. Samples and medications could be kept in glass vessels without the risk of contamination.

For science in general, glass was put to a host of scientific uses, including magnifying glasses and prisms for studying the colors of the rainbow, and to watch chemical reactions and observe hydraulics. Indeed,