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Ceramics

2136 words

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Introduction

What material is used to bury the dead, reach for the stars, eat your food and flush your toilet? The answer is various forms of ceramic, which is heated clay. Malleable in its raw state, clay will take almost any form, including statues, tile murals or bowls. Heated (+/- 500◦ Fahrenheit for low fire), clay becomes rock hard ceramic.

Many cultures associate clay with the creation of humanity itself. Examples include the genesis chapter of the Old Testament and the story of the Mud Diver from indigenous North America.

There are different kinds of clay, as well as different ways to process and purify it. Types of heat also vary, as do forming methods, decorative surface treatments, and uses for finished ceramic objects. Thanks to its persistence in its hardened state for thousands of years, ceramics tell a very long story.

No one knows exactly how humans discovered or invented ceramics. It is easy to imagine people heating a meal at their camp along a river—where clay soils are commonly found—and noticing that the soil beneath the fire hardened. Then, as if enacting a creation myth, humans may have used their hands to model figures. These early representations, of which there are many examples, fit in human hands, and were small enough to be carried and enduring enough to mark territory. Known as 'Venus figures,' these clay representations are among the earliest examples of human manipulation of clay. The oldest known Venus figure dates from about 26,000 years ago, and comes from the region that is now modern Czechoslovakia. Venus figures continued to be created across Eurasia for over twenty thousand years. **<<FIGURE 1>>**

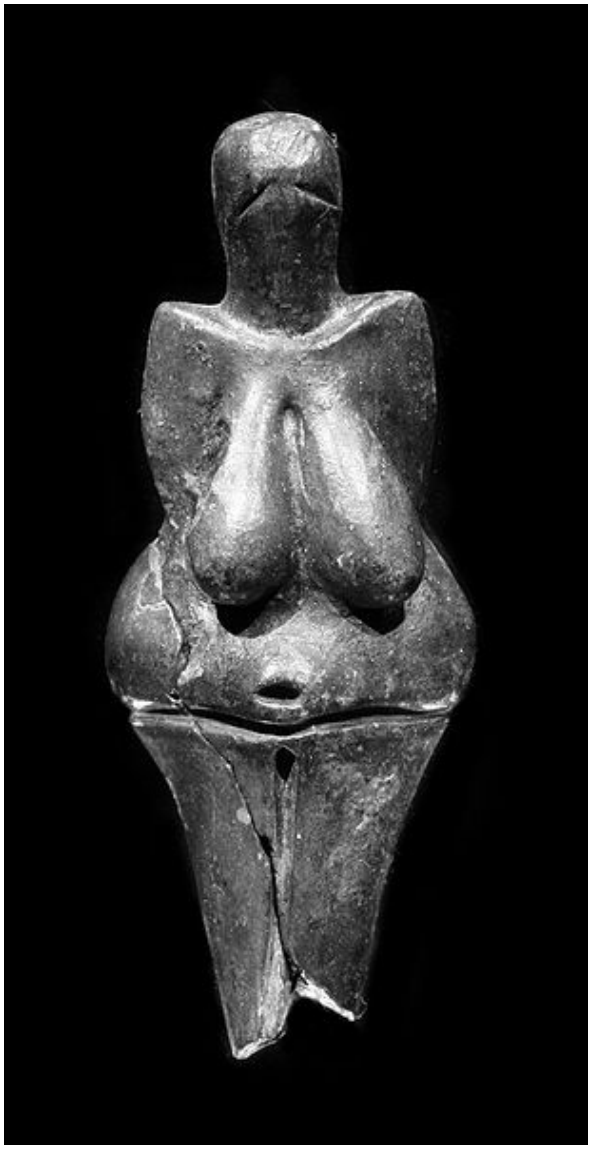

Figure 1: Venus Figurine.
Czech Venus Doni Vestonice
Věstonická venuše na výstavě Lovci mamutů v Národním muzeu v Praze
Petr Novák, Wikipedia, February 9, 2007

The Eurasian archaeological record suggests a long but not necessarily static belief system associated with Venus figures. What kind of communications did they represent over time and space? Did the enlarged breast, abdomen and buttocks relate to fertility rituals? Were they used for trade and magical protection? Are they the ancestors of our first commodity trading markers (3500 BCE in Mesopotamia, where ceramic figures & animals were used), which we know led to writing. Initially, commodity markers were three dimensional objects, such as figures of people

or animals. Subsequently, two dimensional images/marks on clay tablets recorded transactions. Ultimately, the images are abstracted into line systems. The shift from markers to marks is the movement from three dimensions to two dimensions. Whatever their original or subsequent uses, Venus figures now feature prominently in museum exhibitions about early ceramics and early humanity.

Even in the 21st century, ceramics still play a role in daily life and commerce: porcelain fixtures are an industry standard for bathrooms all over the world; ceramics engineers create new materials to withstand the high and low temperatures of space travel; and deceased family and pet remains are often saved in ceramic containers. The history of ceramics chronicles the increasing mastery of clay, fire, forming and decorative techniques. Beautiful and functional ceramic objects of diverse values reflect patterns of aesthetics, status, belief and trade within the human cultures of which ceramics are a significant and enduring part.

Ceramic History through Time

The properties of clay, technological processes, and human cultures have all synergized differently in different parts of the world, so human understanding of ceramics varies with location and our historic point in time. Yet everywhere the journey from clay to ceramics evidences human interaction and movement. It is likely that ceramic technology traveled down Siberian rivers to Japan, where Jomon pottery, the oldest and longest tradition of ceramic vessels known to scholars, began about 15,000 years ago. Jomon means ‘rope,’ and this prehistoric maritime culture likely used rope nets, so it is not surprising that the rope form would be translated into clay. Indeed, throughout the history of ceramics one often sees clay used to imitate other materials, such as rope or metal. Initially Jomon pots were made by forming long,

round, rope-like clay lengths (called coils) and winding them in a circle atop one another. Taken together, the coils formed vessels and ornate patterns. For 10,000 years the Jomon tradition took coiled pots to dramatic levels; indeed, so many stylistic changes took place that scholars identify early, middle and late Jomon periods. **<<FIGURE 2>>**

Figure 2: Middle Jomon Jar 2000 BCE
PHGCOM, 2007

In other parts of the world, humans began a fifteen hundred year peopling of Oceania—a movement scholars can trace in the distinctive Lapita pottery they left behind (1500– 500 BCE). In the same period, the peoples of South America engaged in the creation of at least three thousand years of beautiful and functional ceramics. These ceramics including glyph painted pottery and, long before the Industrial Revolution, molds for mass-producing Peruvian Moche portrait vessels.**<<FIGURE 3>>**

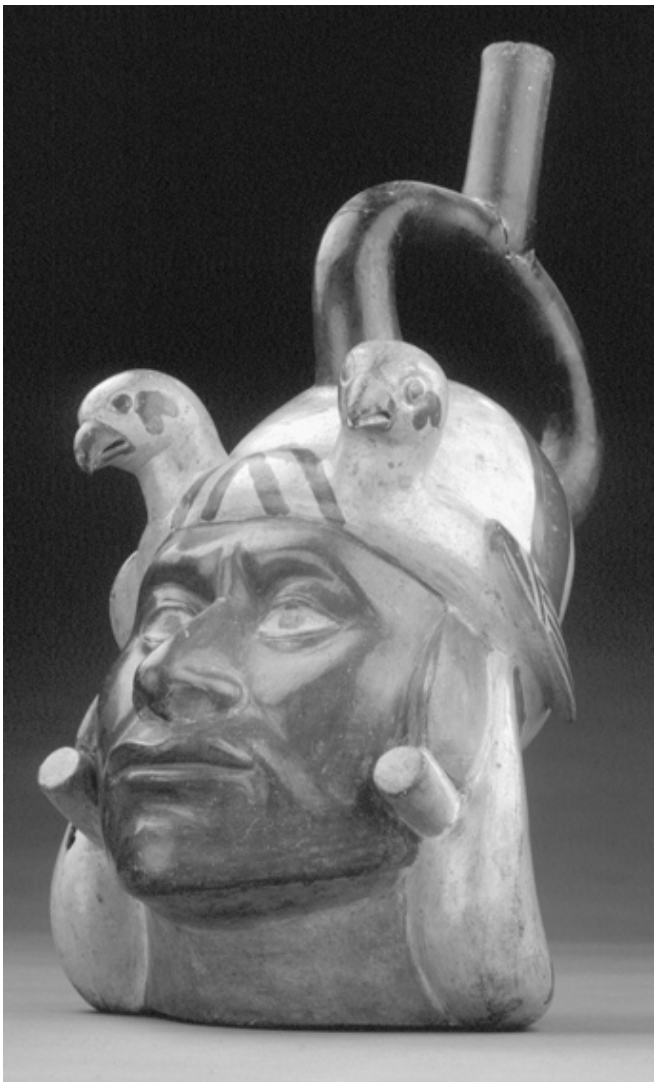

Figure 3: Moche. A Mochica Portrait from the Larco Museum from 400 A.D.
Lindsay Ruell
February 8, 2007
Public Domain

Ceramics Table 1

Prehistory **Ceramic Dates**	**Where/Who**	**What**
30,000-3,000bce	Eurasia	Writing: Markers become Marks.
15,000-300 bce	Japan	Jomon Vessels
2,000-500bce	Oceania	Lapita Vessels
1500bce – 1500ce	Americas	Vessels & Tile

From Clay to Ceramics: Properties, Processes, Value

Processes that transform clay into ceramics require heat, but vary depending on what object one is making, what kind of clay one is using, how it is formed and finished, and how it is used once it is fired. Over time, people have mastered higher temperatures for firing, invented waterproof glazed surfaces, and have created clay bodies to withstand even the pressures and temperatures of outer space. Of the many different kinds of clay that exist or could be made around the world, three common clays are distinguished by their firing temperatures. The first clay is low fire clay, so called because it requires the lowest temperatures and the least control of high heat. Terra cotta planters are a contemporary example of low fire clay. The next type of clay is middle range, of which stoneware mugs are an example. After using low fire clay for tens of thousands of years, Han dynasty (206-220 CE) Chinese hillside kilns increased temperatures and strengthened ceramics with visible wood ash glazes. The Chinese ceramic cultural heritage endures today; in the United States in the 21st century, it is less expensive to purchase a ceramic planter made in China from the local nursery than from a local potter in the U.S. The third type of clay is high fire clay, such as porcelain, which creates strong, white, and even transparent water proof containers. Until 1700 CE, China was the only state able to produce porcelain, although many

others tried to imitate their product as well as their forms and designs. **<<FIGURE 4>>**

Figure 4: High-fired Song dynasty Celadon; Longquan celadons produced in Longquan, Zhejiang, China. 13th century.
Vassil
November 27, 2007
Public Domain

Ceramic trade rests on the many social functions of ceramics. For example, Native Americans living in North American southwest pueblos had specific rights to use imagery and abstract designs, each of which indicated one's group identity. Early Greek red and black pottery, meanwhile, was a prized commodity because its very creation demonstrated technical mastery. Indeed, this form of pottery demonstrated potters' ability to control oxidation and reduction atmospheres as well as their knowledge of saturated solutions. The Greeks made two iron slips (clay poured into plaster molds): one of iron, and one super-saturated with iron. They then created an oxidizing atmosphere in the kiln, which means that the fire had plenty of oxygen. Subsequently they created a reduction atmosphere, in which the amount of oxygen available in

the kiln is reduced and the fire seeks oxygen in the clay body or its surface treatment. Thus, with a firing cycle of: oxidation-reduction-oxidation on slips of two different iron saturations, the Greeks were able to paint mythic narratives and signature patterns to produce their famous and valuable ‘red and black’ painted pottery, which was prized around the ancient Mediterranean world. **<<FIGURE 5>>**

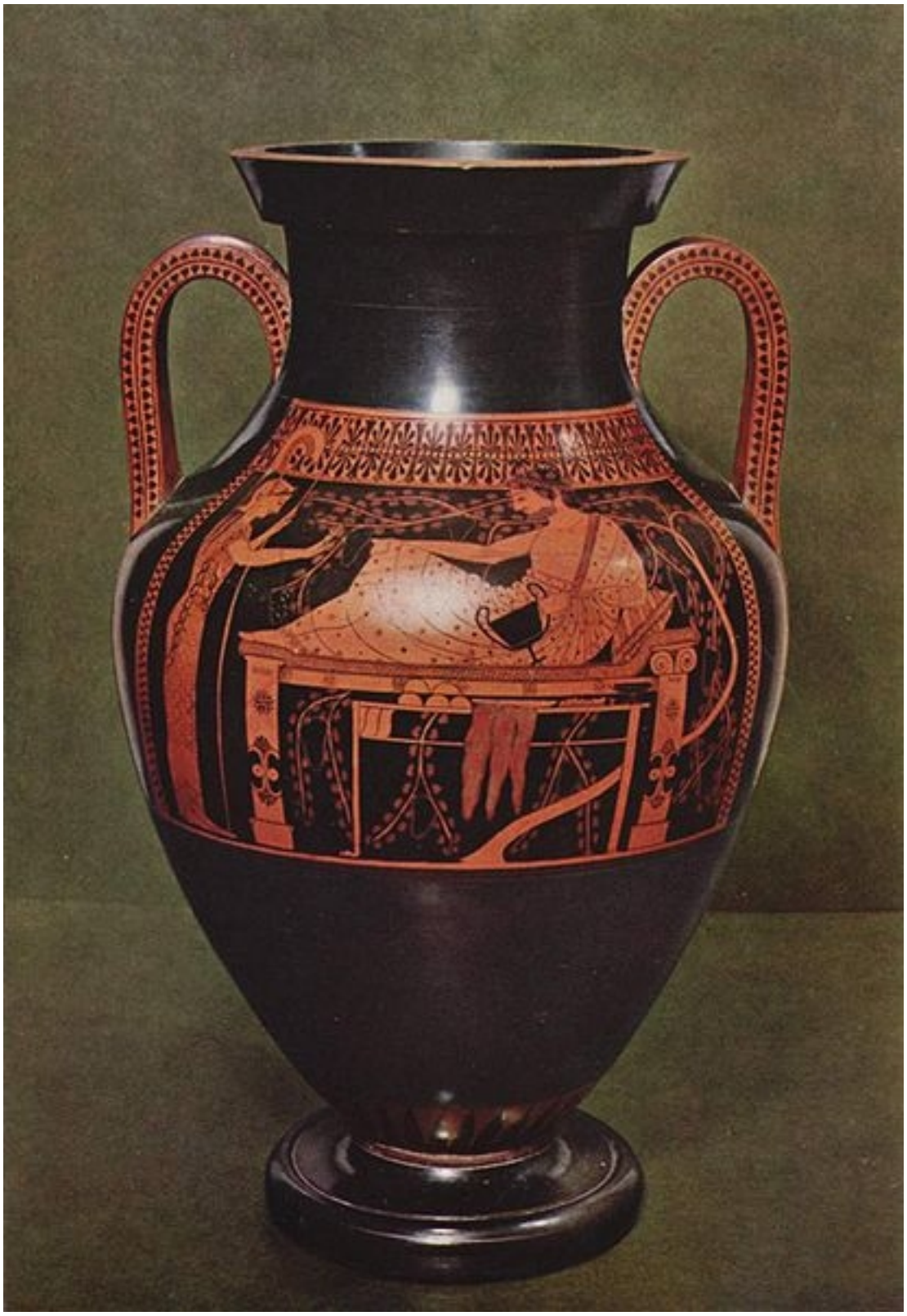

Figure 5: Greek Red and Black Vase – Public Domain

Ceramics around the World

Egyptian Ceramics

Ceramics in Africa go back at least 9,000 years. By 7,000 BCE, ceramics in Africa included painted vessels and figurines, thus continuing a long human tradition. But by 3200 BCE a new type of pottery developed in Egypt, call faience. Faience is a non-clay based ceramic made out of crushed quartz or sand. It is malleable like clay, and firing brings its alkaline salts to the surface as a shiny turquoise color. Ceramics experts also refer to this type of faience as Egyptian Paste. Egyptian ceramics evolved from humble painted pottery to faience as they traded ceramics within and beyond the Mediterranean. In sub-Saharan Africa, for the last three thousand years ceramics have included utilitarian daily ware and ritual vessels representing humans, diseases and spirits. However, by 1000 CE, it is clear that ceramic traditions in North Africa and beyond (including India) were being introduced into sub-Saharan Africa via regular trade routes. **<<TABLE 2>>**

Ceramics Table 2

Africa

Ceramic Dates	**Where/Who**	**What**
7,000-6,000bce	South Nile-West to Mali	Wavy line and dotted line pottery
4,000-3200bce	Pre-dynastic Egypt	Painted vessels & Terra cotta Figures
3200-1786bce	Egypt	Faience sculpture and tile
1885-1750bce	@ Kahun-Egypt	Minoan and Syrian Pottery
800bce-present	E Africa/Yoruba Ife	Pottery & sculpture
400bce-200ce	Nigeria/Nok	Terra cotta figures
200-1000ce	Niger/Bura Asinda	Terra cotta figures
900-1100ce	North African/Fatamid	Islamic Ceramics
1100-1400ce	Mali/Jenne Jeno	Earthenware
1900ce	Central Africa/Mangbetu	Portrait Pots

Lapita Pottery

The most famous pottery from Oceania is called Lapita, named for the culture group that navigated the Pacific and settled its many islands. The most commonly accepted dates for Lapita Pottery are 2000-500 BCE. Based on similar ceramic complexes from Taiwan around 3000 BCE, some scholars believe that the Lapita peoples may have originated in Taiwan and then spread south to the Philippine archipelago beginning about 2500 BCE. From there, they may have migrated on to Borneo and west of New Guinea to Fiji and western Polynesia. In any case, it is clear that by 500 BCE, most of the southeastern Pacific Ocean had been colonized by Lapita peoples.

Ceramics in Eurasia

Eurasian ceramics of the last five thousand years illustrate a complex of styles, cultural influences, and preferences, including evidence of the quest for prestige as well as economic power over specialized resources and techniques. For example, Islamic lustreware—which spread through North Africa to Spain between 1000 CE and 1300 CE—involved complex multiple firings. **<<FIGURE 6>>**

Figure 7: Lustreware. Arch decorated cup, 10th century. Earthenware, metallic lustre decoration, opaque glaze, overglaze painted. From Susa, Iran.

Marie-Lan Nguyen, 2006

Department of Islamic art, Richelieu

Public Domain

Meanwhile, in western Europe between 1400 and 1600 CE, states developed distinct styles of ceramic production, which were given legitimacy by royal patronage. Many of these styles attempted to imitate Chinese porcelain, which were extremely popular and highly sought after in Europe in that period. Among the most successful imitators were the Dutch, who created a style of ceramic known as 'Delftware' in order to compete with Chinese porcelains. Like their Chinese competitors, Delftware also portrayed scenes from nature painted in cobalt blue. **<<FIGURE 7>>** Early in the 1700's, a German finally discovered how to make porcelain, thus ending China's exclusive thousand year control of porcelain production. **<<TABLE 3>>**

Figure 8: Delft vases 1725-1760, photographed at the Musee des Arts Decoratifs, Paris. PHGCOM, 2008

Ceramics Table 3

Eurasian Vessels

When	**Where/Who**
3,000bce	Thailand
2400bce	Pakistan
1500bce	Minoan
1000bce	Iran
1000bce-200bce	Greece
200bce-1700ce	China

Pre and Post Columbian Ceramics

Contact between pre-Columbian residents of the Americas varied considerably depending on location. For example, ceramic evidence indicates that there may have been contact between Western Mexico and Peru as early as 1500 BCE. At that time, ceramic stirrup spout vessels, very much like those then made in Peru, were deposited into graves in western Mexico.**<<FIGURE 8>>**

Figure 9: Teotihuacan Tripod Vessel
Dr. Antonio Rafael de la Cova, December 15, 1997
Public Domain

A thousand years later (500 BCE), thin walled and lidded tripod vessels from Teotihuacan (Central Mexico) were prized throughout Central America. By 1000 CE, diverse culture complexes in Southwest North America included three ceramics traditions: Mimbres, Anasazi, and Hohokam.**<<FIGURE 9>>** Collectors and tourists alike still prize historic and contemporary ceramics from Southwest North America. **<<TABLE 4>>** In addition to a long story (from prehistory to the present), ceramics highlight the importance of commodity history itself. Thanks to ceramics we have evidence documenting much about human history, including our creation stories (how we got here) and where we thought we were going (grave goods & space shuttle tiles); the invention of writing (literal creation of history); trade routes (everyday 'china') and our current fascination: technology (ceramics are process intensive).

Figure 10: Mimbres Bowls, Stanford University

Ceramics Table 4

Pre-Columbian Americas

When	**Where/Who**	**What**
2500bce	SE North America/	Pottery
1500bce	W South America (Peru) & W Mexico/	Stirrup spouted vessels
700bce -1250ce	SW North America/	Painted Vessels
0-900ce	Teotihuacan (Central Mexico) & beyond/	Tripod lidded vessels
100-900ce	W South America (Peru)/Moche	Portrait vessels
1300ce	South America/Inca	Varied Vessels
	Central America/Aztec	
	North America/ NW Coast & E Coast Woodland	

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