NO PREP

Pottery Analysis

Why Broken Pots Are an Archaeologist's Best Friend

Includes: Student reading, case study, differentiated questions, teacher key

Name: Period: Date:

Pottery Analysis: Why Broken Pots Are an Archaeologist's Best Friend

Why Pottery Survives Everything

Of all the materials that humans have produced throughout history, few are as durable and as common in the archaeological record as pottery. Fired clay is virtually indestructible under normal conditions. It does not rot like wood, corrode like metal, or dissolve like bone in acidic soil. A ceramic pot that shatters into fragments when dropped does not decompose further. Those fragments, called sherds, can survive in the ground for thousands of years with their surface details, decorations, and even traces of their contents intact. This combination of fragility and durability is what makes pottery such a gift to archaeologists: pots break easily and are constantly being replaced, which means every occupation layer at a site is usually

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joking. For many periods and regions of the past, pottery is the single most informative category of evidence available.

Typology: Sorting the Sherds

The first step in analyzing pottery is sorting it into types based on observable characteristics. This process, called typology, involves classifying sherds according to features like the shape of the vessel, the type of clay used, the method of construction (handmade vs. wheel-thrown), the kind of decoration (painted, stamped, incised), and the surface finish (polished, glazed, rough). Each combination of features defines a type, and types are given names that archaeologists across a region can use to communicate precisely about what they have found. Typology is not just a filing system. It is a chronological tool. Because pottery styles change over time, identifying the type of pottery in a given layer helps date that layer. Certain types are associated with specific time periods, and when an archaeologist finds a well-known type in an excavation, it immediately provides an approximate date for the deposit. This is one of the most practical applications of seriation, the dating method discussed in Reading 2.4, where changes in pottery style over time create a chronological framework. The speed and reliability of typological dating is one of its greatest strengths. An experienced ceramic specialist can often pick up a sherd, examine it for a few seconds, and immediately identify its type and approximate date, something that laboratory dating methods cannot match for speed. This rapid dating ability is especially valuable during excavation, when archaeologists need to make real-time decisions about which layers to prioritize and how to interpret what they are finding.

What a Pot Can Tell You About Trade

Pottery provides some of the most compelling evidence for ancient trade networks. When archaeologists find pottery that was clearly made somewhere else, using clay and techniques not available locally, it proves that goods were being moved between regions. The distribution of a particular pottery type across a map can reveal the routes and extent of ancient trade networks with remarkable precision. For example, Roman amphorae, the large two-handled jars used to transport wine, olive oil, and fish sauce across the empire, have been found at sites from Britain to India. By analyzing the clay composition of these amphorae and matching it to known clay sources, researchers can determine exactly where each jar was made. Monte

Testaccio in Rome, a hill made entirely of discarded amphora fragments, contains the remains of an estimated 53 million amphorae, each one representing a shipment of goods from across the Mediterranean. The stamps and inscriptions on many of these containers identify the producer, the contents, the shipper, and sometimes even the date, making them one of the richest sources of information about Roman commerce. Ancient trade is not always as obvious as a Roman amphora found in Britain. Sometimes pottery trade shows up in more subtle ways: a local potter imitating a foreign style, a vessel made from local clay but decorated in a foreign technique, or a type of cooking pot that appears at sites along a suspected trade route. These patterns help archaeologists reconstruct not just the movement of goods but the movement of ideas, technologies, and cultural influences between communities.

Looking Inside: Thin-Section Analysis

When archaeologists want to know more about a piece of pottery than what the eye can see, they turn to a technique called thin-section analysis, also known as petrography. The process involves cutting a tiny slice from the pottery sherd, grinding it to a thickness of about 0.03 millimeters (thinner than a human hair), and examining it under a specialized microscope using polarized light. At this thickness, the minerals in the clay become transparent, and their crystalline structures become visible. Thin-section analysis reveals the mineral composition of the clay and the temper, which is the material that potters deliberately added to the clay to prevent cracking during firing. Common temper materials include crushed rock, sand, ground-up shell, plant fibers, or even ground-up old pottery called grog. The specific minerals and temper materials in a sherd act as a geological fingerprint, linking the pottery to the region where the clay was sourced. This technique has produced some remarkable findings. Archaeologists working in the American Southwest used thin-section analysis to demonstrate that pottery found at Chaco Canyon was not made locally but was transported from communities up to 75 kilometers away, suggesting that Chaco was a center of regional exchange rather than an isolated community. In the Mediterranean, thin-section analysis of Bronze Age pottery has mapped trade networks connecting Greece, Crete, Egypt, and the Levant, showing that international commerce was far more extensive in the ancient world than previously believed. Beyond identifying where pottery was made, residue analysis examines

microscopic traces of food, drink, or other substances absorbed into the walls of the vessel during use. Scientists have identified traces of wine, beer, olive oil, milk, beeswax, and even chocolate in ancient pottery, revealing what people ate and drank thousands of years ago. At a Neolithic site in China, residue analysis found evidence of a fermented drink made from rice, honey, and fruit, dating to about 7000 BCE, making it one of the oldest known alcoholic beverages in the world.

Key Information: Pottery Analysis Methods

Method	What It Reveals
Typology	Classifies sherds by shape, decoration, and construction; provides approximate dating based on known style sequences
Seriation	Arranges pottery types chronologically based on changes in frequency and popularity over time
Thin-Section Analysis	Reveals mineral composition and temper materials to identify where clay was sourced
Residue Analysis	Detects microscopic traces of food, drink, and other substances absorbed into vessel walls
Clay Source Matching	Compares the chemical fingerprint of pottery clay to known geological sources to trace trade routes
Monte Testaccio	Hill in Rome made of an estimated 53 million discarded amphorae, a massive archive of Roman trade data
Temper	Material added to clay (sand, shell, grog) to prevent cracking; acts as a geological fingerprint
Sherd	A fragment of broken pottery; the most common artifact type at most archaeological sites

Case Study: The Pottery That Traveled 500 Miles

Dr. Amara Okafor held the pottery fragment up to the light and frowned. She was excavating a small coastal fishing village in Ghana, dating to roughly 800 CE, and the site was producing the expected range of locally made cooking pots and storage vessels. But this particular sherd did not belong. It was made from a fine-grained clay unlike anything found in the region, decorated with a distinctive stamped pattern she had never seen in West African assemblages. She photographed the sherd and sent images to colleagues at three different universities. The response came back within a week: the decoration style was characteristic of pottery produced in the inland Niger Delta region, roughly 500 miles to the north. "This confirms what we suspected," Dr. Okafor told her team. "This fishing village was not isolated. It was connected to long-distance trade routes stretching deep into the interior." She submitted a sample for thin-section analysis to confirm the clay source. "If the minerals match Niger Delta geology, we have physical proof of a trade connection that no historical text ever recorded. This little broken pot might rewrite what we know about West African commerce in the first millennium."

1. Based on the reading, explain how thin-section analysis could confirm or deny that this pottery fragment came from the Niger Delta. What specific evidence would the analysis reveal?

2. Dr. Okafor says this pottery might rewrite what we know about West African commerce. How does this connect to the reading's broader argument about why pottery is one of the most valuable types of evidence for understanding ancient trade networks?

Multiple Choice

1. Why is pottery the most common type of artifact found at most archaeological sites?

a) Other materials like stone and metal decompose faster than clay

b) Pottery was produced in enormous quantities for many purposes, and broken sherds survive indefinitely in the ground

c) Ancient people valued pottery above all other possessions

d) Pottery was only produced by the wealthiest members of ancient societies who had access to premium clay and firings

2. What is temper in pottery production?

a) Material added to clay to prevent cracking during firing, such as sand, shell, or ground-up pottery

b) The process of cooling a pot slowly after removal from the kiln

c) A chemical applied to the surface of a fired pot to make it waterproof and resistant to water damage

d) The temperature at which a pot is fired in the kiln

3. What did residue analysis of a Neolithic vessel from China reveal?

a) Evidence that the vessel was used for mixing paints and pigments

b) A recipe for making porcelain

c) Evidence of iron smelting

d) Traces of a fermented drink made from rice, honey, and fruit

Matching

Write the letter of the correct definition on the line next to each term.

Term	Definition
1. ___ Ceramics	A) A lab technique that cuts pottery extremely thin and examines it under a microscope to identify minerals
2. ___ Typology	B) A fragment of a broken pottery vessel found at an archaeological site
3. ___ Sherd	C) A furnace or oven used to fire clay objects at high temperatures
4. ___ Thin-section	D) The classification of artifacts into types based on observable characteristics like shape and decoration
5. ___ Kiln	E) Objects made from fired clay, including pottery, brick, and tile

Fill-in-the-Blank

1. Monte Testaccio in Rome is a hill made entirely of an estimated 53 million discarded _____, which are large two-handled jars used to transport goods across the Roman Empire.

2. In thin-section analysis, a pottery sample is ground to about 0.03 millimeters thick and examined under a microscope using _____ light.

3. The earliest known pottery in the world comes from East Asia, with fragments dated to around _____ years ago.

Short Answer

Answer each question in 2-4 complete sentences.

1. Explain the difference between what typology reveals about pottery and what thin-section analysis reveals. Why might an archaeologist need both methods rather than just one?

2. How do Roman amphorae found across the empire serve as evidence for ancient trade networks? What specific information can these vessels provide about Roman commerce?

3. The reading describes pottery as an archaeologist's best friend. Based on everything you have learned in this reading, do you agree that pottery is the most important type of artifact? Why or why not?