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Global Warming Threatens the Ancient World

Priestess of Amun: A Virtual Unwrapping

Drugs and Looting: The Crystal Meth Connection

Rome's Appetite for Oil

Coffin of the Egyptian priestess Meresamun, ca. 800 B.C.

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features

In the middle of Rome's trendiest neighborhood, surrounded by sushi restaurants and nightclubs with names like Rodeo Steakhouse and Love Story, sits the ancient world's biggest garbage dump—a 150-foot-tall mountain of discarded Roman amphorae, the shipping drums of the ancient world. It takes about 20 minutes to walk around Monte Testaccio, from the Latin *testa* and Italian *cocci*, both meaning "potsherd." But despite its size—almost a mile in circumference—it's easy to walk by and not really notice unless you are headed for some excellent pizza at Velavevodetto, a restaurant literally stuck into the mountain's side. Most local residents don't know what's underneath the grass, dust, and scattering of trees. Monte Testaccio looks like a big hill, and in Rome people are accustomed to hills.

Although a garbage dump may lack the attraction of the Forum or Colosseum, I have come to Rome to meet the team excavating Monte Testaccio and to learn how scholars

Each day excavators remove bucketfuls of amphorae from the 150-foot-tall Monte Testaccio. The artificial hill is made up almost entirely of olive oil amphorae from the ancient Roman province of Baetica in southern Spain.

are using its evidence to understand the ancient Roman economy. As the modern global economy depends on light sweet crude, so too the ancient Romans depended on oil—olive oil. And for more than 250 years, from at least the first century A.D., an enormous number of amphorae filled with olive oil came by ship from the Roman provinces into the city itself, where they were unloaded, emptied, and then taken to Monte Testaccio and thrown away. In the absence of written records or literature on the subject, studying these amphorae is the best way to answer some of the most vexing questions concerning the Roman economy—How did it operate? How much control did the emperor exert over it? Which sectors were supported by the state and which operated in a free market environment or in the private sector?

"So, professor, just how many amphorae are there?" I ask José Remesal of the University of Barcelona, co-director of the Monte Testaccio excavations. It's the same question that must occur to everyone who visits the site when they realize that the crunching sounds their footfalls make are not from walking on fallen leaves, but on pieces of amphorae. (Don't worry, even the small pieces are very sturdy.) Remesal replies in his deep baritone, "Something like 25 million complete ones. Of course, it's difficult to be exact," he adds with a typical Mediterranean shrug. I, for one, find it hard to believe that the whole mountain is made of amphorae without any soil or rubble. Seeing the incredulous look on my face as I peer down into a 10-foot-deep trench, Remesal says, "Yes, it's really only amphorae." I can't imagine another site in the world where archaeologists find so much—about a ton of pottery every day. On most Mediterranean excavations, pottery washing is an activity reserved for blisteringly hot afternoons when digging is impossible. Here, it is the only activity for most of

Trash Talk

by Jarrett A. Lobell

Sorting through a mountain of pottery to track the Roman oil trade

Remesal's team, an international group of specialists and students from Spain and the United States. During each year's two-week field season, they wash and sort thousands of amphorae handles, bodies, shoulders, necks, and tops, counting and cataloguing, and always looking for stamped names, painted names, and numbers that tell each amphora's story (see sidebar page 24).

Although scholars worked at Monte Testaccio beginning in the late 19th century, it's only within the past 30 years that they have embraced the role amphorae can play in understanding the nature of the Roman imperial economy. According to Remesal, the main challenge archaeologists and economic historians face is the lack of "serial documentation," that is, documents for consecutive years that reflect a true chronology. This is what makes Monte Testaccio a unique record of Roman commerce and provides a vast amount of datable evidence in a clear and unambiguous sequence. "There's no other

Monte Testaccio stands near the Tiber River in what was ancient Rome's commercial district. Many types of imported foodstuffs, including oil, were brought into the city and then stored for later distribution in the large warehouses that lined the river.

place where you can study economic history, food production and distribution, and how the state controlled the transport of a product," Remesal says. "It's really remarkable."

MONTE TESTACCIO HAS STOOD relatively undisturbed for more than 2,000 years in ancient Rome's Emporium district, the main port on the Tiber River from the late Republic (second century B.C.) to the end of the empire in A.D. 476. The trash heap was part of the everyday Roman landscape until a new city wall was built by the emperors Aurelian and Probus between A.D. 271 and 280, effectively closing Monte Testaccio off from the river and ending its usefulness as a dump. After the fall of Rome, the area was largely abandoned, but Monte Testaccio always had a role in the city's life. In the Middle Ages, it was used for religious festivals such as the Way of the Cross, owing to its resemblance to the hill of Calvary. The area around the hill was also the site of jousting tournaments and public spectacles. Throughout the 19th century, excluding a brief moment in 1849 when Italian patriot Giuseppe Garibaldi used it as a gun emplacement during his fight for Italian unification, families went to Monte Testaccio for picnics. Wine merchants discovered that Monte Testaccio's interior was remarkably cool, and deep caves were cut into the sides to create storage cellars that were in use until about 100 years ago. Even into the 20th century, Romans went to pick arugula and hunt rabbits on Monte Testaccio, until it was closed to the public more than a decade ago at a time when people used the park to shoot heroin instead of bunnies. Throughout the millennia, Monte Testaccio was sometimes thought to be a dumping ground for debris from the emperor Nero's A.D. 64 fire that destroyed much of the city, or for discarded funerary urns from the columbaria along the nearby Via Ostiense. The amphorae sherds also provided a seemingly never-ending supply of tiles to refurbish the neighborhood and for visitors to take home as souvenirs.

Weight of each amphora
About 66 pounds
Weight of the oil in each amphora
About 154 pounds
Total weight of amphorae in Monte Testaccio
1,636,932,096 pounds, or 818,466 tons
Total number of amphorae
About 24,750,000
Total amount of olive oil they held
45,767,808 gallons
Amount of oil from Baetica annually at the highest level of import
3,962,580 gallons

In 1872, Monte Testaccio attracted the attention of German archaeologist Heinrich Dressel, who came to Rome to study and catalogue the amphorae and their inscriptions. By reading the consular dates (years in which consuls, the highest non-imperial officers, were in power) on the amphorae, Dressel concluded that Monte Testaccio had been used as a dump from the reign of Augustus until the mid- to late third century A.D. Contrary to the opinion of contemporary French scholars who, perhaps not surprisingly, thought that the amphorae at Testaccio had held wine from France, Dressel claimed they had contained olive oil from the province of Baetica, the region of Spain that is now Andalusia. But for nearly 100 years after Dressel, scholars paid little attention to his discoveries.

Finally, in the 1960s, Spanish archaeologist Emilio Rodriguez Almeida came to Testaccio to investigate how and when the hill was formed. He discovered, and Remesal's current excavations have confirmed, that it grew in two distinct phases—an eastern section in use from the Augustan era through the mid-second century A.D., and a later one on the western side used extensively until A.D. 265, the latest consular date yet found. Remesal believes the sheer number of amphorae suggests Monte Testaccio had its own system of administration, although how this might have worked is unclear.

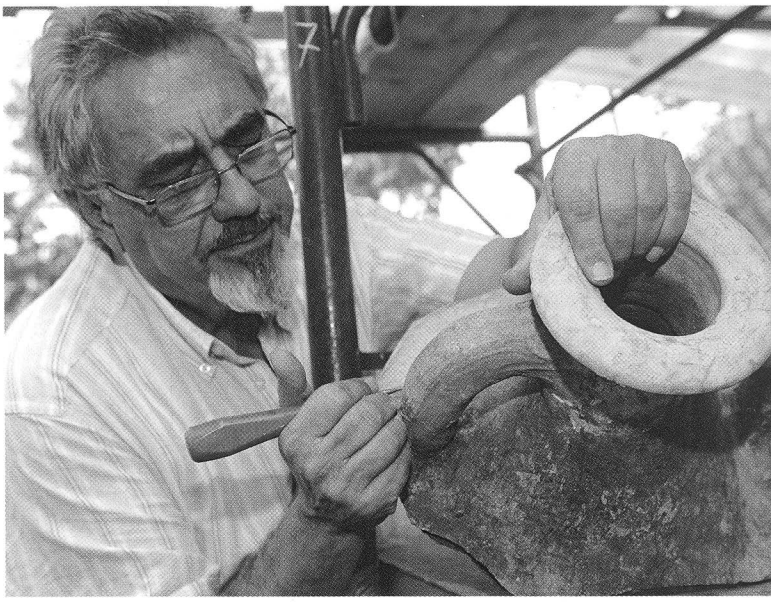
The current team has also solved the mystery of how the mountain was actually formed. They discovered that amphorae without bases were filled with sherds and used to make artificial terraces. Additional sherds were dumped behind these "amphora walls" until the top of the wall was reached. Another row was then begun on top of it and set back a bit to form a sloping hill, which gradually grew to its current (and Remesal thinks close to final) height.

EAGER TO RESUME MY TOUR—is it really *all* amphorae on the other side, too?—I continue up the hill with Remesal. It's surprisingly quiet on the 10-minute walk to the top, although the tranquility is regularly shattered by the wail of ambulances speeding down the tiny streets of the neighborhood of Testaccio, which uses an amphora on its administrative seal. As we reach the top and take in the stunning vista, I am thrilled by my first-ever view of the top

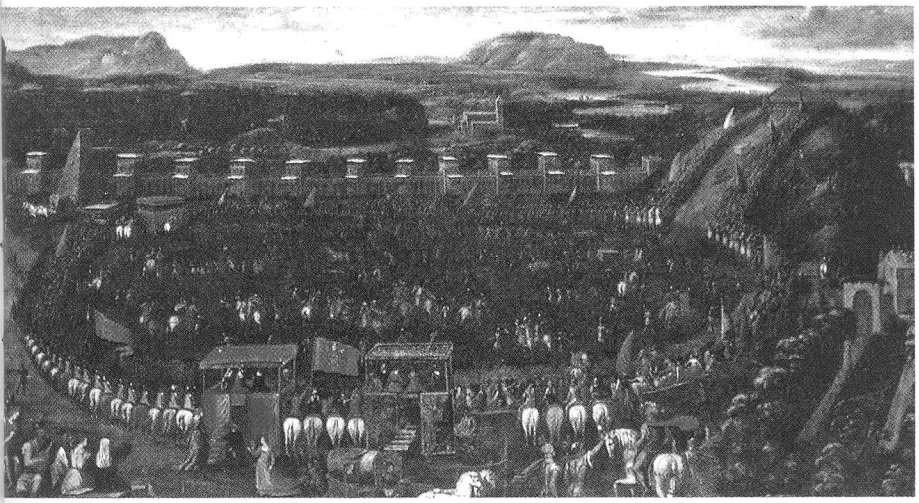
of the Pantheon's dome, impressed by the massiveness of St. Peter's in the distance, and amazed by the density of streets, rooftops, palaces, and churches that make up this extraordinary city. Then I remember I am standing on a mountain of garbage. But thanks to the passage of a few thousand years and the thick coating of lime with which the ancient Romans covered the amphorae to mask the smell of rancid leftover oil, it doesn't smell like your typical landfill.

Today, we covet Italian extra virgin olive oil, but in the Roman Empire the Italian peninsula couldn't produce nearly enough to meet the population's needs. In addition to being one of the staples of the Mediterranean diet, olive oil was also used for bathing, lighting, medicine, and as a mechanical lubricant. During the emperor Augustus's reign, olive oil as well as other products, including *garum* (the fish sauce Romans used to flavor everything from steamed mussels to pear soufflés), metals, and wine began to come into Rome as tax payment in kind from the provinces of Hispania (roughly modern Spain), especially Baetica. Over the next several hundred years, Baetican oil imports continued to grow, reaching their peak at the end of the second century A.D. All of this oil came in amphorae. These inexpensive, durable, and often reusable containers (not to be confused with the expensive Greek painted fineware used as prizes in athletic games) were produced all over the empire in distinctive shapes from local materials. More than 85 percent of the amphorae found at Monte Testaccio are the type from Baetica known as Dressel 20, following Dressel's classification system, which is still in use today. The other 15 percent came from North Africa, chiefly Libya and Tunisia, and are easily distinguished by thinner walls and a more slender shape. Amphorae were also used to transport other products, although the mountains of amphorae for wine or fish products (if they survive) have not been found.

The Dressel 20 was perfect for long sea voyages because its globular shape made it less likely to tip over and spill its contents. We can easily imagine ships with cargoes of Dressel 20 amphorae reaching Portus, the Roman port first built beginning in A.D. 42 by the emperor Claudius to replace the old one at Puteoli (modern Pozzuoli). Several shipwrecks, including the Cabrera III wreck found near Mallorca and the Port Vendres II close to Marseille, were found carrying full loads of Baetican exports that included olive oil in Dressel 20s. At Portus, or in the imperial warehouses closer to Monte Testaccio, the oil was emptied into smaller containers for distribution throughout the city. The amphorae were then taken, probably by mule, to Monte Testaccio, where they were discarded. Although many types of amphorae were reused as flower pots and drainpipes, the thick walls and tendency of the Dressel 20s to break into large curved fragments limited their value as recycled products. Much like New York City, which temporarily suspended its plastic bottle recycling program several years ago because of its cost, so too the Romans may have found it cheaper just to throw the amphorae away.



Project director José Remesal cleans dust from a handle stamp that he believes names the oil's owner, who also may have had kilns to manufacture the containers. Archaeologists have excavated more than 100 of these kiln sites across southern Spain.



A 1570 painting shows a field next to Monte Testaccio hosting a joust. Over the centuries, the mountain was used for contests, to reenact the Way of the Cross, to store wine in caves cut into its sides, and as a park.

OIL AND AMPHORAE PRODUCED in Hispania and transported to Rome for unloading, distribution, and disposal, help tell the story of the Roman economy. Since there is little archaeological evidence of trade in other products such as grain and wine, they also provide a unique snapshot of how Rome developed large-scale imports from the provinces. With such a

What's in a Name?

According to archaeologist Simon Keay of the University of Southampton, "The importance of Monte Testaccio is that it gives us the best look into the scale of essential foodstuffs being imported into Rome between the first and third centuries A.D., as well as how this was organized. It also links provincial producers to consumers in Rome." Most of this information comes from inscriptions on the pots.

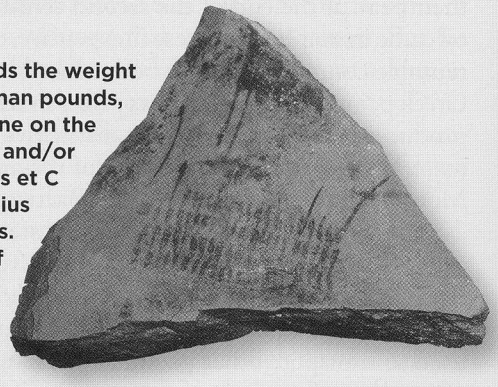
Handle Stamps

José Remesal, director of Monte Testaccio excavations, thinks that handle stamps, like the one at right, name the oil's owner, who may also have manufactured his own amphorae. Other scholars, such as French archaeologist Claude Domergue, believe they denote only the amphora maker and have nothing to do with the oil or the oil producer.

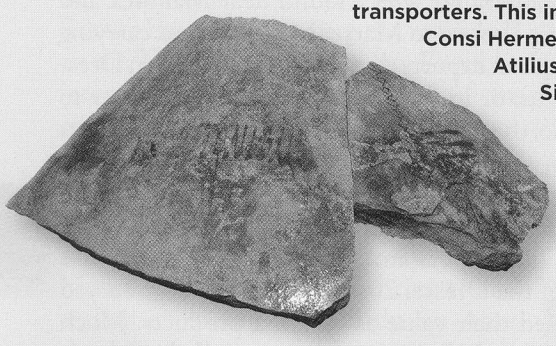
This inscription reads IICAMILI MELISSI—Family members who were either the amphora's manufacturers or the owners of the oil inside the amphora.

Painted Inscriptions

The types of inscriptions below, called *tituli picti*, were painted after firing and relate to regulation of oil production and transport. Greek letters (alpha, beta, gamma, delta, and epsilon) are used by modern scholars to identify each inscription.



The alpha inscription, at the top of the sherd at right, records the weight of the empty amphora. This one weighed XXCII, or 82 Roman pounds, about 66 modern pounds. Beta inscriptions, like the one on the bottom of this sherd, state the names of the oil traders and/or transporters. This inscription reads L(uci) • Atili Hermerotis et C Consi Hermerotis, or property of the merchants Lucius Atilius Hermeros and Caius Consius Hermeros. Similar names are found on thousands of amphorae at Monte Testaccio and on honorary dedications all over the ancient Roman province of Baetica in southern Spain.



The sherd above contains a wealth of information. On the left is a beta inscription reading C(ai) Antoni Balbi, stating that the oil belonged to the merchant Caius Antonius Balbus; next is a delta inscription reading [---] ARCA PRIMA AA [---], which records bureaucratic information about the oil's transfer. Other delta inscriptions record names of customs agents and places of export, as well as inspection dates; a rare epsilon inscription on the far right of this sherd is a storehouse control number, "III" or the Roman numeral 3.

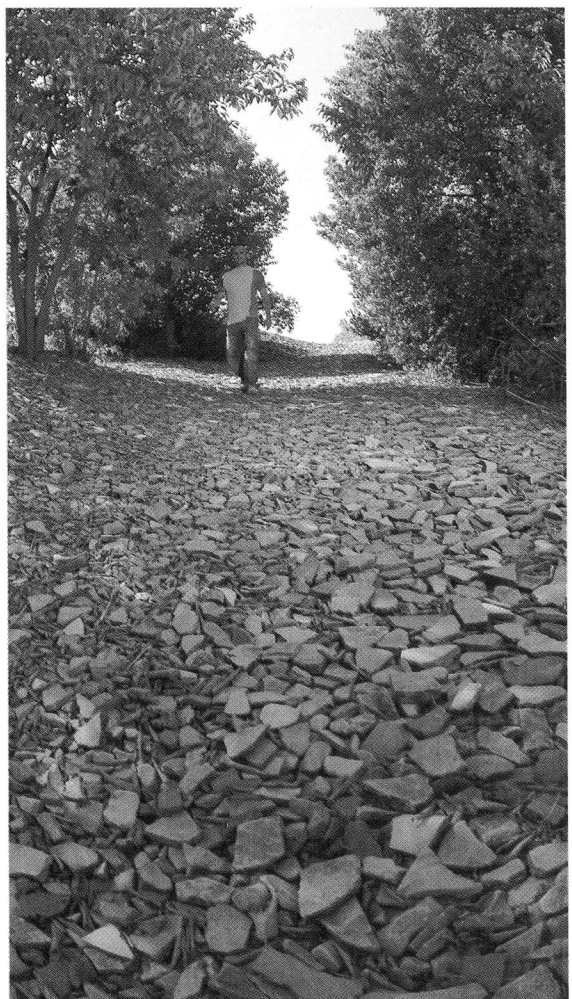
The gamma inscription, left, is the weight of the oil—here CCXVI, or 216 Roman pounds, about 154 modern pounds. Such inscriptions provided a simple system to deter cheating: both the weights of the empty amphora and the oil were written on the pot and could be checked by inspectors at any time.

high volume of imported oil, the Romans needed a system to control distribution and deter cheating and fraud. One of the many advantages of amphorae is that they are easy to write on. Each one carries a thorough accounting of its contents and of the people involved in its creation and transfer. These inscriptions include stamps and incised marks made before firing that refer to the production of the amphora and *tituli picti*—words, names, and numbers painted on after firing. Both provide a wealth of information about the production, administration, and transport of oil.

According to Roman pottery expert Theodore Peña of the Institute for European and Mediterranean Archaeology at the University at Buffalo, State University of New York, "One of the keys to comprehending the Roman economy is to understand how the emperor supplied the people of Rome with basic foodstuffs." This is where Monte Testaccio is again the best source. "In looking at these amphorae," Peña continues, "we realize that this apparatus for handling oil and possibly grain was unique and went far beyond what the empire did for any other products." Augustus, who became

The Romans covered the discarded amphorae in lime to mask the smell of the decaying olive oil.

emperor in 27 B.C., knew that his power base came from two sources—the army and the *plebs*, or common people. He also understood that the needs of a growing population of Rome (between 600,000 and one million in the first century A.D.), along with a massive army stationed along frontiers from Spain to Syria, demanded a sophisticated and complex system to transport food and raw materials between Rome and its provinces. The emperor ensured the army's support by paying and feeding it. He likewise bought the plebians' loyalty by continuing the tradition, established in the mid-first century B.C., of providing them with access to free grain and by subsidizing the price of olive oil much like the current state-regulated price of tortillas in Mexico or baguettes in Tunisia. More than a century after Augustus, the Roman satirist Juvenal would give lasting expression to this populist approach in the famous line about the emperor giving the Romans "bread and circuses" in exchange for their freedom. To administer these needs, Augustus set up the *praefectura annonae*, or "prefect of the provisions," an office whose function remains hotly debated. Some scholars believe the *annona* only handled the grain distribution for the *plebs*. But Remesal argues that the office served all of Rome's inhabitants and dealt with many products, including olive oil. "From Augustus's time, olive oil amphorae from Baetica are found at Monte Testaccio and as far as the northern borders of the empire, in the provinces of Brittania and Retia [parts of Austria and Germany]," he says. "I don't think this could have happened without the emperor being directly involved." But how far-reaching was this so-called "command economy," the state-driven system controlled by the empire that brought olive oil to Rome and the amphorae to Monte Testaccio? University of Southampton archaeologist Simon Keay, who directs a major survey project at Portus, says, "The imperial finger is clearly on the pulse and they are very closely controlling and monitoring everything, but it's not heavily bureaucratic. Rather, this is a system of small suppliers who are well controlled and monitored, not a system of great trade routes like other empires have had. It is uniquely Roman."



An excavation worker walks down a sherd-strewn path from the top of Monte Testaccio.

Monte Testaccio is not one of those sites that amazes either with its beauty or its ability to transport the visitor to another time. In the Forum, walking among the still-standing columns and stepping on the ancient pavement makes me feel as though I am in ancient Rome. I can see the Vestal Virgins walking solemnly to their beautiful round temple to make burnt offerings to the goddess of the hearth; I can almost smell the smoke. Just in front of me, the emperors Titus and Septimius Severus march at the heads of their victorious armies, chained prisoners and captured kings and queens dragging behind them. Looking east to the Colosseum, I hear the roar of the crowd as two gladiators fight to the death. But in a way that no temples, triumphal arches, or arenas ever can be, Monte Testaccio is incontrovertible evidence of the Romans' ability to move the empire's vast resources in an organized fashion, to feed their people, and to offer them a previously unknown level of stability. On the last day I am at Monte Testaccio, a University of Barcelona student going through a bucket finds an amphora missing only its base—the shoulders, neck, and handles are complete and the stamp and *tituli picti* are still there. Remesal takes the amphora and hands it to me, a smile creeping over his face, and says, "Here history is not read in books. We read history on the pots." ■

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