

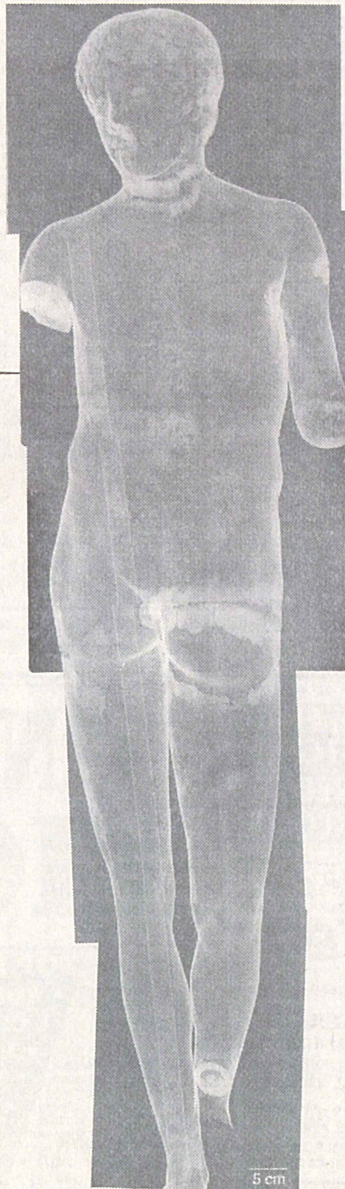
SCIENCE

ART HISTORY



The painted scene on this 1,500-year-old earthenware vase was once thought to illustrate a grisly scene of human dismemberment. Now, researchers say the painting depicts an ancient bronze statue assembly line.

SOURCE: Harvard University



An X-radiograph of the "Statue of a Youth" reveals how the early 5th century Greek bronze statue was produced and repaired. Pale rings at the neck, upper arms, top of the left thigh and left ankle are original lead reinforcements of the joints. Faint oval patterns in the middle of the left thigh and at the mid-torso are welded repairs.



Henry Lie of Harvard University uses a surgical scalpel to remove for analysis a sample of metal from the eye of a statue of Dionysus, the god of wine and revelry. The analysis showed the eye contained tin, probably to imitate silver gilding.

A Bronze Pantheon's Ancient Production Line

Researchers Say 'Masterpieces' Were Really Mass Produced

By Alan Jay Kaufman
Special to The Washington Post

Like many of the grand avenues and parks in Washington, the cities of ancient Rome and Athens were adorned with life-size bronze statues of gods, heroes and, of course, politicians. Most of these ancient bronzes were destroyed when they were recycled to make weapons and kitchen utensils. Only in rare catastrophic events, such as the eruption of Vesuvius that entombed the city of Pompeii in 79 A.D., were hundreds of these bronze statues preserved in one place. This makes the survivors, unearthed from the ashes of classical Mediterranean cities or found in shipwrecks at sea, appear to be one-of-a-kind masterpieces.

Now, in a unique amalgam of art and science, scientists have peered beneath the bronze patina on more than 50 large, hollow-cast Greek and Roman statues from North American collections and discovered that most of the so-called masterpieces were copies—mass produced to keep up with market demands for ornaments, probably to adorn ancient gardens. These surprising conclusions "change the way we view these statues" and the ancient art world, said Carol Mattusch of George Mason University, a leading U.S. authority on classical bronze sculpture.

Many art historians still consider these statues extravagant works created by master artists, but "that simply isn't the case," said Henry Lie, a curator and the director of

Harvard University's Strauss Center for Conservation and Technical Studies. The ancient bronze foundry, Lie said, "was a production line, a business arrangement" between consumers and artists, who used the discovery of bronze and a technological advance called "lost-wax" casting to make mass production a reality, long before Henry Ford came up with the assembly line. While these bronze statues were common in classical Mediterranean cities, Mattusch said, "they weren't quite pink flamingos." But if you went to a garden shop today you'd probably see statues on sale that were made in much the same way as these surviving bronzes, she added.

Using a doctor's endoscope, which is more commonly used to look down the human esophagus into the stomach, Lie and his colleagues peered inside the hollow ancient statues to see where molten lead had been poured to join parts together, or to repair large flaws in the bronze castings. While smaller statues were regularly cast in one solid piece, the examinations showed that the size of larger bronzes made it more practical to assemble them by joining pre-cast parts separately.

Powerful X-rays of the statues, which penetrated the bronze and highlighted the lead joints, revealed that the walls of the bronze sculptures were very thin. Thin walls made the statues lighter in weight, presumably saving the artists money, because the main cost in the foundry was the bronze, an amalgam of copper and tin that is stronger than either

These thin-walled statues were often flawed. But rather than remelting a miscast piece, classical metalworkers were more likely to save time and money and repair the sculpture by pounding in patches of bronze around the flaws, the researchers found. Patches were discovered over joints and imperfections on most of the sculptures. In the more intricate and expensive pieces, ugly joints were even covered under separately cast bronze garments. Then, depending on the depth of the buyer's pocketbook, individual statues could be embellished with silver or stone eyes, teeth and nails, as well as copper eyelashes and nipples.

The lost-wax process made serial production of bronze sculptures possible by allowing many copies to be made from the same original. The process involved using wax to make a clay mold, which was then used to cast each statue. Three statues of the goddess Aphrodite that were examined are so strikingly similar in size and shape that they appear to have been copied from a common masterpiece. X-rays and analyses of the metals used in each statue, however, showed that each Aphrodite was slightly different. This suggests that while they came from a common original, the three similar Aphrodites were probably produced and finished by different copy artists at different times.

"There probably weren't many Michelangelos around who did the original work themselves," said Mattusch, one of the curators of "The Fire of Hephaistos," a museum exhibit exploring the new findings. The exhibit, which is named after the mythological Greek god of metalworking, is showing at the Toledo Museum of Art in Ohio until Jan. 5, when it moves to the Tampa Museum of Art in Florida from Feb. 2 to April 13.

The "Fire of Hephaistos" offers a new way of looking at the classical bronze statues, beyond the abstract notion of art. By adding bits of science to the exhibit, like adding lead to bronze, the curators try to break down traditional concepts of an art exhibit. "What

one normally sees on the surface are beautiful figures and patinas, but we suddenly turned this around and looked at the inside surfaces, and the flaws," Lie said. Carlos Picone, the director of antiquities at the Metropolitan Museum of Art in New York City said, "The more you know how something is made, the more it's bound to enhance your aesthetic appreciation of the art."

One of the rarest objects in the exhibit isn't bronze at all, but a 1,500-year-old earthenware vase, called the Foundry Cup, found in an Etruscan tomb. On one side, a painted scene shows a nude athlete with a detached hand lying before another man holding a hammer. An unattached head lies at the workman's feet.

When the vase was first discovered, the painting was mistakenly thought to depict a grisly scene in which a man was being cut up for a cannibal's feast. Now, however, the scene is interpreted as showing the workings of an ancient foundry assembly line for bronze statues. Molds for hands and feet are clearly hanging on the wall behind the worker.

The painting also reveals that classical artisans used a wide range of sculptural styles at the same time. That's contrary to the view favored by many art historians that style can be used to date these objects from antiquity. In contrast to the graceful bronze athlete, which would normally be assigned to the 5th century B.C., the other side of the painting is dominated by a colossal bronze of a stiff, mechanical warrior, a more archaic style generally attributed by art historians to an older generation of sculptors.

Together on the Foundry Cup, these bronzes show that the two styles were, in fact, produced at the same time. "We're on shaky ground when we date objects based only on their style," Lie said. Evidently ancient artisans were more diversified than they were credited.