

The Forgery of Our Greek Bronze Horse

JOSEPH V. NOBLE

Vice-Director for Administration

AT THE FIRST SESSION Tom Hoving spoke about a museum's responsibility to set the record straight in the case of forgeries that were discovered in its collection. This is the responsible thing to do, because the truth is what we are all seeking. We have an announcement to make tonight; since we were holding this technical symposium and since the announcement concerns a technical analysis, we thought it most appropriate to tell you about it here.

The subject is an important object in the Museum's collection: our famous Greek bronze horse (Figure 3). This piece was bought on February 16, 1923, from a dealer in Paris, and it has always been dated between 480 and 470 B.C. Many scholarly works present the horse as being a high point in the history of Greek art. The horse has been so popular that over the years thousands of plaster casts have been made of him and you can still buy them – up until tonight.

Now the horse, unlike our Etruscan warriors, was never questioned. It was never questioned on any stylistic basis and it was never questioned on a technical basis. All right, if it was never questioned, what happened?

Well, I like the horse a tremendous amount. In fact, in 1946 I bought a plaster cast of him and have had it in my home ever since. And I've passed this horse a thousand times, I've looked at it in every light and from every angle. But one time, in the summer of 1961, as I was walking toward the horse, I saw something I had never seen before. I saw a line running from the tip of his nose up through his forelock, down the mane and back, up under the belly, and all the way around (Figure 1). I recognized it as the casting fin caused by a piece mold. The sections of a mold had come together there and the metal had oozed out, forming a casting fin that had been filed off, leaving this line. Now, you might say, "Well,



1. Head of the Museum's horse, showing the mold line

of course the horse was cast in a mold!" Yes, of course he would have been cast in a mold, but if he had been genuine he would have been cast by the lost-wax process. In ancient Greece, a piece of this size would have been cast by making a wax model of the horse and covering this model with clay, leaving a hole in some inconspicuous place. Next you heat the clay, causing the wax to run out through the hole (hence "lost-wax process"). Then you pour in the bronze, break away the mold when the metal has cooled, and you get a bronze casting. You get a *seamless* bronze casting. Our horse's mold line is from a mold made out of sand, a process not invented until the fourteenth century A.D.

2. *Horse. Greek, about 460 B.C. Bronze, height 8¹⁵/₁₆ inches. Archaeological Museum, Olympia. Photograph: German Archaeological Institute, Athens*



Once you find one thing wrong with a work of art, then your eyes are clear and you can see more errors. We see, for instance, the hole in the mane; it's obviously for the harness. But the hole is misplaced; the harness straps should tie right behind the ears (Figure 2), and this hole is much too low. There's another hole, running deep into the forelock. What was it for? That kind of hole is found on the life-size marble statues on the Acropolis of Athens; whether they're female korai or marble horses, they have a hole on the top of their head. It's for a bronze or iron spike, called a *meniscus*, to keep the pigeons off. The forger saw the marble statues on the Acropolis, he saw the hole and thought it was for a plume or something like that, and so he put a hole on top of his small bronze horse.

I was sure that this was a forgery and turned in a report on August 25, 1961. You don't just rush out and say things are fakes, however; you check your conclusions until you come up with some definitive proof that the piece, and not just your knowledge, is faulty.

Dietrich von Bothmer, the curator of Greek and Roman Art, was going to Greece in a few days, and I asked him to examine the horses at Olympia (including the bronze one that resembled ours, shown in Figure 2),

the marble horses on the Acropolis, and other comparable Greek statues. He did, and sent back a letter saying, "Remove the horse from exhibition," which we did on September 15, 1961.

A month or so after Dietrich came back, we went to Greenpoint, Brooklyn, to visit the Bedi Rassy Foundry, one of the few companies in this area that still uses the French sand piece-mold process (most use the lost-wax technique). We took along a plaster cast of the horse, and told Mr. Rassy that we were interested in having a bronze cast of it; how would he do it? Mr. Rassy took the horse and laid it on its side in a bed of sand mixed with clay. Then he said, "Now I would fill the mold with sand up to this point" – and he indicated a line that exactly followed the line running around the body of our horse. "I would put lumps of sand mixed with clay all over the upper part; then I'd take them away, take out the model, and put the pieces of the mold back together again. You could cast a solid bronze horse in it."

We were about to thank him and go away, when he added, "But I wouldn't do it that way." "What would you do?" I asked. "I'd cast the horse hollow." "How?" "Well, you do it exactly as I've said, but then you make a core out of this sand and clay, and you stick iron wire – about the thickness of coat-hanger wire – through it to support the core so the bronze can flow around it. The iron wire won't melt." I objected that the ends of the wire would stick out. "You cut them off," Mr. Rassy said, "and make little bronze plugs to cover the holes."

Dietrich and I thanked him and rushed back to the Museum, because we realized that we had seen these little plugs on the horse. We had always thought that they were ancient repairs, because in ancient castings you get little bubbles and it's normal for these to be repaired with rectangular bronze plugs like the ones on our horse. We counted them, and they were exactly where Mr. Rassy said they would be – on the head and back, and several along the sides.

How could we find out what really was inside the horse? Of course we thought of x-rays, but in those days there was no way of getting through this much bronze with x-ray equipment; if you did penetrate it, the x-rays would be so scattered that you could not get a clear image of the interior. But the following day, a young assistant curator in the Greek and Roman Department, an Englishman by the name of Brian Cook, came up with a very ingenious thought. "If there's iron in there," he said, "a magnet will stick to it." So he took a little magnet, attached it to a string, moved it around the

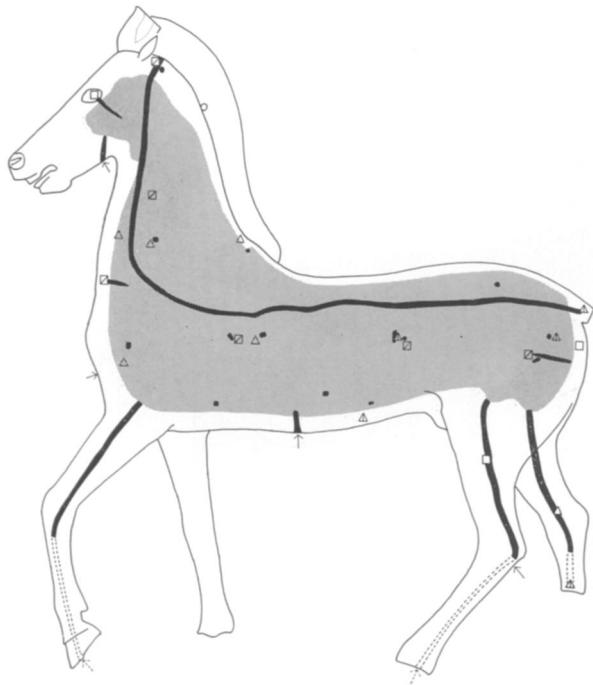
horse, and plotted the points of magnetic attraction on a chart (Figure 4). In some places the magnet stuck to the horse's body; most of these coincided with the location of the plugs. There were other places where the magnet swung toward the horse, but did not stick; these are places where the iron does not come as close to the surface. And so, in the spring of 1962, we had a chart of the internal structure.

Since then Dietrich and I continued to search for ancient examples made by this sand piece-mold process. They do not exist. We were also searching for even more definitive proof that the horse was a fake.

This past summer I heard of an organization called Radiography Inspection Inc. that uses x-rays and gamma rays to inspect for flaws in the nine-inch steel plates on atomic submarines. And I thought, "That's for us!" I called them up and said that we had an art object that



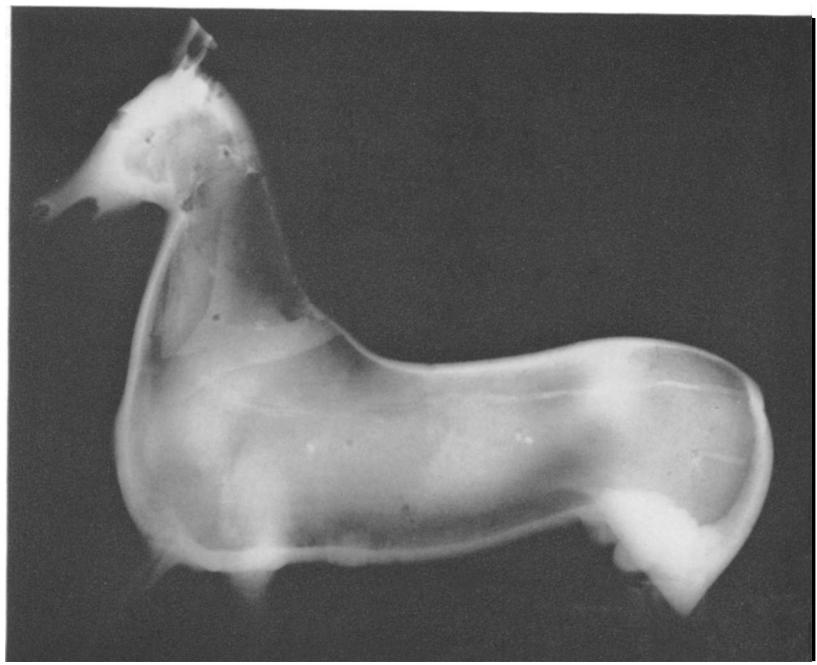
3. *The Museum's horse. Bronze, height 15³/₁₆ inches, weight 25¹/₂ pounds. Acc. no. 23.69*



4. *Chart showing the points of magnetic attraction*

5. *X-ray showing the iron wires and sand core*

	LEFT	RIGHT	CONTOUR
<i>Magnet sticks</i>	☒	△	→
<i>Magnet is attracted, but does not stick</i>	☐	△	→
<i>Iron, as seen in x-ray</i>	—		
<i>Iron, as conjectured (beyond limits of x-ray)</i>	⋯		
<i>Sand core</i>	⋯		



we wanted them to x-ray for us. On September 15, 1967, just a couple of months ago, they arrived here with a truckload of equipment. Figure 6 shows us in the North Parking Lot of the Museum. The radioactivity signs are for real; the chap who is setting up the equipment is licensed by the Atomic Energy Commission. The picture shows the preparation of the first test: very heavy x-ray equipment, the horse, and the film behind it. The image produced by these x-rays was not clear, so we switched to their heavy gun—Iridium 192, which is highly radioactive. This was exposed by gamma rays; they rushed the film into the truck and developed it; and in Figure 5 you will see, for the first time, the inside of the horse. You can see the cavity filled with the sand core, and then the faint, telltale line: the main iron wire running through the horse. The white spots are the ends of the transverse wires that also held the core. The shadowgraph confirms without doubt that the horse was made by the sand piece-mold process; it is the definitive proof of the forgery.

You may wonder why we know the horse is a forgery,

and not simply a work of art made in a neoclassical style. Because it was made with the intent to deceive: not only does it have a poor patina (since patina is a rather nebulous subject, I didn't even bother to bring it up), but it has deliberate mutilation—of the legs and the tail, for instance.

How old is it? Since it was done in the very sophisticated French sand-casting technique, I believe the horse was made in Paris between 1918 and 1923. I do not think that its style, the neoclassical stylization of archaic art, would have been possible earlier. This brings up a subject that Ted Rousseau touched on: why are art forgeries so attractive? The horse appeals to us, and has appealed to us for forty years, because it is closer to our taste than it is to the taste of the ancient Greeks.

What happens to it now? All forgeries found in the Metropolitan Museum are kept here for study purposes; they do not go out on the market. It will be on exhibition and available for study for as long as there is interest.

And that is the story of our Greek bronze horse. It's famous, but it's a fraud.

6. *Setting up the x-ray equipment*

