

# FOUNDRY TO FINISH

THE MAKING OF A BRONZE SCULPTURE

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THE GETTY INVITES VISITORS TO LEARN HOW BRONZES ARE CAST  
THROUGH STEP-BY-STEP MODELS AND X-RADIOGRAPHS

*Foundry to Finish: The Making of a Bronze Sculpture*

At the J. Paul Getty Museum, Getty Center  
Opening June 23, 2009

**Installation complements international touring exhibition**  
***Cast in Bronze: French Sculpture from Renaissance to Revolution***  
**on view at the Getty June 30 – September 27, 2009**

LOS ANGELES—Artists have used bronze for casting sculptures since the early civilizations. Lost-wax casting, the most widely used method, was employed by the Egyptians and the Greeks, and later revived by Renaissance sculptors. *Foundry to Finish: The Making of a Bronze Sculpture*, on view beginning June 23, 2009 at the J. Paul Getty Museum at the Getty Center, will give viewers a rare look at this process, using step-by-step models and X-radiographs.

The 13 step-by-step replicas displayed in *Foundry to Finish* reproduce one of the great masterpieces by Dutch sculptor Adriaen de Vries (1556–1626), the Getty's *Juggling Man* (1615), and illustrate the artist's sculpting and casting process. X-rays reveal the interior of the sculpture and provide clues about de Vries' construction and casting methods.

First, de Vries built an armature of iron rods tied together with wire, which served as a support while the artist modeled wet clay onto the armature to construct a slightly smaller, simplified version of the final composition. Then, the clay was heated to eliminate all moisture. An even layer of wax would then be added over the clay until the final form was achieved. The clay form—now hidden inside the wax—is called the core of the sculpture. The core acts as the inner section of the casting mold.

Next, the artist applied a network of wax rods (called sprues) to the model that would act as a circulatory system, bringing molten metal into, and air and gasses out of, the mold. A

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wax pouring cup was attached, and short iron pins (called core pins) were inserted through the wax and into the core. Using his hands or a brush, the artist applied the outer part of the mold, called the investment (a heat-resistant mixture of sandy clay and water) onto the sprued model. Investment was built up until the model was completely embedded in a solid mass—containing the armature, the inner clay core, the modeled wax layer, and the core pins (which penetrate the investment through the wax and into the core). Turned upside down in an oven (called a kiln), the mold was heated until the wax layer surrounding the clay core had melted out, creating a space for the molten bronze that would become the sculpture. The core pins kept the core in alignment once the wax was gone, then the investment was turned right side up and molten bronze was poured into the hole at the top. Bronze filled the space left by the melted wax, and would harden when the investment was allowed to cool. When the solid investment material was broken, it revealed the bronze inside—letting the sculptor know for the first time whether or not his cast had been successful.

At this stage, a bronze bore little resemblance to the final, polished sculpture. First it had to be cleaned up, a process called fettling and chasing. The bronze sprues were removed by sawing, filing, or chiseling, and the iron core pins were pulled out. The dark, sooty oxide layer covering the surface was scrubbed off. Core-pin holes were patched and flaws were repaired using plugs made of discarded bronze from the removed sprues. In the sculpture featured in this exhibition (*or installation*), de Vries cut out three small miscast areas at the back of the left leg and filled them with round plugs. Next, he smoothed the edges of the repairs to disguise them.

The final steps were to refine and polish the sculpture—sharpen details of the face, hair, nails, etc. – using small, specially-shaped iron tools. The surface was given a smooth, reflective shine by polishing with light abrasives or by burnishing (rubbing) with a rounded tool. The finished bronze preserved every detail of the artist's original wax model in a material that was both permanent and precious.

Patina is the term used to describe the surface finish of a bronze. The word refers both to the coatings that the artist intentionally applied and to the natural changes that occur over time due to weathering and oxidation. This exhibition shows four different types of varnish-like patinas that de Vries could have chosen for his sculpture. Once the bronze is given its final texture and polished, the artist chooses from a wide range of patinas that protect the surface and vary its appearance. A patina can increase luster, change the color, or hide casting imperfections.

***Foundry to Finish: The Making of a Bronze Sculpture*** will go on view June 23, 2009 in the North Pavilion of the J. Paul Getty Museum at the Getty Center, and is curated by Jane Bassett, conservator of sculpture and decorative arts conservation, and Peggy Fogelman, former assistant director, education at the Getty Museum.

### **Related Exhibition**

#### ***Cast in Bronze: French Sculpture from Renaissance to Revolution***

June 30–September 27, 2009

Taking advantage of the current resurgence of interest in sculpture and a widespread taste for Renaissance and Baroque art, this exhibition brings together a large number of spectacular bronzes that exemplify an art form that has been described as "among the most splendid manifestations of artistic genius in France." It is the first comprehensive exhibition on the art of French bronze sculpture from its beginnings during the Renaissance until the end of the ancien régime. Co-organized by the J. Paul Getty Museum, the Musée du Louvre, and The Metropolitan Museum of Art, this exhibition reflects the latest scholarship on the subject. At the same time, it provides a platform for the exploration of 16th- to 18th-century French culture on many levels.

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**Note to editors: Images available on request**

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