Journal of Roman Archaeology 35 (2022), 570–575
doi:10.1017/S1047759421000842

Plaster, wax, and bronze: Medardo Rosso meets the ancient world

Carol C. Mattusch

Department of History and Art History, George Mason University <mattusch@gmu.edu>

HECKER, S., ed. 2021. *Finding Lost Wax: The Disappearance and Recovery of an Ancient Casting Technique and the Experiments of Medardo Rosso*. Studies in Art & Materiality 3. Leiden and Boston: Brill. Pp. xxviii + 350, 157 figs (128 color). ISBN 978-90-04-43421-9.

This book is not about ancient casting, nor, at first glance, is it about anything before the 19th c. Nonetheless, the importance of technical perspectives in the study of ancient bronze statuary cannot be overemphasized, and archaeologists and ancient art historians will be able to ferret out from these 16 essays valuable information about ancient casting that goes far beyond stylistic study. The authors of Chapters 10–14 consider surface features visible to the eye (Chapter 10), waxes of different consistencies (Chapter 11), the accuracy of X-ray fluorescence spectrometry (XRF; Chapter 12), digital surface comparisons (DSC) of bronzes that may belong in a series (Chapter 13), and the misleading changes introduced by modern cleaning and restoration (Chapter 14). Even the chapters on modern casting techniques illuminate indirectly how misunderstandings of ancient processes came about in the early 20th c.

Readers who do not recognize the name of Medardo Rosso (1858–1928) will have to wait until the second half of the book, which contains the results of a joint study of the materials, processes, and techniques that art historians and scientists observed in a series of casts of the *Bambino ebreo* made between 1892 and 1894. Rosso's plaster, wax, and bronze casts are thoroughly illustrated in Part 2, but not until then, which will lead archaeological readers to spend a good deal of time wondering what Rosso's work looked like. Many will be familiar with the fact that lost-wax casting flourished in Italy during the 19th c., particularly after the Unification in 1860, at which time museums opened to the public, and permits were issued to mold and copy works – primarily antiquities – in museum collections, with production by the lost-wax method. This was the world of Rosso, who trained in Milan as a sculptor-founder and took his experience in the lost-wax method to Paris, the center of the sand-casting industry.

S. Hecker, an art historian who has written much about Medardo Rosso, introduces the book by stressing France's leadership in bronze casting during the 19th c., the impetus coming from Italian immigrants. Hecker distinguishes between French sand casting and lost-wax casting, a subject that confounded archaeologists for much of the 20th c. The essays are "part of a growing body of scholarly studies on serial reproduction" (8), a statement that should pique the interest of archaeologists studying serial production in antiquity.

The essays in Part 1, "The global revival of lost wax casting," deal with France, America, Germany, Britain, and Japan – all countries to which Italian immigrants took their expertise. Why those countries were chosen, but not the industry in Italy itself, is not clear. In her overview, "Lost-wax casting" (Chapter 1), with no examples or bibliography, F. Bewer assures

readers that lost wax existed "throughout the centuries" (11). If models are existing bronzes, aftercasts can be difficult to distinguish from the models. This observation would benefit from citations of known examples of this practice, such as the bronze torso from Livorno in Florence.[1] Materials receive brief but tantalizing coverage: beeswax was mixed with tallow and turpentine to make it softer, and with rosin or paraffin to make it harder. Plaster mold material was replaced by flexible materials, such as gelatin or synthetic rubber, and later with rubber compounds. Alloys were chosen for suitability, color, availability of materials, and maybe even for their "symbolic associations" (13), a likely allusion to alchemy.[2]

In "Sculptor-founders in late nineteenth-century France" (Chapter 2), E. Lebon observes that the need for cannons had driven sand casting, a process that was cheaper than lost wax and "adaptable to a division of labor" (19). It was fast and efficient, with reliable results. Sculptors had to choose between art for the privileged few, taking "full control of their work by undertaking their own casting" (27), or art for all, whereby sculptors were also workmen. Many French sculptors finished their models, contracting out the production to industrial sand casters so that their work would look its best. In Italy, however, lost wax was used exclusively, and it was accessible to all. There was much experimentation with this method in France. Clays were brought from Italy; a hard vegetal wax consisting of palm leaves from Guinea yielded astonishingly precise results. Paul Wayland Bartlett (1865–1925) made beautifully patinated tiny animals, with expertise that recalls Pliny's awe at the miniature chariot group by Theodoros of Samos (Plin. *HN* 34.83). The experiments and division of labor in 19th-c. French foundries reflect questions about experimentation and division of labor in ancient foundries. Rodin left traces of his work "in a spirit of aestheticism," but Rosso left all the "scars, shortcomings, and stains" and "celebrated the act itself" (58). Lebon notes that the introduction of flexible gelatin molds made the process easier and cheaper than it had been with rigid plaster piece-molds; they could be reused up to a dozen times, and new ones could be made in a foundry that saved "original models and molds as business assets" (62), which is still the practice today.

In "A tale of two foundries" (Chapter 3), A. Boulton states, "Serial sculpture emerged in Paris during the nineteenth century with the rise of a newly affluent middle class anxious to show status through artwork. Bronze sculpture sized for tabletop display that could be cost-effectively replicated fit the bill, boasting 'art cred' that dated back to the ancient Greeks, but that was more affordable than larger unique sculpture" (67). This is an overstatement: small-scale Greek bronzes were not used as home decor until the Greco-Roman period, and there is much evidence for ancient large-scale bronze sculpture that was not "unique." Boulton observes that "Sand casting was hailed as the new modern industrial process and lost-wax casting was considered a time-consuming relic" (69). It was unusual that Frederick Remington kept control of his models for the *Bronco Buster* (1895) and was involved in their serial production by sand casting at the highly successful Henry-Bonnard Bronze Co., founded by Frenchmen in New York City in 1872. When Riccardo Bertelli of Genoa opened the Roman Bronze Works in New York City in 1897, using lost wax for serial production, Remington moved there. Artists could finally touch up the waxes of their works: "The Italian method introduced by Bertelli allowed molten wax to be painted onto a flexible mold made of gelatin, followed by application of liquid-

[1] Florence, Museo Archeologico Nazionale, inv. no. 1683. Hallett 2015, 131.

[2] This intriguing topic is pursued by Droth et al. 2005.

https://doi.org/10.1017/S1047759421000842 Published online by Cambridge University Press

core material" (88). Boulton does not say how models of the *Bronco Buster* differed from one another, nor does she say how large a series might have been, but both are interesting questions in light of the continued widespread production of many versions of the *Bronco Buster* even today.

In "The subtlety of the surface" (Chapter 4), V. Wiegartz focuses on the Gladenbeck and Noack foundries, established in Berlin in 1851 and 1897, respectively, by founders trained in Rome. They used lost-wax and flexible gelatin molds. In colder climates, bronze was better for outdoor sculpture than stone, which was "vulnerable to weathering and therefore less durable" (96). In Munich, the Königliche Erzgiesserei (Royal Ore [Bronze] Foundry) opened in 1825 (on what is now named Erzgiessereistrasse). The first manager had gone to Naples in 1821–1822, where he learned lost wax from Luigi Righetti, who was casting the colossal equestrian statue of "Charles III [properly Charles VII] of Naples after the model by Antonio Canova" (96). Wiegartz attributes the popularity of lost wax in Germany to the cultural aspirations of the middle class, who saw that process as being more refined than sand. At the same time, flexible gelatin molds made lost wax easier, less dependent on coldwork than sand, and therefore less expensive. Sand was good for industry, but lost wax was more about the surface.

Lost wax was revived in Britain ca. 1900 by Italian founders, following Italian *figurinai* (figurine makers) and street sellers who were active in Britain from the 18th c. onward. R. Wade points out in "Enrico Cantoni: From plasterman to bronze founder in late nineteenth-century Britain" (Chapter 5) that founders and *figurinai* worked side by side, and Cantoni was skilled in both areas. By 1881, he was making plasters with Raffaello Sani, who was married to a Caproni. By 1900, Cantoni had diversified, and his printed invoices read, "Moulding and Castings of all Descriptions for Sculptors. Plaster Casts Supplied for Schools. Casting in Bronze by lost wax known as the Cera Perduta Process, and also Bronzing and Colouring" (119). Wade does not mention that the Caproni family opened a successful business in Boston in 1890 – still operating today – selling plaster copies of more than 2,100 works ranging from antiquities to modern architectural elements.

M. M. Pecoraro's brief essay, "From the island of the sun to the empire of the rising sun" (Chapter 6), tracks the Sicilian sculptor Vincenzo Ragusa from Palermo to Milan to Japan in 1876, where he taught in the newly established imperial schools. Ragusa returned to Palermo with his Japanese wife, and they set up a school for lacquer, embroidery, ceramics, and Japanese lost-wax casting. It would have been interesting to read here something about the derivation of Japanese lost-wax casting from the highly developed Chinese skills, which were fully formed by the 3rd c. BCE.[3] Y. Tsuchikane, in "Defining modernity in Japanese sculpture" (Chapter 7), pursues the influence of Italian sculpture and lost-wax casting in Japan, first in the late 19th c., and again in the early 1960s, when the government sent artists to Rome and Milan to learn how to "express human qualities in metal" through lost wax, combined with other materials (165). Tsuchikane concludes that lost-wax casting removed the boundary between "the Western framework of fine art and Japan's domestic territory of decorative art in object-making" (166).

Part 2, "Medardo Rosso and the modernity of lost-wax casting," begins with "Framing Rosso" (173–76) by P. Curtis, who suggests that Rosso should be interesting to art

[3] Barbieri-Low 2007.

https://doi.org/10.1017/S1047759421000842 Published online by Cambridge University Press

historians in many fields. The link to Rodin, who introduced Rosso in Paris, would have been worth pursuing in a separate chapter. Unlike Rodin, Rosso made sculptures of anonymous individuals, using photography to get "multiple melting profiles" and catching "an apparently unstable motif" (174).

In "Medardo Rosso, the Italian sculptor-founder in Paris" (Chapter 8), S. Hecker explains that Rosso left behind evidence of production, such as sprues [gates], flaws, and holes from core-pins [chaplets]. He used unusual alloys. Rosso never dated or numbered his bronzes, treating each cast in a series differently "in spite of its status as a multiple" (178). A series might include plasters, waxes taken from molds, and bronzes, all mounted on unusual bases; he sold each piece as a finished work. Hecker continues with "The unstable act of seeing" (Chapter 9), exploring how Rosso photographed the sculptures, printing the photographs in different ways.

Although "Comparative visual examination of Medardo Rosso's *Bambino ebreo*" (Chapter 10) applies to Rosso, S. Hecker and A. Nevin describe physical features that relate to all bronzes, spelling out how casts can differ in size, color, definition, contrast, mounting, and materials. These are all points to consider in the examination of an ancient bronze, as well as thickness of the walls, drips, seams, and fingerprints – which record features from the wax working model – and patina, whether ancient finish or modern dirt.

F. C. Izzo and A. Nevin, in "Creative inconsistencies" (Chapter 11), offer the first qualitative study of waxes for Rosso, and they recommend further work on composition and working of the waxes in an effort to determine which were his and which were made posthumously by his son. This can add to what little we know from the literary testimonia about ancient waxes and from the bronzes themselves, because literally all surface details of a bronze, excluding inlays, were executed in the wax working model before casting. An ancient bronze that appears to be "glyptic" (carved) rather than "plastic" (modeled) is not an indication of its earlier date, as was once thought, depending upon the use of a carved wooden model or a modeled clay original.[4] Instead, it depends on the composition of the wax chosen for the working model.

F. Carò and L. Megens studied the chemical composition of four bronze casts of *Bambino ebreo* by portable X-ray fluorescence spectrometry (pXRF) in "Towards an understanding of Rosso's casting practice" (Chapter 12). XRF, a qualitative analysis, can be done in situ and is noninvasive, making it less difficult to obtain permission to take numerous readings from a single bronze. But the depth of XRF measurement is only a few microns (millionths of a meter); therefore, corrosion products, oxide layers, patinas, coatings, and whatever else might be on the surface, such as investment material, affect the results, as shown in a color plate (Fig. 12.1). These bronzes show variable metal compositions, although all contain copper, zinc, tin, and high lead. Readings on each bronze also varied as a result of the pooling of the lead. The authors recommend compiling a comparative database like theirs (Table 12.1), something useful also for ancient bronzes so long as the equipment and process are standardized.

Digital Surface Comparison (DSC) is another valuable way to compare objects in a series, as M. Rahrig and R. E. Street demonstrate with the *Bambino ebreo* in "Rethinking uniformity" (Chapter 13). Rosso worked with misaligned molds, so the authors only compared surfaces

[4] See Kluge 1927; most recently, Carpenter 1960.

https://doi.org/10.1017/S1047759421000842 Published online by Cambridge University Press

of individual sections. Even so, they learned that each cast is different, again showing Rosso's intention to create unique works within the series (300–301). In fact, DSC could resolve questions about the surface similarities of such antiquities as the Riace Bronzes, previously measured by hand, and the five bronze and marble versions of the Apoxyomenos.[5]

In "New technologies, new approaches" (Chapter 14), L. S. Zgonc uses 3D scans to address restorations of a wax-over-plaster cast of the *Bambino ebreo*. The scans were not entirely reliable, being flawed by dirt and cat hair in the wax, previous overcleaning, fragility, and the amount of loss. The cast had been installed in debilitating sunlight; it had been restored, but the angle of the head was wrong. Nonetheless, it was possible to stabilize and restore the disfigured areas, shown in 18 excellent color plates. This brings to mind Herculaneum and the 18th-c. restorations of the Roman bronzes from the Villa dei Papiri: modern bronze busts, plaster eyes painted to look like ancient bronze, and mounts on which formerly upright heads were angled forward, as was typical of 18th-c. busts.

A. Lacey's "Impressions: An artist-founder's impressions of Medardo Rosso, artist-founder" (Chapter 15) begins with a clear warning about modern practice: "The hybrid of sculptor-founder is rare in the art world, probably because the act of sculpting is already difficult enough, and successfully translating that into bronze requires a whole new skill set that does not necessarily sit well with that of the artist" (317). Rosso was both artist and founder, mostly by necessity, but also to ensure his own participation in the task by altering every work and resisting the production of an edition. He made wax the end – rather than simply part – of the process, combining his "aesthetic with the mechanics of an otherworldly alchemical process" (324).

Ancient lost-wax casting is comparable to modern practice in many ways, and the collaborative approaches to 19th-c. context, technology, and serial production presented in Chapters 10–14 of *Finding Lost Wax* mirror some of the ways in which we address the study of ancient bronzes. Chapter 10 suggests what to look for in a visual study of a bronze. Chapter 11 shows the value of studying the evidence for wax, probably the most important material used to produce a bronze, ancient or modern: its consistency, color, melting point, and viscosity can be controlled; wax can be modeled by hand or carved with tools; and it can be tracked on the bronze.

The limitations of qualitative metal analysis (XRF) are evident in Chapter 12. More accurate readings are obtained through quantitative (invasive) techniques such as atomic emission spectroscopy (AES), inductively coupled plasma mass spectroscopy (ICP-MS), and electron probe microanalysis (EPMA). These have been applied to Roman bronzes, although a permit is likely to be issued for only a single drilling, limiting the results, and skewing them if that drilling is made at a point where lead has isolated itself. Using more than one type of analysis to test some of the same major, minor, and trace elements provides useful checks.

The scholarly tradition for Greek bronze "originals" and Roman marble "copies" is now largely abandoned, considering the growing body of evidence for serial production of both Greek and Roman statuary. Lost-wax casting is, by its very nature, a process of reproduction. The key is wax, for which ancient bronzes themselves provide the evidence. A finished bronze cast from a wax working model is of nearly the same thickness as the wax that lined the

[5] Sabbione 1984, 212–25; Daehner and Lapatin 2015, 270–81.

https://doi.org/10.1017/S1047759421000842 Published online by Cambridge University Press

master molds, and its interior and exterior surfaces record the appearance of the wax. Joins between wax slabs may be seen on the interior of a bronze, as well as the marks of blades, gouges made by fingernails, and drips and puddled wax. Tools such as DSC and 3D scans can help, not only in the case of Rosso but also in the study of ancient bronzes. The market demand in antiquity for both public and private statuary confirms without a doubt the status of bronze statuary as a major industry, surpassing the thriving 19th-c. markets described here (Chapters 2–8) for bronzes and for plaster copies of ancient bronzes.

Rosso sold his plasters, his waxes, and his bronzes. Perhaps he was thinking about Arkesilaos, whose models sold for more to artists than finished works by other artists (Plin. *HN* 35.155). For Rosso, each transformation of his work was valuable.

References

Barbieri-Low, A. 2007. *Artisans in Early Imperial China*. Seattle: University of Washington Press.

Carpenter, R. 1960. *Greek Sculpture*. Chicago: University of Chicago.

Daehner, J., and K. Lapatin. 2015. "*Apoxyomenos* and the art of replication." In *Power and Pathos: Bronze Sculpture of the Hellenistic World*, ed. J. Daehner and K. Lapatin, 270–81. Los Angeles: J. Paul Getty Museum.

Droth, M., F. Scholten, and M. Cole, eds. 2005. *Bronze: The Power of Life and Death*. Leeds: Henry Moore Institute.

Hallett, C. 2015. "Looking back: Archaic and classical bronzes of the Hellenistic and Roman periods." *Power and Pathos: Bronze Sculpture of the Hellenistic World*, ed. J. Daehner and K. Lapatin, 127–49. Los Angeles: J. Paul Getty Museum.

Kluge, K. 1927. *Die antiken Grossbronzen.* Vol. 1. *Die antike Erzgestaltung und ihre technischen Grundlagen*, ed. K. Kluge and K. Lehmann-Hartleben. Berlin: Walter de Gruyter.

Sabbione, C. 1984. "Appendice II: Tavole delle misure (con disegni di Alan Ortega)." In *Due Bronzi da Riace: Rinvenimento, restauro, analisi ed ipotesi di interpretazione*, Vol. 1, 211–25. BdA serie speciale 3. Rome: Istituto poligrafico e zecca dello stato.

Journal of Roman Archaeology 35 (2022), 575–580
doi:10.1017/S1047759422000198

New light on the Rhodian lamp market

Jeremy Rossiter

Department of History, Classics, and Religion, University of Alberta <jeremy.rossiter@ualberta.ca>

KATSIOTI, A. 2017. *The Lamps of Late Antiquity from Rhodes. 3rd–7th centuries AD*. Oxford: Archaeopress. Pp. 669 + ii, with numerous color illustrations.[1]

This new catalogue of Roman and Late Antique lamps from Rhodes follows on the heels of several other recent publications of lamps of the same period from different parts of Greece including Athens, Corinth, and Isthmia.[2] Katsioti's (K.'s) aim is to make available the essential data for the large number of (mainly) pottery lamps which have been found in Rhodes

[1] As mentioned in the preface, the English text is a translation from the Greek by Doniert Evely.

[2] Böttger 2002 (Athens); Garnett 2012 (Corinth); Wohl 2017 (Isthmia).

