

The manufacturing process of the gold bust of Marcus Aurelius: evidence from neutron imaging

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This paper presents the results of applying neutron imaging methods to the gold bust of Marcus Aurelius, an analytical procedure that was carried out in 2006 at the Paul Scherrer Institut in Villigen (Switzerland). The results have produced a better understanding of the gold repoussé manufacturing techniques for large pieces.

Given the number of gold statues that existed at Rome and in its provinces,¹ the preserved pieces represent only a tiny fraction; to recover the precious metal, most gold objects were eventually melted down, with the result that only a very small number of pieces are left. That scarcity explains our difficulties in studying the characteristics of this category. Just 6 gold busts of the Roman period have been documented. The bust of Marcus Aurelius² was found in a sewer running beneath a sanctuary of *Aventicum* (figs. 1, 6a and 16).³ Then there is the bust of Septimius Severus discovered at Didymoteichon (NE Greece),⁴ a small fragment from the shoulder *pteriges* of a breastplated bust of the 2nd c. A.D. found at the fort of Dambach (Germany),⁵ the Late Roman head inserted into the 9th-10th c. statue of St. Fides in the Abbaye of Conques (France),⁶ and the much smaller busts of (possibly)

1 G. Lahusen, *Römische Bildnisse. Auftraggeber, Funktionen, Standorte* (Mainz 2010) 510-13.

2 The original (inv. no. 39/134) is not on permanent display in the Römermuseum Avenches but a copy of the bust is. H. 33.5 cm; wt. 1589.07 gm, 22 carat. The first publication was by P. Schazmann, "Buste en or représentant l'empereur Marc-Aurèle trouvé à Avenches en 1939," *ZSchwArch* 2 (1940) 69-93. When found, the bust was only slightly damaged; it was cleaned and restored in the Swiss National Museum in Zurich (ibid. 70). No restoration report exists, but there are photographs in the archives of the Swiss National Museum.

3 The main illustrations are: Schazmann ibid. figs. 1-5, 13, 15 and 17-19; H. Jucker, "Marc Aurel bleibt Marc Aurel," *Bull. Assoc. Pro Aventico* 26 (1981) 5-36 with Abb. 1-10; G. Lahusen, "Zu Bildnissen aus vergoldeter Bronze und Edelmetall," in id. and E. Formigli, *Römische Bildnisse aus Bronze: Kunst und Technik* (Munich 2001) 505-21 with Abb. 1-3; L. A. Riccardi, "Military standards, *imagines*, and the gold and silver imperial portraits from Aventicum, Plotinoupolis, and the Marengo treasure," *AntK* 45 (2002) 86-99 with pl. 20.1; A. Hochuli-Gysel and V. Brodard, *Marc Aurel. Die unglaubliche Entdeckung der Goldbüste in Avenches* (Documents du Musée Romain d'Avenches 13; 2006) figs. 50-64; K. Lapatin, *Luxus: the sumptuous arts of Greece and Rome* (Los Angeles, CA 2015) 82 pl. 51, with p. 235 (*contra* Lapatin, the bust is not conserved in the Musée d'archéologie et d'histoire, Lausanne).

4 Bust of Septimius Severus from Didymoteichon, now in the Archaeological Museum Komotini, inv. no. 207, h 25 cm, wt 980 gm). It was found without an archaeological context. See Lahusen (supra n.3) fig. 4; Riccardi (supra n.3) pl. 20.3; Hochuli-Gysel and Brodard (supra n.3) 96, fig. 104; Lapatin (supra n.3) 83, pl. 52, with p. 235. Publication is in preparation by A. de Pury-Gysel.

5 Archäologische Staatssammlung, Munich, inv. no. 1985.2505. Found in a military context of the 2nd c. A.D. Fragment of the board from the *pteriges*, the leather shoulder protection of the cuirass; l. 4.5 cm. See B. Steidl, "Die goldene *imago* eines Kaisers vom raetischen Limes," in M. Kemkes and C. Sarge (edd.), *Gesichter der Macht. Kaiserbilder in Rom und am Limes* (Schriften des Limesmuseums Aalen 60; 2009) 108, fig. 150; V. Selke, *Römische Funde aus Dambach am Limes (1892-2007)* (Materialhefte zur Bayerischen Archäologie 100; 2014) 76, pl. 49, no. 1561.

6 Now in the Abbaye de Conques; h 16 cm. Provenance unknown; mediaeval re-use. See J. Taralon and D. Taralon-Carlino, "La majesté d'or de sainte Foy de Conques," *BMon* 155.1 (1997) 7-73; *Le trésor de Conques* (exh. cat., Paris); Hochuli-Gysel and Brodard (supra n.3) 98, fig. 105.