



Trabajos de Egiptología

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Alfonso MARTÍN FLORES

**Napatan Tomb Decorations. Loans from Private Theban Burials
in the Royal Kushite Necropolises**
Simone PETACCHI



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Papers on Ancient Egypt

**Preliminary Report on the Third and Fourth Seasons
of the New Kingdom Scribes Project (2021–2022)**

Lucía DÍAZ-IGLESIAS LLANOS, Ángeles JIMÉNEZ-HIGUERAS,
Daniel Miguel MÉNDEZ-RODRÍGUEZ, Ignacio BERMEJA GIGORRO,
Sagrario MARTÍNEZ RAMÍREZ, Santiago SÁNCHEZ-CORTÉS, Antonio GÓMEZ LAGUNA

**Songs and Hymns for Hathor as Gold from the Old Kingdom
to the Late Period. Part I. Corpora of Texts and Complementary Documents**
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Miguel JARAMAGO



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2022

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Artículos | Articles

A Female Egyptian Statuette in the Museo Arqueológico Nacional, Madrid

Miguel JARAMAGO

In this paper, a silver sculpture that entered the Egyptian collection of the Museo Arqueológico Nacional, Madrid, in 2005 is studied. It is a striding figure on a rectangular base, registered as an image of the Egyptian goddess Khereduankh, and dated to the Ptolemaic Period. In this study, a possible attribution to the goddess Renpetneferet is not ruled out and the results of a metallographic analysis are used to establish a more accurate date of the production of the sculpture.

Una estatuilla femenina egipcia del Museo Arqueológico Nacional de Madrid

En este artículo revisamos una escultura en plata que entró a formar parte de las colecciones del Museo Arqueológico Nacional, Madrid, en el año 2005. Se trata de una figura en pie, en actitud de marcha, sobre pedestal rectangular, que es presentada en la institución como una imagen de la divinidad Khereduankh y fechada en época ptolemaica. Consideramos que no debe descartarse una posible atribución a la diosa Renpetneferet y, mediante los resultados de un análisis metalográfico realizado sobre la pieza, proponemos una cronología más ajustada para la elaboración de la escultura.

Keywords: Imhotep, Khereduankh, metallographic analysis, Ptolemaic Egypt, Renpetneferet, silver.

Palabras clave: análisis metalográfico, Egipto ptolemaico, Imhotep, Khereduankh, plata, Renpetneferet.

The production of surviving Ancient Egyptian silver sculpture in the round is small (compared, for example, to the enormous quantity of bronzes that continue to be found in ongoing excavations), mainly – among other reasons – because of the scarcity of silver in Egypt itself. For this reason, it is particularly interesting to present this statue, which entered the collection of the Museo Arqueológico Nacional (Madrid, hereafter MAN) in 2005 following acquisition by an antiquities dealer. When it arrived at the museum,

the sculpture was subjected to a metallographic analysis, which may allow us to establish a possible chronological framework for its production.

Before proceeding, it should be mentioned that work has been carried out in the Museum, a direct examination of the sculpture, and on the excellent photographs of the piece provided by the MAN, as well as on the results of the metallographic analysis carried out by the museum which have also been provided by the MAN.



Figure 1. Complete image of the statuette MAN 2005/135/1. Photograph provided by the Museum. Author: Ariadna González Uribe.



Figure 2. Detail of the lower end of the tunic of statuette MAN 2005/135/1, with an indication of the seam that runs along the entire lower part of the dress. Photograph provided by the Museum. Author: A. González Uribe.

The museum label of the sculpture is:¹

Accession Number: 2005/135/1

Medium: Alloy of silver (88.498 %), copper (7.43 %), and lead (4.07 %).

Measurements of the base: Length: 6.3 cm; width: 3.3 cm; height: 1 cm.

Dimensions without base: Height 14.3 cm; width: 5 cm.

Weight: 277.2 gr.

Technique: Silver casting.

Year of Entry: 2005.

1 | Description. Condition

1.1 | The image analysed in this article is a silver statuette of a young woman. She is depicted with her left leg advanced in a striding pose

atop a rectangular plinth. This is an anepigraphic pedestal, in the shape of a square prism, a sort of hollow plinth with a central stem protruding from underneath the base, which would allow the figure to be inserted into external support, perhaps a wooden one (fig. 1). She wears a long, close-fitting dress over her slender body. Her long tunic (which is assumed to be short-sleeved, although the artist has not indicated the limits of the sleeves or the neckline) leaves only her feet (at ankle level) and her arms outside the dress. In the lower part of the tunic, a continuous incision has been made to mark the presence of a fold that is either a hem or a decorative seam (fig. 2), which runs parallel to the edge of the tunic along its entire lower perimeter; this detail can be seen in some other sculptures (e.g. the private

¹ The measurements were kindly provided by Dr Esther Pons Mellado, Head Curator of the Egypt and Near Eastern Section at the MAN. The rest of the museum label data comes from the *Ceres-Red Digital de Museos* website (<https://ceres.mcu.es/pages/Main>). The results of the metallographic analysis (also provided by the same curator) are commented on in section 3.2.

stone statue Cairo JE 38017 from the Karnak Cachette, dated to the 1st century BC).² The torso shows a female silhouette with a flat belly (with no indication of the *linea alba*),³ a rounded navel, a smoothly marked pubic triangle, a narrow waist, smooth hips, and shoulders (the right slightly lower than the left). As for the full breasts, they are not individualized and there is no indication of nipples under the tunic (fig. 3).

She holds her right arm at her side, clasped (thumb pointing downwards); her left arm is bent at the elbow, also with the thumb straight out, and has pierced fists that once held additional implements; this must have been designed so that the figure would perhaps be holding a long staff (a papyrus sceptre?) in her left hand and an amulet (an *ankh*?) in her right hand (fig. 4). Very similar poses are displayed by many late bronzes representing goddesses: Neith,⁴ Nekhbet,⁵ Mut,⁶ lion-headed goddesses,⁷ bull-headed goddesses,⁸ Satis,⁹ Maat,¹⁰ Hathor,¹¹ etc.

The legs are hidden under the tunic, so that only the rather large bare feet can be seen, with an indication of the toes, but without – as is usually the case in similar pieces – singularizing other anatomical elements (for example, the bulges



Figure 3. Detail of the torso of statuette MAN 2005/135/1. The *linea alba* is absent, and a small loss of metallic material can be seen at the level of the diaphragm. Photograph provided by the Museum. Author: A. González Uribe.

² Albersmeier 2002: 325–326.

³ However, the *linea alba* is represented in other female statues of the 1st millennium BC, e.g. in the Neith bronze from the Allard Pierson Collection, Amsterdam, inv. 391 (Kaper 2000: 270).

⁴ Hildesheim, Pelizaeus–Museum, No. 43, in Schulz 1996: 84 and fig. 82; Emory, Michael Carlos Museum, Inv. No. 2012.046.001 and 2018.010.785; Strasbourg, Musée Archéologique, Inv. No. 11.987.0.71, in Schweitzer and Traun-ecker 1998: 32 no. 30; Paris, Fondation Custodia, Inv. No. 1994–0.3, in Cannuyer 2016: 314, etc.).

⁵ Cairo, Egyptian Museum, Daressy 1905–1906: pl. LIV, No. 39141.

⁶ Angers, Musée Pincé, Inv. No. MTC 8484, in Affholder-Gérard and Cornic 1990: 49, No. 12.

⁷ Weiß 2012: Taf. 38, No. 682, 683; Libert 2016: 352–353; Daressy 1905–1906: pl. LIII, No. 39088.

⁸ Tiribilli 2018: 129, No. 171, Weiß 2012: Tf. 37, No. 661, 662, 664.

⁹ Cairo, Egyptian Museum, Daressy 1905–1906: pl. XLIX, No. 38988.

¹⁰ Athens, National Archaeological Museum, Inv. No. X68.

¹¹ Cairo, Egyptian Museum, Daressy 1905–1906: pl. XLIX, No. 38979.



Figure 4 and 5. Left: Statuette MAN 2005/135/1. The arms adopt a canonical position: the left one is bent forward (did she once hold a sceptre?), the right one runs close to the body (did she carry an *ankh* in her fist?). Photograph provided by the Museum. Author: A. González Uribe. Right: Detail of the wig of the statuette MAN 2005/135/1: short locks, in concentric parallel lines. The presence of greenish stains, as a result of superficial corrosion of the copper present in the alloy, leads us to suppose that the statue may have worn a (bronze?) headdress on the wig. Photograph provided by the Museum. Author: A. González Uribe.

corresponding to the lateral malleoli or the heel are missing).

The head is covered by a short, archaizing wig with staggered quadrangular locks¹² arranged in

concentric horizontal rows when viewed from above (figs. 5 and 7a–d), completely covering the ears and the head in the manner of a skull-cap (e.g. following the pattern of the Saite silver

¹² On the arrangement of the locks in this type of wig, and its relative chronology, see Bosse 1936: 59, n. 1.

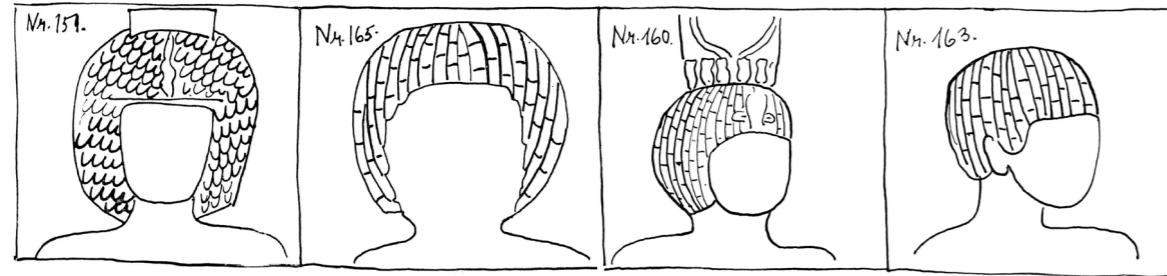


Figure 6. Egyptian wigs with staggered locks, chronological variants in the 1st millennium B.C. (Bosse 1936: Tf. XVIII): (a) Twenty-second Dynasty; (b) Twenty-fifth Dynasty; (c, d) Twenty-sixth Dynasty.

female statue Metropolitan Museum of Art, Inv. No. 30.8.93,¹³ which, however, exposes the ears and neck).¹⁴ This archaizing *Kurzhaarperücke* is a revival from the Third Intermediate Period (hereafter TIP) (fig. 6) and it is also depicted on the so-called *neomemphite* reliefs. In addition to the above-mentioned example (in silver) from the Metropolitan Museum of Art, Inv. No. 30.8.93, another group of statues (in stone), dated to the 30th Dynasty or the beginning of the Ptolemaic Period¹⁵ show this kind of wig – or similar – and they are considered to be images of queens. Finally, the Ptolemaic bronze in the Museo Archeologico Nazionale di Napoli, Inv. No. 523 must not be forgotten,¹⁶ in which a woman wearing this wig (a priestess? a devotee?) carries an image of Bastet on her left shoulder.

In the centre of the forehead, there is the protome of a poorly detailed *uraeus*, with a not very prominent head, a slightly asymmetrical

elongated hood, and a body with little longitudinal development.

The woman's face (fig. 7a) is framed quadrangularly on three sides by the wig. Her eyes, without pupils, have the folds of both eyelids, and her eyebrows are indicated in relief, but the cosmetic line has been omitted. Her mouth is closed, with fleshy lips; her well-defined Cupid's bow, her nasolabial furrows, and also her oral commissures are marked. Her nose is bulbous, with broad *nasal alae*; viewed from the side her nasal bridge (*dorsum nasi*) is slightly depressed at its midpoint. The absence of chin is striking, especially when viewed in profile (figs. 7b, 7d); it is a receding chin, with practically no parallel either in Egyptian sculpture or in the female portraits found in the Hellenistic numismatics of Egypt, but which, curiously, can be seen in some Graeco-Roman funerary masks.¹⁷ In any case, certain elements

¹³ Becker, Pulosi and Schorsch 1994: 40, fig. 7; Russmann 2008: 130–133.

¹⁴ Detail noted in Aubert and Aubert 2001: 298, for the images of Khereduanekh. On the origin and development of this wig, see Russmann 2008: 130.

¹⁵ Such as Copenhagen, Ny Carlsberg Glyptotek, ÆIN 1733, London, British Museum, EA 57355 and Paris, Musée du Louvre E 10758; see Albersmeier 2002: 159, 335–336 and 355.

¹⁶ Barocas *et alii* 1989: 102, No. 10.98 and fig. 12.1; d'Errico 2000: 40.

¹⁷ Vandenbeusch, O'Flynn and Moreno 2021: 293, fig. 16 (EA 29472).



Figure 7. Statuette MAN 2005/135/1. Photographs provided by the Museum. Author: A. González Uribe.

a) Face from the front. Framed by the limits of the tufted wig covering the ears, it exhibits an *uraeus*. The different height of the shoulders is perceptible in this picture. b) Right face profile. Striking absence of chin. The nose flaps also appear to have been worked on by hand. It is also clear the correction made in the direction of the nasal septum. c) Back of the head. The coloured patches due to corrosion (silver chlorides, copper salts) located in several areas, and the bubbles produced during the cooling of the alloy, are visible. d) Left face profile.

of her face (the absence of a cosmetic line, the slightly depressed profile of the nasal bridge, the unmarked chin) offer an image somewhat different from the conventional faces of Egyptian art. Perhaps her face was slightly retouched at a later date or by a second hand?

1.2 | As far as its condition is concerned, it is generally very good. However, it has several small defects on its surface. On the one hand, there are numerous pores or hollows of different diameters on its surface, caused by the formation of bubbles from the gases emitted during the elaboration and solidification process of the piece.¹⁸ There are also many scratches on the tunic (fig. 8), base, and neck (probably due to previous careless attempts to polish or physically clean of the surface), as well as greyish and greenish stains in areas of the base and the feet (perhaps due to surface corrosion with the formation of silver chlorides, chlorargyrite); greenish stains (copper salts, perhaps secondary paratacamite, produced by the alteration of the copper in the alloy, in an excessively saline and arid environment) are also visible in several places on the wig. This has led us to believe that she may have been wearing some sort of crown on her head. Finally, metal has been lost in various places (as a result of deliberate selective removal? or by repairing large pores with plugs that have fallen out over time?): on the left side of the torso, on various edges of the base, on the thumb of the right hand, and so on. The Restoration Department will have the final word on the various types of localised corrosion on the piece, the scratches visible in the patina, and their possible causes and treatment, if any.



Figure 8. Detail of the tunic of statuette MAN 2005/135/1, in the area covering the legs. Scratches due to possible mechanical cleaning of the surface have left traces of parallel and circular lines. Photograph provided by the Museum. Author: A. González Uribe.

1.3 | Based on comparisons to similar examples in bronze, the statuette might have had some additional details in a hypothetical final stage of completion, such as the missing pupils, the tunic (since there is no indication of sleeves or collar), objects held in her hands and she might

¹⁸ This is the same process that took place, for example, in the making of the Metropolitan Museum of Arts statuette 30.8.93, Becker, Pilosi and Schorsch 1994: 48.

have worn the βασιλειον on the tufted wig. All this might suggest that the MAN's piece is an unfinished sculpture, or one that has been subsequently stripped of several of its possible external accessories, if it ever had them. Perhaps she wore some sort of pectoral on her body which would have saved the artist from having to point out, for example, the collar of the tunic. The same goes for the fists, which are pierced to allow something to be worn or held in them.

2 | The Identity of the Woman

2.1 | At least since the figure entered the MAN, the woman represented has been identified with Khereduankh,¹⁹ basically because of the tufted wig and the *uraeus* on her forehead (supposedly characteristic of this goddess according to Weiß,²⁰ who states that “die kurze Lockenperücke

wird von keiner anderen Göttin getragen”; later it will be seen that this is not entirely correct). Khereduankh is the “divine mother” (*mwt ntr*) of Imhotep.²¹ In LGG²² the following mentions of the name of this goddess are recorded, all of them into Graeco-Roman chronology:

- 1) Inscribed on the base of a statue of a Ptolemaic priest called Pedubastis, in the British Museum,²³ which contains a religious-festive calendar associated with Imhotep.
- 2) Two mentions are found in the temple of Imhotep at Philae,²⁴ dated under Ptolemy V.
- 3) One mention on the Ptolemaic pylon at Kalabsha, probably dated under Ptolemy VIII.²⁵
- 4) Once at Deir el-Bahari (on the south wall of the so-called “Ptolemaic Chamber”).²⁶
- 5) Another one on a column at the entrance to the pronaos of the temple of Hathor at Deir el-Medina²⁷ (dated under Ptolemy VI).

¹⁹ Pérez-Díe *et alii* 2018: 422–427. This proper name is transcribed in the literature as Khardit-ankh (old transcription), Khered-ankh, Kh(e)reduankh, Kh(e)redeankh, etc. As an Egyptian gynaeconym, it is documented on several late stelae: Bonn 23 (Wiedemann and Pörtner 1906: 25–26), Hildesheim 6352, 2nd–1st century BC (Jansen-Winkel 1997: 91–100, Panov 2018: 79–82), UC 14357 (London, Petrie Museum) dated under Cleopatra VII and Caesarion (Clarysse 2000: 145 n. No. 1) or on another stela that passed from being part of an American collection to a European one (Prada 2017, accessible at https://www.academia.edu/34180067/Artefacts_as_Revenants_Khereduankhs_Stela_and_the_Dispersal_of_an_Early_American_Museum_Collection [Last accessed: June 2023]). Other mentions of this proper name (in Turin, Paris, Vienna, Bonn) are recorded in Ranke 1935: I, 277. In the British Museum papyrus EA 9916, 2B (Late Ptolemaic) it is the name of the mother of the owner of the papyrus, Nesmin. For De Meulenaere (1966: 45) the translation of the name could perhaps be “daughter of the Living One” (*Fille du Vivant*), where “the Living One” would be a *Gottesbeiname*. However, in LGG: VI, 50 it is translated as “the child lives” (*Das Kind lebt*).

²⁰ Weiß 2012: I, p. 232.

²¹ De Meulenaere 1966: 40. On Khereduankh, see LGG VI: 50, *sub voce* (the dating of the mentions included in this specification would be the Graeco-Roman Period. However, for Łatjar 2005: 12, Imhotep may have been regarded as the son of the god Ptah and the lady Khereduankh already in the Ramesside Period).

²² LGG 2002: VI, 50.

²³ London, BM EA 512 (Gauthier 1914: 38; Wildung 1977: 73–78).

²⁴ Wildung 1977: 159 and 163.

²⁵ Wildung 1977: 178. Imhotep appears in the Offering Hall of Kalabsha described as “son of Ptah, who was born to the noble one, the powerful one, Khereduankh” (Van den Hoven 2011: 186).

²⁶ Wildung 1977: 224.

²⁷ Wildung 1977: 218, Łatjar 2005: 15

To the previous ones, recorded in LGG, other references should be added:

- She is named on the wall next to the entrance of the Adikhalamani Chapel of the temple of Debod.²⁸
- De Meulenaere notes two other epigraphic mentions: (a) on a cubic seat in the Allard Pierson Museum, where it is said of Khereduankh, mother of Imhotep, that she is an “(priestess) excellent musician”, (b) on the dorsal pillar and waist of a male statue of the priest Painmu,²⁹ where it is indicated that Khereduankh is the daughter of Banebdjed (the ram god of Mendes).³⁰
- Finally, there are a large number of epigraphic mentions of Khereduankh on seated bronze statues of Imhotep, specifically on the papyrus scroll which he unfolds over his legs; on many of them is read “Imhotep, son of Ptah, born of Khereduankh”.³¹

Very little is known about this goddess. The few epithets referring to her, apart from the already mentioned “mother of the god”, are:³²

- “beautiful Lady, beloved of the Ram of Mendes and the god Ptah” (at Philae),
- “she who gives life to all” (at Philae and Kalabsha), and

- “the good nurse (*reret neferet*) who appears in the nome of Mendes” (at Deir el-Bahari and Deir el-Medina), who “gives birth to her child at Ankhtau” (at Deir el-Bahari).

Her image on the reliefs of the Ptolemaic temples is always anthropomorphic, with a long tunic, a tripartite wig of tufts, and a vulture's headdress or a hathoric crown completed by two tall feathers (at Deir el-Bahari and Deir el-Medina). As for the festivals in which she participated, the aforementioned Pedubastis Calendar records that the 16th day of the month of Epiphi commemorated the birth in which Khereduankh gave birth to the god Imhotep, born of Ptah.

There are only a few certain sculptures of Khereduankh (confirmed by an accompanying text). This is the case of the statuette Louvre bronze E 11556 (fig. 9), with inlays of gold and silver, dated by the Museum to the 4th century BC,³³ in which the goddess is shown seated, with a wig of tufts that does not cover her ears, *uraeus*, and a hathoric headdress (on a circular modius of *uraei*) before two high feathers,³⁴ and the one in the Jerusalem Museum³⁵ (also seated, holding a *menat* against her chest).³⁶

²⁸ Roeder 1911: I, 53–54; II plate 12; Hyacinthe 2017: II, 266–268 n.º 73.

²⁹ Louvre E 15546.

³⁰ De Meulenaere 1966: 41ss.

³¹ Examples in Daressy 1905–1906: Inv. No. 38046, 38047, 38048; Musée Granet No. 57, in Barbotin 1995: 122; Musée des Beaux-Arts de Grenoble No. 51, in Kueny and Yoyotte 1979: 62; in Spain it is the Imhotep in the Museo de Menorca, Inv. No. 19999. This epithet of Imhotep can also be found on papyri (pLeiden I 384, Ritner 2011: 20, No. 14), etc.

³² De Meulenaere 1966: 40–41.

³³ <https://collections.louvre.fr/en/ark:/53355/clo10010494> [Last accessed: June 2023]. In Málek 1999: 1102 this piece is dated to the 30th Dynasty.

³⁴ On this crown see Albersmeier 2002: 54–55. In any case, it is missing from our piece (although it may have been originally worn by the goddess).

³⁵ Ben-Tor 1997: 81, No. 85, dated to the Ptolemaic Period.

³⁶ Some other bronzes attributed to this goddess are listed in Roeder 1956: 235–236, Weiß 2012: I, 231–232, Aubert and Aubert 2001: 299; Daressy 1905–1906: II, No. 38980 (=Weiß 2012: II, p. 688 No. 127, dated by Weiß to dynasty XXV–

2.2 | Is the figure of the MAN an image of Khereduankh? It is not certain. At least one or two votive bronzes figures of the goddess Renpetneferet are known. This goddess (Imhotep's Ptolemaic period partner)³⁷ is depicted:

- on reliefs in the Ptolemaic Room at Deir el-Bahari,
- in the kiosk of Hathor, and in the temple of Imhotep at Philae,
- in the temple of Hathor at Deir el-Medina; and she is mentioned in the temple of Deir el-Shelwit and in others.

Some of the representations and mentions of this goddess are listed in LGG.³⁸ This divinity wears a long, tight-fitting tunic, a hemispherical wig with short locks (contrary to what is stated in Weiß 2012: I, 232), and a *uraeus*.³⁹ In one of these bronzes, the text on the base confirms that she is Renpetneferet (fig. 10).⁴⁰ On the other hand, the use of silver for the votive offering of a figure of this divinity would also be logical, since she is a goddess who personifies the arrival of a good agricultural year in Egypt (her name means “the perfect year”).⁴¹ About ten years ago, a relatively similar bronze attributed to Renpetneferet was sold at Thierry de Maigret's auction house; in this case, the goddess holds a lotus flower in her left fist (attached to her body at the level of the diaphragm).⁴²

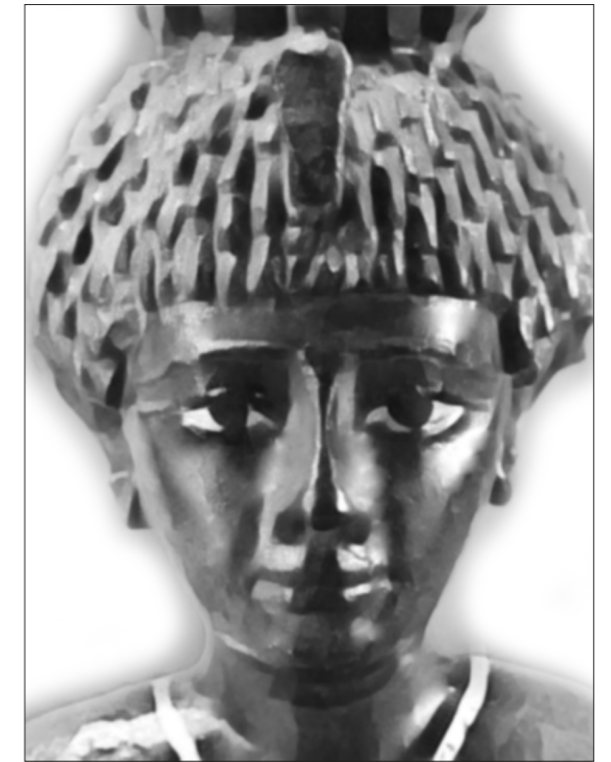


Figure 9. Head of a figure of Khereduankh, detail of the frontal face. Louvre Museum, bronze E 11556. Drawing by Amparo Errandonea, from: CC BY-SA 2.0 FR Deed | Attribution-ShareAlike 2.0 France | Creative Commons.

XXVI); on the website of the Metropolitan Museum is the bronze 26.7.844 (acquired by Lord Carnarvon in Cairo and dated by the museum to the Ptolemaic Period): <https://www.metmuseum.org/art/collection/search/552829> [Last accessed: June 2023]. Finally, we have seen on the international antiquities market another two bronzes attributed to Khereduankh: (1) Pierre Bergé & Associés 2013, lot No. 63: <https://www.pba-auctions.com/lot/15546/2983670-egyptestatuette-votive-represe> [Last accessed: June 2023]. This one (who is “tenant de la main droite une effigie de chatte contre sa poitrine”) could be “Kheredankh (mère d’Imhotep) ou Renpetneferet (son épouse)”; and (2) Ede 2020: 68; pictures on pages 16–19.

³⁷ Ryholt 2009: 308, 310.

³⁸ LGG IV: 679, *sub voce*. See also Corteggiani 2010: 525–526.

³⁹ Aubert and Aubert 2001: 299, pl. 23; the image of the goddess shows her with her left leg extended in a striding pose atop a rectangular base, with her right arm close to her body and her left arm, bent, attached to her torso at the level of the diaphragm.

⁴⁰ Text engraved on the pedestal: “que Renpetnefert accorde vie à Pahapi fils d’Imhotep” (Aubert and Aubert 2001: 299).

⁴¹ Corteggiani 2010: 525, LGG IV: 679, *sub voce*. Quack 2013: 86 comments on the scarcity of images of the personification of the Egyptian “perfect year”.

⁴² Description and images of this second bronze from Renpetneferet, at <https://www.thierrydemaigret.com/lot/13797/2579429-statuette-representant-renepne> [Last accessed: June 2023]. We have already seen (note 36) that at Pierre Bergé & Associés a statue attributed either to Khereduankh or Renpetneferet was put up for auction in 2013.



Figure 10. Figure of the goddess Renpetneferet, bronze. Aubert and Aubert 2001: pl. 23 right.

2.3 | In summary, both the presence of the hemispherical wig with short locks and the *uraeus* on the forehead lead to consider the figure – in the absence of any text – as a probable image of Khereduankh or Renpetneferet, both deities linked to Imhotep.

3 | Metallographic Analysis and Chronology

3.1 | During the 1st millennium BC there was a certain diffusion of small sculptures in the round made of silver in Egypt; most of them are deities, but some of them represent members of the royal family. If our analysis is restricted just to female sculptures, four chronological groups can be considered.

- 1) In the first group, there is only a figurine of a queen or princess, dating from the TIP (it is a small anepigraphic statue, 4.8 cm high, from Bubastis, housed in the University Museum of Zagazig, Inv. No. 1905).⁴³
- 2) A second group consists of several amulets, about 5–15 cm high, depicting Mut, Isis, and leontocephalic goddesses, usually standing with both arms close to the body. They have been dated to the TIP–Saite Period (examples: four statues in the Norwich Castle Museum;⁴⁴ another in the Mariemont Museum).⁴⁵
- 3) The Metropolitan statue no. 30.8.93,⁴⁶ mentioned above, belongs to a third group (within the Saite chronology, see notes 13 and 18).
- 4) Finally, the piece studied in this article would belong to a fourth group (dating from the Late Period and/or Ptolemaic Period).

43 Brandl 2010: 230–231.

44 Kalloniatis 2019: 124–127, Nos. 74–77.

45 Derriks 2009a: 171, No. B.2.

46 <https://www.metmuseum.org/art/collection/search/546746> [Last accessed: June 2023].

3.2 | The piece under investigation was subjected to a metallographic analysis⁴⁷ in 2005. It was subjected to one X-ray fluorescence analysis, carried out at the MAN itself. The analysis was carried out by Salvador Rovira Llorens with a METOREX spectrometer, and the results of this analysis gave the following percentages for the composition of the alloy: silver (88.498 %), copper (7.43 %), lead (4.07 %), and the probable presence of traces of nickel, arsenic, and bismuth (less than 0.1 %). No other metals are mentioned in the report.

The operating silver mines of the Eastern Mediterranean in the Hellenistic Period are reported by Panagopoulou.⁴⁸ In Egypt, the author refers to the mines of Gebel Rusas (near the Red Sea), with negligible silver extraction, as well as to the already proverbial scarcity of silver, a metal that was practically entirely imported into Egypt; she also points at the existence of two possible Ptolemaic silver workshops in Alexandria and Memphis.⁴⁹ As for the presence of nickel, it is known that “nickel is a common impurity in ancient copper alloy objects, but usually below 1 percent”;⁵⁰ this seems to be the case here. As for the detection of traces of the chalcophile semimetals arsenic and bismuth, “traces of bismuth occur in much of ancient and antique silver and, like arsenic, probably derive from copper additions”.⁵¹

The absence of gold suggests that the silver used to make this piece was not alluvial auriferous silver but derived from argentiferous galena (a sulphide of lead and silver; the presence of lead in the alloy would support this possibility) which almost certainly came from outside Egypt, as this mineral does not seem to occur in Egyptian quarries. Traditionally, the silver used in Egypt was imported (from the Aegean, southern Anatolia, or the Near East). Determining the origin of the metals used would have required isotope analysis and neutron activation, tests that have not yet been carried out. Why pure silver was not the only metal used to make the statue? For two main reasons: a) to use less silver⁵² and b) to increase its resistance to wear.⁵³ Copper is usually the most commonly used metal for these purposes.

The analysis therefore shows percentages very far from 96% silver and 2.6% copper (plus 0.6% gold and 0.1% iron), which correspond to the alloy used to make the Metropolitan 30.8.93 female image⁵⁴ (whose chronology is Saite), or the Mariemont Sekhmet LS5632⁵⁵ (with 97.07% silver, 1.07% copper and 1.49% lead).⁵⁶

The date attributed to the Madrid piece has been either Ptolemaic (generically)⁵⁷ or 3rd century BC.⁵⁸ A more accurate date can be proposed based on the data provided by the metallographic analysis.

47 Pérez-Díe *et alii* 2018: 427, n. 23.

48 Panagopoulou 2007: 318–320.

49 Panagopoulou 2007: 323.

50 Ogden 2000: 152.

51 Ogden 1999: 28.

52 Costa 2001: 19.

53 Gale and Stos-Gale 1981: 114.

54 Becker, Pilosi and Schorsch 1994: 47.

55 Martinot and Weber 2009: 447.

56 A silver ring, used to set an Egyptian-type scarab found in Mazarrón (Murcia, Spain) and dated to the 7th century BC, had a slightly lower silver content composition than the Metropolitan’s Saite figurine (94.62% Ag and 5.27% Cu; Miñano 2014: 245), but it is clearly a non-Egyptian product, probably from the Near East.

57 Pérez-Díe, Pons and Zurinaga 2008: 25.

58 Pérez-Díe *et alii* 2018: 427.

3.3 | “Un boucle d’oreille en or, trouvée dans un trésor de Babylone, datant du IV^e siècle avant J.C., présente une composition similaire à celle des doubles-dariques”.⁵⁹ This interesting metallographic finding has provided us with new perspectives in this research, as it links the recasting of objects made of noble metals with the minting of the so-called *double darics*, a coinage issued in Babylon between 331 and 306 BC (although the phenomenon of metal recycling is known to have been a common activity throughout Antiquity, particularly linked to the warfare and financial requirements of the states). Therefore, the following hypothesis is proposed, based on the observation made by Gondonneau and Guerra with which this section was opened: the precious metal alloys used to produce sacred, sumptuary, and gold and silverware objects may have had a similar percentage metal composition to that of the coinage minted at the time, largely as a result of the states recycling processes mentioned above. Given the existence of this possible relationship between metallic objects and coinage (silver/gold/bronze objects, recast to mint silver/gold/bronze coinage),⁶⁰ the next step would be to check the results of the metallographic analyses carried out on the Ptolemaic silver coinage, and compare them with those of our statue. In this way, the dating of those coinages could perhaps suggest a date for the statue we are studying.

3.4 | Based on this hypothesis, in the second half of the 2nd century BC (from 135 BC but especially from 107–104 BC onwards) a significant

devaluation of the Ptolemaic silver coinage was observed in Egypt,⁶¹ with the following effects:

- 1) the alloy now contains from then on 77–87% silver, i.e. less silver than in previous coinage;
- 2) the amount of lead and copper in the mixture increases (copper reaches 8% on silver currency from 136 BC onwards);⁶²
- 3) and traces of bismuth are sometimes found in the alloy.

All this has led scholars to believe that the currency was recycled from earlier issues. From this date onwards, the silver content of the Ptolemaic coinage plummets to its lowest levels under Cleopatra VII. Taking into account these percentages, if the changes in the composition of the Ptolemaic tetradrachms probably ran parallel to the metallic percentages of the alloy used to make the present statuette (and probably other contemporary pieces that have not come down to us), it is possible that our sculpture was made before or at the same time as this devaluation, and was therefore made in the second half of the 2nd century BC or, at the latest, the beginning of the 1st century BC, i.e. either at the end of the reign of Ptolemy VIII Euergetes II (145–116 BC) or under Ptolemy IX Soter II (period 116–107 BC) or Ptolemy X Alexander I (107–88 BC).

Therefore, considering that the hypothesis mentioned in section 3.3 may have been historically feasible, and applying it to the piece under study, these are the three reigns we would propose for dating the silver statuette, with the possible chronological range of production being approximately from 145 (or shortly before) to 88 BC.

⁵⁹ Gondonneau and Guerra 2000: 34.

⁶⁰ Panagopoulou 2007: 332–334.

⁶¹ Faucher and Olivier 2020: 101.

⁶² Hazzard and Brown 1984: 236.

4 | Concluding Remarks

4.1 | It is questionable whether metallographic analysis can be considered conclusive in determining the degree of authenticity of an archaeological artefact. The mere percentage analysis of the components is not, in principle, a definitive proof of the possible antiquity (or not so much) of an Egyptian object; we know of some cases in this respect.⁶³ The use of solid silver also points in this direction. In addition, it would be a necessary condition (not sufficient, but very indicative) to determine, using complementary analyses, the geographical origin of the mineral components of the piece, and to know whether the veins of origin of the minerals used were exploited in Antiquity.

Regarding the piece in question, both its production technique and its state of preservation, as can be deduced from the surface imperfections of the object (presence of bubbles on the surface, formation of chlorides, etc.), seem to be common to some Egyptian silver statuettes of the 1st millennium BC. In any case, the complete absence of gold in the metallographic analysis

carried out on the piece could, among other things, be a reason for caution about its actual date of manufacture.⁶⁴ However, it could also be that the gold content of the alloy is so low that it was not detected by the METOREX spectrometer used in the analysis. It would not be the first time this has happened.

Other elements that could raise some doubts would be formal (such as the different height of the shoulders, the treatment of the face – especially the nose – and the surprising absence of a chin), as well as its character as an “orphan piece”, since we do not know practically anything about its contemporary history.⁶⁵

4.2 | Finally, the statuette documents a pose of the goddess (striding pose with one arm close to the body and the other half-flexed forward, holding two unknown but presumably sacred objects in her hands) which, although widely known for other Egyptian deities, both male and female,⁶⁶ had not yet been documented for the images of Khereduankh and Renpetneferet, whether genuine or attributed, in the round figures.

⁶³ An example of this is the silver sphinx from the Royal Mariemont Museum B.136, which is considered to be a modern copy of an Egyptian original, probably made in the 19th century (Derriks 2009b: 431); according to analysis, it has the following metallographic composition (Martinot and Weber 2009: 447, No. L55623): 91.92% silver, 6.08% copper and 0.05 lead (the relative scarcity of lead, in this case, would indicate a specific mineral origin of the silver).

⁶⁴ Referring to ancient silver pieces, Craddock (2009: 387) comments: “By far the most important trace metal for silver authenticity studies is gold (...) Ancient silver regularly contains from several hundred ppm to a few per cent gold (...) Gold contents found in silver antiquities are naturally variable, dependent on the deposits, but contents much below about 0.05% *should be a cause for concern*”, etc. (italics added); later the same author adds: “Thus the absence of gold does not automatically condemn an antiquity, but it should raise serious doubts” (Craddock 2009: 388). We have already commented that the spectrometer used in the analysis (a METOREX X-MET 920MP) may not have been sensitive enough to detect a minute presence of gold in the alloy used. Therefore, the undetectable levels of gold in the alloy could be due to the equipment used in the metallographic analysis performed.

⁶⁵ Recently some well-known Egyptologists commented that “Publishing ‘an orphan object’, i.e. an artefact about which so little – if anything – is known, is a delicate matter (...)” (Hendrickx *et alii* 2022: 52).

⁶⁶ Some of the latter are listed in § 1.1.

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