THE ANIMAL MUMMIES OF THE MUSEO EGIZIO, TURIN

Edited by
Salima Ikram
Sara Aicardi
Federica Facchetti

Texts by
Salima Ikram
Debora Angelici
Johannes Auenmüller
Matilde Borla
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STUDI DEL MUSEO EGIZIO 5

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STUDI DEL MUSEO EGIZIO | 5

MUSEO EGIZIO

FRANCO COSIMO PANINI

To the memory of Debora Angelici, beloved friend and colleague

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Federico Poole, Susanne Töpfer

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EGIZIO

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PREFACE

Christian Greco

Studying animal mummies is an interdisciplinary undertaking if ever there was one, and this fifth volume in the series *Studi del Museo Egizio* bears ample witness to this.

This publication of the animal mummies in the Turin collection is the final outcome of a project started in 2016, whose priority was designing the best possible protocol for the conservation treatment of these particularly delicate artifacts and living-creature remains. This required in-depth study and scientific testing, which provided the basis for thorough conservation treatment of all the mummies by restorer Cinzia Oliva. The decision was soon taken to publish the results of these studies in a comprehensive monograph including a complete catalogue of all the 173 animal mummies and 61 animal coffins in the Museo Egizio.

We had the fortune of being able to place this study project under the guidance of Salima Ikram, a recognized authority on the subject. Ikram coordinated the project and edited the volume, together with restorer Sara Aicardi and Egyptologist Federica Facchetti (Museo Egizio). An adequately diverse team was assembled to deal with the multiple angles these complex objects can be studied from. Veterinarian Alberto Valazza (University of Turin), with conservation scientist and independent scholar Debora Angelici – who sadly passed away while this work was in preparation, and to whose memory this book is dedicated – worked on scientific analyses and species identification, along with Ikram herself; Egyptologist Matilde Borla (SABAP-TO, Italian antiquities service, Turin) and restorer Cinzia Oliva, also flanked by Ikram, studied textiles and wrapping patterns; Egyptologist Johannes Auenmüller (Museo Egizio) studied bronze animal coffins; and Egyptologists Federica Facchetti and Federico Poole (Museo Egizio) studied wooden animal coffins and their inscriptions, respectively.

While the aforementioned scholars are the editors and authors of the book *strictu sensu*, this demanding project could not have been completed without the valuable assistance of many collaborators, both in and outside the Museo Egizio – they are thanked and listed on the inner front cover – as well as the indefatigable and professional work of the folks at Franco Cosimo Panini Editore, the publishers of the *Studi del Museo Egizio*.

The book consists of two parts. The first encompasses seven essays on various themes related to animal mummification. The second is the catalogue proper.

An interesting characteristic distinguishing a work of this kind from other academic publications is that its intended readership does not belong to a single scholarly milieu. Therefore, the authors – whether zoologists, conservators, or Egyptologists – have striven to make their texts accessible to readers who are not specialists in their respective disciplines – although a certain degree of technicality, of course, could not be avoided, nor should it have been.

With this volume, the Museo Egizio inaugurates a new mode of object publication, relying on full integration of the printed medium with the museum's online database. Publishing all useful photographs and CT scans of all the mummies and coffins, 234 in total, would have inflated the bulk and cost of the book to unsustainable proportions. The decision was therefore taken to provide one photograph and one scan of each, referring the reader to the online database for further images. This entailed additional work to bring all the related database records up to date.

In conclusion, this is probably the most collaborative academic publication we have produced to date. We are particularly proud of it, because teamwork is what the Museo Egizio is all about.

1. THE WORLD OF ANIMAL MUMMIES

Salima Ikram

1.1 Introduction

Animals played a crucial role in the lives of the ancient Egyptians, providing them with sustenance, raw materials, pets, draught animals and, most importantly, a source of inspiration for their language and religion. Indeed, most Egyptian gods were associated with a particular animal that exemplified one or more of the deity's attributes. Thus, cats were associated with the goddess Bastet, who presided over love and beauty and self-indulgence; ibises, with their pen-like beaks and constant hunched over position, searching in the dirt, were associated with Thoth, in charge of writing and seeker of wisdom; golden raptors that soared over the sky were connected with the sun god, Re, master of all he surveyed, while shrews, who were fierce creatures and active (ostensibly "seeing") in the dark were also associated with him. Not all deities were defined by a single animal but rather an amalgam of one sort of animal, creating an *uber* or super creature.[1] Thus, although Re was associated with raptors, he was not one particular raptor but rather a mixture of several, as too was the case for Horus, god of kingship.[2] Anubis, the deity associated with embalming and travel, including between this world and the next, was a super-canid, a combination of dogs, foxes, jackals, wolves, and even hyaenas – the latter not zoologically canines (as we now know) but resembling them. Like humans, animals too potentially had a soul, a *ba*, and thus, dead animals had the same potency as dead humans; therefore it is not surprising that animals, like humans, were mummified too.

Animal burials of different types are known from the early Predynastic Period (c. 5000 BC) onwards,[3] but the majority of animal mummies in museum collections date to the twilight of Egyptian history, from the Late Period (c. 664 BC) through the Roman occupation – until at least the fourth century AD (*Fig. 1*).

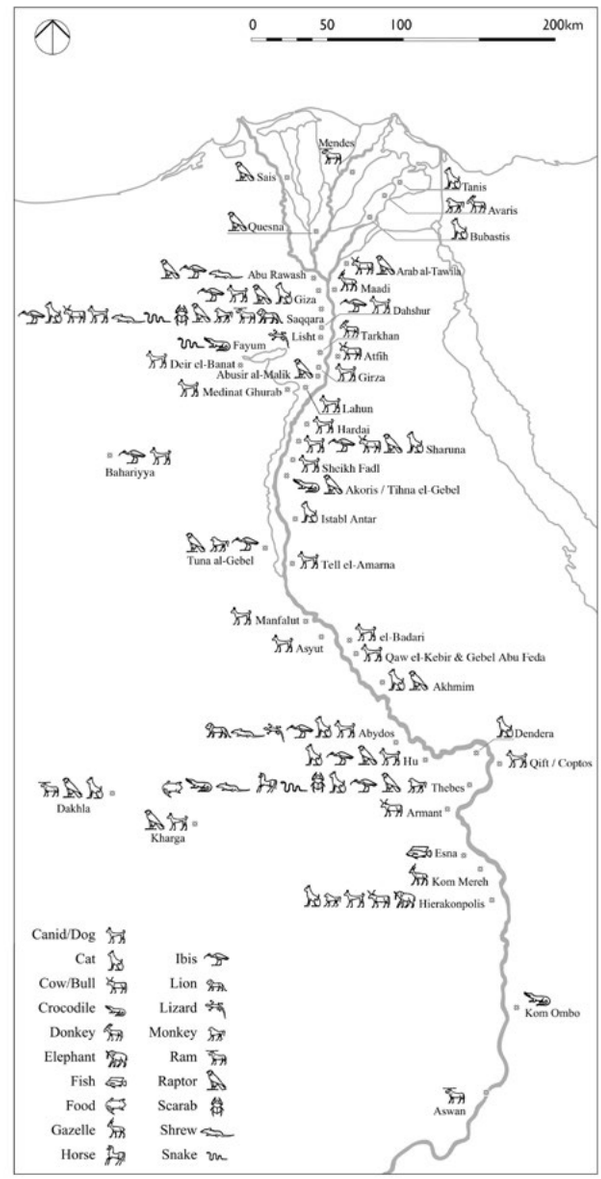


Fig. 1: The main deposits of animal mummies. Map by N. J. Warner.

[1] Houlihan, *Animal World*, 1996.
[2] Ikram, in Wallis (ed.), *The Art and Archaeology of Human Engagement with Birds of Prey*, 2023, pp. 38–53.
[3] Flores, *Funerary Sacrifice of Animals*, 2003.



Fig. 2: One of the galleries of the Anubis Catacombs at Saqqara with the bottom filled with the remains of canine mummies. The dark marks on the side walls of the gallery show the level of the original deposit. It is probable that many of the remains were harvested at the end of the nineteenth and early twentieth century for fertiliser. Photo by P. Nicholson, courtesy of Catacombs of Anubis Project.

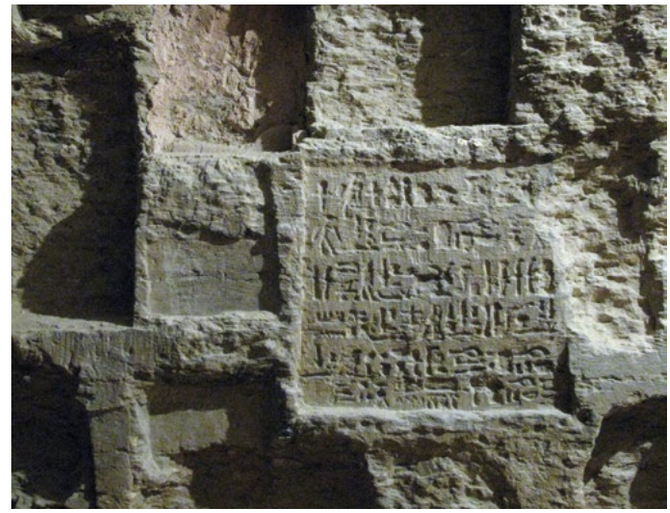


Fig. 3: The walls of the Serapeum at Saqqara where priests and devotees placed votive stelae dedicated to the Apis Bull. These stelae are now mainly in museums such as the Louvre and the Egyptian Museum (Cairo), leaving empty spaces, some still with plaster adhering to them. A few cunning people carved their stelae directly into the living rock, so these remain in situ. Photo by S. Ikram.

Millions of ibises, cats, dogs, raptors and other creatures were mummified and offered at temples throughout Egypt by devotees, often, in lieu of statues and stelae (*Figs. 2-3*).[4] Perhaps the idea was that a blood sacrifice (many of the animals were deliberately killed)[5] would be a more effective intermediary between the devotee and the deity.

The animals were presented to the god, consecrated, and eventually interred in catacombs or other sepulchres that were administered by different groups of priests (*Figs. 4-6*).

The reason for the popularity of such cult activities is unclear. Was it a way for the Egyptians to separate and stress their national identity after (and during) times of crisis when foreigners had been in control of their country? Was it a cry to the gods to help them during these difficult times? Did animals, totems of the gods, provide a way of establishing a more personal relationship with the gods than had been necessary or even possible in earlier eras, when access to the god was limited? Was a blood sacrifice deemed more effective than an offering of wood or stone, like a statue or a stela? The temples themselves also might have encouraged this practice, as possibly they were receiving less consistent royal support in the later periods of Egyptian history, and the animal cults were a means of raising income that would support the temples and their priests. It also would have made for closer ties between the populace and the priesthood.

1.2 Animal Mummification

Millions of animals were mummified in a variety of ways, depending on the era, the atelier, the wealth and status of the devotee, and the type of animal. Mummification was used to preserve the body in order to provide an eternal house for the soul. The technology of mummification changed over the over 3000 years of Egyptian history, but the basic components were:[6] the removal of the internal organs to prevent putrefaction, and washing of the body cavity; the drying of the body with natron – a naturally occurring salt that had defatting and desiccating properties (not always used on animals, and particularly ill-documented for birds[7] and some mammals that were macerated and defleshed,[8] especially when mass-produced[9]); the final anointment of the body with oils, resins, and sometimes

[4] Ikram, in Massiera et al. (eds.), *Apprivoiser le sauvage*, 2015, pp. 211–28.
[5] Armitage and Clutton-Brock, *MASCA* 1 (1980), pp. 185–88; Armitage and Clutton-Brock, *JAS* 8 (1981), pp. 185–96: https://doi.org/10.1016/0305-4403(81)90023-6; Zivie and Lichtenberg, in Ikram (ed.), *Divine Creatures*, 2005, pp. 106–19; Ikram and Bertini, in Nicholson (ed.), *Catacombs of Anubis*, 2021, pp. 135–88.
[6] Ikram, in Ikram (ed.), *Divine Creatures*, 2015, pp. 16–43.
[7] Nicholson, in Ikram (ed.), *Divine Creatures*, 2015, pp. 44–71.
[8] von den Driesch et al., in Grupe and Peters (eds.), *Conservation Policy*, 2004, pp. 231–78; calf/cattle mummies (Ikram, personal observation).
[9] Ikram and Bertini, in Nicholson (ed.), *Catacombs of Anubis*, 2021, pp. 135–88.



Fig. 4: The galleries of the Serapeum at Saqqara when discovered by Auguste Mariette and his team. *The Illustrated London News*, April 16, 1853, p. 284. Photo by S. Ikram.



Fig. 5: The entrance to the Baboon Catacombs at Saqqara. Photo by D. Hilton.



Fig. 6: The Serapeum galleries at Saqqara in their current state. Photo by S. Ikram.

bitumen, which also served to inhibit bacterial activity.[10] Humans were often excerebrated,[11] but this was not the case for animals, whose brains tend to be quite small, even in the case of larger mammals, such as cattle.[12]

Variations also existed based on whether the creature being mummified had fur, feathers, or scales; economic considerations; diachronic change; geographical peculiarities; changes in taste, technology, or style. Some birds, for instance, show evidence for being eviscerated and then immersed in a mixture of oil and resin, after which they were wrapped, without the interim stage of desiccation.[13] Other birds were not eviscerated at all, or had their internal organs returned to their bodies.[14] Reptiles, such as snakes and crocodiles,[15] might not have been eviscerated at all. Sometimes, in place of manual evisceration, enemas of cedar oil were used to melt the internal organs. The oil acted in the same way that turpentine does.[16] Examples

[10] Buckley et al., *Nature* 431 (2004), pp. 837–41: https://doi.org/10.1038/nature02849; Ikram, *JARCE* 48 (2012), pp. 119–35; Clark et al., *PNAS* 110.51 (2013), e2120584119: https://doi.org/10.1073/pnas.1315160110; Nissenbaum and Buckley, *Archaeometry* 55 (2013), pp. 563–68: https://doi.org/10.1111/j.1475-4754.2012.00713.x.

[11] Saleem and Hawass, *AJR* 200 (2013), pp. 336–44: https://www.ajronline.org/doi/pdf/10.2214/AJR.12.9405.

[12] Ikram, in Ikram (ed.), *Divine Creatures*, 2015, pp. 16–43.

[13] Nicholson, in Ikram (ed.), *Divine Creatures*, 2015, pp. 44–71.

[14] Wade et al., *JAS* 39 (2012), pp. 1642–47: https://doi.org/10.1016/j.jas.2012.01.003; Ikram et al., *JAS* 63 (2015), pp. 72–77: https://doi.org/10.1016/j.jas.2015.08.015; several ibis mummies from Abydos in the Museo Egizio's collection (**Nos. 80, 87, 91, 95–97, 101–106**).

[15] Anderson and Antoine, in Porcier et al. (eds.), *Creatures of Earth, Water, and Sky*, 2019, pp. 31–38.

[16] Herodotus II. 87; Ikram, in Ikram (ed.), *Divine Creatures*, 2015, pp. 16–43.

of young cattle and larger dog mummies indicate that the animals might have been macerated or had their flesh removed through other means, and the bones were then collected and placed in a mummy bundle. This technique has also been reported for baboon mummies at Tuna el-Gebel and Saqqara, where the mummy bundles were often also placed in a wooden box and immersed in plaster.[17] Natron was not always used, and sometimes perhaps not directly on the body of the animal, but on the bandages used to wrap them.[18]

Mummification was a means of transformation from a secular state to a sacred one. Once mummified, a creature achieved semi-divine status, and its flesh, like the gods', was turned to gold. This is why so many mummy masks (and body parts) of both humans and animals are gilded (for example, the raptors in the Egyptian Museum in Cairo [CG 29681] and the museum of the Institute for the Study of Ancient Cultures [formerly Oriental Institute] of Chicago, OIM 150) or, at the very least, painted yellow, to reflect this transformation.

After desiccation the body was wrapped, accompanied by the chanting of prayers, which wove physical as well as metaphysical protections around the body. In many instances, starting in the Late Period and flourishing in the Ptolemaic and early Roman periods, the outermost bandages became increasingly elaborate, with coloured cloth being used to create complex and beautiful patterns (see Chapters 3 and 4).[19] Animal mummies, like those of humans, were enhanced by cartonnage masks (*Fig. 7*), or their features were picked out in textiles, as is seen on so many examples from the Museo Egizio, particularly in the case of cat mummies.

The mummy bundles took many shapes, dependent on both the shape of the animal and the choices made by the embalmer (see Chapters 3 and 4). Some animals were wrapped as if they were standing (Paris, Louvre E2815, E2818; Cairo, EMC CG 29836), others (dogs, cats, and monkeys particularly) as if seated within the wrappings, and then the wrappings created a skittle shape around the animal, sometimes with the head standing proud with the facial details picked out in paint or appliqué, or even wearing a mask. Teardrop-shaped bundles were most popular for birds, though other animals also could be placed in these. Snakes and shrews are often found in circular packages,



Fig. 7: A raptor with its cartonnage mask in the Egyptian Museum, Cairo (CG 29695). Photo by A.-M. Kellen, courtesy of Animal Mummy Project/ Egyptian Museum.

with the snakes curled up around themselves, or square/ rectangular ones, particularly in the case of larger snakes and groups of shrews. Anthropomorphic forms are often given to avian mummies.

In many cases, the mummies were placed within wooden coffins. This is most common for the food or victual mummies, which are placed in wooden coffinets that fre-

[17] von den Driesch et al., in Grupe and Peters (eds.), *Conservation Policy*, 2004, pp. 231–78.
[18] Armitage and Clutton-Brock, *JAS* 8 (1981), p. 190: https://doi.org/10.1016/0305-4403(81)90023-6.
[19] For a typology of patterns, see Ikram et al., *RiME* (forthcoming).



Fig. 8: Pottery vessels containing raptor mummies arranged in rows that are stacked up and separated by layers of sand in one of the galleries of the Falcon Catacombs at Saqqara. Photo by S. Ikram.

quently take the form of their contents, and are coloured either white with gypsum and wash, or black with a resinous material,[20] which is often also painted onto the interior of the coffin (see Chapter 8.14). Victual or food mummies are also found in papyrus boxes[21] or grouped together in a single wooden box.[22] Pottery jars are also used as burial containers (*Fig. 8*), particularly for birds (for example **Nos. 111–115** in this catalogue) but also for other animals, such as dogs.[23]

Other mummies are placed in a rectangular, square, or oval container of stone or wood, which was sometimes decorated with images of the animal type (for example, **Nos. 50–52**) and/or inscribed (*Fig. 9*). Another group of receptacles takes the form of the animal itself; these are generally made of wood or cupreous metal (see **Nos. 42–43, 46, 116–117**). The last group of coffins consists of either a plain box or one shaped as an altar or naos, with a cavetto cornice and torus mouldings, and is surmounted by an image of the animal it is supposed to contain. These are made of wood, stone, or, most commonly, cupreous metal (for example, **Nos. 53, 73–74, 137**). See Chapter 7 for manufacturing details.[24]



Fig. 9: An overview of the cemetery for the Sacred Rams of Khnum on Elephantine Island. The sarcophagi are rectangular or oval. Photo by S. Ikram.

[20] Although the combinations might differ, this shiny black substance has been identified as resin, wax, and sometimes oil; for examples see Ikram, *JARCE* 48 (2012), pp. 119–35; Clark et al., *PNAS* 110.51 (2013), e2120584119: https://doi.org/10.1073/pnas.1315160110. For further examples and discussion, see Ikram, *Choice Cuts*, 1995, pp. 231–83; Ikram, in Strudwick and Aston (eds.), *From Objects to Histories*, forthcoming.

[21] Ikram and Iskander, *Non-Human Mummies*, 2002, p. 27, no. CG29840.

[22] For example, London, BM EA51812; Ikram, in Strudwick and Aston (eds.), *From Objects to Histories*, forthcoming.

[23] For examples of such canine burials see Ikram, in Flossmann-Schütze et al., *Kleine Götter – Große Götter*, 2013, pp. 265–71.

[24] For other recent studies of such cupreous containers, see Charron, in Tallet and Zivie-Coche (eds.), *Le myrte et la rose*, 2014, pp. 229–47; Thum, "Creatures Compartmentalised", 2012; Weiß, *Ägyptische Tier- und Götterbronzen*, 2012; Masson-Berghoff, *BMSAES* 24 (2019), pp. 127–58; Masson-Berghoff and O'Flynn, *BMSAES* 24 (2019), pp. 159–74. For an overview including also those in other materials see Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 31–61.

1.3 A Typology of Animal Mummies

One can divide animal mummies into seven different types:[25] pet, victual/food, sacred, votive, "false/fake/amalgam", possibly amuletic/guardian, and other. The easiest for us today to understand are pet mummies. Upon their death, beloved pets would be mummified and placed in their owner's tomb, if it was ready, or in the courtyards of the tomb plots, waiting for their owners to join them – dogs in particular are thus favoured.[26] Due to the robbed and disturbed state of most burials, few of these have been found, though several have been hinted at by the inclusion of the animal drawn on the coffin. In addition, recently what has been identified as a pet/companion animal cemetery has been found at Berenike, dating to the Ptolemaic/Roman eras.[27]

Victual or food mummies are a manifestation of the Egyptians' belief that the body as well as the soul eternally needed sustenance.[28] These mummies consist of joints of meat and entire fowl that are prepared as if they were ready for consumption. The poultry was plucked and the head, feet, and wing-tips removed, it was eviscerated, then possibly slightly cooked, dried using natron or salt, and anointed with oils and resins; the wrapped liver and gizzards were returned to the body cavity, and then the whole bird was bandaged and placed in a coffin or basket, or placed as it was in the tomb to feed the deceased. The joints of meat were dressed, as if coming from a modern butcher, desiccated with natron and salt, then massaged with oils and resins, wrapped, and, like their poultry counterparts, placed in containers and then the tomb. Meat offerings of some sort or the other were part of grave goods from at least 3000 BC if not earlier, but such wrapped offerings are a feature of elite and royal graves dating from c. 1580 BC to c. 1000 BC.[29]

One of the most important types of animal mummy is that of a sacred animal. The Egyptians believed that each deity had a totemic animal related to him or her. Only one particular example of that animal could act as a host for the divine spark, and a portion of the divine spirit would enter into the body of such a creature, recognisable to priests by specific markings, and animate it. During its lifetime that animal was treated as the god on earth, with oracular powers. It was venerated, marched in procession, and fed special foods. Upon its death, when the spirit of the god had moved to another host, much in the same way as the eternal spirit of the Dalai and other lamas, the dead animal was mummified and buried in a special catacomb. Its passing was marked by lavish funerary rituals, and in some cases, such as with the Apis bull, the entire country would go into mourning. Some cults, such as that of the Apis bull, are known from the First Dynasty, c. 3050 BC. However, records for most such cults do not come into prominence until the Twenty-sixth Dynasty, c. 664 BC, and thereafter persist into the Roman era, with the cult of the Buchis bull at Armant, a solar deity, whose last properly attested burial dates to the reign of Diocletian (*Fig. 10*).[30]



Fig. 10: A rare example of a granite sarcophagus from Elephantine Island – currently in the garden of the Nubian museum – with an image of a ram carved on it. Photo by S. Ikram.

[25] Originally, I had divided these into four main categories (Ikram and Iskander, *Non-Human Mummies*, 2002; Ikram, in Ikram (ed.), *Divine Creatures*, 2015, pp. 1–15) but, with the need to refine the types and with more evidence, I have added three additional headings ("false/fake", "possible amuletic/guardian", and "other"), for which see Ikram, in Porcier et al. (eds.), *Creatures of Earth, Water, and Sky*, 2019, pp. 179–91; Ikram, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 225–34. For earlier discussions on animal mummies, see Kessler, in Helck and Otto (eds.), *LÄ*, VI, 1986, col. 571–87; Kessler, *Die heiligen Tiere*, 1989; Ray, in Redford (ed.), *OEAE*, I, 2001, pp. 345–48.

[26] Tooley, *JEA* 74 (1988), pp. 207–11.

[27] Osypińska and Osypiński, *PAM* 26.2 (2017), pp. 167–92: https://doi.org/10.5604/01.3001.0012.1825; Osypiński and Osypińska, *PAM* 28.2 (2019), pp. 175–93: https://doi.org/10.31338/uw.2083-537X.pam28.2.11.

[28] Goodman, *JSSEA* 17 (1987), pp. 67–77; Ikram, *Choice Cuts*, 1995; Ikram, *SEP* 1 (2004), pp. 87–92; Ikram, *JARCE* 48 (2012), pp. 119–35.

[29] Ikram, *Choice Cuts*, 1995; Ikram, in Barta (ed.), *Old Kingdom Art and Archaeology*, 2006, pp. 167–74; Ikram, *JARCE* 48 (2012), pp. 119–35.

[30] Mond and Myers, *Bucheum*, I, 1934, p. 171; Dodson, in Ikram (ed.), *Divine Creatures*, 2015, pp. 72–105.

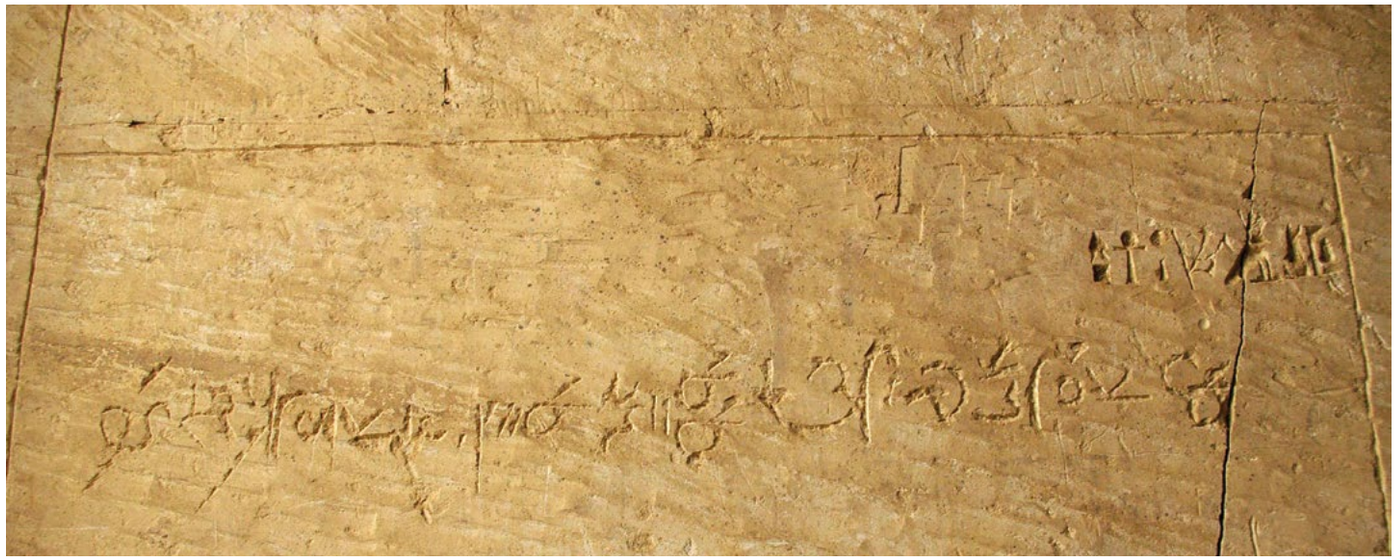


Fig. 11: Demotic and hieroglyphic texts left by priests serving the cult of Thoth the Baboon in Saqqara. Photo by D. Hilton.

The most commonly found type of animal mummy is the *ex voto* or votive offering. These were mummies of animals that were associated with a particular god, though they did not host his/her divine spark, and presented in the temple as offerings by pilgrims/devotees. All sorts of animals were offered, including gazelles, cats, dogs, shrews, snakes, mongooses, ibises, crocodiles, fish, and even scarab beetles.[31] It is thought that, though these offerings could be given at any time, such gifts to the gods were particularly common during special festivals.

Scholars believe that pilgrims would come to the temple, purchase a mummy, and explain their needs to the priest, who would then consecrate the mummy and convey the prayer/request to the god (*Fig. 11*).

Then the mummy would be kept in a sacred place until it, together with other similar offerings, would be buried, either in a catacomb, pit tomb, or some other mass sepulchre, as part of a major religious festival (see *Fig. 2*).[32] The appearance of these mummies varied, possibly reflecting different costs, as well as, possibly, diachronic change, or being manifestations of particular geographic areas or ateliers (see Chapter 4 for further discussion on the topic). Millions of such mummies have been found and were a major part of cultic activity from the Late Period until the Roman era (c. 664 BC – AD 320), and suggest intensive breeding programmes to provide the animals that were needed to fulfil the demands, with specific priests detailed to look after the animals.[33] Indeed, many of the animals that were used as the votive mummies were deliberately killed as a blood sacrifice,[34] which was not the case for the sacred animals or the pets – although Pliny, who most probably never saw the Apis, writes that "it was not lawful to suffer him [Apis] to live above a certain Number of Years", so he was drowned and then replaced.[35] Additionally, some animals, such as baboons, were imported specially in order to serve the cults and are an early example of intensive trade in exotic animals.[36]

Amongst these votive offerings are mummy bundles that are called fake, false, or amalgam mummies. These are mummy bundles that do not contain an entire animal but rather fragments of bone or feathers or fur, or even just a part of an animal. There are many possible inter-

[31] A recent discovery even includes a lion cub: Waziry, *Vestiges of Ancient Egypt*, 2023, p. 26.
[32] Davies and Smith, *Falcon Complex*, 2005, pp. 66–67.
[33] Ikram et al., *ARC* 28 (2013), pp. 48–66; Nicholson et al., *Antiquity* 89 (2015), pp. 645–61: https://doi.org/10.15184/aqy.2014.53; Ikram, in Massiera et al. (eds.), *Apprivoiser le sauvage*, 2015, pp. 211–28; Ray, *Archive of Hor*, 1976.
[34] Armitage and Clutton-Brock, *MASCA* 1 (1980), pp. 185–88; Armitage and Clutton-Brock, *JAS* 8 (1981), pp. 185–96: https://doi.org/10.1016/0305-4403(81)90023-6; Zivie and Lichtenberg, in Ikram (ed.), *Divine Creatures*, 2015, pp. 106–19.
[35] Pliny VIII.46.
[36] Dominy et al., *eLife* 9 (2020), e60860: https://elifesciences.org/articles/60860; von den Driesch and Boessneck, *TierPrax* 13 (1985), pp. 367–72; von den Driesch, *Sartoniana* 6 (1993), pp. 15–36; Nerlich et al., *IJO* 3 (1993), pp. 189–98; von den Driesch et al., in Grupe and Peters (eds.), *Conservation Policy*, 2004, pp. 231–78.

pretations for these. Possibly a part symbolises the whole, and these mummies thus became complete creatures by the transformative power of the words and rituals of the priests. Or else, they were made when there were insufficient numbers of a particular creature and it hence had to be divided between several bundles. Another reason might be that bits fell off during mummification, and as these belong to creatures dedicated to the gods they must be gathered up and given as offerings.[37] Conceivably, animals of a given god were found dead and partially decomposed by people, and brought to the priests for pious burial. In some instances the bones of a human, mud, sand, textiles, or vegetal material form the core of the mummy, making it more difficult to understand what the intention was – other than impropriety on the parts of the priests and an absence of the animal they were supposed to offer, and hence a need for a substitute to create a simulacrum of the animal. Again, however, the magic of the word could transform these bundles into what the pilgrim intended as an offering. Perhaps this is also the reason why some animals that seem to have little or no association with a deity are also found in some votive mummy bundles. If a particular creature was unavailable, then a desperate devotee (or a poor one, if it was he or she who provided the animal to the priests) might make a substitution. Of course, it is also possible that these non-canonical animals happened to die within the sacred precincts, were thus thought to have become sacred to the god, and were mummified and buried with other votive offerings.[38]

The designation of mummies as "amuletic/guardian" is tentative. Some dog mummies have been found in relation with human burials and, due to their placement, the excavators have called them "amuletic" burials,[39] although this sobriquet is debatable. Other excavators who have found dog and human mummies together take this as a manifestation of some other kind of ritual.[40]

The last category of animal mummy encompasses all those that do not fit comfortably into the other major divisions, and can be called "other". A group of five geese and ducks that were mummified and placed as a foundation offering at the funerary temple of King Tuthmosis III (1479–1424 BC) in Thebes are examples of such mummies,[41] as is another group of animals (ibis, dog, and monkey) found in a tomb, surrounding the body of the deceased.[42] Perhaps these are taking the place of guardian statues that might have been placed here otherwise. As they are only three, and an ibis is included, they cannot be taking the place of the Four Sons of Horus, the habitual guardians of the dead, who take the form of deities with the heads, respectively, of a hawk, canine, baboon, and human.

1.4 The Study of Animal Mummies

Although animal mummies were well known to visitors to Egypt, and of considerable interest to naturalists,[43] they were largely ignored by Egyptologists, as they were collected and thought of more as curiosities rather than significant remains from the time of the pharaohs. They were used as ship ballast, and even sold as fertiliser![44] Increasingly, scholars and the public have realised that animal mummies are a rich source of information on many aspects of ancient Egypt. They tell us about the Egyptian state and popular religion, the work of different sorts of priests (*Fig. 12*), mummification and changes in its materials and technologies, trade routes that transported animals as well as materials for mummification such as exotic resins to Egypt, the economy of Egypt, the textile industry, veterinary practices, the relationship between the ancient Egyptians and animals, and the ancient landscape. Animal mummies can even serve as proxies to indicate changes in the climate or landscape.[45]

Initially, if these mummies were studied, they were unwrapped. Now, however, there are a host of technologies

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[37] Kessler, in Helck and Otto (eds.), *LÄ*, VI, 1986, col. 571–87.
[38] Kessler, in Helck and Otto (eds.), *LÄ*, VI, 1986, col. 571–87; Kessler, *Die heiligen Tiere*, 1989.
[39] Hartley et al., in Coppens and Krejčí (eds.), *Abusir and Saqqara 2010*, 2011, pp. 17–29.
[40] Adam and Colin, in Nenna (ed.), *L'enfant et la mort II*, 2012, pp. 315–30; Colin et al., *Archimède* 1 (2014), pp. 32–63.
[41] Lortet and Gaillard, *La faune momifiée*, 1909, pp. 154–55.
[42] Rhind, *Thebes*, 1862, pp. 99–101.
[43] Ikram, in Shaw and Bloxham (eds.), *Oxford Handbook of Egyptology*, 2015, pp. 151–64; Baber, in Porcier et al. (eds.), *Creatures of Earth, Water, and Sky*, 2019, pp. 67–86.
[44] A practice lampooned in *Punch* of February 15, 1890, with a cat auction being reported upon in the *Daily Graphic*, 12 February 1890; see also McKnight and Atherton-Woolham (eds.), *Gifts for the Gods*, 2015.
[45] Woodman and Ikram, *QuatRes* 100 (2021), pp. 21–31: https://doi.org/10.1017/qua.2020.89.

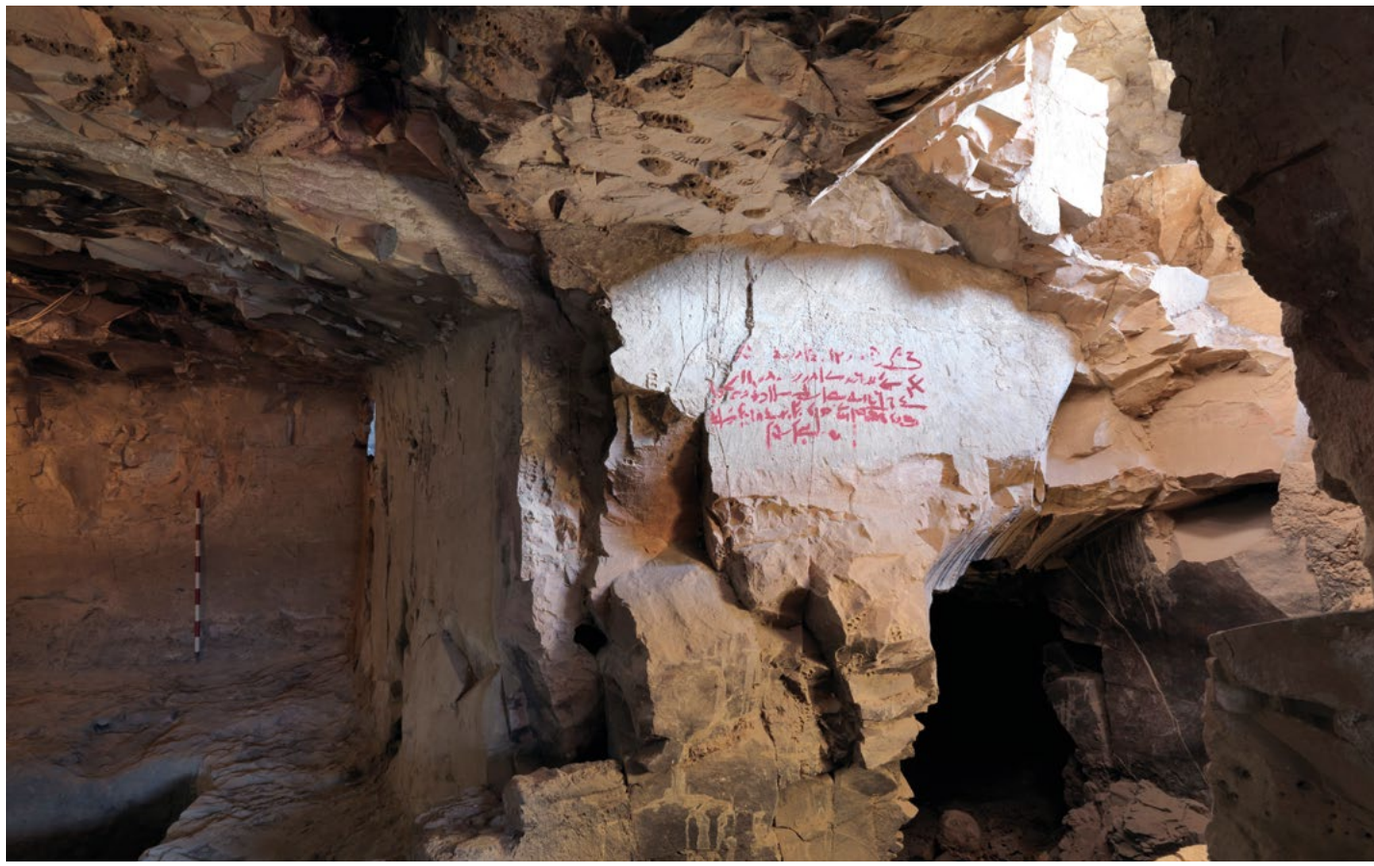


Fig. 12: Demotic graffiti (enhanced) in Theban Tomb 12 giving directions and guidance to the priests who were interring ibis and raptor mummies there, dedicated to Horus and Thoth. Photo by F. Bosch-Pusche, courtesy of Proyecto Djehuty.

used to study animal mummies, in addition to the crucial visual examinations, which are the initial form of studying a whole mummy.[46] Instead of unwrapping, scholars are using sophisticated imaging technologies such as X-rays and increasingly elaborate types of CT-scans.[47] Dating is being done by Carbon 14. Embalming materials are identified using high temperature gas chromatography (HTGC), gas chromatography-mass spectrometry (GC-MS), and Fourier transform infrared (FTIR) spectroscopy.[48] Large-scale DNA studies are being started in order to find and trace the genomes of certain animals, such as ibises[49] and cats,[50] including tracing the geographic dispersal of animals or sites for their domestication,[51] which, to some extent, is aided by isotope analyses, as these allow one to establish points of origin of animals or where they have spent considerable amounts of time.[52]

An additional means of learning about animal mummies and how they were made is by experimental archaeology.[53] No complete ancient texts exist that provide a manual for mummification – they tend to focus on ritu-

[46] Ikram, in Ikram (ed.), *Divine Creatures*, 2015, pp. 16–43.
[47] Armitage and Clutton-Brock, *JAS* 8 (1981), pp. 185–96: https://doi.org/10.1016/0305-4403(81)90023-6; Ikram and Iskander, *Non-Human Mummies*, 2002; Raven and Taconis, *Egyptian Mummies*, 2005; McKnight, *Imaging Applied to Animal Mummification*, 2010.
[48] Buckley et al., *Nature* 431 (2004), pp. 837–41: https://doi.org/10.1038/nature02849; Ikram, *JARCE* 48 (2012), pp. 119–35; Clark et al., *PNAS* 110.51 (2013), e2120584119: https://doi.org/10.1073/pnas.1315160110.
[49] Hekkala et al., *MolEco* 20 (2011), pp. 4199–215: https://doi.org/10.1111/j.1365-294X.2011.05245.x; Wasef et al., *JAS:Rep* 4 (2015), pp. 355–61: https://doi.org/10.1016/j.jasrep.2015.09.020; Kurushima et al., *JAS* 39 (2012), pp. 3217–23: https://doi.org/10.1016/j.jas.2012.05.005.
[50] Kurushima et al., *JAS* 39 (2012), pp. 3217–23: https://doi.org/10.1016/j.jas.2012.05.005.
[51] Ottoni et al., *NEE* 1 (2017), 0139: https://doi.org/10.1038/s41559-017-0139.
[52] Dominy et al., *eLife* 9 (2020), e60860: https://doi.org/10.7554/eLife.60860.
[53] Clifford and Wetherbee, *KMT* 15 (2004), pp. 64–65; Ikram, in Graves-Brown (ed.), *Experiment and Experience*, 2015, pp. 53–74, Ikram, in Massiera et al. (eds.), *Apprivoiser le sauvage*, 2015, pp. 211–28.

als.[54] The pictorial evidence is also limited, with few images appearing in tombs, while a handful of coffins show portions of the purification of humans. Classical authors such as Herodotus provide more information on the subject but more on humans than on other animals. The only ancient text devoted to animal mummification is the "Apis Embalming Ritual", which focuses on the wrapping rather than the actual embalming.[55] One can only learn about the technology of mummification by studying the mummies themselves, through an analysis of their embalming agents, and by experimental archaeology–actually making mummies of animals, and gauging the success of the results in comparison with what was done by the ancients. All these methods, used together, have allowed for a greater understanding of the technologies and materials used by the ancient Egyptians in preparing their dead. The analysis of the architecture and finds of the discovery in 2023 at Saqqara of an embalming workshop for humans and animals will also elucidate the materials and technologies of animal mummification.[56]

1.5 In Conclusion

This catalogue provides a unique opportunity to present a large collection of animal mummies of all types and varying species, studied by an interdisciplinary team. The analyses of the mummies, their wrappings, and their containers provide better dating for these mummies, which will provide the basis for a more nuanced understanding of the chronology of animal cults. They have also provided identifications of mummification materials, particularly coniferous resins, that impact the understanding of trade and the economic impact of mummification, as well as the materials used in mummification. The study of the textiles and bandaging patterns highlight the skills and creativity of the embalmers, as well as helping to establish diachronic change or provenance. Information about the mummies' conservation and threats to their survival are explored, with the results of the Museo Egizio's efforts potentially being of use to other museum and conservation professionals who face similar challenges with their collections. Thus, it is hoped that this catalogue sheds important light on the Museo Egizio's animal mummies, and provides other scholars with information that will promote our understanding of the culture and religion of the ancient Egyptians and their complex relationship with the animal world.

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[54] Some of the material used in mummification is discussed in Schiødt, *Papyrus* 36 (2016), pp. 18–25; for rituals, see Töpfer, in Janowski and Schwemer (eds.), *Texte zur Wissenskultur*, 2017, pp. 206–231.
[55] Vos, *Apis Embalming Ritual*, 1993; Meyrat, in Quack (ed.), *Ägyptische Rituale der griechisch-römischen Zeit*, 2014, pp. 247–62, 263–337.
[56] https://cairoscene.com/Buzz/Ancient-Animal-Embalming-Workshop-Unearthed-in-Saqqara.

2. THE MUSEO EGIZIO AND ITS ANIMAL MUMMIES

Matilde Borla, Federica Facchetti

2.1 The Donati Collection

The collection of animal remains of the Museo Egizio in Turin consists of over 200 items, and is one of the largest outside of Egypt. The collection began to form in the eighteenth century, with the last animal artefact entering the collection in the twentieth century. The Savoy Collection, which is the earliest core of the Museo Egizio, included no animal mummies but rather different artefacts purchased on the antiquities market or retrieved from archaeological sites in Piedmont. Objects included sculptures, funerary stones, terracottas, lamps, and coins. The most significant object was arguably the so-called "Mensa Isiaca", a bronze altar table purchased around 1630 by the King of Savoy Carlo Emanuele I.

The earliest mummified animals arrived in Turin in the eighteenth century with the collection of Vitaliano Donati (1717–62).[1] Donati (*Fig. 13*) was a professor of Botany at the University of Turin. In 1759, King Carlo Emanuele III of Savoy entrusted him to undertake and direct an important mission in Egypt and the Near East in order to collect artefacts for the Regio Museo di Antichità in Turin, which had been established by Vittorio Amedeo II in 1723. The antiquities were housed at the University, in a building erected between Via Po and Via della Zecca (now Via Verdi). Donati was also tasked to gather scientific specimens for a botanical garden.

His journey started in Turin in June 1759. Sailing from Venice, Donati arrived in Alexandria in July 1759. He then travelled through the Nile Valley and the Sinai Peninsula until April 1760. His journey continued to the Middle East and ended tragically in February 1762, when he died on a Turkish boat not far from the Indian coast near Mangalore. Donati's collection arrived at the Museo di Antichità in 1763, as recorded in the University's register.[2] The original document with the list of antiquities collected in Egypt is lost, but a handwritten copy commissioned by Jacopo Bonino in 1832 was discovered at the Biblioteca Civica in

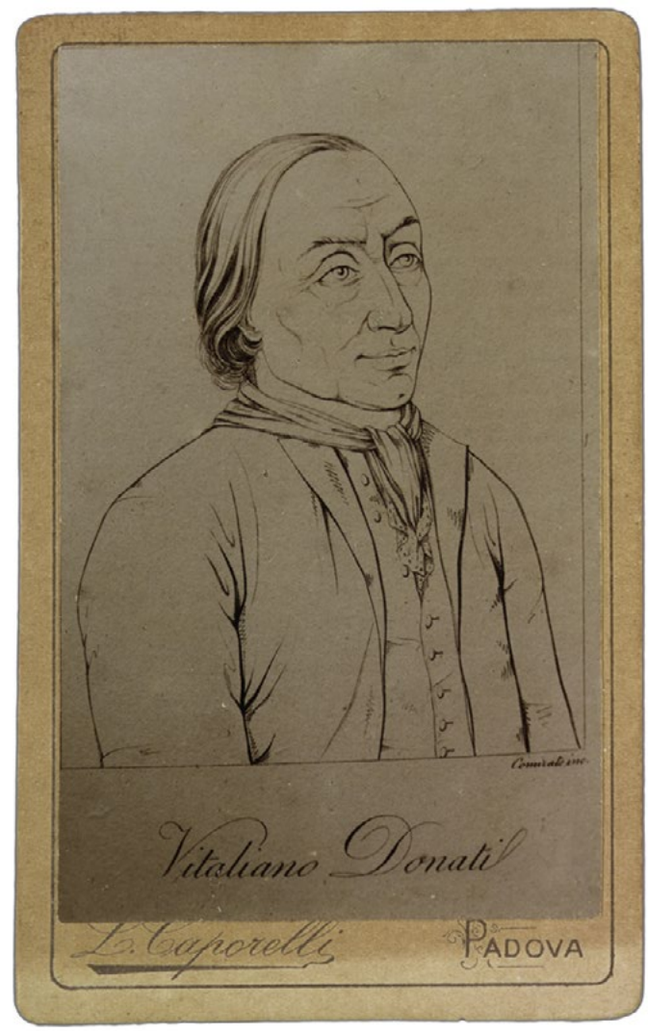


Fig. 13: Portrait drawing of Vitaliano Donati. Reproduction of a Marco Comirato (engraver, lithographer and painter, 1800 ca. – 1869) print, mounted on cardboard, 105 x 65 mm. © Biblioteca storica di medicina e botanica Vincenzo Pinali e Giovanni Marsili – Università degli studi di Padova.

[1] Scalva, *Nuncius* 15 (2000), pp. 365–97: https://doi.org/10.1163/182539100X00524.
[2] Morecroft, *JEA* 92 (2006), pp. 278–82: https://doi.org/10.1177/030751330609200122.

Turin (MSB23). The list numbers 1689 items: 659 artefacts and 1030 scientific samples.[3] The list includes about twenty animal mummies, some apparently from Medinet Habu, together with a clay vase. The items that were transported from Alexandria to Turin were described according to the contents of each transport container. Case 7 contained thirteen unidentifiable animal mummies, and the mummies of one bird, one cat, three dogs, one fish and one vase containing a bird mummy (twenty items). As Donati pointed out in his *Giornale*,[4] some were bought at Medinet Habu, others on the antiquities market of Luxor.

2.2 French Takeover and Restoration

At the end of the eighteenth century, during Bonaparte's campaign in Egypt, Turin was occupied by the French, and the Savoy family was exiled. During the French occupation of Turin (1798–1814), some important Egyptian artefacts from the Museo Egizio, including animal mummies, were sent to Paris, as part of the French policy of obtaining important works of art from various countries to add to the new Museum at the Louvre, and thus to show French supremacy by acquiring cultural treasures from all over. Only one fourth of these artefacts returned to Turin after Napoleon's downfall in 1814. The list of items sent to Paris records: "*Une vase de momie d'oiseaux*"; "*Trois momies qu'on croit d'oiseaux*"; "*Une momie d'animal*". These four mummies were never returned to Turin.[5]

Pietro Ignazio Barucchi, director of the Museum in Turin – who also compiled two inventories, the second of which was published as the Museum catalogue in 1878[6] – briefly describes, room by room, the antiquities that were displayed in the Museo di Antichità up to 1832. Nevertheless, the description of animal mummies in the room called "*sala del mosaico*" is so concise that it makes it very difficult to identify with precision any mummified animal, as he did not specify the size, shape, or species of each. After Napoleon's demise, the power of the Savoy family was re-established in Piedmont, ushering in the "restoration" period. In this historical framework, the reign of Carlo Felice of Savoy (1821–31) stands out for its active cultural policy.[7] Indeed, the year 1824 is characterised by two important events: the opening of the newly restored Accademia di Belle Arti, and the arrival of the Drovetti Collection in Turin.

2.3 The Drovetti Collection

Bernardino Drovetti (1776–1852) (*Fig. 14*) was born in 1776 in Barbania, Piedmont, and studied law at the University of Turin. Influenced by the ideology of the French revolution, he was 20 years old when he joined the French army and immediately distinguished himself during Napoleon's campaign in Italy. Thanks to his brilliant military and diplomatic career, in 1811 he was appointed as French General Consul in Egypt. During his stay in Egypt he became a collector of antiquities, partly through purchases from the antiquities market. His political influence grew progressively. He became a good friend of Mohamed Ali (1769–1849), viceroy of Egypt, and obtained permission to collect antiquities from archaeological sites during his travels through Egypt in 1811, 1814 and 1816. In 1818, he met Count Auguste de Forbin, Director of the Royal French Museum, in Thebes and attempted to sell his collection to the French government, without success.

In the meantime, Drovetti started separate negotiations with the Piedmontese government. At the same time, Carlo Vidua (1818–30), Count of Conzano, Piedmont, an academician who was travelling through Egypt, met Drovetti in Cairo in 1820 and saw a small part of the collection, which was divided between Alexandria and Leghorn. This small sample was enough to convince Vidua that the acquisition of the collection would benefit Turin. The collection consisted of 5304 pieces (excluding coins), including a group of 102 human and animal mummies (lumped together as "*Momies et autres objets*" in the anonymous handwritten sale catalogue of the Drovetti collection[8]). He and his fellow colleagues from the Accademia delle Scienze all brought pressure to bear on King Carlo Felice, who purchased the collection after a long negotiation in 1823.[9]

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[3] Morecroft, *JEA* 92 (2006), pp. 278–82: https://doi.org/10.1177/030751330609200122.
[4] Manuscript, ASTo Corte MS98.
[5] Fabretti, *Museo di Antichità*, 1872, pp. 7–12.
[6] Ministero della pubblica istruzione (ed.), *Documenti inediti*, I, VIII, *Inventario del Museo di Antichità,* 1878, pp. XX–XXIV, pp. 428–65.
[7] Levra, *Storia di Torino,* VI, 2000, p. 688.
[8] Subsequently published in Ministero della pubblica istruzione (ed.), *Documenti inediti*, III, 1880, pp. 206–92.
[9] Moiso, *Storia del Museo Egizio*, 2016, pp. 40–44.



Fig. 14: The funeral monument of Bernardino Drovetti in the monumental cemetery of Turin. Archivio Museo Egizio, A2743.

About eighty items in the Drovetti collection can be identified with animal mummies and/or containers for mummified animals that are currently in the Turin collection. In the handwritten catalogue, the objects are listed and classified by materials and/or type, as in the following examples.[10]

Under *"Objets en bronze, en fer, en plomb"*:
"**378. Une caissette contenant jadis la momie d'un serpent, dont on voit la représentation, surmontée d'un buste à tête humaine."* (p. 221)
Under *"Objets en bois"*:
"*48. Caisse; momie d'épervier avec figure du même oiseau; momie de cet animal, yeux postiches*; 60 c." (p. 237)
"*66. Poisson grossièrement travaillé, contenant la momie de cet animal.*
67. Épervier mitré, contenant une momie apparemment de cet animal." (p. 237)
"*263–266. Cassettes qui contiennent, ou ont dû contenir, des momies de serpent."* (p. 242)
"*277. Chat contenant la momie de l'animal, tête dorée; 59 c. sur 36."* (p. 242)
"422. *Petit épervier de la plus parfaite conservation* *."[11] (p. 247)
Under *"Momies et autres objets":*
"1. *Crocodile embaumé."* (p. 260)
"20. *Momie d'un petit taureau."* (p. 260)
"49–50. *Momies de singe."* (p. 261)
"55–56. *Momies d'Ibis dans des cartons faits de toile."* (p. 261) (*Fig. 15*)
"79. *Crocodile embaumé, au quel* [sic] *il manque la queue*". (p. 261)

Once in Turin, the Drovetti collection was housed at the Accademia delle Scienze and in 1832 the former collection of the Museo di Antichità was transferred to the same building. This collection was so important that Jean-François Champollion himself came to Turin to study the Egyptian antiquities and wrote some notes about them.[12]

The two collections thus came together in the new Regio Museo di Antichità ed Egizio. Combining Donati's and Drovetti's collections, the number of items related to animal mummies (mummified animals plus containers) in the nineteenth century was around 100 objects. Further objects were acquired in the nineteenth century.[13] The catalogues for the Regio Museo di Antichità ed Egizio were written in the form of a "guide for visitors" by Pier Camillo Orcurti,[14] curator at the Museum from 1849 to 1860, and

[10] Ministero della pubblica istruzione (ed.), *Documenti inediti*, III, 1880, pp. 221, 237, 242, 247, 260–61. The identification of the objects in the Museo Egizio in the handwritten catalogue is an ongoing project; see Moiso and Montonati, *RiME*, forthcoming. The asterisk in front of the number designates objects added to the collection from December 1820 onwards (as noted on p. 210 and elsewhere); see Moiso and Montonati, *RiME*, forthcoming. It is perhaps worth pointing out that these objects include several that can be traced to Saqqara; see Poole, *RiME* 3 (2019), pp. 13–14: https://doi.org/10.29353/rime.2019.2808.
[11] The note specifies that the wood is gilded.
[12] Champollion, in *Calendario Generale*, 1825, pp. 463–70; Champollion, *Lettres*, 1824–26.
[13] Among the numerous donations, there are two bronze cats (**Nos. 55–56**) and a limestone coffin for a shrew (**No. 80**), donated by Bussa in 1850, and two votive coffins (**Nos. 137**, **148**), donated by L. Zucchi in 1858. See Curto, *Storia del Museo*, 1976, pp. 94–108.
[14] Orcurti, *Catalogo illustrato*, 1855, pp. 80, no. 58; 81, nos. 59–60; 82, no. 64; 83.



Fig. 15: Two ibis coffins (**Nos. 116–117** in this catalogue), described in the Drovetti collection as follows: "momies d'Ibis dans des cartons faits de toile".



Fig. 16: Some of the animal mummies acquired by Drovetti when they were on display in Room VII in a previous exhibition at the Museo Egizio. Picture from the 1970s. Archivio Museo Egizio, B7308.

subsequently serving as its director from 1861 to 1870. The second volume of this work describes, in few words, animal mummies displayed on the left side of the "*sala a mezzogiorno*". Only some boxes are recognisable from the description or the translation of the inscription. Later on, the first volume of the whole catalogue compiled by Ariodante Fabretti (Museum Director from 1873 to 1893), Francesco Rossi (assistant from 1865, Vice Director from 1867) and Rodolfo Vittorio Lanzone (curator from 1872) devote an entire chapter to animal mummies, collating all the animal mummies and coffins that had arrived in Turin before 1882, namely those from the Donati and Drovetti collections, as well as those donated to the Museum between 1824 and 1882 (*Fig. 16*).[15]

2.4 Schiaparelli and the Missione Archeologica Italiana

2.4.1 Excavations and Purchases

In the twentieth century, the Museum's collection was once more enlarged, through the acquisition of more than 15,000 items, partly purchased,[16] but mostly from excavations in Egypt by the M.A.I. (Missione Archeologica Italiana) under the direction of Ernesto Schiaparelli (director of the Museo Egizio from 1894 to 1928), accompanied by his colleague Francesco Ballerini (curator in 1902), and Giulio Farina (director of the Museo Egizio from 1928, after Schiaparelli's death).[17] The majority of the animal mummies and coffins acquired by Schiaparelli were the result of his purchases (1900–01), which were then augmented by the archaeological campaigns conducted by Ernesto Schiaparelli and Giulio Farina. While relatively few in number, the mummies from these excavations were of diverse species and particularly valuable as they are provenanced (*Table 1*).

2.4.2 Asyut

The majority of animal remains came from the excavations at Asyut, with campaigns conducted in 1906, 1908, 1910, 1911, 1912 and 1913. The excavations yielded six dogs (in this catalogue, **Nos. 14–18, 20**), two cats (**Nos. 39–40**), twenty-six ibises (**Nos. 83–87, 89–109**), three hawks (**Nos. 118, 123–124**), and two shrews (**Nos. 71–72**). Schiaparelli chose to dig at Asyut in order to fill the geographical and chronological gaps of the Turin collection at the time. He wrote: "*Per le rimanenti concessioni, quanto a ritrovamento di oggetti, devono ritenersi allettanti, quella di Gizeh per i monumenti dell'antico impero, quelle di Assiut per il medio impero* [...]".[18]

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[15] Fabretti et al., *Regio Museo*, 1882, "Animali imbalsamati, cassette e statuette funerarie", pp. 332–56.
[16] Curto, *Storia del Museo Egizio*, 1976, pp. 51–55; 105–10.
[17] Moiso, *Storia del Museo Egizio*, 2016, pp. 104–05.
[18] ASTo, MAE, II vers., M. 1 n. 10, p. 8: "As to the remaining concessions, as far as objects to be discovered are concerned, those that must be considered attractive are that of Giza for the monuments of the ancient empire [Old Kingdom], those of Asyut for the middle empire [Middle Kingdom]".

Table 1 Animal mummies preserved in the Museo Egizio divided by provenance and date.

Date \ Provenence	Asyut	Gebelein	Thebes, Valley of the Queens, tomb of Imhotep (QV 46)
Old Kingdom		Dog – 1	
New Kingdom, 18th Dynasty, reign of Tuthmosis I			Victual mummies – 39
Late Period	Ibis – 2		
Late Period – Ptolemaic Period	Cat – 1		
	Dog – 2		
	Ibis – 5		
Ptolemaic Period	Dog – 1		
	Raptor – 1		
Late Ptolemaic – Roman Period	Ibis – 2		
Unknown	Dog – 3		
	Raptor – 2		
	Ibis – 17		
	Shrew – 2		

Asyut had been little investigated before Schiaparelli; the first excavations date to 1903, and were conducted by É. Chassinat and C. Palanque.[19] The presence of an important community of Franciscan missionaries was most likely a determining factor in choosing the site, which had also been the base for his first explorations in Egypt in 1884–85 and 1891–92 when he was still Director of the Egyptian Museum in Florence. The Franciscan missionaries always willingly offered assistance to the Italian archaeological expeditions. Schiaparelli was highly convinced of the site's importance, to the extent of abandoning the mission at Giza to dedicate more resources and time to Asyut. This then became one of the sites that was investigated for one of the longest periods of Schiaparelli's career, from 1906 until 1913. In 1906, the English archaeologist David Hogarth, working for the British Museum, also asked for permission to excavate at this site. As a result, the site was divided between the English, who were to work on the western portion of the north end of the hill, and the Italians, who were awarded the rest of the high ground (*Fig. 17*).[20]

Animal mummies were found during the first campaign (1906) in the area between the slope above Deir el-Meitin and Tomb IV,[21] where about thirty tombs were uncovered. Two shrew mummies were found (**Nos. 71**–**72** in this catalogue). The majority of the animal mummies were found in 1910. The area at the foot of the mountain was investigated, immediately above Tomb I (also known as Stabl Antar, but not to be confused with the homonymous site at Beni Hasan), and near the modern Islamic cemetery and Tomb VII, known as Salakhana Tomb due to its location behind Asyut's old abattoir (the word for slaughter house in Arabic is *maslakh*),[22] in which many canid mummies were found as well as steles and sculptures dedicated to Wepwawet (*Fig. 18*). The main focus was the area at the foot of the mountain immediately above Tomb I near the modern Islamic cemetery, which was cleared, as well as the more distant Tomb VII. During this mission, many animal mummies were unearthed, many of which probably remained in Egypt, on-site or perhaps taken to a museum. A little further south of this area is the "Tomb of the Dogs",[23] thus called

[19] Del Vesco, in Del Vesco and Moiso (eds.), *Missione Egitto*, 2017, p. 295.
[20] Del Vesco, in Del Vesco and Moiso (eds.), *Missione Egitto*, 2017, p. 296.
[21] Sbriglio, in Kahl et al. (eds.), *Asyut*, 2019, p. 80.
[22] Kahl, in Kahl et al. (eds.), *Asyut*, 2019, p. 33.
[23] Kahl, in Kahl et al. (eds.), *Asyut*, 2019, pp. 35–36.

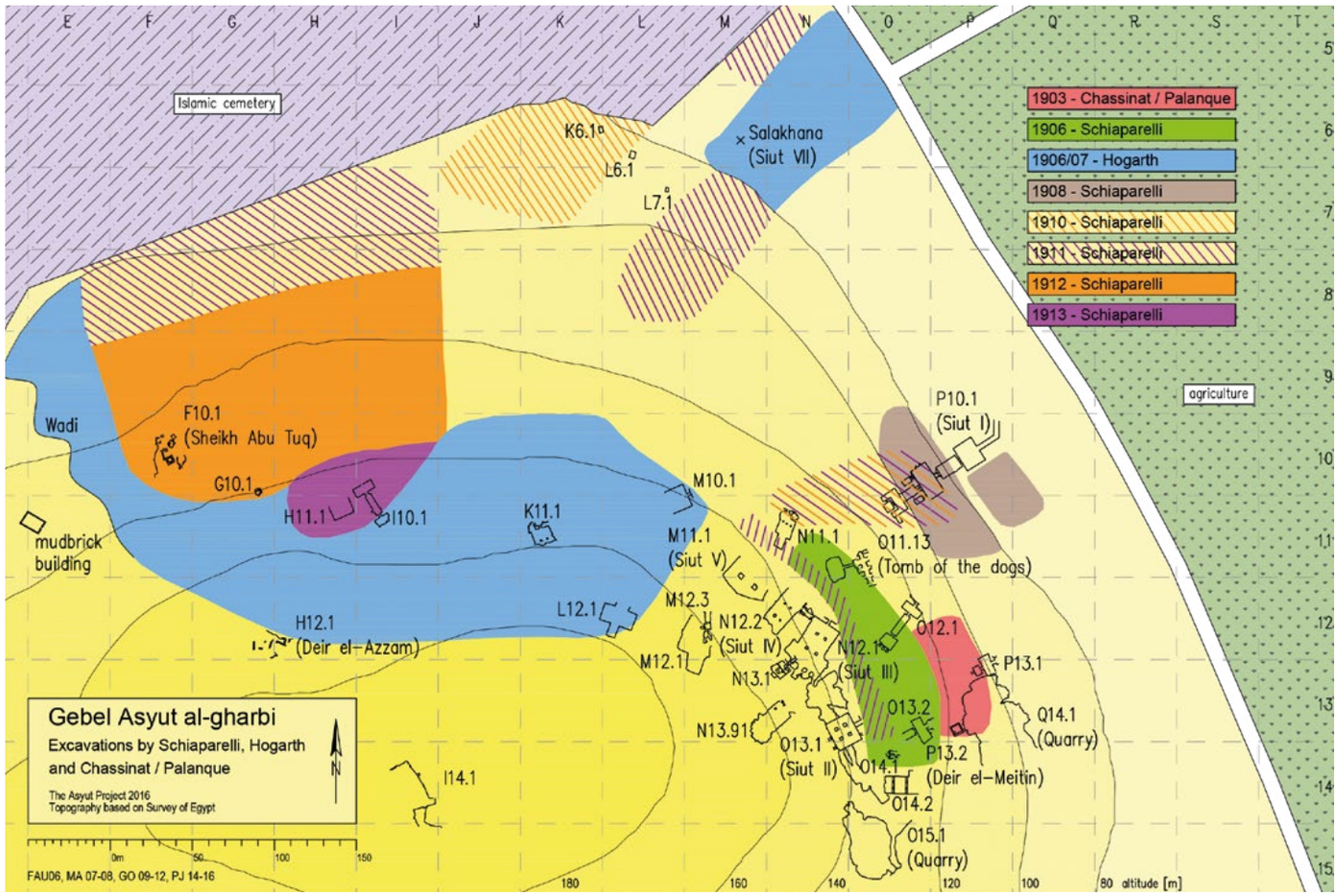


Fig. 17: Reconstruction by J. Kahl and A. Sbriglio. Map by P. Jansen; Copyright: The Asyut Project.

because it contained thousands of mummies of canids, as well as cats, crocodiles and birds.[24] The tomb was used between the Twenty-sixth Dynasty and the Roman Period.

2.4.3 Gebelein

The Museum's collection of animal mummies was also augmented by Schiaparelli's excavations at Gebelein.[25] In 1910, Schiaparelli organised the first of four campaigns (1910, 1911, 1914 and 1920), explored the two hills that constitute the site and are the source of its name (Gebelein means "two hills/mountains").[26] On the southern hill, the Temple of Hathor and a fortress from the Third Intermediate Period came to light, of which only ruins remain today, while in the plain adjacent to the hill remnants of the Ptolemaic Period were found. On the slopes of the northern hill, Schiaparelli unearthed a Predynastic settlement and cemetery, necropolises of the Old Kingdom and First Intermediate Period, and on the ridge of the northernmost part, opposite the modern village of Al Gharirah, tombs of the Middle Kingdom. In 1911, the excavations were carried out by one of Schiaparelli's assistants, the young Virginio Rosa, who documented and photographed the work. Unfortunately, neither Rosa nor Schiaparelli ever published their work, though their excavation journals survive in the Archivio di Stato in Turin. Thus, the precise location of the animal burials remains uncertain.

The anthropologist Giovanni Marro (*Fig. 19*) who had worked at Gebelein in 1914 and 1920, and in 1930 with

[24] Kitagawa, *Tomb of the Dogs*, 2016.
[25] Curto, in Posener-Kriéger (ed.), *Mélanges Gamal Eddin Mokhtar*, 1985, pp. 167–75; Ejsmond et al., *JEA* 106 (2020), pp. 105–22: https://doi.org/10.1177/0307513320970944.
[26] Moiso, in Del Vesco and Moiso (eds.), *Missione Egitto*, 2017, pp. 271–91.

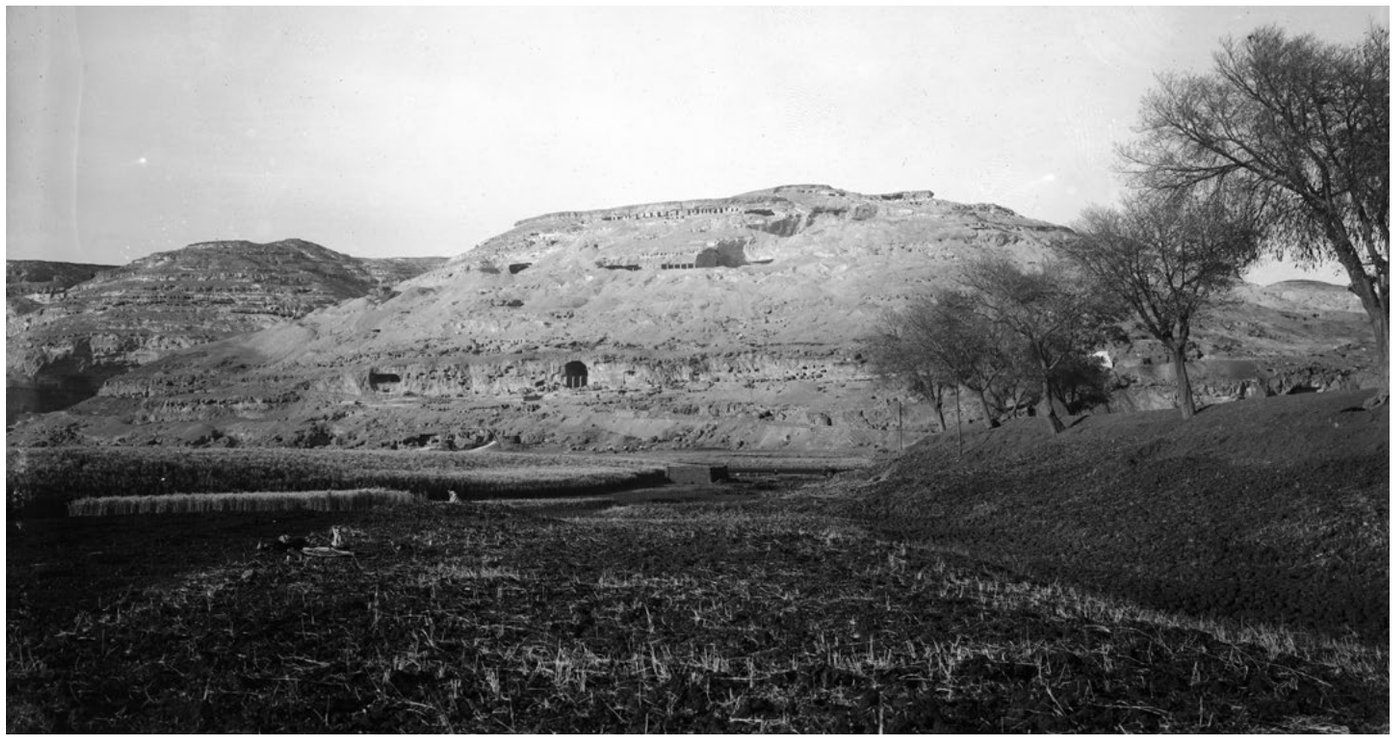


Fig. 18: The necropolis of Asyut. In the middle is Tomb I, while at the top, from left to right, are Tomb II, Tomb III and Tomb IV. 1906–1913. Archivio Museo Egizio, CO1081.



Fig. 19: Excavations on the north hill of Gebelein. On the left is Giovanni Marro, on the right Giulio Farina and Michelangelo Pizzio. 1930. Archivio Museo Egizio, BOO566.

Guilio Farina, published an article on the excavations at this site in the *Atti Società Italiana per il Progresso delle Scienze di Torino* in 1929.[27] In his article, Marro describes Protodynastic pot burials found on the site and mentions the discovery of a dog mummy "*del quale ben si scorge ancora la varia chiazzatura sul mantello*"[28] and writes that it was kept in a "*coccio di quei soliti vasi a cono rovesciato dall'apertura molto ristretta*".[29] Two further dog mummies found in the tomb of Iqer, at the entrance to the burial chamber, are documented in Marro's article. However, it is impossible to know whether these mummies dated from the original Twelfth Dynasty tomb or from its reuse in the Graeco-Roman Period. The description of the fur, however, and the vase fragment in Marro's article seem to be that of the dog in a jar now kept in the Museo Egizio and inventoried under the number Suppl. 17016 (**No. 21** in this catalogue). The handwritten inventory also tells us that the dog mummy preserved in the vessel was found during the 1920 campaign, but unfortunately we do not know the exact place of its discovery. This burial is particularly interesting because it dates to the Old Kingdom, and is the oldest attestation found to date of a dog mummy burial in a pot.[30]

2.4.4 Valley of the Queens

The archaeological context of the thirty-nine "victual mummies" and their containers held in the Museo Egizio is clear (*Fig. 20*). These were found in the tomb of Imhotep, discovered by Schiaparelli and his assistant Francesco Ballerini in the Valley of the Queens (Tomb QV 46).[31] The tomb was found in early 1904, next to that of Princess Ahmose. Imhotep was the vizier of King Tuthmosis I and tutor to his sons.[32] While his grave had been violated, his body desecrated, and most of the grave goods almost totally looted, Schiaparelli's team found the body, some largely damaged funerary furniture, and a group of encoffined victual mummies (see Chapters 1 and 8.14 for an explanation of victual mummies). Schiaparelli describes them as follows: "*varie cassette di legno incatramate internamente e colorite esternamente di bianco, imitanti nella loro forma quella di un'anitra mummificata*".[33] Thus, the animal mummies held in the Museo Egizio are notable not only for their quantity, but also for the fact that many of them are provenanced and thus since most animal mummies in museum collections are unprovenanced, provide crucial information on a number of aspects (see Chapter 1).

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[27] Marro, *Atti SIP* 7 (1928), pp. 3–47.
[28] "... of which the various patches of the coat are still well visible".
[29] "... a fragment of those usual upside-down-cone-shaped pots with very narrow mouth".
[30] Facchetti et al., *A dog in a vessel,* in preparation.
[31] Schiaparelli, *Esplorazione della Valle delle Regine*, 1923.
[32] De Garis Davies, *Two Ramesside Tombs*, 1927, pl. XV; Auenmüller, *Territorialität*, 2013, pp. 815-16, WS18-2.
[33] "... various wooden boxes, internally tarred and externally coloured white, imitating in their shape that of a mummified duck". Schiaparelli, *Esplorazione della Valle delle Regine*, 1923, p. 25.

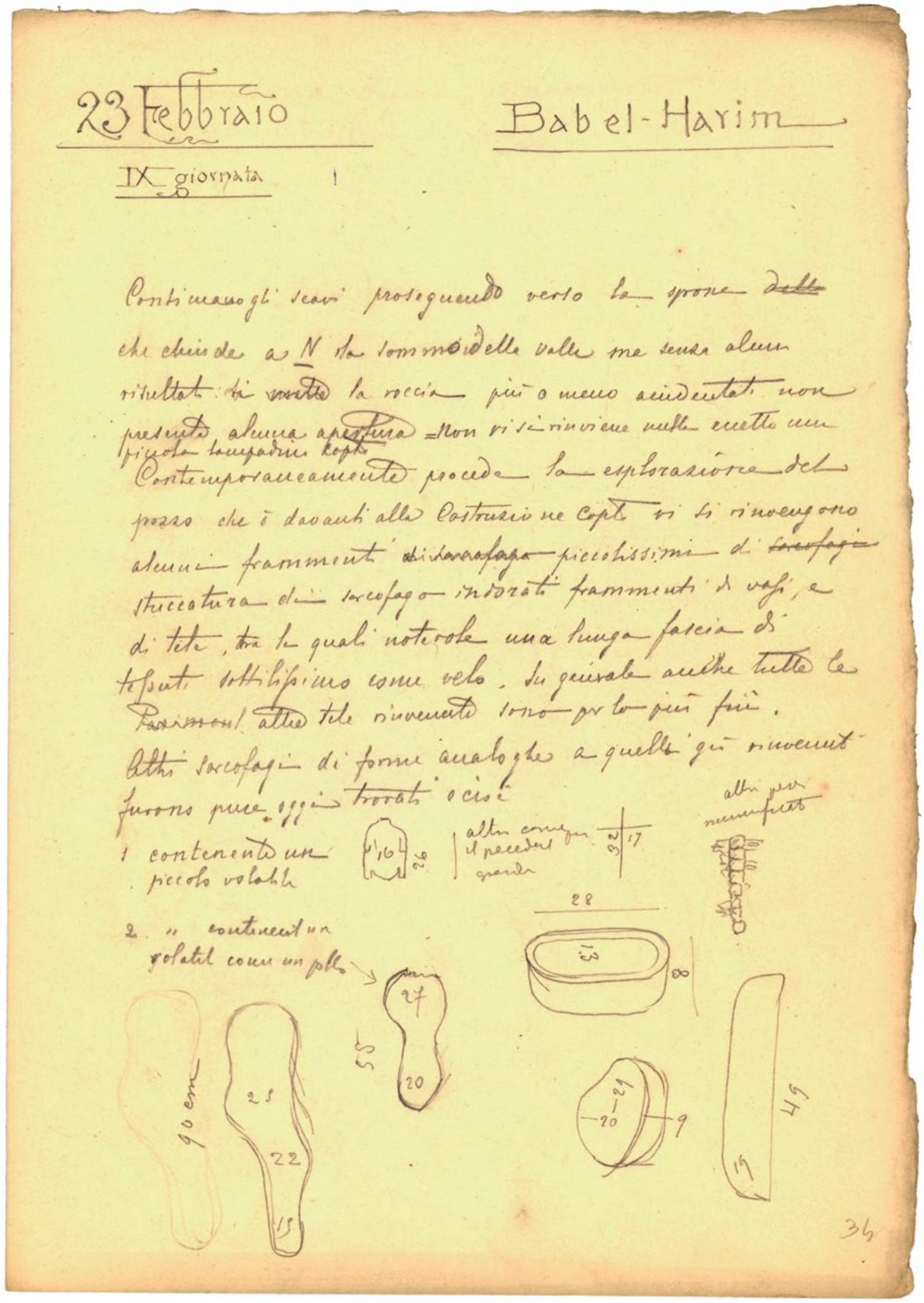


Fig. 20: A page on the discovery of the tomb of Imhotep in Francesco Ballerini's excavation journal. B6 16 35. © Archivio di Stato di Torino, Fondo MAE, II vers., M. 6, n. 16.

3. ENVELOPING THE ANIMALS: TEXTILE TYPES & PATTERNS[1]

Matilde Borla with a contribution by Cinzia Oliva

3.1 Introduction

Animal mummies are very common in museum collections and are increasingly featured in scientific publications.[2] One of the most striking features of animal mummies is that the wrapping is often very elaborate, in particular with examples held in museum collections, as these were chosen for the aesthetic quality of the wrappings. The textiles used, and the bandaging itself, formed a part of the economic aspect of fabricating animal mummies,[3] and have recently been receiving increased attention.[4]

In the Turin Animal Mummy Project, we identified the fabrics used in preparing the mummies, tried to identify dyes, examined patterns, and studied the techniques used to create those patterns.

3.2 Methodology

The first step of the study was the identification of the different textiles present in each artefact. For this reason, each individual catalogue entry is provided with a table under the heading "Textile notes" (*Fig. 21*) that contains the main information relating to the wrappings:

1. Number of textiles or threads detected on the mummy;
2. Type of fibre;
3. Torsion (spin form);
4. Weave form;
5. Thread count;
6. Dyes/colours;
7. Technical details and sewing features (selvedge, starting and finishing borders, fringes, self-bands, and sewn features such as hemming, darning or stitching).

In the case of a very complex pattern, the table of textile notes is supplemented by a drawing showing the position of the different types of fabric used for the mummy.

3.2.1 Number of Textiles

Each textile is labelled with a letter and/or number (T1, T2, etc.). The total number of textiles examined is more than 400, from 234 entries in this catalogue. It should be noted that, with animal mummies, it is always quite difficult to identify the precise number of textiles and their technical features, because the bandages are very narrow, interwoven, and superimposed. Moreover, even when two or more fabrics have a similar weaving reduction (warp and weft count), it does not mean that they come from the same cloth. For this reason, we tried to record any visible textile, one by one, only suggesting that, when the thread count is similar, they might come from the same piece of fabric. At the same time, two fabrics that have a different thread count might come from the same cloth, and the discrepancy might only be due to a different state of conservation.

3.2.2 Raw Material

The numerous raw materials used for textiles during the Pharaonic Period in Egypt included flax, wool, hemp, and other bast fibres.[5] However, all the textiles we examined from the animal mummies are likely to be flax fibres (*Linum*

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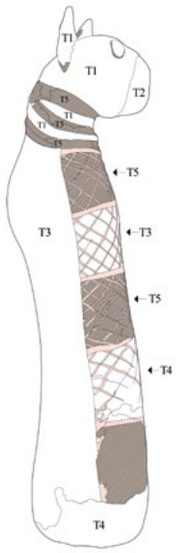
[1] This chapter draws on a paper by M. Borla, C. Oliva and S. Aicardi entitled "Dressing Animal Mummies: The Collection of the Museo Egizio, Turin", presented at the *3rd International Symposium on Animals in Ancient Egypt, the Middle Nile and their Hinterlands*, Naples, 15–17 June 2022.

[2] Ikram, in Porcier et al. (eds.), *Creatures of Earth, Water, and Sky*, 2019, pp. 179–91; Ikram, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 225–34.

[3] Ikram, in Massiera et al. (eds.), *Apprivoiser le sauvage,* 2015, pp. 211–28; Riggs, *Unwrapping Ancient Egypt*, 2014, pp. 109–51; Bussi, in Porcier et al. (eds.), *Creatures of Earth, Water, and Sky*, 2019, pp. 119–26.

[4] McKnight, in McKnight and Atherton-Woolham (eds.), *Gifts for the Gods*, 2015, pp. 78–80; Letellier-Willemin, in Porcier et al. (eds.), *Creatures of Earth, Water, and Sky*, 2019, pp. 221–29; Dunand et al., *El-Deir Nécropoles IV*, 2017; Dunand et al., in Porcier et al. (eds.), *Creatures of Earth, Water, and Sky*, 2019, pp. 145–54; Letellier-Willemin, in Ikram et al. (eds.), *The Ancient Egyptians & the Natural World*, 2021, pp. 183–90; Ikram et al., *RiME* (forthcoming).

[5] Vogelsang-Eastwood, in Nicholson, and Shaw (eds.), *Ancient Egyptian Materials and Technology*, 2000, pp. 268–70; Kemp and Vogelsang-Eastwood, *The Ancient Textile Industry*, 2001, pp. 23–26 (flax), 35–35 (wool).



1	2	3	5	4	6	7
	Material/ fibre type	**Spin form**	**Weave**	**Thread count/ density**	**Colours/ dyes**	**Technical details/ sewn features**
T1 (head and ears)	Linen	S	Warp-faced	24 x 9	Undyed	
T2 (muzzle)	Linen	S	Warp-faced	30 x 11–12	Undyed	
T3	Linen	S	Warp-faced	18–20 x 10	Undyed	
T4	Linen	S	Warp-faced	44 x 15	Undyed	
T5	Linen	S	Warp-faced	28 x 13	Dark brown Hydrolysable tannins	
Thread	Linen	S			Pinkish	

Fig. 21: Drawing and table with textile notes on a cat mummy (**No. 22** in this catalogue). Drawing by V. Poletto.

usitatissimum),[6] the only exception being a small piece of woollen textile found in a hole in the back of the bovine mummy **No. 6**, possibly used as filling material (see Chapter 6, *Fig. 100* for yarn analyses).

3.2.3 Spin Form

Plant fibres possess particular types of natural twists and flax fibres are S-twisted. The yarn-making process of linen follows a number of steps[7] that can be thus summarised: to obtain a single and continuous thread, bundles of linen fibres (about 60–70 cm long) are twisted together ("spliced"),[8] one alongside the other with the edges overlapping by a few centimetres, then wrapped around a core. Next, to obtain a strong and elastic length of yarn, two threads are plied together using a spindle.[9] In general, in Pharaonic Egypt, flax fibres were twisted together in the S-direction.[10] Over time, the torsion could be weakened and difficult to detect. Furthermore, the general state of conservation can interfere with the torsion itself. Almost all threads sampled from the wrapping fabric of the Turin animal mummies are spun in the S-direction.[11] We both find single S-spun threads and S-plied yarn made of two S-spun threads, among which the latter type is most common in the Turin collection (*Fig. 22*). Only the final twist direction is given in the table, as it was often difficult to distinguish between S and S2s due to fibre preservation or textile dimensions.

3.2.4 Texture and Density of Fabric: Dimensions, Thread Count and Weave Forms

Weaving is the method to produce a textile in which two distinct sets of threads (called warp and weft) are interlaced at right angles.[12] The warp is the base system that

[6] Animal mummies are generally wrapped in linen textile. The only exception seems to be the use of cotton for a fish mummy. See Letellier-Willemin, in Ikram et al. (eds.), *The Ancient Egyptians & the Natural World*, 2021, pp. 183–89. In the el-Deir necropolis, all animal mummies are wrapped in linen fabrics, while for the bandages of human mummies cotton textile is also used: Dunand et al., *El-Deir Nécropoles IV*, 2017, pp. 187, 190. Cotton and flax union textile has been identified in the fabric from the survey in North Kharga Oasis: Jones, in Rossi and Ikram (eds.), *North Kharga Oasis Survey*, 2018, pp. 541–49.

[7] For the cultivation and the processing of flax in the Pharaonic Period see Vogelsang-Eastwood, in Nicholson and Shaw (eds.), *Ancient Egyptian Materials and Technology*, 2000, pp. 270–74; Kemp and Vogelsang-Eastwood, *The Ancient Textile Industry*, 2001, pp. 27–33. The processing of flax fibre was investigated by SEM images only on a reduced number of samples within the framework of a study focused on dyeing: Tamburini et al., *HeritSci* 9 (2021), no. 106: https://doi.org/10.1186/s40494-021-00585-2.

[8] Fibre preparation and splicing are described and discussed by Cartwright, in Quirke (ed.), *Lahun Studies*, 1998, pp. 103–07; Kemp and Vogelsang-Eastwood, *The Ancient Textile Industry*, 2001, pp. 70–82; Gleba and Harris, *ArchAnthr* 11 (2019), pp. 2329–46: https://doi.org/10.1007/s12520-018-0677-8.

[9] Spindle and spindle whorls are attested in Egypt from the Neolithic Period onwards: Spinazzi Lucchesi, *Unwound Yarn*, 2018, pp. 84–87.

[10] From the Naqada II Period onwards, the S-twist became the dominant spinning technique: Jones, in Midant-Reynes et al. (eds.), *Egypt at its Origins 2*, 2008, pp. 110–11.

[11] An example of a fibre with a Z-torsion can be seen in a textile from the mummy of a cat – **No. 40** in this catalogue

[12] Vogelsang-Eastwood, in Nicholson and Shaw (eds.), *Ancient Egyptian Materials and Technology*, 2000, pp. 274–76.

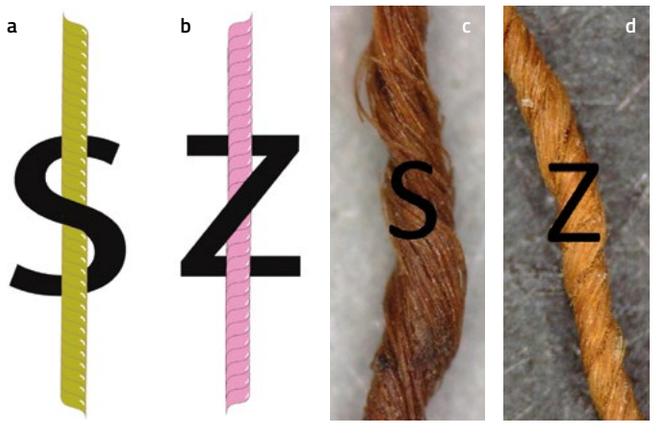


Fig. 22: Drawing and pictures showing twist direction of fibres: a. S-twist (anti-clockwise twist); b. Z-twist (clockwise twist); c. Dino-Lite S-spun fibres from cat mummy **No. 32**; d. Dino-Lite Z-spun fibres from cat mummy **No. 40**. Dino-Lite by M. Borla

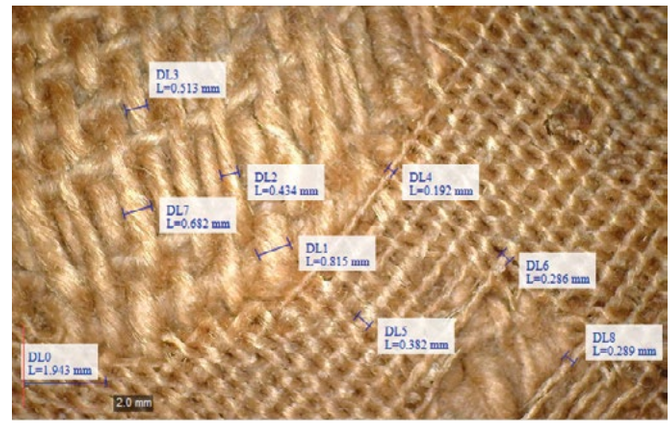


Fig. 23: Thread dimensions: fibres from cat **No. 32**, textiles T2 (44 x 18 cm) and T2b (10 x 9 cm). Dino-Lite by M. Borla.

range of warp per centimetre	number of specimen
not detectable	83
≥ 0 ≤ 10	2
≥ 11 ≤ 20	77
≥ 21 ≤ 30	113
≥ 31 ≤ 40	108
≥ 41 ≤ 50	45
≥ 51 ≤ 60	14
≥ 61 ≤ 70	2
≥ 71 ≤ 80	1
≥ 81 ≤ 90	0
≥ 91 ≤ 100	1
	446

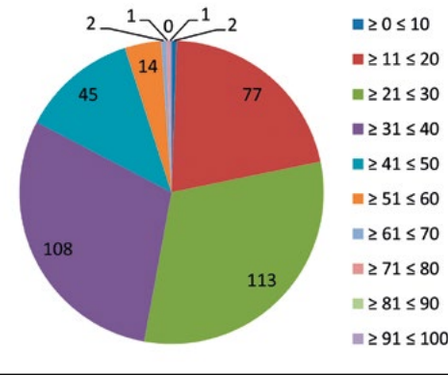


Fig. 24: Table and graph with warp values.

must be kept in tension during weaving; the weft runs perpendicularly to the warp, passing alternately over and under the threads of the warp. The outcome depends on three elements: the diameter of the individual yarns (dimension); the number of warp and weft threads per square centimetre (density); the way wefts pass through warps (weave form):

a) The dimension (size) of each individual yarn was measured only sporadically and, for this reason, is not recorded in the table of textile notes (*Fig. 23*). However, the examination conducted during the restoration process allows us to state that, although the fabrics chosen for the animal mummies are heterogeneous, we found neither very fine nor very thick yarns.

b) The number of warp and weft threads per square centimetre determines the texture or "quality", meaning the fineness as well as density of the fabric (*Fig. 24*). Counting the threads is sometimes impossible and generally very difficult in animal mummies for a number of reasons. One reason is the size of the bandages, that in some instances are very small; the strips used for patterns can be less than one centimetre wide. Dark-brown and black textiles are often too damaged to be counted. Animal mummies can be made of numerous pieces of different textiles and only some of the outermost ones can be counted. Moreover, the count made on a small fragment can only be indicative, because if this fragment was damaged or subjected to tension, the detected thread count could be very different from that of the original fabric. Hence, two fragments having two different counts could belong to the same original fabric.



Fig. 25: Examples of weave forms: a. balanced weave, bull mummy **No. 6** (T3 13 x 13 cm); b. warp-faced weave, dog mummy **No. 9** (T3 24 x 9 cm); c. basket regular weave, ibis mummy **No. 99** (T3 36 x 18 cm); d. irregularity in basket weave, dog mummy **No. 17** (T1 28–30 x 14 cm). Dino-Lite by C. Oliva.

c) The way yarns are interlaced results in different forms in the woven material. All of the weaving forms identified among the textiles examined are well-known Pharaonic forms: plain weave and basket weave.[13] Plain weave is where horizontal (weft) threads alternately pass over and under the vertical (warp) ones. It can be described as balanced plain weave if there is an equal number of warp and weft threads per centimetre (*Fig. 25a*). Instead, if the number of warp threads is higher than weft ones, we have a warp-faced weave (*Fig. 25b*). Basket weave is a plain weave in which two or more warps and two or more wefts are woven side by side (*Fig. 25c-d*). It is firm, thick and elastic. Warp-faced weave is the most common weave attested in the Pharaonic Period and this trend is confirmed by our data: out of 446 linen textiles examined, 327 have a warp-faced weave, while only twenty have a balanced plain weave and sixteen have a basket weave.

3.2.5 Colours, Dyes, Painting

Some animal mummies were originally very colourful. Chromatic contrasts were achieved by alternating undyed and dyed fabrics or adding painted motifs. It is often very difficult to distinguish between dyed and undyed fabrics in animal mummies, due to poor condition and prolonged exposure to light, which irreversibly alters the original colour. Dyed textiles and painted motifs were used to create some of the anatomical parts of the animal (eyes, ears, beak, etc.) and decorative patterns.

Undyed textiles

Undyed textiles can differ significantly from one another. Variations in the natural colour of textiles can be attributed to several elements and can occur at different stages. Variation of flax colour depends on place of cultivation, time of harvest, processing stage, fibre contamination, storage, and ancient and/or modern contamination. Furthermore, natural ageing of cellulose fibres contributes to variations in colour. In some cases, the colours of fabric could be the result of staining or the presence of additional organic material used in the mummification process.

Dyed textiles

The distinction between dyed and undyed fabric is sometimes difficult when the original colour is faded. Some of the substances used for dyeing are very sensitive to light. In these cases, the original colour is only visible when the dyed fabric is covered and protected by overlapping bandages. The colour variations of dyed linen are numerous (*Fig. 26*).[14] We have identified shades ranging from yellow to dark brown, and from orange-pink to red. White is also present. We have not identified any shades of blue[15] or green[16] on bandages. Safflower and red ochre were identified as the main dyestuff used to obtain orange/red/pink

[13] We have detected some irregularities in the weaving patterns of two ibis mummies from Asyut, **Nos. 15, 17** in this catalogue. In some areas there are four warp threads instead of two; we believe that these mummies may come from the same workshop.

[14] See Chapter 6. The material used to colour the textile wrappings of animal mummies and the dyeing techniques has been studied combining non-invasive and micro-invasive techniques: Tamburini et al., *HeritSci* 9 (2021), no. 106: https://doi.org/10.1186/s40494-021-00585-2. On dyeing methods, see Germer, *Textilfärberei*, 1992; Vogelsang-Eastwood, in Nicholson and Shaw (eds.), *Ancient Egyptian Materials and Technology*, 2000, pp. 278–79.

[15] One cat in Washington, NMNH 251758, is wrapped with blue strips of linen.

[16] A green thread has been identified in the fabric used for the head of a gazelle (Lyon, MdC 90001211): Letellier-Willemin, in Porcier et al. (eds.), *Creatures of Earth, Water, and Sky*, 2019, p. 223.

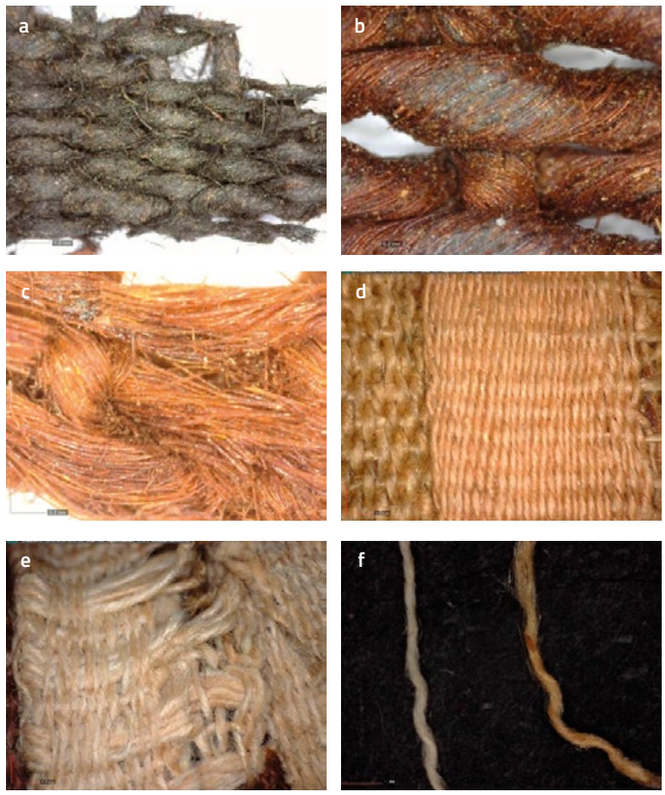


Fig. 26: Dyed textiles and fibres: a. black, **No. 151**; b. brown, **No. 162;** c. light brown **No. 22**; d. faded orange-pinkish, **No. 31**; e. white-bleached, **No. 4**; f. comparison of bleached and undyed fibres, **No. 9** (a, b, c: photos by D. Angelici; d, e, f: Dino-Lite by M. Borla).

colours.[17] Dark brown and black were obtained by combining hydrolysable tannins (cat mummy **No. 22** in this catalogue) with an iron mordant, as opposed to lighter brown colours, which were possibly obtained by using only hydrolysable tannins without iron. Bandages with a whitish appearance have been identified in some patterns (e.g., dog mummies **Nos. 9**–**11**). The bleaching of flax fibres was first achieved by exposing the fibres to the sun but natron was also probably used as a bleaching agent.[18] It has been stressed that dyeing and bleaching are attributes of the quality of the fabric, as they are time-consuming and expensive treatments, reserved for fabrics used by the elite.[19]

Painted textiles

Some animal mummies are decorated by combining dyeing and painting techniques. For example, in the bull mummies **Nos. 4**–**6**, the pupils are made by painting the white bleached fabric underneath in black,[20] while the eyelids are

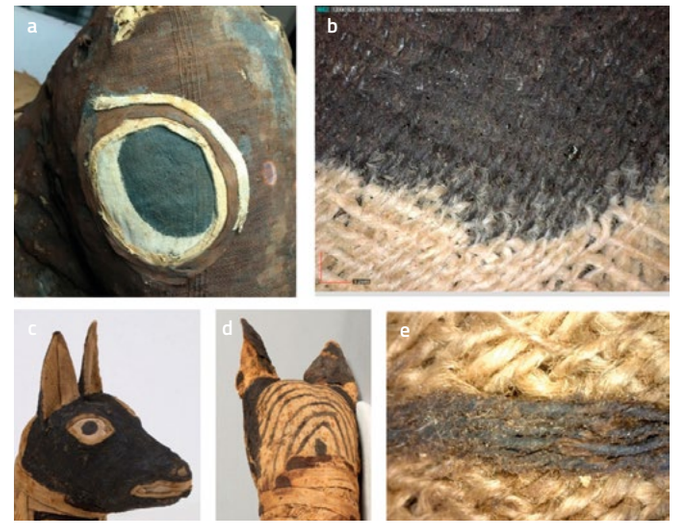


Fig. 27: Examples of painted textiles: a-b. bull mummy **No. 4**: black painting on white bleached fabric underneath (Dino-Lite by M. Borla); c. black painting on the muzzle of the dog **No. 10**; d. black concentric semi-circles lines on the back of the head **No. 9**; e. dipped fibres for the cat whiskers **No. 31** (photo by D. Angelici).

made with two strips of linen: one dyed orange-pinkish and the second one dyed brown (*Fig. 27a-b*). The muzzle of the dog mummy **No. 10** is entirely covered in black paint (*Fig. 27c*), evoking Anubis, who is entirely black, and the head of dog mummy **No. 9** is painted with concentric black lines (*Fig. 27d*), perhaps to imitate the fur on its back.[21] Some anatomical details, such as cat whiskers, are made by dipping the fibres into substances of an organic nature (*Fig. 27e*).[22]

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[17] In a previous investigation on human mummies, madder was also identified as a source of red: Tamburini et al., *Molecules* 24 (2019), p. 3761.
[18] Vogelsang-Eastwood, in Nicholson and Shaw (eds.), *Ancient Egyptian Materials and Technology*, 2000, p. 180, mentions exposure to sun and natron as possible bleaching agents. Riggs, *Unwrapping Ancient Egypt*, 2014, pp. 92, 117; Landry, in Fossey and Caron (eds.), *Coptic Textiles,* 2019, p. 12.
[19] Letellier-Willemin, in Porcier et al. (eds.), *Creatures of Earth, Water, and Sky*, 2019, pp. 223, 229.
[20] The same way of making the eyes is used in a bovid from Thebes (Cairo, EM CG 29676): Lortet and Gaillard, *La faune momifiée*, 1905, p. 259, fig. 128; Gaillard and Daressy, *La faune momifiée*, 1905, pl. XLII. The black is most likely carbon black: Lee and Quirke, in Nicholson and Shaw (eds.), *Ancient Egyptian Materials and Technology*, 2000, p. 108.
[21] A similar concentric decoration made with brown and undyed strips is present on a dog mummy from Thebes, in Lyon, MdC; see Lortet and Gaillard, *La faune momifiée*, 1905, p. 2, fig. 2.
[22] Pyrolysis-GC/MS analysis carried out on the dark/blackish substance impregnating the textile used for the fashioning of the muzzle revealed the presence of proteinaceous and polysaccharide materials. This data suggests that plant gum was the main component; see here Chapter 6 and Brettell et al., *SC* 62 (2017), pp. 68–82: https://doi.org/10.1179/2047058415Y.0000000027.

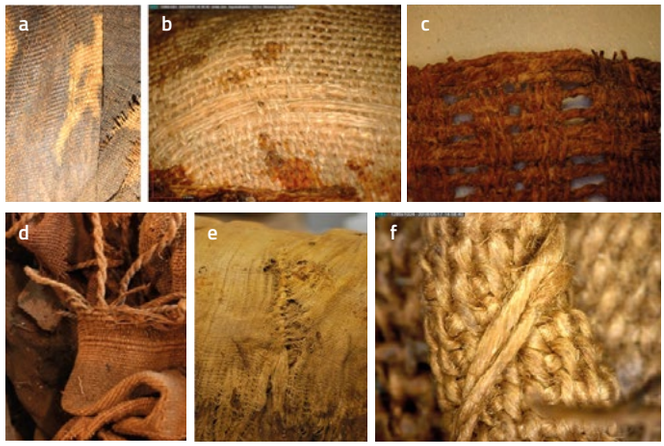


Fig. 28: Examples of constructional details and tailoring elements (sewing): a. selvedge of dog mummy **No.16**; b. self-bands of cat mummy **No. 33** (Dino-Lite by M. Borla); c. starting border of dog **No. 14**; d. fringes of cat mummy **No. 51**; e. stitching and darning, back side of cat mummy **No. 33**; f. rolled hem on back side of ibis mummy **No. 92** (Dino-Lite by C. Oliva).

3.2.6 Technical Details and Sewn Features

As the textiles used for animal mummies tend to consist of fragments cut from a larger cloth, we could only identify a limited number of technical details relating to the production of the textile and, sometimes, tailoring features. For each mummy, we provide details on the edges of the fabric (selvedges), starting and finishing borders, fringes, warp decoration (self-bands), and tailoring elements, such as seams, hems, stitching and darning (*Fig. 28*).[23] Selvedges are the lengthwise edges of both sides of the fabric. Their function is to secure the fabric from fraying out the warp threads and it is characterised by a higher thread count. The so-called "self-bands" are texture strips made of multiple (or thicker) weft threads. They usually occur near the starting border. Their function is both decorative and structural.

On 446 linen textiles examined, we have recorded fifty examples of self-bands, twenty fragments of selvedges, eight pieces with starting borders, ten with hems, and eight with fringes. Very few examples of stitching (six) and only one of darning have been recorded.

3.2.7 Single Threads

Individual threads were used for a variety of purposes: to stitch together seams or ends (sewing threads) (*Fig. 29a*), to hold the inner bandages in place, tightly wrapped around the body, or to create a decorative pattern. The mummies of cat **Nos. 22–23** illustrate both functions simultaneously: the inner bandages, which are currently visible only through the gaps, are secured using undyed threads (S-spun) running all around the body and are hidden by a subsequent layer of bandages. On the outer layer, the decoration is composed of three groups of threads (S-spun), probably dyed pink, which create a net pattern. Groups of eight to nine horizontally arranged threads complete the decoration at the junction of the two cloths (*Fig. 29b*). Their function here is both structural and decorative.



Fig. 29: Threads: a. sewing thread (Z2s torsion) on dog mummy **No. 9**, T3 (22–26 x 9); b. cat mummy **No. 22**. Inner threads (S torsion) are used to hold in place inner bandages while outer ones create a net pattern.

3.3 Some Considerations on Animal Mummy Textiles

As the animal mummies in the Museo Egizio's collection are a heterogeneous group in terms of provenance, typology and dating, it is difficult to make conclusive remarks about the fabrics used to wrap the animal mummies. However, by comparing the thickness of the threads, the thread count, as well as weave forms, technical details, and sewn features, we can draw some preliminary conclusions. The first concerns the number of different fabrics that were detected on each mummy. Simply wrapped mummies were made with a limited number of textiles (one or

[23] Different sewing techniques are described by Vogelsang-Eastwood, in Nicholson and Shaw (eds.), *Ancient Egyptian Materials and Technology*, 2000, pp. 282–83.



Fig. 30: Different qualities of textiles (in terms of texture and density) used in wrapping the dog mummy **No. 9**.

two), whereas mummies with elaborate wrapping patterns could be made using as many as nine to ten different textiles (e.g., dog mummy **No. 9** and bull mummy **No. 6** in this catalogue). This calculation of course does not take into account the fabric that is not visible in well-preserved mummies. The second conclusion regards the quality of fabric in terms of texture and density (*Fig. 30*).

For some mummies, textiles for inner layers were chosen with a sparser weaving, possibly because they were more flexible. Outer textiles and strips used to create patterns are made, instead, from more densely woven cloth. As for weaving forms, warp-faced textiles would appear to predominate. The percentage of warp-faced textiles throughout the collection is over 90% in the collection as a whole, and 85% in the animal mummies from Asyut.

The choice of a fabric with some strengthening features (such as selvedges, self-bands, or hems) was probably deliberate. Textile fragments that retained the selvedge could be very useful for bandages. The same goes for fringed fabrics, which were probably chosen for their decorative value.

The data collected from the animal mummies confirms that the textiles employed therein had been previously used before serving as wrappings for mummies.[24] Still, the choice was hardly random. Each piece of fabric was carefully selected for its quality or colour in relation to its role in creating the wrappings, as inner bandages or outer decorative strips; they were, as they have been called, "choice-cuts".[25]

3.4 Shape, Bandaging Technique, Pattern

The importance of linen bandaging as a possible source of information for dating and identifying workshops has been stressed by all scholars who deal with animal mummies (see Chapter 4). Similarly, during our study, we tried to investigate the relationship between the content of the animal mummy and its shape, the bandaging technique, the pattern, and the methods used to achieve all these.

It should be noted that the following observations about shape, bandaging technique and pattern are based on material observations relating to the manufacturing process. They are mainly based on animal mummies from the collection of the Museo Egizio in Turin and hence should not be regarded as exhaustive. More extensive comparison with animal mummies in other collections and from archaeological sites could be the object of future research projects.

3.4.1 Shape

Regarding the shape of animal mummy bundles, in some cases the outer shape of the mummy is closely related to the natural shape of the animal contained within. In other cases, instead, the packaging is quite ambiguous. We have distinguished three groups.

The first encompasses animal mummies with a "naturalistic" shape. The different parts of the body (head, torso, legs and tail) are wrapped separately or in a way that suggests the animal's true shape. The animal is clearly identifiable by means of specific characteristics (see, e.g., cat Paris, Louvre E2815_N2913a, E2818 and AF2055, and baboons **Nos. 1**–**2** in this catalogue). Ibises are often wrapped in such a way that they appear to be sitting in a self-grooming position. The head is turned backward. The bandaging hints at the plumage of the wings folded over the body.

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[24] Recycling textile was a common practice well documented in human mummies and is also recorded in animal mummies: Ikram and Dodson, *The Mummy in Ancient Egypt*, 1998; Vogelsang-Eastwood, in Nicholson and Shaw (eds.), *Ancient Egyptian Materials and Technology*, 2000, p. 295; Bruno, in Bleiberg et al. (eds.), *Soulful Creatures*, 2013, pp. 111–15; Bleiberg, in Bleiberg et al. (eds.), *Soulful Creatures*, 2013, pp. 127–28; Riggs, *Unwrapping Ancient Egypt*, 2014; Dunand et al., *El-Deir Nécropoles IV*, 2017, pp. 187, 190; Letellier-Willemin, in Porcier et al. (eds.), *Creatures of Earth, Water, and Sky*, 2019, p. 228; Oras et al., *PLOS ONE* 15.1 (2020), e0227446, p. 18: https://doi.org/10.1371/journal.pone.0227446.

[25] Ikram, *Choice Cuts*, 1995.

In the second group, the focus is on the head. The attributes of a particular animal species (ears, whiskers, horns, beak), recreated using strips of fabric or painted details, indicate the species contained within the mummy bundle. More abstract shapes (cylindrical/skittle/anthropoid/other) can be decorated with bandages of various colours arranged in a geometric pattern, in some cases a very elaborate one (e.g. see in this catalogue dog **No. 10**, bull **No. 6**, raptor **No. 122**).

The third group of mummies have a more generic shape. The wrappings are not arranged so as to immediately evoke the natural shape of the animal inside. In some cases, only the head and the body are distinguishable. However, the shape of the head is generic and does not show any details that would allow for the identification of the embalmed species, though in some cases this might be due to the loss of the outermost wrappings. Many are flattened and lying on one side (e.g., cat mummy **No. 40** and dog mummy **No. 13**). Other mummy bundles are round, conical, ovoid or drop-shaped, of shapes, that is, that do not explicitly indicate their contents. They may have an intricate geometric pattern, whose design also does not indicate the contents of the mummy bundle. For example, in the case of raptor mummy **No. 118**, neither the shape nor the pattern suggests a raptor. In such cases, the identifying function was probably performed by something other than the shape of the mummy. This could be a coffin carefully depicting the embalmed animal (e.g., the fish mummy **No. 174**), a "cartonnage" decorated with a distinctive iconographic repertoire, a decoration painted or applied to the outer shroud, an inscription, or maybe merely the placing of the mummy in a particular burial place.

3.4.2 Bandaging Technique

The opportunity to study a large number of mummies preserved, by chance, at different stages of the wrapping process allowed us to study the bandaging technique and establish that wrapping could have several functions, which were not mutually exclusive.

The wrapping process observed in the Turin collection can be roughly subdivided into three steps: once the embalmer had prepared the animal's body (see Chapter 1), he or she created a regular shape (Step 1) that covered and protected the corpse, then modelled the anatomical features (Step 2) (depending on the type/shape of mummy), and finally created the patterns (where they exist) by interlacing strips of linen (Step 3) or by decorating the outer shroud with painting and/or applications (appliqués).

Step 1: Creating a shape

The internal bandages are mainly used to protect the body, to hold it (or parts of it) together tightly and to create a shape. Different pieces of textile were chosen according to the size of the animal and the form that was required. When the mummies are well preserved, most inner bandages are not visible, though holes in the outer wrappings often show that they are kept in place by linen threads. When the outer bandages were intact, the inner bandages were investigated through CT scans, though sometimes the resolution (slice thickness) was insufficient to detect single layers. Nevertheless, with the CT images we could identify the presence of internal supports (rods) or fillings (earthy materials, sand/mud?) and sometimes also the internal arrangement of the bandages (concentric or spiral). In some cases, we noted the presence of a coating applied directly to the body of the animal (depicted as radio-opaque layers) or between the layers of bandages, probably used as an adhesive, or as a resinous/oligenous/bitumen coating. This stage of the wrapping is essential for determining the position of the mummy (standing or lying) and the possible presence and placement of decoration. In addition, a compact background is a prerequisite for the creation of patterns.

The twenty-six ibis mummies from Asyut, whose state of preservation is heterogeneous, allowed us to study the different layers of bandages and the techniques used to make them. Multiple layers of bandages (at least five) are arranged on the animal's body. We have noticed that the fabrics used for the inner layers tend to be less compact (lower thread count). Since this factor has been observed in different contexts, it seems to be a technological constant. They are held in place by threads that are repeatedly wrapped around the bandages as well as by various substances used as adhesives (*Fig. 31*).

The use of multiple threads to secure bandages is not the prerogative of one site or species but is in fact widespread. There are numerous examples in which threads are visible under the dark bandages of the head, including the raptor mummy in this catalogue, **No. 120**; dog mummies **No. 9**,



Fig. 31: Several turns of threads are used to hold in place inner bandages: a. ibis mummy **No. 90**; b. **No. 94**.

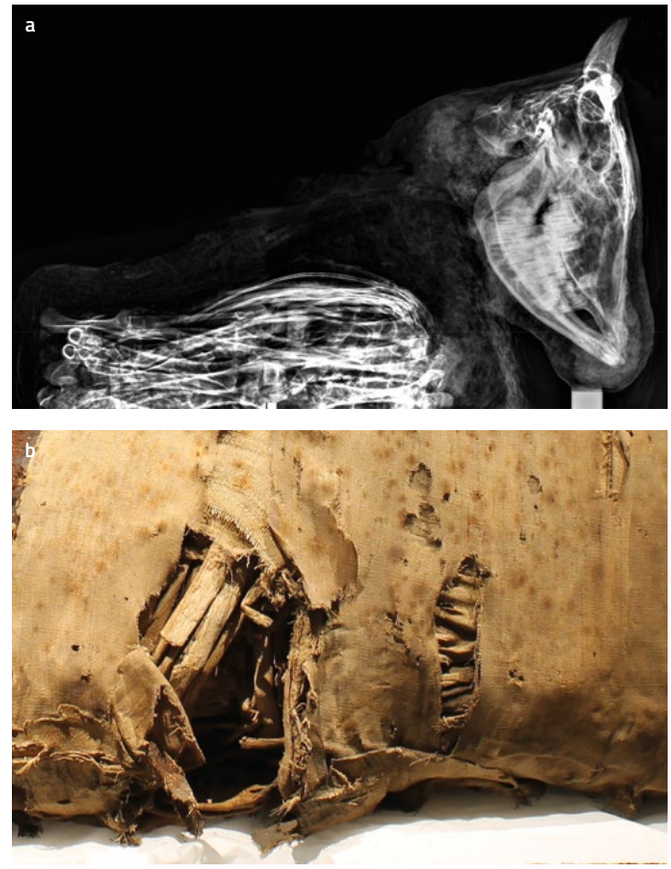


Fig. 32: Bull mummy **No. 6**. CT scan shows that there is no anatomical connection between the body and the skull. Textiles, plant fibres and sands are used to fill the gaps.

London, BM EA6743 and BM EA6744; cat mummies **Nos. 29, 52**, Cairo, EMC CG 29.655; and a calf from Asyut, whose inner bandages were similarly held together with threads.[26]

A further technique is documented on the mummies of dogs and cats from Asyut. Dogs are wrapped in a large fragment of textile, a kind of shroud (**Nos. 14, 16, 18, 20** in this catalogue), or in several layers of bandages (**Nos. 15, 17**), held in place by some adhesive substances and spiral bandages knotted together. All but one of them (**No. 15**) are undyed. The textiles used are of medium quality (≥ 20 ≤ 40 warp per square centimetre). This type of wrapping does not provide a compact and regular base for the creation of a pattern. In fact, no evidence of more elaborate outer wrapping was found on these mummies. Cats **Nos. 39–40** appear more accurately wrapped than dogs. The body itself was first covered with a shroud (**No. 39**) or a bandage (**No. 40**), interspersed by thread to keep them in place and then covered by a second shroud. In both mummies, the textiles used are of good quality (≥ 30 ≤ 60 warp per square centimetre).

Bull mummies in this catalogue **Nos. 4–6**, probably from Thebes, have a different type of wrapping (*Fig. 32*). The function of the inner bandages is not just to hold together the bones of the body. In fact, the body does not actually contain all the bones of the animal but often only some parts of the skeleton (*pars pro toto*). The volume of the body is created with parts of the animal, heterogeneous pieces of textile combined with plant fibres and sand, all of which serve as filler. Those materials serve to create a robust structure, which is able to support the weight of the skull that is not anatomically connected with the body. For this purpose, the embalmers were likely to use pieces of cloth of all kinds, retaining larger fabric for the outer wrapping.

Other kinds of mummies, such as crocodiles (**Nos. 150–151**) and gazelles (**No. 8**), are supported by a kind of "armour" of vegetal fibres (papyrus for the gazelle and a mat of reeds and papyrus strips for the crocodile).

Small animals such as fish, lizards, shrews, snakes and other animals that are usually placed inside a coffin are in

[26] Lortet and Gaillard, *La faune momifiée*, pp. 86-88, f. 59.



Fig. 33: Details of the head of cat mummy **No. 23** showing how bandages are used to create the muzzle, the ears and the eyes.

most cases simply wrapped in a single layer of textile (e.g., see in this catalogue snake **No. 145**, fish **Nos. 174–175, 164, 168**), more rarely two (e.g., snake **No. 139**, fish **No. 167**, shrew **No. 71**) or three (e.g., fish **No. 170**, shrew **No. 72**) layers of fabric, without anatomical details or elaborate decoration.

Victual mummies (**Nos. 177–215** in this catalogue) are spirally wrapped in different layers of broad strips of fabric. In such cases, the wrapping process stops at the first stage.

Step 2: Modelling the anatomical details

In this stage, the anatomical details that distinguish different species are modelled: head, ears, whiskers, horns, beak, paws, tail. The attributes of each species are re-created with strips of fabric or painted details to suggest which species should be present within. Different steps and techniques have been identified in the creation of the animal heads and we can assume that these steps and techniques were probably different from one local workshop to the other. Some cats (e.g. **Nos. 22, 32** in this catalogue) show round heads with a slightly protruding muzzle. The first step consists of creating the protruding parts, such as the ears, which stand erect on top of the skull, and the nose. Ears are shaped by overlapping layers of fabric, held together with an adhesive substance and sometimes outlined in brown (with paint, gum or resin, or dyed cloth). Then different types of fabrics are strategically chosen and stretched on the head in order to create a contrast between different surfaces (finer/coarser) or colours (undyed/dyed) of the muzzle (*Fig. 33*). It has been suggested that textiles used for modelling of the head or other parts of the body may have been moistened prior to application, but they would need to be tested to see if natron or other materials were added to the liquid. The outermost fabric of the muzzle could be a dyed pink textile (see in this catalogue **No. 31**). The mouth and whiskers could be outlined with narrow strips of brown bandages or with a brown-dipped thread. The eyes are button-shaped and could be outlined by a few linen threads dipped in an unidentified black resin-like substance and arranged around them.

In examples from other collections (London, BM EA37348 from Abydos, Cambridge, FM 132.1891 from Beni Hasan/Stabl Antar, Cairo EMC CG 29658 and CG 29660 from Stabl Antar), there are cat mummies with the head covered by a single cloth, where anatomical features are rendered by painting.

In the dogs from the Turin collection, protruding parts are made separately and kept in place by a final transverse band, which is often coated with a black finish (**Nos. 9–10**) (*Fig. 34*). Sometimes the interior of the earlobe is made with two different fabrics with the intent of creating a hollow surface, and the mouth is outlined by white narrow bandages.

In bovids, ears are made by overlapping brown fabric; their internal structure is reinforced by perpendicular white strips, glued to the fabric by dots of a dark adhesive substance, which at the same time creates a three-dimensional effect. Horns, when present in the original (e.g., **No. 6** in this catalogue), are wrapped separately with multi-coloured bandages; or are otherwise made by fragments of different fabric and then wrapped in an outer layer of undyed textile (e.g., **Nos. 4–5**). Eyes are painted black on



Fig. 34: Details of the head of dog mummy **No. 10** showing the technique used to shape ears, eyes, nose and mouth. Two different fabrics are used to create the depth of the ear flap.

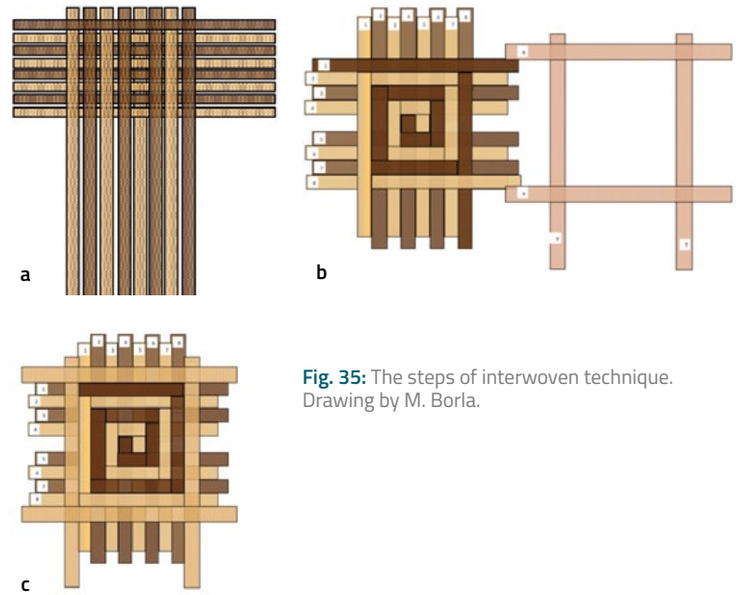


Fig. 35: The steps of interwoven technique. Drawing by M. Borla.

a white background and eyelids are made with multicoloured strips glued to the background fabric.

Crocodile heads in the Turin collection (e.g., **No. 150**) are coated with a black substance and anatomical details are outlined in undyed textile strips. The eyes are made with great care, using a small piece of bandage that is folded and rolled up on itself and then applied to the top of the snout, at the orbital cavity.

Step 3: Creating a pattern

From the study and analyses of the patterns on animal mummies in Turin's collection and the comparison with specimens in other collections, one can assume that the decorative patterns were made by interlacing distinct sets of linen strips. This technique can be compared to that of weaving and basketry. Each strip is made up of a fabric with one side folded, in order to hide the unravelled edge of the fabric and allow the positioning of the subsequent bandage (which would have slipped if the strip had been completely folded double). A discussion about pattern types and what they reveal about provenance and diachronic change can be found in Chapter 5.[27]

Different patterns were obtained through a variety of techniques, sometimes combined:

a) A technique used in the production of many patterns is what we refer to as the **interwoven technique**: the pattern is created by interlacing vertical bandages with horizontal ones (they can vary in number and colour). It is therefore reasonable to assume that the pattern was made directly on the mummy and could not have been prepared separately and then positioned on the body. First, vertical bandages were applied, starting with the central bandage, which was flat and not folded. Next, the side strips were placed on either side of the central bandage. They were folded so that each one covered and overlapped the ends of the previous one. All the vertical bandages were fixed to the ground fabric of the compact background with dots of adhesive. This gave them enough tension to be interwoven (as in a loom). Next, horizontal folded strips were placed and interlaced with vertical ones, according to a predefined scheme, thereby creating the required pattern. Each square could further be framed by two horizontal and two vertical bandages folded on both sides, whose function was to secure the edges of each square (*Fig. 35*). If the pattern appeared only on one side of the animal (front for cats, dogs, cattle; back for crocodiles), the sides and bottom were covered by an extra piece of fabric to hide and protect the frayed ends of the bandages. Dots of adhesive materials were also used to hold this fabric in place.

[27] A definition of patterns can be found in Ikram et al., *RiME* (forthcoming).

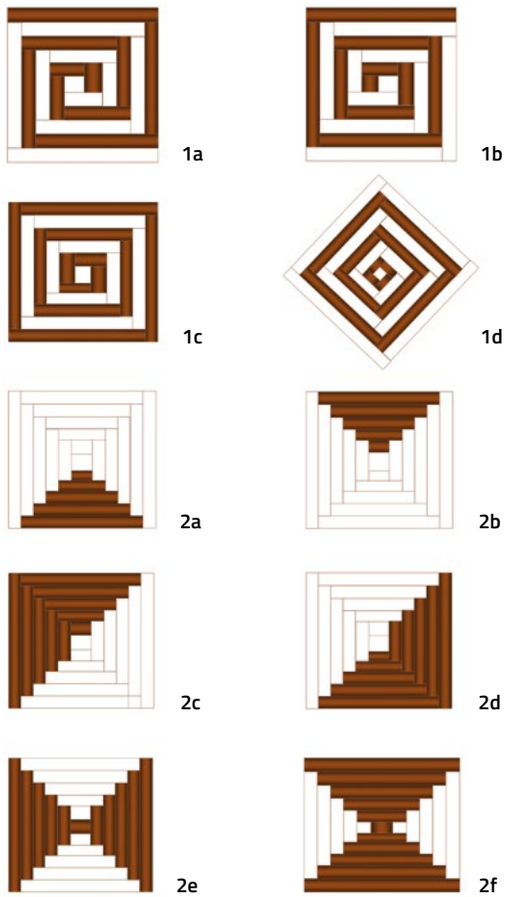


Fig. 36: Different outputs of square patterns. Drawing by M. Borla.

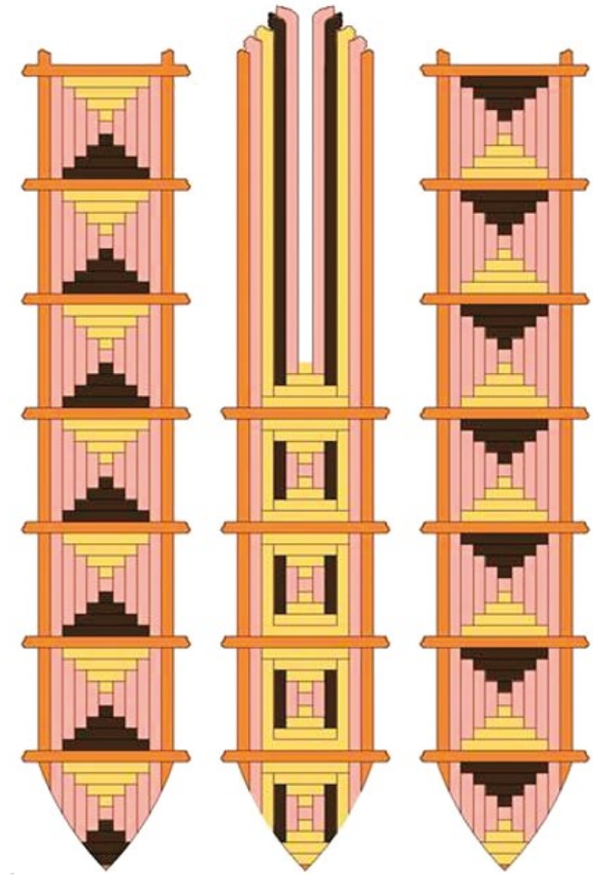


Fig. 37: Sketch of the pattern of ibis mummy **No. 105**. Drawing by V. Poletto.

All **squared-shaped patterns** (meander, *Fig. 36.1a-b*; concentric square, *Fig. 36.1c-d*; coffer, *Fig. 36.2a-f*) are made using this technique. The number of interwoven horizontal and vertical bands varies, but the number of vertical strips always equals the number of horizontal strips. The difference in the design is mainly obtained by the use and the alternation of strips of different colours. For example, each square of the meander pattern of cat **No. 31** in this catalogue has six vertical and six horizontal strips, alternately brown and undyed. In the case of bull mummy **No. 6**, dog **No. 9**, and cat **No. 32**, ten to twelve strips are used for the coffered pattern.

Sometimes the decoration is completed by multi-coloured bandages around the neck, which serves as a trim for the head and back's wrapping and also reinforces and decorates the neck itself – the neck of cat and dog mummies is particularly vulnerable, and such decoration ensures that the head does not snap off the body. All these steps can be observed on cat mummy **No. 31**.

The drawing shows ten different visual outputs that can be obtained by interlacing the same number of coloured strips in a different way (*Fig. 36*).

One of the most common square patterns is the "**meander pattern**" (*Fig. 36*, 1a, 1b). Here the term "meander" is used for motifs constructed with straight lines and right angles by creating a frieze that can be oriented either clockwise (1a) or anticlockwise (1b). The meander pattern is employed for several types of animal mummies in this catalogue: bull **No. 4**; dog **No. 10**; cat **Nos. 26–27, 31**; raptor **No. 118**.

Another kind of design is the **coffer pattern** (*Fig. 36*, 2a-f). It is made up of a series of coloured bandages arranged in such a way as to create one or more triangles (**quarter coloured coffer**) (*Fig. 36*, 2a, 2b), which may be of different colours, and arranged either side by side (**diagonally coloured coffer**) (*Fig. 36*, 2c, 2d) or in a mirror-like layout (**step diamond coffer**) (*Fig. 36*, 2e, 2f). In some specimens of animal



Fig. 38: Tabby weave pattern with chess board effect in the cat mummy New York, MMA 13.182.50. Cat mummy **No. 25** has a different pattern, with a V-shaped motif reminiscent of a design used in basketry (see *Fig. 50c*).



Fig. 39: Overlapping technique: herringbone pattern on cat mummy **No. 28**. Drawing by V. Poletto.

mummies (ibis **No. 105**, *Fig. 37*, and dog **No. 9**), the decoration may consist of different square coffers grouped together.

A different design, usually called 'basketry' or 'checked', is obtained by the orthogonal interweaving of horizontal and vertical bandages. The change of colours and the equal distance between the horizontal and vertical bands create a **tabby weave pattern** with a chess-board effect (see dogs New York, MMA 13.182.49–50 from El-Deir, Karga, *Fig. 38a*). By altering the sequence of coloured bandages, numerous variants can be obtained, like the V-shaped motif of the cat mummy **No. 25** (*Fig. 38b*) or the "continuous wave" of the cat mummy London, BM EA37348.

b) A second procedure to create patterns, called the **overlapping technique,** consists of overlapping several bandages, which are wound around the animal's body (generally from the neck or from the narrow part of the body). **Herringbone patterns** are made with this technique. Each strip, folded on one side, is wrapped all around the body, converging at the far end, and slightly overlapping the previous one. It is then secured at the intersection using dots of adhesive. In some examples, every three to four bandages, there is an inset (which looks triangular but is actually a transverse bandage, sometimes coloured) which secures the structure of the pattern to the animal's body (see in this catalogue **Nos. 97, 100–101**). Herringbone patterns are employed for the decoration of many species of animal mummies (ibis, raptor, dog, cat, *Fig. 39*).

c) A similar technique, which we call the **spiral technique**, consists of spiral wrapping of several sets of continuous bandages, bi-chrome or poly-chrome, wound around the animal's body. The resulting decoration, called **spiral pattern**, closely wraps the body of the animal into a very solid shape, since the bandages are continuous and the decorative motif is produced by the combination of different coloured bandages (e.g., **No. 36** only partially preserved,



Fig. 40: Spiral technique on cat mummy **No. 36**. Drawing by V. Poletto.



Fig. 41: Net pattern on cat mummy **No. 23**. Drawing by M. Borla.

Fig. 40; London, BM EA65502, Naples, SAI 65, 66, 67). The spiral technique is sometimes used in combination with other techniques and patterns to decorate the edges, such as the tail of crocodile mummies or the paws of other animals.

d) The fourth technique is called the **net technique**. We have seen that interlaced threads are used to hold in place inner bandages. With this technique, the body is covered by a large bandage or by different bandages alternating in colour; on this ground, a series of interlaced threads, sometimes dyed, creates a net pattern (see in this catalogue **Nos. 22**–**23, 33**). It should be noted that the polychrome bandages are made from reused dyed fabrics. The threads, however, are likely to have been dyed for the purpose. **Plain or banded net patterns** are used on cats (**Nos. 22**, *Figs. 41, 23*) and ibis mummies (e.g., Cairo, EM CG 29.697).

e) Another procedure consisted of covering the inner bandages evenly with a plain fabric. This could be fixed with a folded bandage on the perimeter (see in this catalogue snake **No. 139**). In other cases, the background may be enriched with contrasting bandages (e.g. cat **No. 37**, *Fig. 42a*), with a painted decoration (e.g., fake ibis New York, MMA 90.6.109), or with an appliqué (e.g., ibis New York, MMA 90.6.104, Cairo, EMC CG 29692, New York, BM 14.657, raptor Cairo, EMC CG 29693, or baboon Cairo, EMC CG 29701).

f) **Mixed techniques** combining the previous ones are very common.

Diamond pattern could be described as the result of two techniques, combining overlapping and interwoven, because it is made with two or more sets of continuous bandages wound around the body that are interwoven with one another; the effect is a square pattern, turned 45° to the vertical axis. The final result is given by alternating bandages of different colours (pink, brown and undyed). Only one example of a diamond pattern is present in the Turin collection (raptor mummy **No. 122**, *Fig. 43*).

Another combination of two techniques is found in the **D-shaped polychrome pattern** (see in this catalogue



Fig. 42: Plain textile with contrasting bandages on cat mummy **No. 37**.



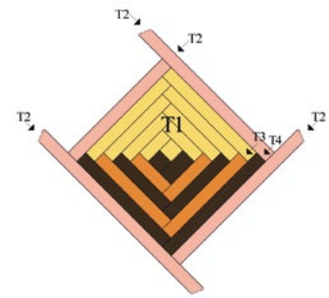


Fig. 43: An example of a diamond pattern on raptor mummy **No. 122**. Drawing by V. Poletto.



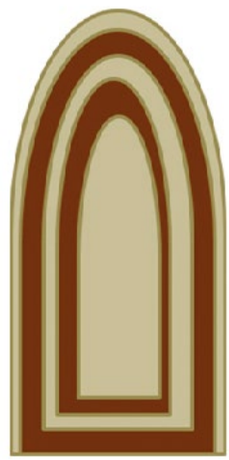


Fig. 44: D-shaped pattern on ibis mummy **No. 106**. Drawing by M. Borla.

ibis mummy **No. 106**, *Fig. 44*). The body is decorated by an initial series of overlapping bandages that are wound around the neck and beak (as with the overlapping technique). They do not converge at the end, as they do in the herringbone pattern, but are arranged in parallel and then interlaced with horizontal strips (as with the interwoven technique). A textile with an applied decoration covers the end.

4. REFLECTIONS ON WRAPPING: SHAPES, PATTERNS, PROVENANCE, AND PERIODS

Matilde Borla, Salima Ikram

4.1 Introduction

As with human mummies, the creation of an animal mummy requires not only a great deal of technical knowledge but also a very complex organisation or *chaîne opératoire*: collecting and selecting all the raw materials (animals, embalming materials, textiles); making the animal mummies; selling them to the pilgrims; organising and managing the offering areas; consecrating the mummies; storing them; burying them. Many questions remain unanswered about several aspects of these different steps. One aspect in particular is that of the bandaging.

The starting point for a study of bandages is to establish a terminology for bandaging styles, a task which is currently underway.[1] Questions that a study of bandaging styles might answer, or aid in elucidating, are: is a particular pattern the hallmark of a certain atelier or geographical area;[2] did different bandaging styles have different costs; is a bandaging style a chronological indicator; is the style a matter of choice on the part of the devotee; are certain patterns used exclusively for a particular animal? Some mummies show several styles of bandaging incorporated in a single specimen,[3] which argues against a pattern being a geographical indicator, as does the fact that ibises, for instance, originating from different sites are often bandaged in the same style (for example, the herringbone pattern is found on ibises from Asyut in the Museo Egizio (**Nos. 88–104, 106–109**), from Abydos (Cairo, EMC G 29866; Manchester, MM 6098), and from Saqqara (Cairo, EMC CG 29871–29872; New York, MMA 13.186.8).

The following remarks are an initial exploration of some of these themes using the Museo Egizio's collection as a starting point for future research. Further comparisons with other ensembles and contributions from new studies, surveys, and diagnostic campaigns should contribute to shedding light on some of the issues raised by our investigations.

4.2 The Relationship Between Mummified Animal Species, Mummy Shape, Wrapping Technique and Pattern

As one might expect, the shape and size of a mummy bundle depend on the shape, size, and body position of the animal. The same animal can be wrapped in different shapes, though certain shapes are better suited for particular animals – particularly the teardrop shape for birds. An animal can be wrapped so that its shape is naturalistic, cylindrical, teardrop, conical, spherical, or rectangular, and then covered with a final wrapping, either plain or patterned.

It is clear from the example of ibises excavated at Asyut that distinctive postures give rise to distinctive forms. For example, some are wrapped in a teardrop shape (see in this catalogue **No. 86**, 370–90 BC), lying on their back with the head and beak prominently displayed on the belly (**No. 91**, 390–190 BC), or as mummiform figures with the head modelled in linen and thread (**No. 87**, 750–370 BC) (*Fig. 45*).

Cats also display considerable variability in position: natural, with the legs separately wrapped (Paris, Louvre E2815, E2818),[4] skittle-shaped with the head standing proud,[5] and skittle-shaped with a modelled head (**Nos. 22–32**, among others). Once the position and shape of the

[1] Ikram et al., *RiME* (forthcoming).
[2] McKnight, in Pinarello et al. (eds.), *Current Research in Egyptology*, 2015, pp. 239–52; Dunand et al., *El-Deir Nécropoles IV*, 2017; Atherton-Woolham et al., *Antiquity* 93 (2019), pp. 128–43: https://doi.org/10.15184/aqy.2018.189; Tarek et al., in Porcier et al. (eds.), *Creatures of Earth, Water, and Sky*, 2019, pp. 315–21; Brandt et al., in *ATRev* 62 (2020), pp. 6–20; Pubblico, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 331–47.
[3] This is also the case of the ibis in the conical-shaped bundle from Saqqara, which shows six types of decoration on the outside: Atherton-Woolham et al., *Antiquity* 93 (2019), p. 136: https://doi.org/10.15184/aqy.2018.189.
[4] Zivie and Lichtenberg, in Ikram (ed.), *Divine Creatures*, 2015, pp. 106–19, fig. 5.6; Waziry, *Vestiges of Ancient Egypt*, 2023, figs. 22–39, *passim*, including a mongoose mummy.
[5] Zivie and Lichtenberg, in Ikram (ed.), *Divine Creatures*, 2015, pp. 106–19, fig. 5.3.



Fig. 45: The same animal (ibis) wrapped in different shapes. They are all from Asyut: a. **No. 86**, 370–90 BC; b. **No. 91**, 390–190 BC; c. **No. 87**, 750–370 BC.

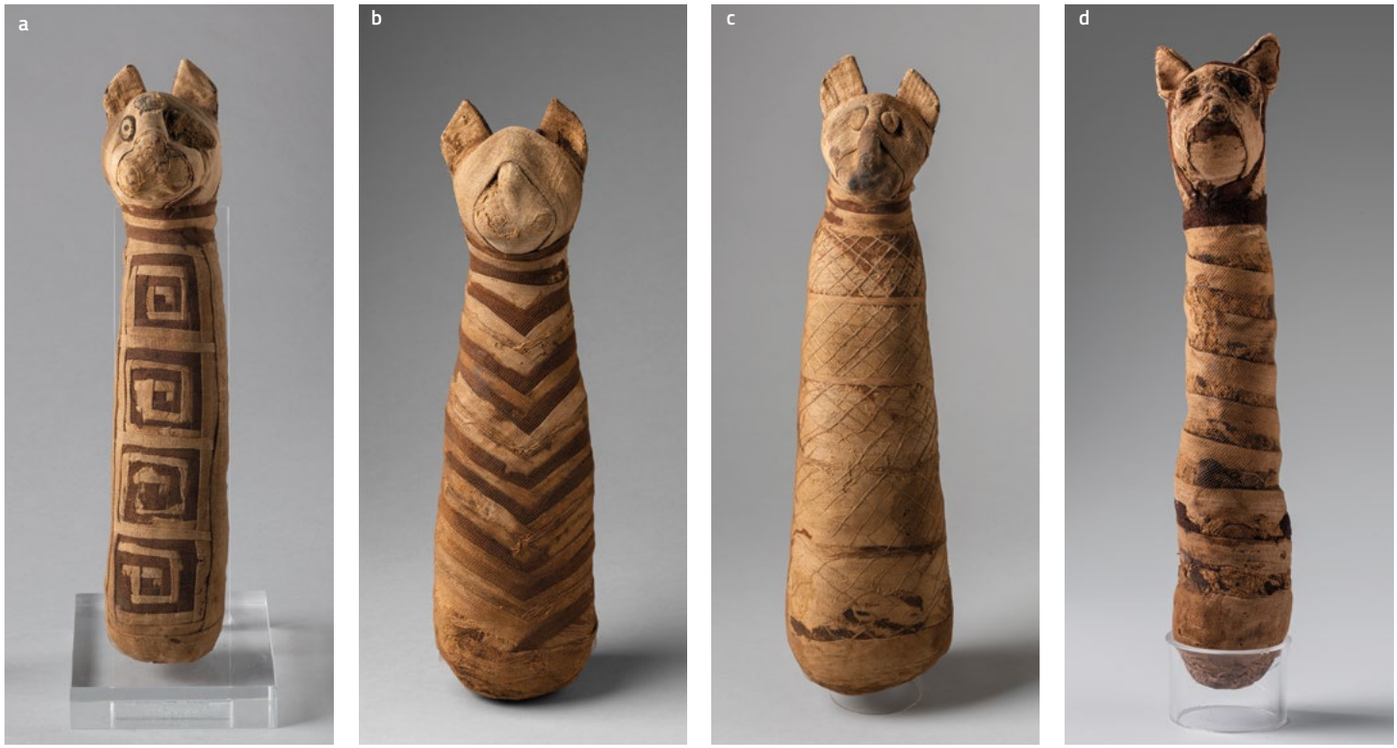


Fig. 46: Four cats, whose provenance is unknown, wrapped into the same shape but with different techniques. a. **No. 26**: interwoven technique and meander pattern; b. **No. 28**: overlapping technique and herringbone pattern; c. **No. 22**: netting technique; d. **No. 36**: spiral technique.

animal has been determined, the next step is the selection of the bandaging pattern and, in some instances, the fashioning of the facial details to be appliquéd to the bandages. Certain shapes are suitable for almost any wrapping technique: cylindrical, oval, teardrop, skittle, or trapezoidal.

Depending on the technique that is chosen, a variety of patterns can be created (for example, coffer, herringbone, meander, chessboard, etc.).[6] As an example, we can mention four cats in this catalogue that have a similar skittle shape but are decorated with four different techniques and designs: **No. 26** is decorated with the interwoven technique and a meander pattern; **No. 28** with the overlapping technique and a herringbone pattern; **No. 22** with the netting technique and a banded-net pattern; **No. 36** with the spiral technique (*Fig. 46*).[7]

Several ibis mummies from Asyut also display considerable diversity in their wrappings. Some are wrapped with the overlapping technique and a herringbone pattern (e.g., **No. 98** in this catalogue). However, mummies **Nos. 105–106** also from Asyut (*Fig. 47b, c*), which are embalmed in the same position and therefore have the same shape, are dec-

[6] Ikram et al., *RiME* (forthcoming).

[7] The provenance of these animals is unknown, while the date is known only for **No. 22**: 400–200 BC. It is thus impossible to use this information to establish date or provenance.



Fig. 47: Four ibises from Asyut, wrapped into the same shape with a combination of different techniques. a. **No. 98**: overlapping technique and herringbone pattern; b. **No. 105**: overlapping technique and coffer pattern; c. **No. 106**: mixed technique and D-shaped pattern; d. **No. 85**: drop shape and squared pattern.

orated with a combination of overlapping and interwoven techniques. Another ibis (**No. 85**), wrapped in a teardrop shape with a slightly curved upper surface, is decorated with a square pattern (*Fig. 47d*). Thus, a variety of patterns can be used on mummies of the same species originating from the same necropolis.

Also, it is clear that a single pattern is not exclusive to a single species. For example, the herringbone pattern is very common on ibis and raptor (e.g., London, BM EA68006) but is not exclusively restricted to them and may also be used for other animal mummies, including cats (Turin, **No. 28** and London, BM EA6758) and dogs (London, BM EA6743). The meander (*Fig. 48*) and coffer patterns (*Fig. 49*) are common on cats, dogs and ibises but are also used on crocodiles, bulls (**No. 4** in this catalogue), raptors (**No. 118** in this catalogue) and snakes (**No. 142** in this catalogue), as well as on humans.

Diamond and banded-net patterns are frequently used to decorate mummies of birds (Cairo, EMC CG 29872), possibly crocodiles (Cairo, EMC CG 29886 from Tebtynis is thus wrapped, although the mummy bundle appears to be empty), and cats (**Nos. 22**–**23** in this catalogue), but thus far have not been found on dogs or larger animals, such as cattle.

Since the flexibility of the technology allows the same mummy shape to be decorated in different ways, and different shapes to be decorated with the same pattern, it is possible to say that the relationship between animal, shape and design is not strictly one-to-one. However, some species, such as raptors, are distinguished by a specific shape (wrapped in the form of a standing figure with a raptor head) associated with a specific pattern (diamond or herringbone: e.g., **No. 122**) that occurs in several variations.

4.3 Correlation Between Provenance and Pattern

In most museum collections, many animal mummies decorated with elaborate patterns lack reliable provenance information. As a result, it is very difficult to establish a definite correspondence between a specific pattern and a specific archaeological site, particularly if the same pattern is used to wrap different species. For example, the banded-net pattern is common on ibises from Saqqara



Fig. 48: The same meander pattern on different animals: a. cat **No. 31;** b. bull **No. 4;** c. dog **No. 10;** d. raptor **No. 118**.

(Cairo, EMC CG 29697), while cats with the same decoration (Turin, **Nos. 22–23, 33**, Paris, Louvre N2678B, Oxford, Pitt 1884.57.5) are of unknown origin. In this case, it is not really possible to establish a relationship based on provenance. Even when we examine mummies with a secure provenance, we find similarities between patterns from different sites, for example, the ibis in this catalogue **No. 86** from Asyut shows a similar coffer pattern to the ibis from Abydos (New York, MMA 13.186.9) (*Fig. 49*). Ibis mummies from Asyut (e.g., **No. 98**) are often wrapped using the herringbone pattern, but this is also true for ibis mummies from Tuna el-Gebel (e.g., Cairo, GEM 1032), Abydos (e.g., New York, MMA 13.186.8 and Philadelphia, Penn E12438), Saqqara, and Thebes (Theban Tomb 11, personal observation). Thus, patterns do not always provide provenance, though they might, after sufficient radiocarbon dating has been carried out, provide some clues to chronology. However, as mummies were generally produced in different local workshops, if a sufficient number of mummies are known from a provenanced site it might be possible to identify workshops.[8] This is particularly true for provincial centres, as exemplified by the dog mummies from the necropolis of el-Deir, in Kharga Oasis, whose construction technique is very homogeneous and which are decorated with three different patterns: chessboard, coffer and cross.[9]

On the whole, based on our studies, there is no overwhelming evidence to suggest that specific styles of wrapping can be attributed to particular geographical areas/ateliers, not only as we have identified the same patterns on mummies of the same species with different provenances, but also as patterns can be mixed on the same mummy. Some patterns, such as herringbone, are found in many necropoleis because they are associated with certain animals and fit the wrapped shape well. The only wrappings-to-site identifications that we have detected thus far are the spirally wrapped bi/poly-chrome cats with distinctive painted features from Stabl Antar and, possibly, cat mummies in a natural or semi-natural position with articulated limbs originating from Saqqara, as well as mummy bundles with external appliqués, which usually come from Saqqara's Sacred Animal Necropolis, though a few are also known from Tuna el-Gebel.[10] Further work on this topic might reveal further site-specific types.

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[8] Emery, *JEA* 51 (1965), p. 4; Atherton-Woolham et al., *Antiquity* 93 (2019), p. 142: https://doi.org/10.15184/aqy.2018.189.

[9] Dunand et al., *El-Deir Nécropoles IV*, 2017, p. 204. The study of the textiles from the necropolis of el-Deir has also highlighted the correspondence between the fabrics used for human mummies and those used for animal mummies (the same ateliers were responsible for the preparation of both human and animal mummies). This correspondence has not been examined to date for the Asyut mummies in the Turin collection.

[10] Emery, *JEA* 51 (1965), p. 4; Atherton-Woolham, *Antiquity* 93 (2019), p. 142: https://doi.org/10.15184/aqy.2018.189; Ikram et al., *RiME* (forthcoming).



Fig. 49: The same coffer pattern (c) is found on two ibis mummies of different provenance: a. **No. 86**, 370–90 BC, from Asyut; b. New York, MMA 13.186.9, c. 440 BC – AD 100, from Abydos.

4.4 Correlation Between Chronology and Patterns

As established above, most patterns cannot be associated with a specific provenance. This leaves the question of whether patterns were related to diachronic change, and whether they originated from a single workshop from which they were disseminated, or workshops independently came up with the same patterns.

The majority of the animal mummies in the Museo Egizio are dated between the Late and the Ptolemaic Periods, and the most recent ^{14}C-date is that of a gazelle mummy (**No. 8**) from the Roman Period (see catalogue and Chapter 6). It is very important to remember that the suggested date is only based on the sampling of one, rarely two, components of the mummy, with the sample taken from an accessible area that causes the least damage to the mummy. Most of the time only a fragment of the wrapping fabric is tested. As these textiles are recycled, they could be older than the body around which they are wrapped. Such is the case for the raptor mummy **No. 126** in this catalogue, whose textile is dated to 1290–930 BC and the wood of the coffin to 400–200 BC – indeed, both the textile and the wood could have been reused. The fish mummy **No. 175** shows the reverse pattern: its coffin (1880–1640 BC) predates its fabric (830–350 BC). In this case, it is most likely that the coffin was made of reused wood. Other cases show similar dating results when the samples are from two different materials. Examples in this catalogue include bull mummy **No. 6**, where the textile is dated to 410–360 BC and the plant matter to 400–190 BC, and cat mummy **No. 42**, where the textile dates to 740–400 BC and the wood to 730–380 BC.[11] On the whole, though, research conducted on large groups of animal mummies has shown that when bone and textile are taken, the dating results are similar.[12] This is also in line with the data from the Turin study.

Animal mummies of unknown provenance and date, decorated with elaborate patterns, are generally attributed to the Ptolemaic/Roman Period. As noted by recent studies, ibis mummies from north Saqqara graced with a rhomboid lozenge design, previously assigned by some to the Roman Period, can be attributed to the Late or Ptolemaic Period instead.[13] The same chronological range is found in the Musée des Confluences in Lyon, where mummies are now dated from the Late (722–322 BC) to the Ptolemaic Period (323–30 BC).[14]

Unfortunately, the number of ^{14}C-dated patterns from the Museo Egizio is relatively small.[15] Therefore, we cannot draw any solid conclusions about the diachronic distribution of patterns. Nevertheless, if we frame them in a chronological sequence, we can observe that between 400 BC and 200 BC there is a proliferation of pattern types (*Table 2*). In addition, our ^{14}C-testing shows that the very elaborate patterns, previously tentatively dated to the Roman Period on a stylistic basis, actually belong to an earlier chronological horizon.[16] Future large-scale dating projects need to be carried out on animal mummies bearing a wide range of patterns in order to define their possible diachronic evolution.

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[11] See Chapter 6.
[12] The collection of animal mummies in the Musée de Confluences of Lyon is the largest group of animal mummies outside Egypt, comprising 2500 specimens. Sixty-three samples were examined using ^{14}C. Richardin et al., *Radiocarbon* 59.2 (2017), p. 603: https://doi.org/10.1017/RDC.2016.102.
[13] Atherton-Woolham et al., *Antiquity* 93 (2019), p. 141: https://doi.org/10.15184/aqy.2018.189.
[14] Richardin et al., *Radiocarbon* 59.2 (2017), p. 603: https://doi.org/10.1017/RDC.2016.102.
[15] Only twenty-four samples are related to a sure pattern: see Chapter 6.
[16] A sample from the ibis mummy Boston, MFA, acc. no. 6200.2 dates to the late Twenty-sixth Dynasty (555–527 BC). See McKnight, *Arts* 9 (2020), pp. 1–16: https://doi.org/10.3390/arts9040128.

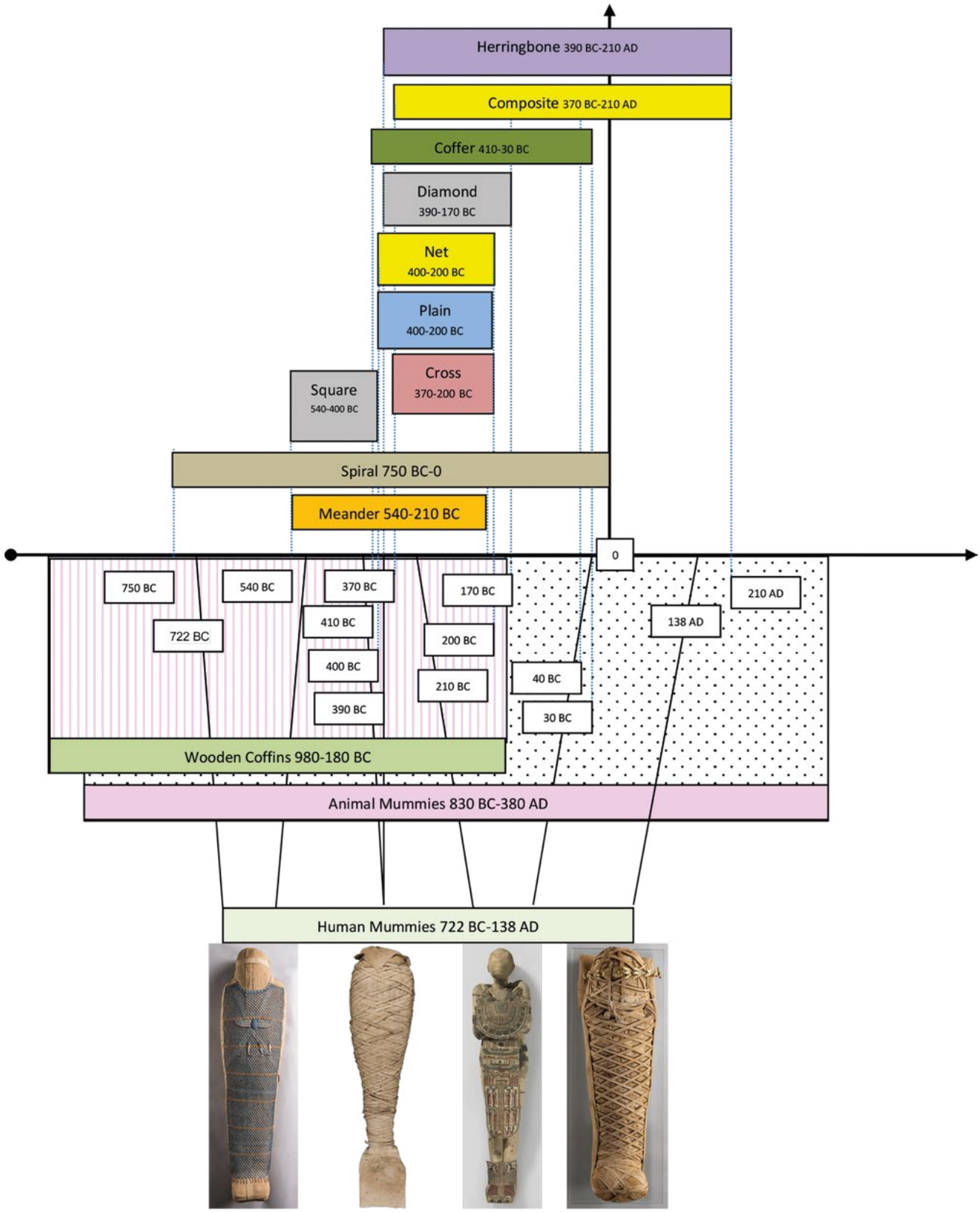


Table 2: Correlation between chronology and patterns. The upper part of the table shows the chronological development of the animal mummy patterns in the mummies of the Museo Egizio. The lower part shows the chronological overlap between animal mummies, wooden animal coffins and four examples of wrapping styles attested on human mummies (see also *Fig. 53*).

4.5 Function of the Pattern

One of the most intriguing questions is the reason, if any, behind each design.[17] From the study of bandaging technique, the function performed by shape can be summarised as follows. Shaping has a substantial/mechanical function: it serves mainly to preserve the content and to give the mummy a regular silhouette and, in some cases (such as teardrop shaped), makes it easier to store; this feature can be observed in all mummies, even in those embalmed in an apparently crude manner, such as fish or victual mummies. The function performed by modelling and decoration of the head and the body is "narrative" (descriptive): the purpose is to convey a message and describe which animal was intended to be inside the mummy bundle, although the exterior appearance does not always comply with the contents.[18] Because of their form, mummies that are prepared in a "natural" pose (for example, the cats with each leg separately wrapped, Paris, Louvre E2815, E2818)[19] are at risk of losing a limb due to careless handling, but clearly, the emphasis in such mummies is on showing the animal in its active and live state.

In terms of using patterns, it should be noted that wrappings and a pattern require a lot of textiles, often of diverse quality (though this might be a by-product of re-use and availability), the use of dyed or bleached cloth if the composition is polychrome, and an adept at creating patterns, sometimes on the mummy itself (this might be one reason why the more complex patterns are not – or are rarely – used on humans as they are larger and more difficult to manoeuvre), who not only has expertise but also the requisite amount of time in which to complete the work. Certainly, the patterns are decorative and presumably also indicative of the wealth and status of the donor of the offering. Intricate outer patterns may also have a mechanical function in some cases, helping to compress the inner bandages, thus better protecting the contents. In addition to protecting the contents and displaying the wealth of the donor, well-decorated votive mummies[20] with elaborate and colourful patterns must have appealed not only to pilgrims who bought them but also to the gods to whom they were offered.[21] Indeed, they remain aesthetically appealing to this day, which is one of the reasons that they have been acquired by museums and antiquarians. Possibly, a function of the pattern was apotropaic,[22] protecting the dead animal and speeding it to its eternal union with its emblematic deity. The great skill and time invested in selecting the materials, in preparing the multiple threads, in making the small and large bandages, in carefully folding the small strips and interlacing the patterns, are all aimed at protecting the animal inside, which is considered a "divine creature",[23] a "god's soul",[24] as well as a gift to the god.

4.6 Inspirations for the Patterns

The origin of these patterns is another fascinating question. The sources from which the Egyptians drew these designs can be multiple and intertwined and are set within the cultural and religious context of the ancient Egyptian world. One obvious inspiration is the natural appearance of an animal, which is particularly relevant when it comes to birds. The position of the wings on the body and the striations of the plumage can be translated into the stylised, thin, overlapping bands that make up the herringbone pattern. This is one of the most common patterns used on birds, particularly ibises (e.g., **Nos. 91–104** in this catalogue but also on raptors, such as Cairo, EMC CG 29881). The fact that it is also used for

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[17] McKnight, in Pinarello et al. (eds.), *Current Research in Egyptology*, 2015, pp. 239–52; Tarek et al., in Porcier et al. (eds.), *Creatures of Earth, Water, and Sky*, 2019, pp. 315–21.

[18] X-rays and CT scans have allowed us to discover that, in some instances, the content does not correspond to the shape. Ibis shapes could contain shrews (see New York, BM, inv. 37.1987E), a dog-shaped mummy has been found to contain a human arm bone (London, BM EA54430). In other instances, the wrapping may contain only part of an animal (like feathers), *pars pro toto*, or could be empty (in which case it is called a fake mummy or substitute mummy). There are some examples within the Turin collection (see Chapter 1).

[19] Zivie and Lichtenberg, in Ikram (ed.), *Divine Creatures*, 2015, pp. 106–19, fig. 5.6; Waziry, *Vestiges of Ancient Egypt*, 2023, figs. 22–39, passim, including a mongoose mummy.

[20] There is much debate about the purpose of the votive animal mummy. The various interpretations have been examined by Nicholson, in Nicholson (ed.), *The Catacombs of Anubis at North Saqqara*, 2021, pp. 245–48.

[21] McKnight, in Pinarello et al. (eds.), *Current Research in Egyptology*, 2015, p. 2.

[22] Riggs, *Unwrapping Ancient Egypt*, 2014, p. 137, states that: "[t]he elaborate interweaving of linen strips, which were sometimes dyed in shades of brown and purple and folded to create a clean edge on each side, created an optical effect of depth and detail" and suggests that "[it] may well have been constructed as repelling harmful forces, much as net or knot patterns do in other cultural contexts".

[23] Ikram (ed.), *Divine Creatures*, 2015.

[24] Bleiberg, in Bleiberg et al. (eds.), *Soulful Creatures*, 2013, pp. 63–105.



Fig. 50: Basketry and patterns: a. cartonnage footboard Turin, Provv. 8596, Provv. 5623; b. cat mummy **No. 25**; c. basket New York, MMA 36.3.57, a, b.



Fig. 51: Examples of geometric decorations from the tomb of Kha: a. the ceiling vault of the chapel; b. wooden box Turin, Suppl. 8440; c. detail from the lid of wooden box Turin, Suppl. 8617.

other animal species (e.g., cat **No. 28** and dog London, BM EA6743) is not necessarily a contradiction in terms. It can be interpreted as a sign that the pattern has emancipated itself from its source of inspiration and is perceived with added value as a decorative motif, which might indicate a chronological evolution in the use of bandaging styles.

The geometric patterns may have been inspired by other sources as well. As some scholars have pointed out, the so called "basket-pattern" (e.g., dogs New York, MMA 13.182.49–50 and dogs from the necropolis of el-Deir[25]) is probably derived from basket weaving. This design is also very common on some cartonnage footboards of human mummies dating to the Ptolemaic Period, representative of the plant fibre from which sandals are made (e.g., footboards Turin, Provv. 8596 and Provv. 5623, *Fig. 50a*).[26] Basket weaving is even older than textile weaving and involves a large number of techniques, such as plaiting, knitting, netting, which can produce very elaborate weaving patterns and designs.[27] Cat mummy **No. 25** in this catalogue (*Fig. 50b*) is a good example of the relationship between basketry technique (e.g., oval basket New York, MMA 36.3.57a, b,[28] *Fig. 50c*) and its reworking for a pattern in mummy bandages. Some basketry designs can also be termed "checked", reflecting the polymorphism of inspiration, which is inclusive rather than exclusive.

Indeed, decorating walls, ceilings and funerary objects with colourful and complex geometric motifs, either painted on, or woven into mats or textiles, is known and widespread in all of Egypt from the Predynastic Period onwards, and could be another source of inspiration for some of the square patterns. Among the many examples are the ceiling decoration of Kha's tomb (Theban Tomb 8, New Kingdom, 1390–1353 BC) with spirals, circles and frames (*Fig. 51a*), and some wooden boxes from his burial equipment (*Fig. 51b*), held in the Museo Egizio in Turin.

It is worth noting that amphora Suppl. 8619 from the tomb of Kha is closed by a stopper, further covered by a fabric with a polychrome pattern of concentric squares (*Fig. 52*). Again, the function is not only structural (for effective sealing) but also decorative and apotropaic.[29] This is one of the oldest extant examples of a pattern of concentric squares in multi-coloured fabric, and is echoed on the face

[25] Dunand et al., in Porcier et al. (eds.), *Creatures of Earth, Water, and Sky*, 2019, pp. 145–54.
[26] Dunand et al., *El-Deir Nécropoles IV*, 2017, pp. 187, 202.
[27] Wendrich, *Who Is Afraid of Basketry*, 1991. The image on the cover page is a perfect synthesis of the elaborate weaves that can be realised with various techniques.
[28] From Egypt, Upper Egypt, Thebes, Sheikh Abd el-Qurna, Tomb of Hatnefer and Ramose, MMA excavations, 1935–36, dating back to the early Eighteenth Dynasty.
[29] Riggs, *Unwrapping Ancient Egypt*, 2014, p. 137; talk given by M. Borla and F. Facchetti, "Use and Re-use of Textiles on Some Vessels from the Tomb of Kha and Merit" at the conference *Old Textiles – More Possibilities*, 14–18 June 2021, Copenhagen, *Session 5 – Reuse, Repair, Redesign*.



Fig. 52: New Kingdom pattern: amphora Turin Suppl. 8619 and detail of its textile stopper.

of a human mummy in the Louvre (Pasherimin, N627, AF 6882), as well as in the coffers on animal mummies.

Human mummies are certainly another important cultural context to consider.[30] Notably, while different types of coffers and lozenges, common on animal mummies, were used on human mummies, certainly from the Ptolemaic era onwards, if not slightly earlier (for example, Paris, Louvre Pasherimin N627, AF 6882 [*Fig. 53c*]; Oxford, Ash. AN1888.820; London, BM EA6704; Brussels, MRAH E.3975 and Museo Egizio Petamenophis Cat. 2230/1, dated to AD 123 [*Fig. 53d*]), herringbone, meander, and polychrome spiral bandaging styles have not been recorded on them but only on the mummies of other animals. Whether the narrower range of wrapping styles used on humans was due to decorum or other, more practical reasons, is unclear. One particular wrapping style that is shared by both humans and animals: raptors with an anthropoid appearance, whose body tapers to protruding feet (e.g., Cairo, EMC CG 29682–29689),[31] have a criss-cross pattern similar to the criss-cross bandages of human mummies; perhaps this style anthropomorphised the birds even more as they were transformed into Osiris.

From the Twenty-fifth–Twenty-sixth Dynasty (722–525 BC) onwards, some human mummies were covered by a bead-net over their plain shroud (e.g., Turin Cat. 2233/1 [*Fig. 53a*]), of which criss-cross bandaging may be an abstract rendering.[32] This kind of bandaging is also seen on animal mummies, notably the anthropomorphic raptors mentioned previously (Cairo, EMC CG 29682–29689). More literally, the coffin of a cat in Paris, Louvre (E 2812=N2896), dating to the Late or Ptolemaic Period (664–30 BC), has a bead-net decoration similar to that found on human mummies, and the Sacred Rams from Elephantine not only had bead nets over their backs but amulets, cartonnage masks and "bibs" (Cairo, EMC CG 29861–29863).[33]

Additionally, from the fourth century BC onwards, human mummies, some of which were partially covered with masks, pectorals and foot-cases, were sometimes associated with bandages woven in net-like or intricate patterns. An example of such a pattern is found on mummy Cat. 2211/2 of the Museo Egizio (*Fig. 53b*), which dates to 426–388 BC.[34] Possibly human mummies inspired some of the animal mummies patterning, though, as noted above, the repertoire of patterns was richer for animals than for humans.

The use of cartonnage on animal mummies is a tradition that clearly has its roots in human mummification. Thus, the masks found on animal mummies (such as Cairo, EMC CG 29682, CG 29805; CG 29806, TR 14+4/27+2, 4 (raptors), and cat CG 29655) parallel those on humans. Some raptor masks are made from clay/mud (such as Cairo, EMC CG 29804), a cheaper and quicker material to use. Some animal mummies, like their human counterparts, are completely encased in cartonnage of different qualities and consistency (Cairo, EMC ibis CG 29874, crocodile CG 29816 *bis*, cow CG 29860).

When we compare certain votive and sacred animal mummies, a hypothesis comes to mind. Some mummies of bulls (e.g., **Nos. 4, 6**) or rams (e.g., London, BM EA6775) are distinguished by a geometric textile pattern placed only on their chest, like a "bib".[35] What did this pattern symbolise here? It certainly does not identify the animal in any biological sense, it is the head that does. It is possible that this "bib" is related to the bandages described in the "Apis Embalming Ritual"[36] that were wrapped around the chest

[30] Dunand et al., *El-Deir Nécropoles IV*, p. 203.
[31] From Saqqara or Akhmin: Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 13, 76–77.
[32] See also Cairo, EMC CG 61099/100 from KV 34: Ikram and Dodson, *The Mummy in Ancient Egypt*, 1998, pp. 160–61.
[33] Ikram and Iskander, *Non-Human Mummies*, 2002, CG 29861, pp. 35–36, illustration on p. 91.
[34] Radiocarbon dating thank to Human Remains Project, led by Museo Egizio with Eurac Research (Bolzano), Soprintendenza Archeologica, Belle Arti e Paesaggio per la Città di Torino, Horus Team, Curt Engelhorn Zentrum Archäeometrie of Mannheim, Politecnico di Torino, Department of Architecture and Design VIBT, University of Natural Resources and Life Sciences, Institute of Biotechnology, Vienna.
[35] Also found on ovine mummies, Leiden, RMO AMM 16e and BA 217.
[36] Vos, *Apis Embalming Ritual*, 1993, Rt. II, 22–23; Rt. III, 1–2, fig. 4.



Fig. 53: Human mummies and patterns: a. Turin, Cat. 2233/1 (Late Period, 25th–26th Dynasty, 722–525 BC); b. Turin, Cat. 2211/2 (426–388 BC), photo by Centro Conservazione e Restauro "La Venaria Reale"; c. Paris, Louvre N2627 (Ptolemaic Period, 332–30 BC); d. Turin, Cat. 2230/1 (Roman Period, AD 117–138).

of the sacred Apis bull. It is also possible that the textile "bib" on some animal mummies is akin to the cartonnage mentioned above.

In summary, the following points can be made: the relationship between the type of animal, the shape of the mummy, the technique used to wrap the body, and the decorative pattern is not rigid; certain technical and decorative features point to local workshop production with a specific style, while others are widespread; very elaborate patterns, previously dated to the Roman Period, are actually older; the sources of inspiration for the designs are multiple and intermingled. What emerges is that a pattern is not a mere sum of decorative elements manufactured to produce a "pretty" design. The pattern is the result of a technical and cultural synthesis that could have had an apotropaic function, that of protecting the animal that was the object of the cult, and play a role in the transformation of the animal into a divine being through the act of embalming and wrapping. As yet, there is no documentary evidence concerning who designed and selected the patterns, which leaves us speculating on the role of the donor and embalmer in these matters. Regardless of who chose the pattern or why, these beautifully wrapped mummies remain a testament to the skill, patience, and creativity of those who prepared and wrapped them, and speak to us across the ages.

5. CONSERVING ANIMAL MUMMIES

Cinzia Oliva

5.1 Introduction

With the increase of projects dealing with animal mummies, particularly in museums,[1] strides are being made in studying animal mummies non-destructively, focussing on the animals themselves, their mummification, materials and modes of wrappings,[2] date, or socio-cultural and religious aspects of the phenomenon of animal mummification (see Chapter 1). In addition, advances are being made in the conservation of these delicate and complex artefacts.[3]

Conservators generally dedicate their time and effort to technical studies of the production and materials of textile artefacts in order to better understand deterioration processes. This leads to the development of new treatments.[4] However, in the case of animal mummies, the increasing attention paid to them has not coincided with an equal interest in their fragility from a conservation standpoint. This fragility is due both to their depositional and to their post-depositional history, including their museum life over the previous centuries. Thus, very few treatments have been published on the conservation of animal mummies[5] and, more often than not, these have only focused on individual specimens[6] rather than on the subject as a whole, and without highlighting the critical issues of these treatments. At the same time, there has been a noticeable increase of public interest in the subject,[7] which is matched by a greater desire on the part of museums to reveal what lies behind the work of curators and restorers, using all the new ICT resources, which have been greatly increased during the Covid-19 pandemic.[8]

Undoubtedly, most of the conservation strategies that have been applied so far have been derived from the restoration of human mummies,[9] which certainly share common elements with animal mummies, most notably being made of organic remains and textiles, and the use of embalming techniques. There are many points in common between the two fields, both in terms of the theoretical approach to restoration and the consequent need to preserve the material uncontaminated. But there are also a number

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[1] Ikram in Porcier et al. (eds.), *Creatures of Earth, Water, and Sky,* 2019, pp. 179–91; Ikram, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life,* 2023, pp. 225–234.

[2] See Letellier-Willemin, in Ikram et al. (eds.), *The Ancient Egyptians & the Natural World*, 2021, pp. 183–89; Letellier-Willemin, in Dunand et al., *El-Deir Nécropoles IV*, 2017, pp. 187–205; Letellier-Willemin, in Porcier et al. (eds.), *Creatures of Earth, Water, and Sky*, 2019, pp. 221–29; Brandt, *ATRev* 62 (2020), pp. 6–19; McKnight, *Arts* 9 (2020), 128: https://doi.org/10.3390/arts9040128; Tarek et al., in Porcier et al. (eds.), *Creatures of Earth, Water, and Sky*, 2019, pp. 315–22.

[3] Incordino and Oliva, in Ikram et al. (eds.), *The Ancient Egyptians & the Natural World*, 2021, pp. 141–46; Oliva and Borla, in Porcier et al. (eds.), *Creatures of Earth, Water, and Sky*, 2019, pp. 259–67; Pubblico and Oliva, in Porcier et al. (eds.), *Creatures of Earth, Water, and Sky*, 2019, pp. 293–304.

[4] Gänsicke et al., *JAIC* 42 (2003), pp. 193–236: https://doi.org/10.1179/019713603806112804; Schorsch, in Shaw and Bloxam (eds.), *The Oxford Handbook of Egyptology*, 2020, p. 1206.

[5] Sportun, in McKnight and Atherton-Woolham (eds.), *Gifts for the Gods*, 2015, pp. 96–98; Borla and Oliva, in *Lo Stato dell'Arte 13*, 2015, pp. 153–60; Oliva and Ceruti, in *Lo Stato dell'Arte 15*, 2017, pp. 397–403; Oliva and Borla, in Porcier et al. (eds.), *Creatures of Earth, Water, and Sky*, 2019, pp. 259–65; Pubblico and Oliva, in Porcier et al. (eds.), *Creatures of Earth, Water, and Sky*, 2019, pp. 301–02; Timbart, in Porcier et al. (eds.), *Creatures of Earth, Water, and Sky*, 2019, pp. 323–30.

[6] Paillier, *LOCIM* 136 (2011), pp. 21–26; Abdel-Maksoud and El-Amin, *MAA* 13 (2013), pp. 45–67; Leveque, "Reports on Conservation on Animals", 2017. I thank Mimi Leveque for generously sharing this information with me.

[7] Ikram, in Porcier et al. (eds.), *Creatures of Earth, Water, and Sky*, 2019, pp. 179–92.

[8] Conservation of a crocodile mummy, British Museum, London: https://www.youtube.com/watch?v=XgMZBPYcKRk; Animal Mummy Conservation, Brooklyn Museum, New York: https://www.youtube.com/watch?v=90UYJzk_t2E; From Storage to Showcase: Conserving Ancient Egyptian Animal Mummies, Sarah Schellinger, Mimi Leveque: https://www.youtube.com/watch?v=xQaINlczrjI.

[9] Johnson et al., in Brown et al. (eds.), *Conservation in Ancient Egyptian Collections*, 1995, pp. 47–55; Marochetti et al., *JBR* 80 (2005), pp. 239–43; Cadot, *Coré* 27 (2012), pp. 3–11; Cadot et al., *Techné* 38 (2013), pp. 59–64; Guérin et al., *LOCIM* 148 (2013), pp. 12–20: https://doi.org/10.4000/ocim.1241; Wills et al., in Fletcher et al. (eds.), *Regarding the Dead*, 2014, pp. 49–73; Wills, in Douny and Harris (eds.), *Wrapping and Unwrapping*, 2014, pp. 157–70; Lacovara et al., *JARCE* 51 (2015), pp. 65–74; Oliva, *Technè* 44 (2016), pp. 122–26; Oliva and Borla, in Rosati and Guidotti (eds.), *Proceedings of the XI International Congress of Egyptologists*, 2017, pp. 462–67; Brown et al., *AIC Objects Specialty Group Postprints* 24 (2017), pp. 293–318; Marochetti et al., *QAP* 4 (2020), pp. 147–62; Bruno, in Barbash and Cooney (eds.), *The Afterlives of Egyptian History*, 2021, pp. 3–18; Gambino and Oliva, in Basile and Di Natale (eds.), *Atti del XIX Convegno di Egittologia e Papirologia*, 2022, pp. 271–310.

of important differences between the two classes of artefacts, which in the course of treatment can become decisive in terms of methodological choices.

From the point of view of conservation ethics, an identical approach is used for human and animal mummies. "'Minimum intervention' is now widely accepted as the best methodology to follow when working on archaeological materials. It is an approach that preserves both the artefact and all the technical information relating to its original function, production, technologies and provenance. Furthermore, conservation plays a key role in making organic remains (both human and animal) available and accessible for long-term study. For this reason, it is essential to avoid, as much as possible, using materials and techniques which, in the long run, could alter the artefact and compromise future analyses."[10] The aim of any treatment should be to extend the 'life' of an artefact, preserving its past and the related information and making them accessible to visitors and scholars through permanent, temporary or travelling exhibitions.

Another aspect that human and animal mummies have in common is the embalming technique. The techniques used for animal mummies probably derived from those used for humans. However, though a lot of research has been carried out on human mummification, much less has been done thus far on animal mummification techniques,[11] although this is changing.[12]

Whilst there are many similarities between the two, there also are some significant differences. In animal mummification we find less extensive use of natron, if not, in some cases, a total absence of it. Some techniques are used only for animal mummies, such as dipping the body in melted and hot resin.[13] Furthermore, in animal mummies, we observe the widespread occurrence of extraneous materials, for example sand, mud, reeds and palm ribs. Sand, mud and sawdust have also been found inside human mummies but in different proportions compared to the size of the body, possibly because the embalmers preferred to use folded textiles or recycled fabric fragments as filling materials, which were more suitable to recreate the desired body shape. Vegetal material in animal mummies tends to be used to reinforce the structure, as in the case of the bulls (**Nos. 4–6** in this catalogue), or to enhance the animals' actual shape, as seen in crocodile **No. 150**, where the body and head were modelled on bundles of palm ribs tied together by small knotted ropes. The presence of organic materials of different types, sizes, and densities affects the preservation of the artefacts and the problems they pose from a conservation point of view.

The widespread use of recycled fabrics for bandages and shrouds is a feature shared by human and animal mummies. Identifying the number of textiles and technical details in animal mummies is often troublesome, due to the usually small size of the bandages and the way in which they are interwoven. Nevertheless, in the Museo Egizio collection, we found several examples of reused textiles, including fragments with traces of hemming, sewing and even darning. We found most traces of reuse in animals of larger sizes[14] and inside or at the base of the animal.[15] In dog mummy **No. 16** and gazelle **No. 8**, the outer shrouds were probably torn from tunics, judging by their shape and the presence on them of seams and rolled hems. Recent studies[16] have confirmed that large quantities of textiles were required for each animal mummy, and it is reasonable to think recycled textiles were used for them in the same way as for human mummies.

One last difference, of course, is the smaller size of animal mummies (except for bulls, such as those in the Smithsonian Institution's Museum of Natural History, Washington DC, 413941 and 413942). In the case of human mummies, total consolidation may be indispensable in the presence of advanced decay, while in animal mummies intervention can be circumscribed and calibrated more precisely on smaller portions, where the conservator can work locally. Furthermore, the conservator must be careful to preserve the features of the animal, such as the shape of a crocodile's mouth or of a cat's muzzle, whereas the human mummy requires simpler coverings.

The differences between the two types of artefacts call for specific attention and research into appropriate methods for the conservation of animal mummies.

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[10] Wills, in Douny and Harris (eds.), *Wrapping and Unwrapping*, 2014, pp. 49–51. Cf. Oliva, *Technè* 44 (2016), p. 123.
[11] Ikram, in Ikram (ed.), *Divine Creatures*, 2005, p. 16.
[12] Ikram, in Porcier et al. (eds.) *Creatures of Earth, Water, and Sky*, 2019, pp. 179–91; Ikram, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 225–34.
[13] Ikram, in Ikram (ed.), *Divine Creatures*, 2005, p. 26.
[14] Bulls **Nos. 4–6** in this catalogue.
[15] Ibises **Nos. 81–82**, **88**, **100**, **103** in this catalogue.
[16] Brandt et al., *ATRev* 62 (2020), pp. 17-18.

5.2 Causes of Decay

Animal mummies are complex artefacts, consisting mainly of organic materials: textiles, skeletal remains and soft tissues, and anomalous material used for stuffing in addition to residues of embalming and mummification substances.

Thanks to favourable environmental conditions, organic materials are widely represented in Egyptological collections, but it is precisely their provenance from such a dry environment that compromises their physical stability and makes them very unstable, due to the oxidation of cellulose.[17]

The great majority of textile wrappings in animal mummies are made from linen, made from flax fibres (see Chapter 3). Linen is a natural fibre, composed of cellulose, waxes, non-cellulosic polysaccharides, and lignin. Cellulose fibres are very sensitive to moisture and humidity variations and can become very brittle in conditions of low humidity (below 40%, desiccation of the fibre can occur).[18] Furthermore, cellulose can be severely attacked by acids. Textile wrappings and bandages have all been exposed, during their entombment, to a very dry environment and have been in contact with acidic substances, both from the soil and from contact with embalming resins and treated animal bodies, which can alter the fibres and lead to their degradation (*Fig. 54*). In addition, cellulose can deteriorate as a result of exposure to ultraviolet radiation. The effect of photo-oxidation is a change in colour (yellowing of the fibres) or the fading of dyed fabrics (*Fig. 55*) and a subsequent loss of mechanical strength. "The chemical deterioration of a cellulosic fibre is a complex process (involving cellulose, hemicellulose and lignin, if present) resulting in decreased mechanical strength, rigidity, friability and colour change."[19]

A further cause of degradation is related to the type of mummification the animal underwent and the type of mummy (see Chapter 1). Embalming techniques varied depending on the type of mummy and the purpose for which the animal was preserved. Often these techniques were applied hastily or partially, negatively affecting the preservation of the bodies and the bandages. Due to these variations and in close association with environmental fluctuation, the mummies could have started to decay even before burial.[20]



Fig. 54: Traces of contamination from inside the body, **No. 9** (before conservation). Photo by Croma.



Fig. 55: Evidence of the original pink dyed bandage, **No. 82** (before conservation). Photo by C. Oliva.

In votive mummies, while many seem to have been desiccated with natron, the absence of evisceration and insufficient use, or no use at all, of natron, together with an over-generous use of oils/resins and possibly bitumen often resulted in a partial or total disintegration of flesh and a disarticulation of the skeleton, which produced a sort of black powder, both within as well as spilling out of the bandages (see, in this catalogue, dog **No. 17**, *Fig. 56*).[21] At the same time, the contact with acidic substances, like resins and waxes, accelerated the oxidation and degradation of cellulose, leading to a breakdown of the textile structure. In dog **No. 12** in this catalogue, we have marked contamination of the animal from the inside, with brown resin

[17] Schorsch, in Shaw and Bloxam (eds.), *The Oxford Handbook of Egyptology*, 2020, p. 1207.
[18] Tímár-Balázsy and Eastop, *Chemical Principles*, 1998, pp. 34–36.
[19] Tímár-Balázsy and Eastop, *Chemical Principles*, 1998, p. 36.
[20] See fn. 26 below.
[21] Ikram, in Ikram (ed.), *Divine Creatures*, 2005, p. 21.



Fig. 56: Degraded organic remains came out from inside the body, **No. 17** (before conservation). Photo by P. Robino.



Fig. 57: Evidence of contamination from inside the body, **No. 12** (before conservation). Photo by P. Robino.



Fig. 58: Dog mummy wrapped in a shroud kept in place by bandages, **No. 14** (before conservation). Photo by P. Robino.



Fig. 59: Cracking and loss of the outer covering of the crocodile snout, **No. 150** (before conservation). Photo by P. Robino.

stains that have affected the bandages and compromised the whole condition of the animal (*Fig. 57*).

Other mummies, notably many of the avian ones, were probably mummified by dipping them in melted resin[22] and then quickly wrapping them in comparatively few layers of bandages and/or textile fragments. The artefacts were wrapped in textiles, which are currently brown and brittle due to the resin (see, for example, **Nos. 120–121**) and detached from the corpse.

In other cases, the animals were roughly wrapped in a few layers of fragmentary shrouds held in place by knotted bandages (*Fig. 58*), like the group of dog mummies from Asyut,[23] perhaps because they were intended to be stored in a coffin or covered by cartonnage. For some mummies, such as those of baby crocodiles,[24] mummification could have been achieved simply by drying the body in the sun and then wrapping it in fragments of reused bandages kept in place by strings of twisted linen thread, and sometimes supported by strips of palm rib.

Furthermore, animal mummies contain extraneous materials such as reeds, wooden sticks, palm leaves, sand and mud, which reinforced the body and helped shape the animal. Over time, and because of thermo-hygrometric variations in the environment, alternating expansions and contractions of the stuffing/reinforcing materials and the textile wrappings resulted in fracturing and caused the total collapse of the animal's structure, as in the case of a crocodile's muzzle (**No. 150**, *Fig. 59*) and a bull's head (**No. 4**, *Fig. 60*), leading to breakage and loss of the bandages and original materials.

In addition, thermo-hygrometric variations can be the cause of biological attacks by pests or fungal or bacterial growth. These can seriously compromise both the mechanical stability of the mummy and that of the textile wrappings by staining the cellulose fabric and opening holes of different sizes all over a textile. Traces of pest attacks (for example, on **Nos. 6**, **16**, **22**, **108**, **127, 158**, *Fig. 61*) or fungal growth (for example, on **Nos. 23**, **37**, **39**, **108, 157**, *Fig. 62*) were present on the mummies of the Museo Egizio, though the scientific tests showed the fungi and bacteria to be inactive (see Chapter 6).

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[22] Ikram, in Ikram (ed.), *Divine Creatures*, 2005, p. 26.
[23] **Nos. 14–18** in this catalogue.
[24] **Nos. 156–159** in this catalogue.



Fig. 60: Breaking and degradation of the shroud covering the coat and head of the bull, **No. 4** (before conservation). Photo by Croma.

A recent study conducted on the state of preservation of mummified remains (both human and animal) in the Museo Egizio (before the re-opening) confirmed the presence of fungal communities in the exhibition and storage areas, which could become a biodegradative risk only if environmental conditions change.[25] At present, it is quite difficult to establish with confidence when the insect, bacterial, and fungal attacks took place, whether it was during the burial, after excavation, or in the course of the mummies' museum life. In the literature, there are several examples of animal mummies attacked by pests during their entombment,[26] and insect infestations used to be not uncommon in museums that housed collections of organic material.[27] A study conducted in 2003 on insect presence in some organic artefacts of the Museo Egizio (bread, wheat, and a victual mummy) emphasised the vulnerability of this material to pest attack and the need to take great care in distinguishing which species are contemporary with the artefacts and which are recent or post-collection contaminants.[28] It should be stressed that in some cases, the presence of entomological findings can be the result of secondary contamination, and a critical approach and in-depth knowledge of their biology and distribution are required to avoid incorrect assessments.[29]



Fig. 61: Traces of a previous pest attack on the inner lining of the bull's ear, **No. 6** (before conservation). Photo by C. Oliva.



Fig. 62: Traces of a likely fungal attack on the animal's skeleton, **No. 39** (before conservation). Photo by C. Oliva.

Traces of infestation were found in the majority of animal mummies of the Museo Egizio, without any particular distinction related to species or type of mummification. We found the remains of larvae, empty puparia, and fragmented insect exoskeletons within the bandages and sometimes inside the animals themselves. In most cases, it is quite difficult if not impossible to ascertain when these

[25] Samadelli et al., *RiME* 3 (2019): https://doi.org/10.29353/rime.2019.2765.
[26] Examples of infestations by fly larvae have been remarked upon in various mummies: Ikram, in Flossmann-Schütze et al. (eds.), *Kleine Götter – Grosse Götter*, 2013, pp. 265–71; Ikram and Bertini, in Nicholson (ed.), *Catacombs of Anubis*, 2021, pp. 135–88.
[27] Curry, in Davis (ed.), *Multidisciplinary Research*, 1979, pp. 113–17.
[28] Panagiotakopulu, *Archaeometry* 45 (2003), pp. 355–62.
[29] Tuccia et al., *ArchAnthr* 14 (2022), p. 70: https://doi.org/10.1007/s12520-022-01524-3.

infestations occurred, though sometimes this can be established. Larvae and insects were sampled and preserved and will be available for future study. It should be noted that insects prefer feeding on protein rather than cellulose fibres, though mummies, both human and animal, provide an extensive source of stored meat for insect attack since their entombment, contributing to the said difficulty in determining when an infestation occurred.[30]

While insects develop and reproduce in a broad variety of environmental conditions,[31] found in Egypt and/or in Europe, or indeed anywhere else in the world, the same cannot be said for fungi and moulds, which require specific environmental conditions. The most common fungi in textile collections are those that live on the surface and are capable of digesting cellulose. Fungal spores are present everywhere and it is impossible to create a sterile environment, but they require certain conditions and nutrients to develop. Organic materials, such as textile or plants, are the perfect nutrients, but they need oxygen and specific temperatures (from 4° to 40°C, with an optimum between 24° and 30°C). By far the most important condition for fungal growth is moisture: fungi need an RH between 70% and 100% in order to develop,[32] which is less usual for Egypt than for Europe or the United States.

Fungi cause damage to textiles in a variety of ways. They damage the structure of the material, breaking down the fibres and producing holes and gaps. They can also cause indirect damage, as they produce acidic or coloured metabolites resulting in a phenomenon called "foxing", a term indicating the appearance of small red/brown/black spots on the surface. The brown spotting is clear on the undyed bandages of the front pattern of dog **No. 9** (*Fig. 63*) and in the mantle wrapping of the bulls (**Nos. 4–6**) where we found irreversible brown stains on the undyed linen of the back and several holes, of different sizes, produced either by the prolonged action of insects or by fungi (*Fig. 64*).

The mummies of bulls (**Nos. 4–6**) and a crocodile (**No. 150**) in the Museo Egizio date from the time of Drovetti (see Chapter 2). Unfortunately, the only photographic documentation dates to the 1960s and 1970s. It shows the mummies in an already precarious state of preservation, with large brownish stains on their light-coloured mantles and several tears and holes in the fabric covering the bulls. *Fig. 65* shows the bull **No. 4** in the black-and-white



Fig. 63: Evidence of "foxing" on the undyed bandages, **No. 9** (before conservation). Photo by Croma.



Fig. 64: Traces of a fungal attack on the shroud on the bull's back, **No. 6** (before conservation). Photo by C. Oliva.

[30] Panagiotakopulu, *JAS* 28 (2001), pp. 1235–46.
[31] Boersma, *Unravelling Textiles*, 2007, pp. 61–67.
[32] Boersma, *Unravelling Textiles*, 2007, pp. 67–68.



Fig. 65: The same animal in a Museo Egizio archive picture from the 1960s and photographed before the current conservation, **No. 4**. Photo by the Museo Egizio and Croma.



Fig. 66: The same animal in a Museo Egizio archive picture from the 1960s and photographed before the current conservation, **No. 150**. Photo by the Museo Egizio and by C. Oliva.

photo from the 1960s compared with the one taken at the beginning of the project; the general state of conservation is quite similar, except for the total collapse of the left horn. The same can be said about the crocodile, **No. 150** (*Fig. 66*), where cracks in the dark resinous/bituminous cover of the snout were already present. These cracks may be attributed to either a thermo-hygrometric variation or careless handling, or both: the cracks are positioned in the lower part of the muzzle, in correspondence with an area reinforced with sticks, but also subject to major mechanical stress when the artefact needed to be lifted or moved. All this shows how complex it is to establish a precise cause of degradation and situate it in time.



Fig. 67: Detail of a cat's snout, with abraded textiles and crushed and deformed ears, **No. 23** (before conservation). Photo by C. Oliva.



Fig. 68: Detail of the muzzle of a dog, with a deformed ear and detached jaw, **No. 10** (before conservation). Photo by P. Robino.

The shape of the mummies influences their state of preservation. The various shapes may have contributed to their decay by mechanical stress caused by the archaeological context or due to improper display and/or storage conditions. Thus, the mummies made with realistic muzzles appear deformed and abraded, and the three-dimensional inserts (such as ears, nose, mouth) are often crushed (*Fig. 67*), detached (*Fig. 68*), or missing.



Fig. 69: Detail of an ibis tilted to one side, showing the tears and residues of organic remains on the bottom, **No. 92** (before conservation). Photo by P. Robino.

Votive mummies, which constitute the main group represented in collections and museums worldwide, including the Museo Egizio, are often displayed vertically, though in antiquity they would have been stored horizontally. In these animals, several abrasions and losses in the textiles at the base were noted, while the irregular and curved shape of the bottom of ibises shows breaks and detachment of some of the bandages from the bottom and perimeter of the mummy (*Fig. 69*).

Even the way in which the mummies were created has played a role in their preservation. Most of the votive mummies were simply made by wrapping textiles tightly around the body, sometimes fastening them with linen threads (*Fig. 71*) or knotted bandages (*Fig. 58*). No stitches or traces of sewing have been found on the wrappings of the mummies in the Museo Egizio, although there are a few documented examples where textiles were stitched together[33] to fit the animal's body. The outer textiles were kept in place by dots of resinous material only, as were the intricate bandages that composed the decorative pattern, which were secured in position by resinous materials applied directly to the fabric. The degradation and ageing of the resin caused its breakdown and the subsequent falling and detaching of the bandages from the corpse, thus precluding a clear understanding of the original decorative pattern, as we can notice in several mummies in the Museo Egizio, notably some bulls, **Nos. 4–6**, some ibises, **Nos. 93**, **95**, **100**, and a dog, **No. 9** (*Figs. 54–72*). Also, since the resin was applied when melted, the heat could have adversely affected the survival of the mummy, as noted during the course of experimental mummification.[34]

The use and presence of dyed textiles is one of the most visible signs of textile degradation. Most of the dyes faded over time, perhaps because they were already unstable upon manufacture or due to prolonged exposure to ultraviolet lighting during their museum life.



Fig. 70: Detail of degraded bandages with the loss of the original decoration pattern, **No. 6** (before conservation). Photo by C. Oliva.



Fig. 71: Detail of the degradation of the beak cover; underneath, the threads that hold the structure in place are visible, **No. 97** (before conservation). Photo by Croma.

All the details of the pink muzzles of the cat and dog mummies in the Museo Egizio[35] have completely faded; the original colour can only be seen inside folded bandages or in areas that have been protected from light exposure. In addition, the netting pattern on cat **No. 23** reveals where the interwoven linen threads were originally pink, positioned over an alternating creamy and brown ground, with a decorative effect that is now totally lost.

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[33] Letellier-Willemin, in Porcier et al. (eds.), *Creatures of Earth, Water, and Sky*, 2019, p. 222.
[34] Ikram, in Graves-Brown (ed.), *Egyptology in the Present*, 2015, pp. 53–74; Ikram, in Ikram (ed.), *Divine Creatures*, 2015, pp. 16–43.
[35] In this catalogue: cats **Nos. 24–25, 27, 31, 35**; dogs **Nos. 10–11**.



Fig. 72: Decay due to the combined effects of light, pollution and mechanical stress, **No. 9** (before conservation). Photo by Croma.

The dark and brown bandages were all in a very poor condition. The presence of iron compounds in dark textile dyes are widely known[36] to affect cellulose fibres, from the beginning of the dyeing process, and it causes their breakdown and possible eventual loss. Most of the mummies with elaborate decorative patterns in different colours, alternating unbleached and dyed bandages (pink, different shades of yellow, brown and dark brown), show extensive loss and gaps in the material, which made it difficult to reconstruct the original pattern of the interwoven decoration (*Fig. 70*).[37]

In some animals, snouts/muzzles were not wrapped with dark-dyed textiles but rather with textiles impregnated with a resinous black substance, which created a certain thickness and consistency; over time this coating broke down, creating gaps of varying sizes. This kind of damage is visible in a large proportion of ibis mummies, where the upper beak cover is often broken when not completely missing (*Fig. 71*), revealing the inner bandages and the linen threads securing the structure. We can see this kind of damage also in the muzzles of dog **No. 9** (*Fig. 72*) and crocodile **No. 150** (*Fig. 59*).

In addition, animal mummies have often been on display for a long time in museums, and thus exhibit signs of damage due to atmospheric pollution, mechanical stress and excessive light exposure (*Fig. 72*). We have already mentioned the effects of light on both fibre degradation and the loss of the original colour of dyes; this type of decay is irreversible and depends both on the quantity and quality of the light the artefacts have been exposed to.[38] Besides, over time a diffuse presence of dust and deposits on the animal's surface – in conjunction with thermo-hygrometric variations – can produce micro-abrasion of the fibres, leading to physical collapse and the loss of mechanical strength. Indeed, most of the wrappings of the animals were loose and detached, sometimes with a consequent unravelling of the original pattern of the decorative features and severe loss of the original shape.

Another cause of decay, closely linked to what has just been said, is due to the conservation treatments that most mummies in Egyptological collections underwent during the many years of their museum life. The main problem faced by conservators is the deleterious effects of previous interventions on Egyptian artefacts in order to stabilise or restore them.[39] In our case, the problems posed by previous restoration are made worse by the fact that these jobs were often performed by professionals from other fields (such as restorers of paintings or parchments) who used inappropriate and overaggressive methods[40] for flexible and sensitive materials such as textiles. In some animals, even though we lack written or photographic documentation of work carried out in the distant past, there are evident traces that they have undergone crude restoration. The brown wrappings on the bull's muzzle (**No. 4**) show glue or adhesive residues on the surface, which, over time, became degraded and eventually broke and came off (*Fig. 73*).

In some cases, degradation was caused by looters, probably in search of amulets and jewellery. They cut through the bandages, sometimes leaving the organic remains ex-

[36] Bruno, in Bleiberg et al. (eds.), *Soulful Creatures*, 2013, pp. 113–14.
[37] In this catalogue: bulls **Nos. 4–6**; crocodiles **Nos. 150–151**; dogs **Nos. 9, 10**; cats **Nos. 22–23, 25, 27, 29, 33–36**; ibises **Nos. 83, 86, 90–92, 96–98, 100, 102, 105–109**; raptors **Nos. 118–122**; snakes **Nos. 140–142.**
[38] Boersma, *Unravelling Textiles*, 2007, pp. 47–48.
[39] Schorsch, in Shaw and Bloxam (eds.), *Oxford Handbook of Egyptology*, 2020, p. 1207.
[40] Oliva, *Technè* 44 (2016), p. 123; Timbart, in Porcier et al. (eds.), *Creatures of Earth, Water, and Sky*, 2019, p. 324.



Fig. 73: Glue spots from a previous restoration on the muzzle of bull, **No. 4** (before conservation). Photo by Croma.

posed and the textiles torn apart. This is not the case with the Museo Egizio collection, where there are no apparent signs of deliberate looting on the mummies; this is probably due to the fact that generally only intact specimens were acquired. Of course, it is not possible to establish a single cause for the decay of animal mummies; it is clear, in any case, that multiple factors contributed to the general decay of the material.

In the following examples, we can see how the interaction of different decay-inducing factors worked together. In bull **No. 6** and crocodile **No. 150**, the natural decay of cellulose fibres, accelerated by the presence of treated bodies and the presence of acidic resins, in connection with strong mechanical stress due to the size and three-dimensional shape of the mummies, resulted in a total collapse of the textiles. Furthermore, the internal structure of both animals collapsed, due to the shrinkage of the internal filling (papyrus reeds, sticks and sand), possibly caused by a sudden change in the relative humidity. In the bull, this rapid shrinkage not only caused the collapse of the animal as a whole but also that of its frontal part, following an alteration of the artefact's shape, and the subsequent bursting of the frontal decorative pattern (*Fig. 70*). In the crocodile, the shrinkage broke the muzzle's top coating (*Fig. 59*), revealing the internal filling, while the pattern on the back was already lost, partly due to the decay of the black-coated bandages, but mainly due to the degradation of the adhesive used for a previous consolidation, which stiffened and darkened.

5.3 Conservation of Animal Mummies

The project had as its main objectives:

- To stabilise the artefacts, halting material degradation by removing its main causes: dust, pollutants, mechanical stress, deformation;

- To recover the integrity of the artefacts, both mechanically and visually;

- To allow for the study of the textiles and organic material, and the sampling required by the diagnostic campaign;

- To provide the artefacts with adequate support to enable their display and proper handling.

The work was divided into two main areas: restoration/conservation and maintenance, depending both on the general state of preservation and whether the artefact is intended for display. Also, the type of mummification, as seen above, and the size of the artefacts were crucial in the choice of the consolidation approach and the way they would be displayed or moved.

The work started with the usual photographic documentation of each stage of the conservation treatment and of all of the diagnostic work carried out on the animals. Then it proceeded with the identification and study of the different textiles that were present in each artefact. A record card was filled in for each textile found on the mummies, providing all the relevant technical information (see Chapter 3).

Replicas (*Fig. 74*) and drawings of the patterns were also made, and then coloured, in order to reconstruct the whole of the original pattern on the animals. Of course, working

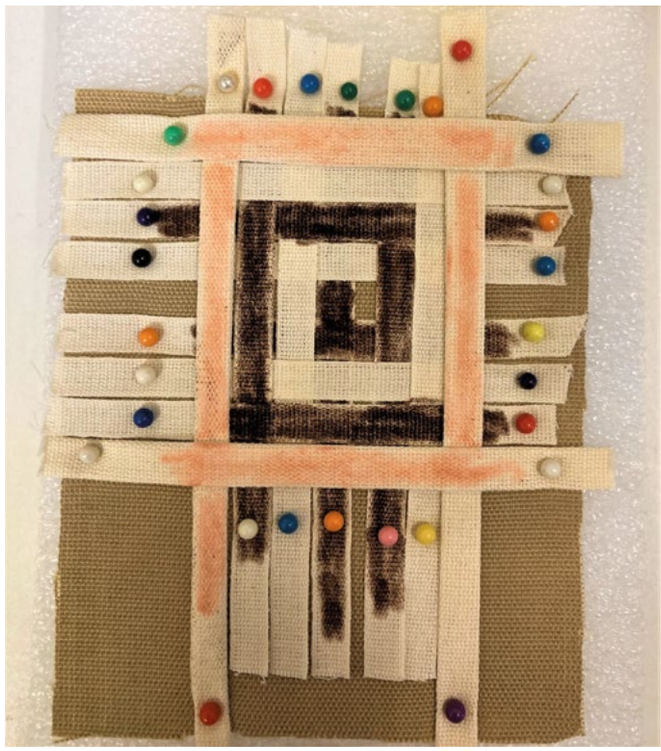


Fig. 74: Example of a replica of a decorative pattern made by weaving coloured cotton tape. Photo by C. Oliva.



Fig. 75: Cleaning with a low-suction vacuum. Photo by C. Oliva.



Fig. 76: Cleaning of a crocodile's skin with vulcanised sponges. Photo by C. Oliva.

closely on these precariously preserved animals allowed for a closer view of the materials[41] and for detecting otherwise concealed features, such as the original colours of the dyes or some particular aspects of the construction of the individual mummies.

In the conservation of animal mummies, cleaning is the first step in the more complex task of mechanically stabilising the artefact. Cleaning is always an irreversible process, which can result in loss of information, but it can be essential to remove degrading agents from the fibres and thus stop chemical reactions and mechanical friction. It was performed with a low-suction vacuum pump (as used in surgery) with the help of soft brushes, when the degree of decay of the material allowed it (*Fig. 75*). Where the dust adhered to the fibres, it was necessary to gently clean them with vulcanised natural rubber sponges (additive and latex-free). The sponge is gently pressed on the surface to trap dirt particles and suck them into the micro-holes of the sponge (*Fig. 76*).

Some crocodiles in the Museo Egizio[42] being totally unwrapped, their scaly skin had greasy dirt (due to airborne pollutants) adhering to it, which could not be removed by simple vacuuming. An ultrasonic steamer was hence used, which emits slightly warm steam, and vulcanised sponges.

The ultrasonic humidifier, with cold steam in order to avoid unintended and dangerous chemical reactions, was also used on bandaged mummies to rehydrate the fibres of the bandages and let the textiles recover their original shape and position on the animal's body (*Fig. 77*). Most of the bandages were detached from the body of the animal and this had resulted in localised deformations over time. Fragments were twisted and misshapen, and the fibres were dehydrated and had lost their flexibility. Particular

[41] McKnight, *Arts* 9 (2020), 128, https://doi.org/10.3390/arts9040128.
[42] A complete one, **No. 149**, and three incomplete ones, **Nos. 152–153, 160**.



Fig. 77: Rehydration of the fibres with an ultrasonic humidifier. Photo by C. Oliva.

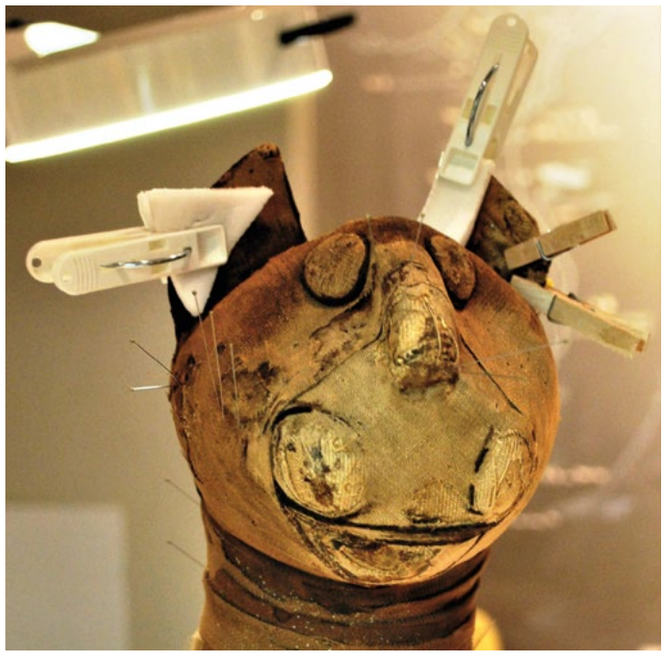


Fig. 78: Fragments and three dimensional parts kept in place by temporary pinning, **No. 24** (during conservation). Photo by C. Oliva.

care was taken not to let excessive humidity affect the surrounding area or penetrate too deep in the animal's body, jeopardising the stability of the organic remains.

To keep the fragments in place during the treatment, they were temporarily pinned to an inert support with entomological pins or plastic pegs (*Fig. 78*).

In some cases, steam was also useful in reactivating the original resinous material in order to recover the original shape of the three-dimensional parts of the animals, such as ears in cats and dogs. In the case of the bull (**No. 4** in this



Fig. 79: Nylon-net temporary support held in place by a linen ribbon, **No. 39** (after conservation). Photo by Croma.



Fig. 80: Detail of the bottom reinforced by shaped polyester fabric kept in place by Velcro® and a linen tape, **No. 40** (after conservation). Photo by Croma.

catalogue), the steamer was used to soften the deposits of previous treatments in order to reactivate the glue and make its mechanical removal from the fibres possible.[43]

While cleaning operations are basically the same for most animal mummies, consolidation must be adapted to each artefact, taking into account its condition, size and envisaged future life to choose the right level of physical support.

For all those animals in which the bandages were already loose and detached from the body, leaving access to organic remains, it was decided that using a removable support would allow for future scientific investigations. The animals[44] were therefore simply wrapped in properly dyed nylon net, which was kept in place by linen or silk ribbons, so as to hold the material in place and provide full access to the organic remains (*Fig. 79*). When needed, the lower side was reinforced with a removable support of inert material, such as a sheet of Melinex®[45] or a shaped polyester fabric (*Fig. 80*).

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[43] Oliva and Borla, in Porcier et al. (eds.), *Creatures of Earth, Water, and Sky*, 2019, p. 262.

[44] Ibises **Nos. 100, 108, 110,** raptors **No. 123**, cats **Nos. 39–40**, and dogs **Nos. 13–14, 17, 20** in this catalogue.

[45] Melinex® (or Mylar) is a transparent polyethylene terephthalate (PET) plastic foil without plasticisers, available in different thicknesses. See Boersma, *Unravelling Textiles*, 2007, p. 126.



Fig. 81: Nylon-net support, **No. 24** (after conservation). Photo by Croma.



Fig. 82: Detail of a sewn linen ribbon, **No. 24** (after conservation). Photo by Croma.

In mummies (animal or human), surface consolidation is the main challenge, because it is necessary to keep fragments in place, most of the time without any access from the back and trying to avoid, as far as possible, the use of adhesives, which could stain the fabrics[46] and affect the organic remains inside. To consolidate the animal's body, a fine nylon net, properly dyed in a matching colour, was sewn onto itself, through a linen ribbon (specially woven for this work) placed on the back or onto the hidden side of the animal (*Figs. 81, 82*). Sometimes, working with local supports, the net was fixed onto itself through short insertions of sewn Velcro® (*Fig. 83*).[47] This treatment is non-invasive and totally reversible, and no stitches were applied to the original material; a nylon net is transparent, easy to manipulate and dye, with non-fraying edges, and flexible enough to follow the three-dimensional shape of a small animal. The mummy is clearly visible below it, while the conservation netting remains largely invisible to the museum visitor, unless closely scrutinised.[48] This kind of consolidation has proved successful in both human[49] and animal mummies.[50]

The use of a total support shows all its limitations when it comes to small and highly detailed anatomical elements, such as snouts, ears, or muzzles. Any transparent support (nylon net and/or silk crepeline) cannot be adhered to or sewn onto the animal's structure, so consolidation must be carried out by other means.

In conservation literature there are several cases where different kinds of adhesives[51] have been applied to reposition and hold in place small textile fragments detached from the animal's structure. In this project, the decision was made to use an adhesive derived from natural cellulose (hydroxy-propyl cellulose) diluted in ethyl alcohol, so as to reduce the risk of any staining or shrinking of the organic materials.[52]

Ears in cats and dogs were repositioned with steam and then consolidated locally with dots of adhesive and tiny fragments of Japanese paper coloured to match the

[46] Oliva, *Technè* 44 (2016), pp. 123–24.
[47] In this catalogue: ibises **Nos. 86**, **99**, **103**; cat **No. 40**.
[48] Wills, in Douny and Harris (eds.), *Wrapping and Unwrapping*, 2014, pp. 157–70.
[49] Marochetti et al., *JBR* 80 (2005), pp. 239–43; Wills, in Douny and Harris (eds.), *Wrapping and Unwrapping*, 2014, pp. 157–70; Oliva and Borla, in Rosati and Guidotti (eds.), *Proceedings of the XI International Congress*, 2017, pp. 462–67; Gambino and Oliva, in Basile and Di Natale (eds.), *Atti del XIX Convegno di Egittologia e Papirologia*, 2022, pp. 291–92.
[50] Sportun, in McKnight and Atherton-Woolham (eds.), *Gifts for the Gods*, 2015, p. 997; Oliva and Borla, in Porcier et al. (eds.), *Creatures of Earth, Water, and Sky*, 2019, p. 262.
[51] Paillier, *LOCIM* 136 (2011), pp. 22–23; Abdel-Maksoud and El-Amin, *MAA* 13 (2013), pp. 60–61.
[52] The adhesive is Klucel G in a solution with 2–4% of ethyl alcohol, depending on purpose. See also: Johnson et al., in Brown et al. (eds.), *Conservation in Ancient Egyptian Collections*, 1995, p. 50; Abdel-Maksoud and El-Amin, *MAA* 13 (2013), p. 60.



Fig. 83: A local support attached by sewn Velcro®, **No. 103** (after conservation). Photo by Croma.



Fig. 84: Consolidation of a crocodile's muzzle with Japanese paper and nylon-net, **No. 150** (after consolidation). Photo by P. Robino.

bandaging, inserted under the external fabric layers, and kept temporarily in place by means of pegs and/or pins (*Fig. 78*). The paper worked as an interface or fill between the uneven surfaces of the different layers of overlapping fabric.[53] The collapsed crocodile's muzzle (**No. 150**) was consolidated and filled with Japanese paper. The reeds were held in place with glued Japanese paper, then covered with nylon-net strips (*Fig. 84*). More in-depth action was required for the ears of the two bulls (**Nos. 5**–**6**), to recreate the original profiles of the animals and allow the ears to recover their original position on the head. In both cases, the ears were reinforced using a hybrid technique, combining both adhesion and stitching (*Fig. 85*). They were first consolidated on dyed silk crepeline, which was treated with a thermoplastic adhesive,[54] then stitched between two layers of nylon net, a method widely used in textile conservation.[55]

In some cases, the collapse of the internal structure or the presence of breaks, from which both organic remains or filling material had slipped out, required more specific consolidation, for structural as well as aesthetic purposes. Such degradation had occurred not only in larger animals, such as the bulls or crocodiles but also in a raptor (**No. 127** in this catalogue), a cat (**No. 39**) and a dog (**No. 18**).

The shrinkage caused a collapse of the frontal part of the bulls, following an alteration in the animal's dimensions, and the subsequent bursting of the frontal decorative pattern. To recreate the original body form, it was necessary to insert specifically shaped supports into the base of the animals (through small holes in the fabric, which were already present at the bottom), but in order to reach the underside it was indispensable to turn the mummy onto its side.

During my experience as a conservator, I have used several different methods to obtain access to the back of human mummies,[56] and I drew on this experience to work on the larger animal mummies. For the bulls, it was chosen to use an inflatable surgical mattress, as used in hospitals for the care and treatment of traumatised patients. It can be perfectly adapted to the shape of the mummy by releasing air from inside the mattress by means of an electrical pump. It creates a perfectly solid mould, which surrounds the mummy and adheres entirely to the body. The mummy was first protected by wrapping it in a temporary nylon support, then all the protruding parts were protected with a customised layer of Plastazote® (3 mm thick), kept in place by removable cotton tape (*Fig. 86*). Then the mattress was placed against the mummy's side and while it was being deflated in order to fit the mummy's shape, we held it in place by hand until it firmly adhered to the mummy (*Fig. 87*). Once the mummy was shifted, the shaped support was easily inserted onto the base. Having regained the original height of the chest, which had slumped, it was possible to reconstruct the original pattern and restore the mechanical tension of the front pattern, keeping it in place with a covering of dyed nylon net sewn onto the bottom patch (*Fig. 88*).

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[53] Johnson et al., in Brown et al. (eds.), *Conservation in Ancient Egyptian Collections*, 1995, p. 52.

[54] The crepeline was treated with a solution of 15% Vinamul 3252 (vinyl acetate-ethylene copolymer dispersion) in deionized water. Vinamul was chosen for its specific properties (ease of application, reversibility, flexibility and good ageing properties); see Tímár-Balázsy and Eastop, *Chemical Principles*, 1998, pp. 309–12.

[55] Tímár-Balázsy and Eastop, *Chemical Principles*, 1998, pp. 359–61; Landi, *The Textile Conservator's Manual*, 1985, pp. 109–11.

[56] Oliva and Picchi, in Ørsted Brand et al. (eds.), *Textile Layers* (forthcoming).



Fig. 85: Consolidation of a bull's ear through a combination of adhesion and stitching, **No. 5** (after conservation). Photo by C. Oliva.

Different kinds of material[57] are used as filling. We opted for inert material. The supports were made from high-density Plastazote®,[58] covered with polyester fabric sewn onto it, thus avoiding the use of adhesives in direct contact with the archaeological material. Polyester tabby weave was chosen because it is highly inert,[59] resistant and smooth, which made it easier to slide the shaped supports underneath or inside the structure.

When gaps and holes were present on the base of the animal, often due to the collapse of the structure and/or the degradation of the linen fabric, these were covered by patches of polyester tabby weave to reinforce the underside. The material will be easily distinguishable from the original material in the future, even after it will have degraded (*Fig. 89*).

Following recent trends in the conservation and display of archaeological materials and organic remains, we opted for a methodology of "passive conservation"[60] to allow for safe handling during storage and display. Customised supports were made for each artefact, with attention given to their condition, original function and display requirements.

The animals that were intended to be displayed horizontally were provided with a support made from a sheet of Correx®[61] covered with polyester wadding[62] and a linen fabric (*Fig. 90*); when necessary, we added three-dimensional shapes in order to completely support the structure of the animal and to match any distortions due to the original embalming techniques and/or deterioration (*Figs. 90, 92*).



Fig. 86: Protection of mummy **No. 6** with a customised support (during conservation). Photo by C. Oliva.

The animals that were intended to be displayed vertically (cats and dogs) were supported by a custom-made plexiglass support, shaped so as to not be visually intrusive from a display point of view. In order to not have all of the animal's weight on the base, the support was made with a

[57] Abdel-Maksoud and El-Amin, *MAA* 13 (2013), p. 61, where the holes were filled with a paste of mixed organic components and linen bandages soaked in Arabic gum.

[58] Plastazote® is an inert polyethylene foam closed cell, available in different thicknesses, and used widely for the storage of organic materials. See Wills et al., in Fletcher et al. (eds.), *Regarding the Dead*, 2014, pp. 49–73.

[59] For the characteristics of synthetic fibres, see Tímár-Balázsy and Eastop, *Chemical Principles*, 1998, pp. 59–62.

[60] Oliva and Ceruti, in *Lo Stato dell'Arte 15*, 2017, pp. 397–403; Ceruti and Oliva, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 141–44.

[61] Correx or Coroplast is a synthetic twin-walled board which consists of 90% polypropylene and 10% polyethylene, available in different thicknesses. It is inert, lightweight, and fairly rigid (Boersma, *Unravelling Textiles*, 2007, p. 124).

[62] This is a non-woven material, manufactured in different ways, whose fibres can be glued or melted together. We chose a wadding where fibres are bonded together thermally without any adhesive, which could have degraded and contaminated the material in the course of time.



Fig. 87: Placing of inflatable surgical mattress on mummy, **No. 6** (during conservation). Photo by C. Oliva.



Fig. 88: Detail of pattern reconstruction and consolidation of bull **No. 4** by means of a net (after conservation). Photo by Croma.



Fig. 89: Local consolidation of the base of a bull with polyester fabric, **No. 4** (after conservation). Photo by C. Oliva.



Fig. 90: Shaped support made with Correx® covered by linen fabric, **No. 17** (after conservation). Photo by Croma.



Fig. 91: Customised support for the baboon **No. 1** (after conservation). Photo by Croma.



Fig. 92: Detail of three-dimensional supports for the paw of baboon **No. 3** (after conservation). Photo by Croma.

slight slope, giving the back of the animal additional support. For the bulls, we also added a plexiglass support for the chin (*Fig. 88*), which is always a heavy part of the head and tends to break the whole structure.

The two baboons (**Nos. 1**–**2**) had the seat and back encrusted with sand, pebbles and bits of limestone, apparently cut out of the matrix with a sharp tool (a similar situation is seen in a baboon in the British Museum, EA6736). The surface of the base was very uneven and unstable and the animals rather heavy. It was thus necessary to create a gypsum support, which was made using a plaster mould. The support was protected internally by a thin sheet of Plastazote® lined with the same fabric used for all the supports (*Fig. 91*).

Animal mummies are very fragile and sensitive artefacts, and any conservation treatment, even the most careful and gentle, will interfere with the original material at different levels. The best way to preserve animal mummies is to maintain them under proper environmental conditions, both for storage and display. Temperature and relative humidity (RH), as well as air pollution, play an important role in the degradation of organic materials, and a crucial one in biological attacks. Prolonged exposure to light can also be harmful, depending on the quality of the light and the duration of exposure. These factors are impactful not only individually but also in combination. Clearly, preventive conservation is ultimately the best option to extend the museum life of an object.

6. SCIENTIFICALLY INVESTIGATING ANIMAL MUMMIES

Debora Angelici

The animal mummies project of the Museo Egizio (*Fig. 93*) was aimed at cataloguing, studying, and conserving the museum's animal mummies through an interdisciplinary collaboration involving archaeologists, curators, scientists, and restorers. In the initial phase of the project, a scientific investigation protocol was designed to answer specific research questions about animal mummification.

The investigation required the use of different scientific techniques, both invasive and non-invasive, and called for contributions from experts from several fields (conservation scientists, veterinarians, physicists, chemists, and Egyptologists). The main focuses of the study were dating (radiocarbon dating), X-raying, and CT examination for species identification and wrapping/mummification details. It is worth noting that animal mummies are complex artefacts composed of very different materials – organics (the corpse and the wrappings) and embalming materials – as well as being often associated with containers of different types.[1] To begin with, radiography and computed tomography (CT) of the mummies was carried out. This provided researchers with information concerning the contents of the mummy bundles and coffins, as well as the ability to study them non-invasively. The CT acquisitions were carried out in December 2016 by means of equipment commonly used in the medical field (a 16-slice CT system), installed outside the museum for a short period of time (about 5 days) (*Fig. 94*).

The use of this equipment and the ability to place it in the immediate surroundings of the museum allowed for quick and safe analysis of these fragile artefacts. We successfully imaged a total of 152 specimens, including 105 animal mummies and fourty-seven wooden coffins.

Based on the results of the analysis, in most cases it was possible to identify the animal species, the position within the wrappings or coffins, the degree of completeness of each animal, and the age at the time of the death, as well as to identify the presence of organic remains inside sealed coffins and/or bandaging, and some details of wrapping and anointing, as has been done in other studies elsewhere. The details about the method, parameters and results are provided in the catalogue entry for each specimen, with overviews provided in Chapters 1 and 3.[2]

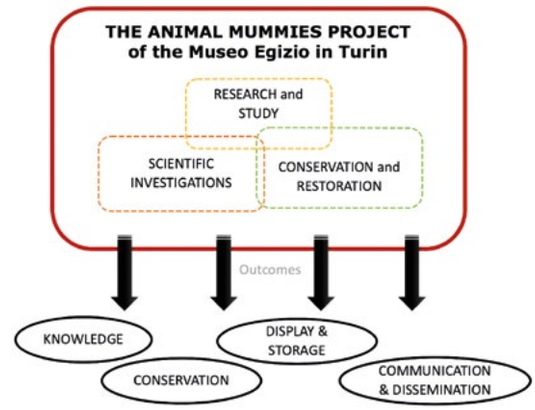


Fig. 93: The animal mummy project of the Museo Egizio.



Fig. 94: The CT acquisitions were carried out in front of the Museo Egizio.

[1] Ikram (ed.), *Divine Creatures*, 2005; McKnight and Atherton-Woolham (eds.), *Gifts for the Gods,* 2015.

[2] Also see Wade et al., *JAS 39.5* (2012), pp. 1642–47: https://doi.org/10.1016/j.jas.2012.01.003; Gostner et al., *JAS 40* (2013), pp. 1003–11; Raven and Taconis, *Egyptian Mummies* (2015).

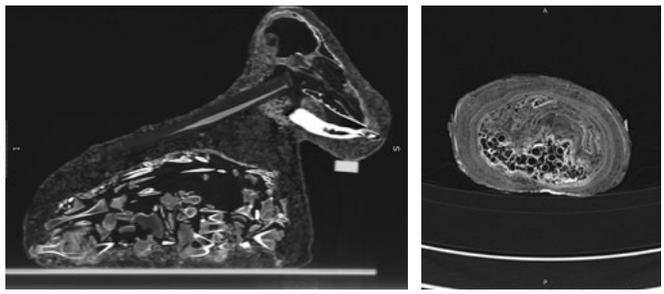


Fig. 95: Slice of a bull mummy (**No. 4**) vs slice of an ibis mummy (**No. 86**).

Imaging was a key component for the study as in some cases it was also possible to identify the presence – or lack – of the complete animal skeleton inside the bandages, as well as information about the wrapping. For example, all three bull mummies in the collection were disarticulated and incomplete, with padding and wrapping providing the shape of the animal. The skulls were supported by wood. Such information is also beneficial for the designing of mechanical supports that need to be fashioned for safe storage and display of these mummies in the museum (*Fig. 95*).

With the CT scan it was also possible to identify mummies that were made for the antiquarian market in recent times, in which the external appearance does not correspond to the internal one.[3] In the collection of the Museo Egizio, four examples of this particular category of artefacts are present (**Nos. 216**–**219** in this catalogue). They consist of four birds wrapped in cartonnage fragments taken from other finds in order to make them look like human foetuses.

It is worth noting that artefacts smaller than approximately 20 cm were not investigated in depth due to the technical limitations of the instrument used in this first campaign. However, they will be studied in the future, using higher resolution systems, e.g., micro-CT scanners or radiographic examination focussing on specific aspects.

A complete observation of the entire collection was performed by ultraviolet fluorescence (UV). This technique enables conservators to observe restorations, imperfections, and repairs carried out on mummies. Specifically, each mummy was observed using Wood's lamps, analysing the different response of the organic materials to the fluorescence in visible light induced by UV radiation. The results were very rewarding. For example: *Fig. 96a* shows an ibis mummy (**No. 107**) whose external bandages are partially impregnated with embalming substances; *Fig. 96b* shows the bandages of a baby crocodile (**No. 161**) affected by biodeterioration (in these

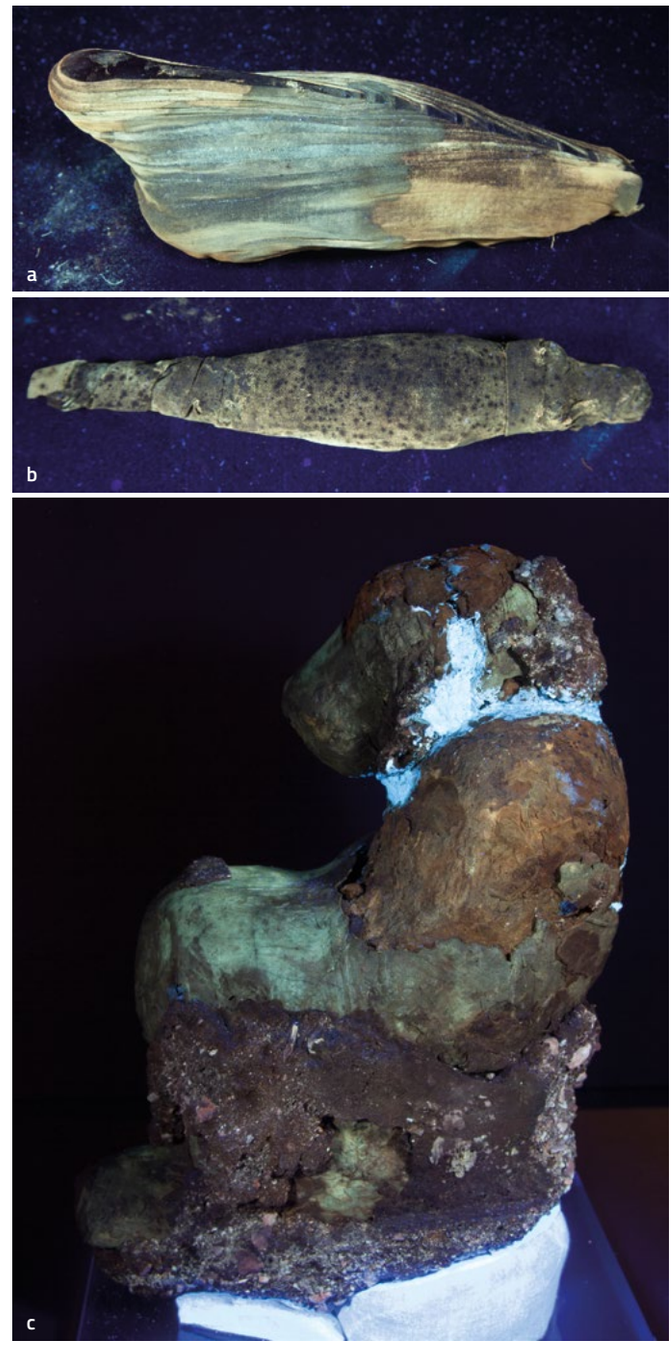


Fig. 96: Some examples of different responses under UV irradiation : a. ibis mummy **No. 107**; b. crocodile mummy **No. 161**; c. baboon mummy **No. 2**.

[3] Piombino-Mascali et al., *JSSEA* 40 (2013), pp. 71–79; McKnight et al., *Pap-Anthr* 23 (2014), pp. 97–107: https://doi.org/10.12697/poa.2014.23.1.08; Charlier et al., *JFRI* 3 (2015), pp. 24–28: https://doi.org/10.1016/j.jofri.2015.01.007.

cases further tests about the vitality of fungal colonies were carried out, allowing to exclude ongoing bio-colonization); *Fig. 96c* highlights probably previous restoration interventions in the neck area of the baboon mummy (**No. 2**).

The other part of the diagnostic plan employed micro-invasive/destructive techniques. Generally, sampling from artefacts (or artworks) is always a delicate task. Despite the small amounts of samples required for the analyses, different levels of difficulties might occur, depending on the type of material and the state of preservation of the artefact. A sample should be representative if it is to answer a specific archaeological question, it should be appropriate for the scientific analyses to be performed, and its size and location should be as minimally invasive as possible. Taking into account the aforementioned criteria, the animal mummies were sampled for different purposes: radiocarbon dating, analyses of the embalming substances, and textile examination.

In order to improve on the information regarding the chronology of the collection and better define the chronological framework for animal cult activities in Egypt, radiocarbon testing was performed on sixty-nine artefacts in the Turin collection, including fifty-four mummies, four Osirian obelisk figures and eleven wooden coffins, yielding a total of seventy-two dated samples (*Table 3*).

Mummy type	Dated artefacts/samples
Crocodile	8
Cat	12
Dog	7*
Bird	17
Bull	2*
Gazelle	1*
Baboon	1
Snake	3
Fish	2
Victual mummy	1
Obelisk/Osirian figures	4
Coffin	11
Total artefacts	69
Total samples	72

Table 3: Total number of dated mummies and samples. The (*) means that for a same mummy two different samples were dated.

Diversity of species, bundle typology, and coffin typology were essential to the selection of the items. Whenever possible, samples were taken directly from the body of the animal in the form of bone tissue, biological tissue, or fur. In other cases, the samples were taken from plant elements present inside the mummies (possibly leaves or small reeds) or, most frequently, when no access to the internal part of the mummies was possible, from the bandages.

It should be emphasised that during the sampling phase priority was given to directly sampling the animal, or alternatively the plant elements inside the bundle, because in ancient Egypt textiles were often reused and, consequently, a fragment of a bandage may be older than the mummified animal.[4]

Nevertheless, due to the rarity of direct access to the mummified animal, as well as to limit the invasiveness of the sampling and avoid possible contaminations (such as from "resinous" or embalming materials), direct sampling of the animal was limited to about 17% of the total amount of dated mummies. The greater quantity of samples was hence taken from textiles.

In addition to the mummies, it was also decided to date four Osirian obelisk figures in order to obtain more chronological information about these, as well as some of the wooden coffins in the collection. In some cases, both mummy and coffin were sampled (see in this catalogue **Nos. 42**, **46**, **126, 175**) to see if their ages correlated, as sometimes dealers created groups using materials separated in time.

In order to remove possible natural contamination on the samples (e.g., salts, resins, oils, embalming balms), the materials were pretreated using the ABA (acid-base-acid) method, which consisted of a succession of baths in hydrochloric acid (HCl) and sodium hydroxide (NaOH) solutions. After a preliminary optical microscope investigation, samples with suspected heavy contamination by resinous materials were previously treated with chloroform ($CHCl_3$), while the modified Longin method was used for collagen extraction from bone samples.

The measured radiocarbon ages were calibrated using the OxCal v.4.3 software with the IntCal13 calibration curve.[5]

[4] Richardin et al., *Radiocarbon* 59.2 (2017), pp. 595–607: https://doi.org/10.1017/RDC.2016.102.

[5] Bronk Ramsey, *Radiocarbon* 51.1 (2009), pp. 337–60: https://doi.org/10.1017/S0033822200033865; Reimer et al., *Radiocarbon* 55.4 (2013), pp. 1869–87: https://doi.org/10.2458/azu_js_rc.55.16947.

The summary chart in *Fig. 97* provides an overview of the ^{14}C results, indicating the different types of artefacts and materials, whereas *Table 4* gives the complete list of the dated samples and the results, organised by animal species or artefacts.

Exclusively focusing on the dataset related to the mummies, the calibrated ^{14}C results (cal. 95%) are grouped by animal species and represented versus time, in order to provide an immediate overview of their temporal distribution (*Fig. 98*). It is worth noting that most of the mummies are dated between the Late and the Ptolemaic periods, and the most recent ^{14}C date was obtained for the gazelle mummy **No. 8** in this catalogue (Roman Period), a result consistent with the work carried out on the collection of animal mummies of the Confluences Museum in Lyon (France).[6] Another interesting point to highlight concerns the two earliest mummies: two different samples from dog mummy **No. 21** were analysed, one from the fur and the other from the basket containing the animal. Both the obtained results are consistent, dating it to between Early Dynastic Period and the Old Kingdom; this is surely one of the oldest dog mummies to survive. The result obtained for victual mummy **No. 200** is 1760–1530 BC (cal. 95%). This is in keeping with the results from bandaging textiles on a human mummy found in the same tomb (1615–1509 cal. BC [95%, MAMS 33323, IntCal20]), that of Imhotep, vizier of the pharaoh Tuthmosis I.[7] It should be noted that to have a more representative number of samples for this mummy group, initially two other victual mummies were selected for radiocarbon dating, but in these cases the samples were contaminated in such a way that they could not be cleansed through the chemical pre-treatment, so they were not considered.

Another interesting topic, so far still not studied as extensively and systematically as it could be, is that of the characterisation of organic materials employed in the mummification process.[8] Indeed, the molecular characterisation of these materials acts as a powerful support to reveal the complexity of the embalming mixtures. These results could be important indications to study several correlated aspects, such as the investigation of mixtures for different species or types of animal mummies, also considering the provenance and the chronology, the comparison with the substances employed for human bodies, etc.

With these goals in mind, an initial characterisation of twenty-one samples was carried out by means of Py-

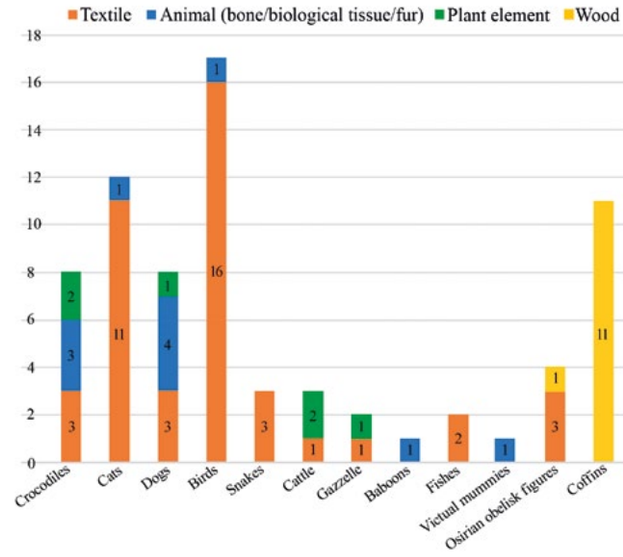


Fig. 97: Summary chart of the number of dated samples (n. 72), divided by type of artefact and nature of the material (different colour code for textile, biological sample / animal body, plant elements and wood).

rolysis-Gas Chromatography/Mass Spectrometry (Pyrolysis-GC/MS). Most of the samples were taken from internal bandages, far from the surface of the mummy, and a few from the external bandages (*Fig. 99*) – mainly from mate-

[6] See Richardin et al., *Radiocarbon* 59.2 (2017), pp. 595–607: https://doi.org/10.1017/RDC.2016.102. The ^{14}C dates (with their possible standard errors) fall within a defined range, which, however, extends along the so-called "Hallstatt plateau" of the calibration curve. This plateau is the result of a reduction of the atmospheric ^{14}C concentration between 2500 and 2400 BP, with the effect that the ^{14}C dates corresponding to that period are always calibrated between 800 and 400 BC.

[7] In the framework of the Human Remains Project, led by the Museo Egizio with Eurac Research (Bolzano), Soprintendenza Archeologica, Belle Arti e Paesaggio per la Città di Torino, Horus Team, Curt Engelhorn Zentrum Archäeometrie of Mannheim, Politecnico di Torino, Department of Architecture and Design VIBT, University of Natural Resources and Life Sciences, and Institute of Biotechnology, Vienna, a human mummy found in the same tomb was radiocarbon-dated. The result obtained from the textile of the bandage is: 1615–1509 cal. BC (95%, MAMS 33323, IntCal20). The mummy belongs to Imhotep, vizier of pharaoh Tuthmosis I, who reigned at the beginning of the New Kingdom. Imhotep is the owner of the funeral assemblage including the victual mummy.

[8] A few studies are: Spielmann, *JEA* 18 (1932), pp. 177–80; Buckley et al., *Analyst* 124 (1999), pp. 443–52: https://doi.org/10.1039/A809022J; Colombini et al., *SC* 45 (2000), pp. 19–29: https://doi.org/10.1179/sic.2000.45.1.19; Buckley and Evershed, *Nature* 413 (2001), pp. 837–41: https://doi.org/10.1038/35101588; Buckley et al., *Nature* 431 (2004), pp. 294–99: https://doi.org/10.1038/nature02849; Clark et al., *PNAS* 110.51 (2013), pp. 20392–95: https://doi.org/10.1073/pnas.1315160110; Jones et al., *PLOS ONE* 9 (2014), e103608: https://doi.org/10.1371/journal.pone.0103608; Brettell et al., *SC* 62 (2017), pp. 68–82: https://doi.org/10.1179/2047058415Y.0000000027; Łucejko et al., *JAS* 85 (2017), pp. 1–12; Jones et al., *JAS* 100 (2018), pp. 191–200; Dutoit et al., *AnChem* 92 (2020), pp. 15445–53: https://doi.org/10.1021/acs.analchem.0c03116; Fulcher et al., *PNAS* 118.18 (2021), e2100885118: https://doi.org/10.1073/pnas.2100885118.

Table 4: List of mummies/artefacts/samples radiocarbon-dated; the results of the measurements are reported as follows:

- Radiocarbon age (years BP): conventional radiocarbon age expressed as BP, i.e. Before Present (conventionally 1950)
- Cal. age (68% probability): calibrated ages interval considering the probability level of 68%
- Cal. age (95% probability): calibrated ages interval considering the probability level of 95%

	Inventory n°	Mummy type	Material	Radiocarbon age (years BP)	Cal. age (68% probability)	Cal. age (95% probability)
1	Cat. 2353/11	Crocodile (small/wrapped)	Textile	2235±45	310–210 BC	370–200 BC
2	Provv. 1458/12	Crocodile (small/wrapped)	Textile	2110±50	180–90 BC	210–40 BC
3	Provv. 1443	Crocodile (small/wrapped)	Plant element	2240±60	310–210 BC	370–200 BC
4	Provv. 1461/15	Crocodile (“baby”)	Textile	1945±50	20 BC – AD 70	50 BC – AD 120
5	Provv. 1462	Crocodile	Biological tissue	2110±30	170–90 BC	190–50 BC
6	Provv. 1447	Crocodile	Biological tissue	2000±35	20 BC – AD 50	50 BC – AD 70
7	Cat. 2351/1	Crocodile	Biological tissue	1995±35	20 BC – AD 60	50 BC – AD 70
8	Cat. 2351/2	Crocodile	Plant element	1930±45	AD 20–130	40 BC – AD 210
9	Cat. 2345/1	Baboon	Fur	2410±50	540–430 BC	740–400 BC
10	S. 11011	Cat	Fur	2420±45	540–430 BC	740–400 BC
11	Cat. 2350/3	Cat	Textile	2160±90	320–210 BC	370–200 BC
12	Cat. 2350/4	Cat	Textile	2310±45	410–360 BC	440–240 BC
13	Cat. 2350/6	Cat	Textile	2221±74	380–200 BC	400–50 BC
14	Cat. 2372	Cat	Textile	2440±55	550–420 BC	740–400 BC
15	Cat. 2370	Cat	Textile	2490±45	570–420 BC	730–410 BC
16	Cat. 2358	Cat	Textile (sample A)	2450±40	550–420 BC	740–400 BC
17	Cat. 2348/1	Cat	Textile	2260±45	390–230 BC	400–200 BC
18	Cat. 2360	Cat	Textile	2400±45	700–400 BC	750–390 BC
19	Cat. 2362	Cat	Textile (sample A)	2430±45	730–410 BC	750–400 BC
20	Provv. 6117	Cat	Textile	2100±45	170–50 BC	350 BC – AD 0
21	S. 11010	Cat	Textile	2335±45	480–360 BC	540–230 BC
22	Provv. 1464	Dog	Textile	2270±50	310–210 BC	380–200 BC
23	Provv. 1455	Dog	Biological tissue	2160±40	350–120 BC	360–90 BC
24	Provv. 1442	Dog	Textile	2255±60	310–210 BC	370–200 BC
25	S. 11004	Dog	Bone/biological tissue	2200±50	320–210 BC	360–200 BC
26	S. 11006/1	Dog	Bone/biological tissue	2105±45	180–90 BC	200–50 BC
27	S. 11009	Dog	Textile	2230±35	310–210 BC	370–200 BC
28	S. 17016	Dog (into a vase)	Fur (sample A)	4105±35	2840–2570 BC	2870–2490 BC
29			Plant element (sample A)	3990±50	2580–2460 BC	2840–2340 BC
30	Cat. 2344	Bull	Plant element (sample A)	2170±30	370–320 BC	400–190 BC
31			Textile (sample B)	2320±30	410–380 BC	410–360 BC
32	Cat. 2343/01	Bull	Plant element	2325±45	470–260 BC	540–210 BC
33	S. 01599	Gazelle	Plant element (sample A)	1815±45	AD 130–240	AD 80–330
34			Textile (sample B)	1920±45; 1740±50	AD 50–220 AD 130–330	AD 10–240 AD 130–380

	Inventory n°	Mummy type	Material	Radiocarbon age (years BP)	Cal. age (68% probability)	Cal. age (95% probability)
35	Provv. 1483	Bird of prey	Textile	2160±40	340–210 BC	360–190 BC
36	S. 11040	Bird of prey	Textile	2080±55	170–80 BC	210–30 BC
37	Cat. 2373	Bird of prey	Textile (sample A)	2890±45	1190–1000 BC	1210–930 BC
38	Provv. 1515/1	Ibis	Textile	2180±40	330–210 BC	360–200 BC
39	Provv. 1484	Ibis	Textile	2235±60	310–210 BC	370–200 BC
40	S. 11019/2	Ibis	Biological tissue	2380±35	520–420 BC	730–390 BC
41	S. 11025	Ibis	Textile	2175±55	330–210 BC	360–200 BC
42	S. 11013	Ibis	Textile	2225±45	370–210 BC	390–190 BC
43	S. 11038	Ibis	Textile	2375±45	510–390 BC	750–370 BC
44	S. 11017	Ibis	Textile	2125±45	330–90 BC	360–40 BC
45	S. 11018	Ibis	Textile	1930±45	AD 20–120	40 BC – AD 210
46	S. 11016	Ibis	Textile	1965±45	40 BC – AD 80	50 BC – AD 130
47	Cat. 3507	Ibis (into a vase)	Textile	2230±40	310–210 BC	370–200 BC
48	S. 11027	Incomplete	Textile	2295±45	400–230 BC	410–200 BC
49	S. 11037	Incomplete	Textile	2175±45	360–170 BC	370–90 BC
50	Provv. 1440	Incomplete	Textile	2330±40	410–370 BC	460–350 BC
51	Provv. 1460/13	Incomplete	Textile	2210±45	360–200 BC	390–170 BC
52	Provv. 6111	Snake	Textile	2225±55	320–210 BC	370–200 BC
53	Provv. 1515/2	Snake	Textile	2180±40	330–210 BC	360–200 BC
54	Provv. 6110	Snake	Textile	2400±45	540–400 BC	750–390 BC
55	Cat. 2394/2	Fish	Textile	2320±50	410–360 BC	460–250 BC
56	Cat. 2389	Fish	Textile (sample A)	2590±45	820–600 BC	830–540 BC
57	S. 05100	Victual mummy	Biological tissue	3370±40	1740–1610 BC	1760–1530 BC
58	Cat. 2407	Obelisk figure	Wood	2630±45	830–780 BC	900–760 BC
59	Cat. 2411	Osirian figure	Textile	2135±45	350–90 BC	360–40 BC
60	Cat. 2415	Osirian figure	Textile	2415±45	730–400 BC	750–400 BC
61	Cat. 2416	Osirian figure	Textile	2035±45	100 BC – AD 20	170 BC – AD 60
62	Cat. 2373	Coffin	Wood (sample B)	2260±45	390–230 BC	400–200 BC
63	Cat. 2358	Coffin	Wood (sample B)	2375±40	510–400 BC	730–380 BC
64	Cat. 2362	Coffin	Wood (sample B)	2735±45	920–830 BC	980–810 BC
65	Cat. 2361	Coffin	Wood	2215±45	360–200 BC	390–180 BC
66	Cat. 2371	Coffin	Wood	2475±45	760–680 BC	770–430 BC
67	Cat. 2389	Coffin	Wood (sample B)	3435±45	1870–1680 BC	1880–1640 BC
68	Cat. 2386	Coffin	Wood	2725±45	910–820 BC	970–800 BC
69	Cat. 2395	Coffin	Wood	2480±45	760–540 BC	770–430 BC
70	Cat. 2393/1	Coffin	Wood	2510±45	780–540 BC	800–480 BC
71	Cat. 2388/1	Coffin	Wood	2670±45	890–800 BC	910–790 BC
72	Cat. 2374/1	Coffin	Wood	2300±45	400–230 BC	470–200 BC

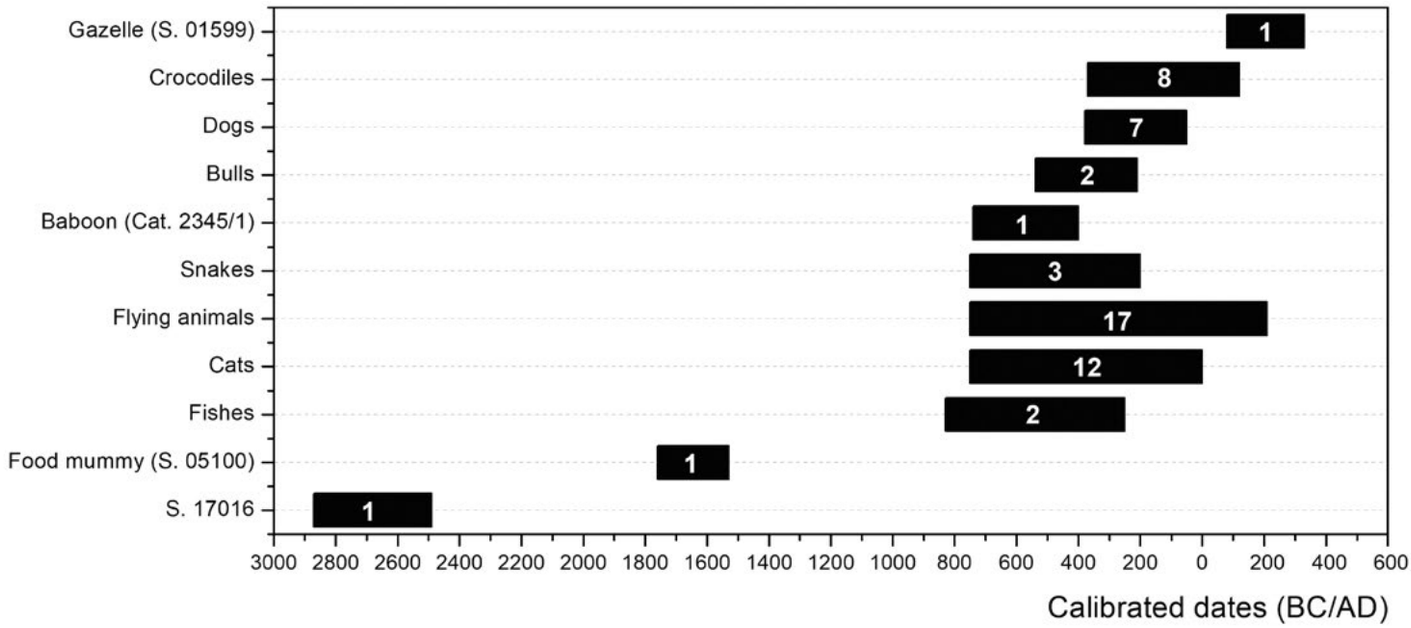


Fig. 98: Range of calibrated intervals for the different animal species, considering the probability level of 95%. The two most ancient mummies of the collection are **Nos. 21, 200**.

rials used for decoration/facial details or those that were simply used to support the wrapping. In addition, three samples were taken from baboon mummy **No. 2** in this catalogue, for which different embalming procedures may have been used.

Pyrolysis-gas chromatography/mass spectrometry (Pyrolysis-GC/MS) analysis was conducted with an instrument composed of a CDS Pyroprobe 1500 filament pyrolyzer (Analytical Inc, USA), a 6890N Network GC System gas chromatograph (Agilent Technologies, USA) with HP-5 cross-linked 5% Ph Me Silicone capillary column (30 m x 0.25 mm x 0.25 μm) and a 5973 Network Mass Selective Detector mass spectrometer (Agilent Technologies, USA).

The details of the results obtained for each sample are reported for each mummy's catalogue entry; therefore, only three general points are noted here:

1) Most samples taken from the animal bodies, possibly embalming material, are characterised by the presence of diterpenes, markers of conifer resin, possibly mixed with fats/oils. Specific attention was also focused on the cholesterol, a diagnostic marker for the presence of animal fats;
2) The three samples taken from the external bandages are different from those of the previous group, mainly due to their different function (decorative or adhesive). They are characterised by the primary presence of saccharides, with the profile peculiar to plant gums, possibly from acacia (gum arabica), which grows plentifully in Egypt;
3) The samples from the baboon mummy show differences. The first sample taken directly from the body belonged to the first group; the second sample, taken from the black material painted along the left flank of the body, is mainly composed of lipids with traces of beeswax; the third one, sampled from the seat, is entirely composed of beeswax and gypsum (detected by XRF).

As mentioned before, these are the results of an initial investigation, which will need to be completed by increasing the number of samples and possibly implementing other methods, in order to confirm the absence or the small amount of bitumen in the set of samples considered so far. Although the samples show very different compositions, bitumen was not found to be a primary component for this initial group of analysed samples.

Finally, the last part of the scientific investigations aimed at complementing the study of the textiles and decorative patterns of the bundles. Therefore, the sampling and analytical phases were concurrent with the restoration. They sought to: identify the nature of the fibres; assess their state of conservation; and characterise the



Fig. 99: Examples of different samples taken from embalming or "resinous" substances.



Fig. 100: Examples of the photomicrographs acquired for flax fibres (above) and wool fibres found in bull mummy **No. 6** (below).

materials and technologies employed to obtain the dyed textiles.

For the first two objectives, the analyses were carried out by means of optical microscopy in transmitted light. Some examples highlighting the photomicrographic documentation acquired are shown in *Fig. 100*. With the exception of a textile fragment from bull mummy **No. 6** which consisted of animal fibres, viz., wool, all the other samples show the morphological features of vegetal fibres, most likely flax, i.e., *Linum usitatissimum* L., commonly used in ancient Egypt. Nevertheless, it should be noted that it is difficult to distinguish among bast fibres (flax, hemp, nettle) and the morphological analysis might be usefully integrated with other methods, such as staining tests.[9]

Concerning the last objective, most of the decorative patterns of the animal mummies are mainly composed of brown textiles; in a few cases, dark brown and pink/red ones are also used. In order to begin the identification of the dyes (and additional materials) employed in the colours used for animal mummification, a study in collaboration with the British Museum was initiated. A set of representative samples for both the collections (eleven from the Museo Egizio and nine from the British Museum) was selected and a multi-scalar investigation was carried out on them, using broadband multispectral imaging (MSI), fibre optic reflectance spectroscopy (FORS), optical microscopy (OM), scanning electron microscopy with energy dispersive X-ray spectrometry (SEM-EDX), and high-performance liquid chromatography tandem mass spectrometry (HPLC-MS/MS)[10]. The main results of the work on the Museo Egizio animal mummies can be summarised as follows:

- The red/pink colours were obtained using safflower (*Carthamus tinctorius*) and red ochre;
- All the dark colours are characterised by the presence of tannins (as expected), both hydrolysable ellagitannins and condensed tannins. The darkest colours were found to be combinations of tannins with iron as mordant; these colours are generally the worst preserved;
- The study was an occasion to observe interesting features concerning the processing of the flax fibres (see Chapter 3).

In conclusion, these analyses – radiographic imaging, radiocarbon dating, UV light analysis, Pyrolysis-GC/MS, and FTIR – have shed new light on the animal mummies held in the Museo Egizio's collection.

[9] Textile Institute, *Identification of Textile Materials*, 1975; Campo et al., *Identificació de fibres*, 2009.
[10] Tamburini et al., *HeritSci* 9 (2021), no. 106: https://doi.org/10.1186/s40494-021-00585-2.

7. CREATING COFFINS: MAKING ANIMAL MUMMY CONTAINERS IN BRONZE

Johannes Auenmüller

7.1 Introduction

The Museo Egizio holds an important assemblage of bronze containers for animal mummies. While some hollow cat figures have received more attention in the form of exhibitions and publications in the past due to their iconographic subject,[1] others, such as shrew figures, lizards or hybrid creatures have been largely ignored. This contribution aims to offer a general account of the production of these objects based on visual inspections reflected in the detailed information provided in the catalogue entries.[2] The technological observations on the single objects are discussed here in context to provide a more coherent assessment of their materiality and manufacture.[3] Relevant imagery of the individual objects and their technological details are available on the Museo Egizio's online collection website under the single inventory numbers.

Before the production technique and the vestiges of the casting process are addressed in more detail, a few introductory remarks about the relevant objects are in order. Single iconographical groups such as hollow cat figures,[4] shrew containers[5] or lizard boxes,[6] as well as hybrid creature votive coffins,[7] have been studied in the past but generally only in terms of their religious significance. They have rarely been viewed as coherent object groups,[8] with some exceptions. Alain Charron provided an overview of the different animals, container types, and their archaeological provenance and dating.[9] Jen Thum focussed on terminology, use, and production as well as typology.[10] Katja Weiß studied animal mummy containers as a particular design group within the larger assemblage of bronze figures from Lower Egypt, focussing on their typology, provenance, and religious meaning.[11] In the last two publications, the production of figurative bronze objects is also touched upon, providing general overviews. Due to recent advances in the understanding of casting technology and archaeometry,[12] the following pages provide an up-to-date review of the production of bronze containers for animal mummies.[13]

These containers have been variously called "relic boxes", "reliquaries", "animal sarcophagi" or "mummy cases".[14]

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[1] The full bibliographic references of mentions and publications of the relevant objects are appended to the individual object catalogue entries.

[2] At the time of writing, *Guidelines for the Technical Examination of Bronze Sculpture* (Bourgarit et al. [eds.] 2024) was not yet published. In this work, evidence for individual production steps and other manufacturing features of figurative bronzes are discussed in detail. For Early Iron Age Aegean figurative bronzes and their vestiges in cast objects, see Murray, *Male Nudity in the Greek Iron Age*, 2022, pp. 138–71.

[3] Scientific analyses of selected pieces (by methods such as pXRF, X-ray computed tomography, neutron tomography and neutron activation analysis) were undertaken in cooperation with the Centro di Conservazione e Restauro "La Venaria Reale", the University of Turin, the Politecnico di Torino, the University of Florence, the "Nello Carrara" Institute of Applied Physics, the Nuclear Institute Delft, and the Istituto Nazionale di Fisica Nucleare. Their results will be reported upon in forthcoming specialist studies.

[4] E.g., Delvaux, in Delvaux and Warmenbol (eds.), *Divins chats*, 1991, pp. 129–34; Schorsch and Frantz, *BMMA* 55.3 (1998), pp. 16–28; Nigro, *BMMGP* 19 (1999), pp. 53–86; Pubblico, in Popielska-Grzybowska and Tomorad (eds.), *Egypt 2015*, 2017, pp. 207–18.

[5] E.g., Brunner-Traut, *NAWG* 7 (1965), esp. pp. 133–42; Peterson, *MedMus-Bull* 21 (1986), pp. 11–13; Kessler, *BEM* 4 (2007), pp. 71–82.

[6] Guilhou, *JHIE* 4 (2021), pp. 125–42: https://doi.org/10.5281/zenodo.5775649.

[7] E.g., Myśliwiec, *MDAIK* 37 (1981), pp. 377–82; Myśliwiec, in Junge (ed.), *Studien zu Sprache und Geschichte*, 1984, pp. 809–22. The fitting term "hybrid creature", designating figures consisting of a winding eel-body, an erect cobra-hood, and a human head, often surmounted by a double crown, is borrowed from Masson-Berghoff and O'Flynn, *BMSAES* 24 (2019), pp. 159–75.

[8] But see, e.g., the comprehensive discussion of the bronze container for faunal remains in Davies and Smith, *Falcon Complex*, 2009, pp. 52–56, and the studies by Masson-Berghoff and O'Flynn, *BMSAES* 24 (2019), pp. 159–75 and O'Flynn et al., *SciRep* 13 (2023), pp. 1–12.

[9] Charron, in Zivie-Coche and Guermeur (eds.), *Parcourir l'éternité*, 2012, pp. 281–304.

[10] Thum, "Creatures Compartmentalised", 2012.

[11] Weiß, *Tier- und Götterbronzen*, 2012, esp. pp. 264–316, 380–481.

[12] See, e.g., Masson-Berghoff and O'Flynn, *BMSAES* 24 (2019), pp. 159–75, and O'Flynn et al., *SciRep* 13 (2023), pp. 1–12.

[13] For technological terms, see, e.g., Rama, *Bronze d'art*, 1995; Sias, *Lost-Wax Casting*, 2005; Campbell, *Complete Casting Handbook*, 2015.

[14] E.g., Schorsch, in Watkins and Brown (eds.), *Conservation of Ancient Egyptian Materials*, 1988, p. 41 ("sarcophagi"); Nigro, *BMMGP* 19 (1999), p. 53 ("urna di bronzo"); Grenier, *Bronzes*, 2002, p. 139 ("sarcophages votifs"); Charron, in Zivie-Coche and Guermeur (eds.), *Parcourir l'éternité*, 2012, p. 281 ("bronzes reliquaires"); Weiß, *Tier- und Götterbronzen*, 2012, pp. 75, 298 ("Mumienbehälter" or "-kästchen"); Masson-Berghoff and O'Flynn, *BMSAES* 24 (2019), p. 133, and O'Flynn et al., *SciRep* 13 (2023), pp. 1–12 ("votive boxes" and "mummy cases").

These terms circumscribe the general function of the artefacts as "bronze boxes"[15] for faunal remains from various conceptual angles with different emphases.[16] While the term "bronze box/container for animal mummies" aims at offering the most neutral notion, the phrase "bronze votive coffin" favoured by Thum[17] puts the emphasis on the religious-ritual use context of these objects. The object category of "bronze containers for faunal remains" in the Museo Egizio collection is indeed represented in three different main forms: larger figures of cats (**Nos. 55–62**; **No. 63**, a broken head of a large cat figure, also belongs to this group) or falcons (**Nos. 134–135**); boxes surmounted by in most cases one, sometimes several animals such as cats (e.g., **No. 67**), falcons (**Nos. 129–133**), shrews (**Nos. 74–76**), and lizards (**Nos. 137–138**), as well as hybrid creatures (**Nos. 147–148**); and one Osiris in front of an obelisk (**No. 232**).

The bronze cat heads (**Nos. 64–66**) constitute a sub-group of the larger complete cat figures, as they are generally understood as originally being part of composite figures of cats with a wooden body and a bronze head.[18] Shrews (**Nos. 77–79**), ichneumons (**No. 69**)[19] and lizards (**No. 136**) standing on plinths or bases open at the bottom form a sub-group of boxes surmounted by an animal. These are likely bronze elements surmounting wooden mummy boxes or standalone votive or ritual objects. Further subdivisions in terms of types, functions and expenditure of these artefacts could also be obtained by taking account of the difference between plain and naomorphous boxes, the size of the objects, or the presence or absence of loops.[20] As far as the Turin pieces are concerned, such an approach does not promise any further insights. One would need larger corpora to gain more meaningful understandings of the different roles and economic settings from such a typological approach.

The precise dating of the bronze boxes is notoriously difficult, particularly regarding unprovenanced objects and because most of the relevant parallels also lack proper provenances, and thus chronological contexts. The term "bronze" is used here throughout the text, mindful of the inaccuracy of this term to describe the precise copper alloy composition of individual objects.[21] The cultic roles and the religious significance of the animals represented by bronze coffins will not be discussed here.[22]

7.2 The Lost-Wax Casting Method

The containers had to be hollow in order to accommodate the mummies. This was achieved by employing the "lost-wax technique" for direct hollow casting,[23] a process "by which a model made of wax is translated into metal."[24] A brief description of the *chaîne opératoire*, illustrated by a hollow-cast cat figure (*Fig. 101*), is provided here, with particulars appearing in the individual sections dealing with the relevant evidence.

First, a casting core was roughly modelled in the shape of the intended hollow object (*Fig. 101.1*), giving it either the general form of the animal or a rectangular or trapezoidal box-like form. Next, wax was applied to this core (*Fig. 101.2*). Solid, probably prefabricated wax components of the object such as, for example, the front legs of cats or individual animals surmounting the boxes, were now also joined to the main model. The technologically necessary elements of the gating system, such as sprues or feeder channels, were mounted in wax. Basically, the final wax model had to be equivalent to the to-be-cast object, together with all the technically essential elements.

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[15] Davies and Smith, *Falcon Complex*, 2005, p. 52 ("bronze boxes").
[16] Cf. Thum, "Creatures Compartmentalised", 2012, pp. 68–74.
[17] Thum, "Creatures Compartmentalised", 2012.
[18] Charron, in Zivie-Coche and Guermeur (eds.), *Parcourir l'éternité*, 2012, pp. 284–85; Weiß, *Tier- und Götterbronzen*, 2012, p. 300. For an example of such a composite cat coffin, see Gaillard and Daressy, *La faune momifiée*, 1905, p. 134 (CG 29778 [JdÉ 34651]).
[19] Since no tenon is present in the case of **No. 68**, this piece might also be the upper part of a now corroded-away bronze box.
[20] Thum, "Creatures Compartmentalised", 2012, pp. 75–85.
[21] Cf. Schorsch, in Hill and Schorsch (eds.), *Gifts for the Gods*, 2007, p. 189; for an overview of the different copper alloys, see Ogden, in Nicholson and Shaw (eds.), *Ancient Egyptian Materials and Technology*, 2000, pp. 152–55.
[22] Instead, see, e.g., Liptay, *BMH* 85 (1996), pp. 7–15; Aufrére, *DE* 41 (1998), pp. 7–28; Van Voss, in Hoffman and Thissen (eds.), *Res severa*, 2004, pp. 233–35; Vernus and Yoyotte, *Bestiaire*, 2005, pp. 20–49; Quack, in Kampling (ed.), *Seltsame Gefährtin*, 2007, pp. 11–39; Bleiberg et al., *Soulful Creatures*, 2013, esp. pp. 19–61; Guichard (ed.), *Des animaux*, 2014, esp. pp. 223–77; Fernández Pichel, *Polis* 29 (2017), pp. 31–54.
[23] For comprehensive descriptions, see, e.g., Rama, *Bronze d'art*, 1995, pp. 203–344; Ogden, in Nicholson and Shaw (eds.), *Ancient Egyptian Materials and Technology*, 2000, pp. 157–58; Davey, in Mei and Rehren (eds.), *Metallurgy and Civilisation*, 2009, pp. 147–54; Fitzenreiter, in Fitzenreiter et al. (eds.), *Gegossene Götter*, 2014, pp. 91–98; Fitzenreiter et al., *Materialien einer Gusswerkstatt*, 2016, pp. 118–33; Auenmüller et al., in Verly et al. (eds.), *Studies in Experimental Archaeometallurgy*, 2019, pp. 147–55; Bewer, in Hecker (ed.), *Finding Lost Wax*, 2021, pp. 11–17; Murray, *Male Nudity in the Greek Iron Age*, 2022, pp. 138–71.
[24] Bewer, in Hecker (ed.), *Finding Lost Wax*, 2021, p. 11.

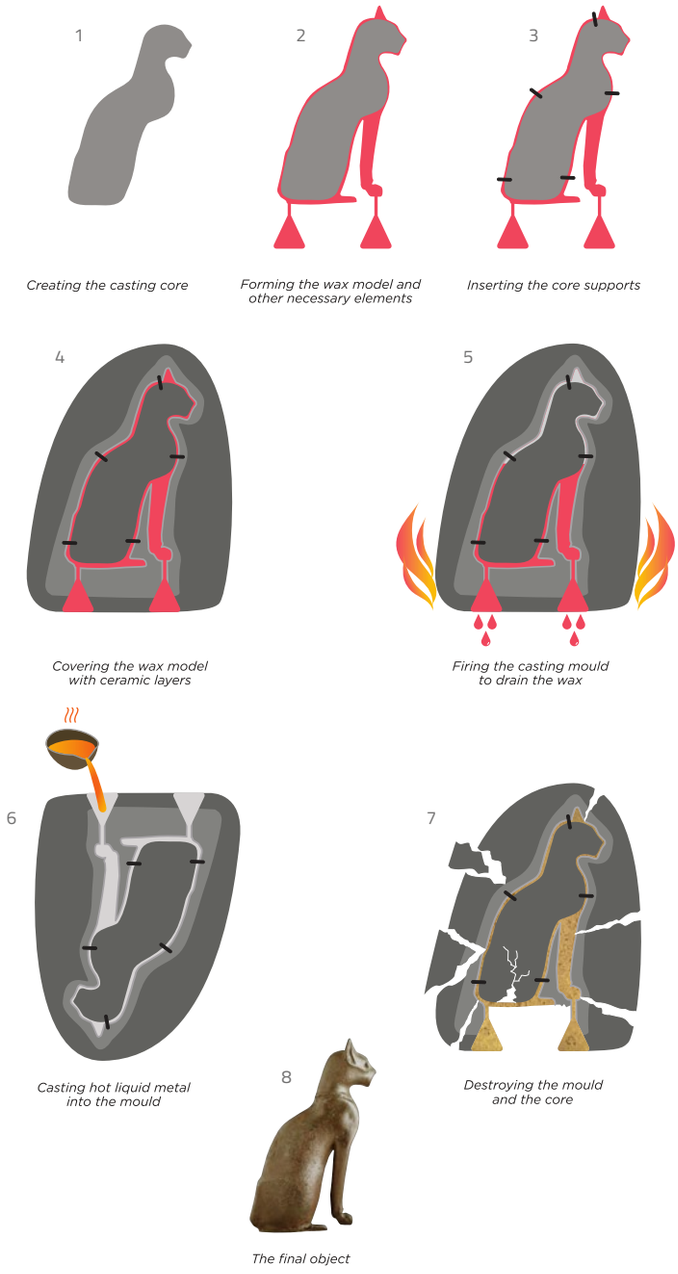


Fig. 101: Simplified rendering of the *chaîne opératoire* of casting a hollow object, exemplified by a cat figure. Graphic by P. Luisolo/J. Auenmüller.

To avoid any later shifting of the core, small rods (chaplets/core supports) were plugged through the wax into the core (*Fig. 101.3*). They needed to extend outward from the wax for a certain length at both ends, in order to connect the inner casting core with the to-be-applied outer mould layers. The completed wax model was encased in layers of special ceramic pastes forming the casting mould (*Fig. 101.4*). Each layer had a specific function and thus a customised material composition, and the number of casting mould layers seems to have depended on the complexity of the object to be cast. Three main layers and further additional structure elements seem to have been the general practice for small figurative bronzes.[25] The outer endings of the core supports had to be fully embedded in the innermost casting mould layers to provide a solid connection between them and the inner casting core once the wax had melted away. The subsequent heating and firing of the mould not only caused the wax to melt and burn out but also baked the mould, ensuring its robustness, which was crucial for successful casting (*Fig. 101.5*). Firing the mould also served to completely burn out any wax remnants.

After the wax had melted away, the hollow space inside the casting mould had the shape of the to-be-cast artefact. The core supports held the casting core inside the outer mould in its proper place. With the core stabilised, the casting mould was now ready to be used for casting (*Fig. 101.6*). The hot liquid metal was poured in through both the pouring cup and any now-hollow sprues that had been created in the wax model. Once the metal had cooled and solidified, the mould was destroyed to obtain the cast piece (*Fig. 101.7*). In the case of components that had to be hollow, the casting core was taken out, too, after which the artefact's surface was cleaned and finished, and the no-longer required parts of the gating system, such as the pouring cup(s) and the protruding ends of the core supports, were removed (*Fig. 101.8*). Other elements, such as the sprues, were often partly left in place to be used as pegs for the final mounting of the object.

7.3 Vestiges of the Lost-Wax Technique

Bronze coffins allow us to study individual stages of the production process in the form of vestigial remains on the coffins themselves. Naturally, casting-mould remains cannot be discussed, as they were destroyed during the course of manufacture and no remnant survives on the finished objects.[26]

[25] Auenmüller et al., in Verly et al. (eds.), *Studies in Experimental Archaeometallurgy*, 2019, esp. pp. 149–55.

7.3.1 Casting Core Remains

Casting core remains offer a great potential as a means to identify the workshops that produced the metal objects since, in most cases, local materials were sourced.[27] Thus far, casting core remains from ancient Egypt are still understudied, particularly in terms of their mineralogical composition, local footprints, and potential for answering questions of chronology.[28] Most publications do not mention the presence of casting core remains,[29] though there are some specialist exceptions.[30]

Late Period casting cores generally consisted of a mixture of quartz sand and clay minerals tempered with plant remains (quite probably from [donkey] dung).[31] Other organic fibres such as animal hair, which are attested in Greek casting cores, might also have been added.[32] In this way, the cores generally conform to the material that was used for the coarser outer mould layers.[33] Besides providing the primary form of the to-be-cast object for the following stage of fashioning the wax model, casting cores needed to be porous to absorb the gases and pressure that are generated during casting. This quality was ensured by the material properties of the sand-clay mixture in synergy with the already mentioned temper of dung and vegetal components, which appear as burnt-out voids in the ceramic matrix after the firing of the mould for dewaxing and their even more considerable exposure to heat during casting.[34] *Table 5* provides an overview of the casting core remains in the bronze coffins in Turin.

Currently, no scientific analyses of the casting core remains in the Museo Egizio have been undertaken; a dedicated study, however, is envisaged for the near future, including not only the remains in the bronze containers for animal mummies but also those present in other objects, particularly figurative bronzes. Macroscopic examination establishes that their general appearance is a coarse sandy/silty substance, dark grey or brown, that is blackened by organic matter. In one case, there are also some white speckles (**No. 57** in this catalogue). In the case of cat head **No. 63**, several larger green corroded bronze particles are embedded in the matrix, a feature that has also been reported for other casting cores[35] or even moulds.[36] These particles are technologically insignificant contaminations that found their way into the mix during its preparation in the metallurgical workshop.[37] Except for **No. 63**, the core remains preserved in the containers are distributed in interior narrow or bulging spaces that are difficult to reach from the openings. While the main part of the core had to be removed to provide a hollow interior in the cast object, these areas could be left in place without impeding the use of the objects as mummy containers. Casting core remains might also be present in the trousers of falcon **No. 134** or the legs of cat **No. 56**, as is evidenced by other figures of these types and has been made visible by radiographic analyses.[38]

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[26] For a unique assemblage of preserved Late Period casting moulds mainly used for solid casting of small figurative bronzes, see Fitzenreiter et al., *Materialien einer Gusswerkstatt*, 2016; Auenmüller, in Rosati and Guidotti (eds.), *Proceedings of the XI International Congress*, 2017, pp. 19–25; Auenmüller, in Kahlbacher and Prigliner (eds.), *Tradition and Transformation*, 2018, pp. 45–60; Auenmüller et al., in Verly et al. (eds.), *Studies in Experimental Archaeometallurgy*, 2019, pp. 141–63.

[27] E.g., Scheider and Zimmer, *BBArch* 9 (1984), pp. 17–60; Lombardi and Vidale, *JAS* 25.11 (1998), pp. 1055–66: https://doi.org/10.1006/jasc.1998.0321; Castelle et al., *MicJourn* 126 (2016), pp. 121–31: https://doi.org/10.1016/j.microc.2015.11.032; Jones et al., in Photos-Jones (ed.), *Proceedings of the 6th Symposium*, 2016, pp. 21–27; Schneider, in Fitzenreiter et al., *Materialien einer Gusswerkstatt*, 2016, pp. 66–70.

[28] Riederer, *SAK* 6 (1978), pp. 163–68.

[29] Due to his "iconographic" approach, Grenier, *Bronzes*, 2002, does not mention technological details or casting core remains; Mendoza, *Bronze Priests*, 2008, esp. pp. 112–13 divides her material into solid and hollow casts, but does not seem to mention casting core remains for the latter; Tiribilli, *Bronze Figurines*, 2018, does also not report on this type of technological detail.

[30] E.g., Riederer, *BBArch* 7 (1982), esp. p. 30; Schorsch, in Watkins and Brown (eds.), *Conservation of Ancient Egyptian Materials*, 1988, pp. 44–45; Hill and Schorsch, *MMJ* 40 (2005), pp. 171–73; Craddock, *OPA* 19.1 (2014), pp. 9–10: https://doi.org/10.11588/opa.2014.1.14852; Agresti et al., *JAAS* 30 (2015), pp. 713–20: https://doi.org/10.1039/C4JA00447G; McArthur, *BMTRB* 9 (2015), p. 113; Ghoneim, *IJConsSci* 7.2 (2016), pp. 463–68; Agresti et al., *MicJourn* 124 (2016), pp. 765–74: https://doi.org/10.1016/j.microc.2015.10.030; Maher, *RPC* 166 (2020), pp. 1–7: https://doi.org/10.1016/j.radphyschem.2019.108475; O'Flynn et al., *SciRep* 13 (2023), p. 10.

[31] Riederer, *BBArch* 7 (1982), p. 30; Hill and Schorsch, *MMJ* 40 (2005), p. 172; Craddock, *OPA* 19.1 (2014), p. 9: https://doi.org/10.11588/opa.2014.1.14852.

[32] E.g., Scheider and Zimmer, *BBArch* 9 (1984), pp. 17–60; Lombardi and Vidale, *JAS* 25.11 (1998), pp. 1055–66: https://doi.org/10.1006/jasc.1998.0321; Jones et al., in Photos-Jones (ed.), *Proceedings of the 6th Symposium*, 2016, esp. p. 26, table 2; Fitzenreiter et al., in Fitzenreiter et al., *Materialien einer Gusswerkstatt*, 2016, p. 127.

[33] Schneider, in Fitzenreiter et al., *Materialien einer Gusswerkstatt*, 2016, pp. 66–70.

[34] Craddock, *OPA* 19.1 (2014), p. 9: https://doi.org/10.11588/opa.2014.1.14852, and Agresti et al., *JAAS* 30 (2015), p. 719: https://doi.org/10.1039/C4JA00447G, report on scientific analyses of the mineral components. These analyses have not only led to an understanding of the heat-related mineralogical transformations that took place, but also determined the firing temperature of the cores before or during casting.

[35] Hill and Schorsch, *MMJ* 40 (2005), p. 173.

[36] Fitzenreiter et al., in Fitzenreiter et al., *Materialien einer Gusswerkstatt*, 2016, p. 127.

[37] The presence of these bronze particles attests to the immediate proximity of mould making, casting and object finishing within the metallurgical workshop. Bronze droplets or swarf ended up randomly in the mix during the preparation of the casting core.

[38] Cf., e.g., Schorsch, in Watkins and Brown (eds.), *Conservation of Ancient Egyptian Materials*, 1988, pp. 44–45, fig. 7; Schorsch and Frantz, *BMMA* 55.3 (1998), pp. 22–23, fig. 12; Maher, *RPC* 166 (2020), pp. 1–7: https://doi.org/10.1016/j.radphyschem.2019.108475.

No.	Type	Location of casting core remains
55	Seated cat	Front chest, inner crotches of front legs, head
57	Seated cat	Lower back, left belly, chest, and muzzle
57	Seated cat	Front chest and muzzle
60	Seated cat	Chest, back and top of the head, and muzzle
61	Seated cat	Base of tail (remainder of interior not visible)
63	Cat head	Entire head
131	Falcon on naomorphous box	Lower corners and under top of box
132	Falcon on box	Corners of upper pedestal
134	Falcon figure	Tip of tail and head (and possibly trousers)

Table 5: Casting core remains.

7.3.2 Wax Model Working Traces

The preliminary firing of the complete casting mould removes all traces of wax; thus the model can never be assessed. The finished objects do, however, often bear distinct traces which can be linked back to the wax model and the individual steps of its creation.

7.3.2.1 Applying Wax to the Casting Core

The ways of applying wax to the casting core depend on the model to be made and the shape, size, and volume of its individual parts. For the hollow cats, the "wax was probably applied in even sheets over the core with little added modelling except [...] for solid components."[39] To obtain a smooth initial "skin" of wax around it, one could also have immersed the core in liquid wax for a certain amount of time so that a wax layer with a specific thickness could form around it. It is possible that a brush was used to apply the wax, as has been suggested based on the varying thicknesses of bronze walls.[40] It also has been surmised that wax models were made of individual pre-moulded wax parts that were joined on top of the core.[41] However, no evidence for the use of this method, which would be recognizable by metal seams or internal burrs, could be identified in the Turin bronze coffins so far – or Egyptian Late Period bronzes in general – as the use of pre-moulded parts is based on later technological practices.[42]

Different wall thicknesses can be detected particularly in hollow figures and mummy boxes. These variations cannot only be related to different or inconsistent ways of applying wax to the core; they are also a result of the subsequent working of the wax model. The largest remaining wall thickness might be closest to the original strength of any consistently applied wax, while the thinnest wall shows how much wax was removed with modelling tools at a certain area in the process of finishing the model. Cat head **No. 63**, which belonged to a larger seated feline figure, for example, shows bronze walls varying considerably in strength in the breaks. Since these variations are neither connected to the anatomy of the cat head nor do they have any technological reason, it seems that either inconsistent application of wax or, more likely, different intensities of working the wax around the core can be identified. Since the inner core was hidden from the modeller by the wax that coated it, the distance between the wax surface that was under treatment by the craftsperson and the core could not always be fully controlled.[43] A casting core which was not properly fixed by the chaplets and thus moved inside the mould could also have been a reason for the variable thicknesses of the bronze walls; no such examples have been noted in the Turin collection.

Wax sheets were most likely used to coat the rectangular casting cores of the simpler boxes. In the case of **No. 76**, the particular form of the box's edges suggests that the box was made from a sheet of thin wax that was folded

[39] Schorsch, in Watkins and Brown (eds.), *Conservation of Ancient Egyptian Materials*, 1988, p. 45. The same applies to the falcon figures.
[40] Agresti et al., *JAAS* 30 (2015), p. 716: https://doi.org/10.1039/C4JA00447G.
[41] Roeder, *Bronzewerke*, 1937, p. 48, figs. 119–20; pp. 187–94; Roeder, *Bronzefiguren*, 1956, pp. 5, 522–23, §704.
[42] Schorsch, in Hill and Schorsch (eds.), *Gifts for the Gods*, 2007, p. 193.
[43] Potentially, the thickness of the wax could have been controlled by using the chaplets as some sort of measuring device. This would, however, mean that the length of the pins sticking out from the core was controlled and that they were put in before the wax was applied. In the case of the wax being applied by dipping the core into wax so that a consistent wax skin solidified around it, the pins could have been inserted in a controlled mode after the application of the wax.

around the core. The front end was then patched with a separately cut wax sheet. If decorative elements such as a torus moulding with a cavetto cornice had to be present, these were either modelled on, or the wax was initially applied in such a thickness that these parts could be shaped in profile. Further observations on the application of wax could not be made since its subsequent modelling obliterates most of the earlier features.

7.3.2.2 Joining Components

Since methods such as soldering, brazing and welding are, as far as Egypt and copper alloy metals are concerned, not attested before Roman times,[44] one-piece casting dominated in the Late Period. This entails the joining of all the individual elements of the to-be-cast object during the wax-model making stage. For larger pieces, other joining methods had to be used.[45] In a recent study, however, possible Late Period evidence for the soldering (or fusion / hard welding) of the image of a hybrid creature to its rectangular bronze box, and of the front part of a hybrid creature to the box, has been reported (London, BM EA36151 and EA71428).[46] In the Turin animal mummy containers, soldering or welding could not be identified, though future X-ray or neutron tomography studies might change the picture.

Once the casting core was coated with wax to its necessary strength, other elements were added. For cat figures, solid elements such as the ears, the tips of the nose, the small protruding hind legs, the tails and the front legs and paws were attached in wax and properly modelled. When a cat's front legs are hollow (**No. 56** in this catalogue), they were likely made separately around individual casting cores and then joined to the main wax structure.[47] For animals surmounting boxes, the animals and the boxes, as well as smaller parts such as loops, were most likely modelled separately first. Then the individual parts were joined while assembling the wax model.[48] Often, an intermediate wax layer was used to bond the parts together.[49] A few of such glueing joints, now translated into metal, can be identified under the feet of animals (**No. 79**) or connect the Osiris figure with the obelisk (**No. 232**). A similar practice can also be seen with **No. 148**, where the connection of the Maat-feather with the back of the uraeus is characterised by a wax agglomeration. The small metal bars between the front and hind feet of **No. 56** not only served as original wax feeder channels (see Chapter 7.3.3) but also stabilised the wax model and its components. The tails of cats **Nos. 59–60** were connected to the rump by a wax bridge, or joined to the front paws with a wax patch. The cylinder on which cats **Nos. 56**, **61–62** rest was most likely also prefabricated and attached to the wax model when the gating system was assembled.

7.3.2.3 Modelling Details

Architectural details such as cavetto cornices, or anatomical details such as eyes, ears, noses, legs, paws, toes, etc., were finished in the wax model. The eye sockets of several cat figures (**Nos. 61**, **63, 65**) or the elements of the to-be-inlaid facial emblems of falcon **No. 135** were cut into the wax. For this purpose, the necessary wall thickness was either anticipated in the initial application of the wax or additional material was employed. A few pieces in this catalogue show details modelled in relief: **No. 65** has a scarab on its head, **No. 61** bears a cowrie-shell necklace with an aegis, and **No. 68** – a standing ichneumon – is graced by a relief necklace. These ornaments were most likely added to the surface of the wax model or, more likely, carved from the wax as raised relief and then finalised with all the internal lines and details. The openings and frames at the back of boxes **Nos. 67**, **131, 148**, which were meant to receive the panels sealing the coffins, were also created in the wax.

In some cases, it appears that the wax was not fully worked (**No. 65**: the tip of the left ear seems not to be modelled), or the model never completed properly. While most wax models were generally well smoothed and finished,

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[44] Garland and Bannister, *Ancient Egyptian Metallurgy*, 1927, p. 69; Ogden, in Nicholson and Shaw (eds.), *Ancient Egyptian Materials and Technology*, 2000, p. 159; Schorsch, in Roberts and Thornton (eds.), *Archaeometallurgy in Global Perspective*, 2014, p. 298: https://doi.org/10.1007/978-1-4614-9017-3_12; Willer, in Fitzenreiter et al., *Materialien einer Gusswerkstatt*, 2016, p. 139.

[45] Schorsch, in Watkins and Brown (eds.), *Conservation of Ancient Egyptian Materials*, 1988, p. 43; Hill and Schorsch, *MMJ* 40 (2005), p. 171; Schorsch, in Roberts and Thornton (eds.), *Archaeometallurgy in Global Perspective*, 2014, p. 276: https://doi.org/10.1007/978-1-4614-9017-3_12; Delange-Bazin et al., *RdL* 48 (1998), pp. 67–75.

[46] O'Flynn et al., *SciRep* 13 (2023), pp. 7, 10: https://doi.org/10.1038/s41598-023-30468-4.

[47] Schorsch and Frantz, *BMMA* 55.3 (1998), p. 23.

[48] See also Masson-Berghoff and O'Flynn, *BMSAES* 24 (2019), pp. 170–71.

[49] Heinz, *Anatolica* 40 (2014), p. 205, fig. 6: https://doi.org/10.2143/ANA.40.0.3036682. The seated cat figure numbered H11026 from Thonis-Heraklion shows a larger "buffering layer" between the animal and the rectangular base, which attests to the fact that both elements were originally joined in wax and only then cast.

several not fully cut-away parts are apparent in the final product. While the inner sides of the front legs of several cat figures are often left rough (e.g., in this catalogue, **No. 58**), the following pieces show not fully cut-out parts: **No. 56** (space between the front feet), **No. 67** (the crotch between the front legs of the kittens is not always cut out and smoothed), **No. 74** (crotch of front and hind legs not cut out) and **No. 138** (inside of the loops). In the case of **No. 133**, the space between the falcon's legs was not cut out due to its diminutive size.

7.3.2.4 Adding Inscriptions and Decorative Lines

The sunken lines of decorative details such as ornaments, plumage, and coat patterns, as well as inscriptions, were generally made in the original wax model.[50] Otherwise, sunken lines would have had to be chased in the cast metal surface.[51] The three inscriptions that are known amongst the bronze coffins in the Museo Egizio were all made in the original wax model, as is suggested by the character of the lines (**Nos. 74**, **77**, **132**). Decorative details such as necklaces, aegises, vultures and scarabs (**Nos. 57**, **60**, **74**, **77–79**) were also already incised into the wax. The same applies to the plumage (**Nos. 129–131, 134**), skin (**Nos. 129–131, 134**) and coat patterns (**Nos. 63**, **65**, **68–69**). The skin pattern of the frontal uraeus-hood of **No. 147** and the lines along the back of the dorsal fin were cut into the wax, as were the small dots marking the skin of **No. 136** and the lines along the necks of **Nos. 137–138**.

7.3.4.5 Further Observations

Some bottom surfaces of the boxes or open bases in the Museo Egizio seem to represent a wax surface that solidified while cooling and that was not further worked afterwards (**Nos. 67**, **74, 78**). Since these surfaces were invisible in the final artefact and had no functionality, it was not essential to properly finalise them. Their character, however, was translated into bronze via casting. This approach, which saves material, cost and time, is also apparent in another feature: the tail and hind feet of a large cat figure, **No. 56**, and the hind feet of cat Cat. 866 were not made as full wax bodies in the original model, but their lower side was left hollowed to save material, first wax and later bronze. This feature is related to the size of the cast object, as it would be difficult to realise in smaller figures, both in terms of wax modelling and of casting technology.

7.3.3 Gating System and Feeder Remains

The finished objects often still preserve elements of the gating system, which were made in wax. The main role of the gating system was to ensure that the hot liquid metal would reach all hollow areas within the casting mould, and its intricacy depended on the complexity of the object to be fabricated.[52] The individual components of the gating system are often completely removed, which is particularly the case for the boxes surmounted by animal representations and the cat heads (see *Table 6* for Turin examples without gating system remains[53] and *Table 7* for examples with the remains).

No.	Type
64	Cat head
65	Cat head
66	Cat head
70	Ichneumon on box
74	Shrew on naomorphous box
75	Shrew on box
76	Shrew on box
129	Falcon on box
130	Falcon on naomorphous box[54]
131	Falcon on naomorphous box
132	Falcon feet on box
133	Three falcons on box
137	Lizard on box
138	Lizard on box
147	Hybrid creature on box
148	Hybrid creature on box
232	Osiris in front of obelisk

Table 6: Animal mummy containers and cat heads without gating system remains.

[50] Roeder, *Bronzefiguren*, 1956, pp. 521–22, §702.
[51] Ambers et al., *BMTRB* 2 (2009), p. 6.
[52] Cf., e.g., Fitzenreiter et al., *Materialien einer Gusswerkstatt*, 2016, pp. 97–99, 293–95 (QH 207/132). See also the Anubis figure FCO-182 (Cairo JdE 91471) from the Saqqara North Falcon Catacomb with feeder channels around the piece still present (Davies and Smith, *Falcon Complex*, 2005, p. 93, pl. XLIVa–b, fig. 23).
[53] Thum, "Creatures Compartmentalised", 2012, pp. 27–28, rightly identifies metal nubs in the centre base of the British Museum votive boxes as traces of the sprue, and cites lizard box New York, BM 08.480.60, which still shows a short tang at its bottom.
[54] An irregular blot is present in the centre of the base which could be a removed base of a tang.

In the case of the seated cat figures, however, two different technological approaches have been distinguished (*Table 7*). One group of cats show tenons, rectangular in section and of different sizes, both in front under the feet and back, under the base of the tail. The other group of cats shows a tang on the front, while the lower rump rests on a short, recessed cylinder surrounding the lower opening. In the case of **No. 56**, a tang was also once present at the cylinder's back, evidenced by a rectangular cut-off area. Based on this observation, it seems highly likely that **Nos. 61–62** also once had such a rear tang. The use of either the "two tenon" or the "tenon & tube with tenon" gating system is not related to the size of the cat figures; it rather seems to be a technological option. All preserved tangs are solid, taper towards their end, and appear to be cut or pinched off at a certain level.

No.	Type	Gating System Remains
55	Seated cat	Tenon under front feet, cylinder under rump
56	Seated cat	Tenon under front feet, cylinder under rump with tang base at rear
57	Seated cat	Tenon under front feet, tenon under base of tail
58	Seated cat	Tenon under front feet, tenon under base of tail
59	Seated cat	Tenon under front feet, tenon under base of tail
60	Seated cat	Tenon under front feet, tenon at the back removed
61	Seated cat	Tenon under front feet, cylinder under rump
62	Seated cat	Tenon under front feet, cylinder under rump

Table 7: Cat-figure coffins with gating system remains.

While the function of the tenons as vestiges of channels is clear, it is more difficult to determine whether they represent sprues or gates. If both the front and back tenons constituted the remains of two sprues, the melt would have been filled with each sprue receiving an individual bronze batch. The ends of the two tenons would have continued into parts such as individual pouring cups which are now cut off. If the two tenons are to be understood as two gates, a different filling system was most likely in place: a pouring cup was connected with a main sprue which branched off into a runner which then led to two vertical ingates. Such a system would allow the figure to be cast with only one batch of bronze that would be directed into the mould cavity through all the channels. The lack of any gating system remains of this type, however, makes it difficult to determine whether the two tenons represent two individual gating systems or are the vestiges of a joint unit to lead the bronze into the mould cavities. A third option would be to interpret the tenon under the front feet as a vent duct that, as it were, also mainly functioned as a riser, as seen in cat British Museum EA 64391.[55] In this case, only the rear tenon, representing the original sprue with a pouring cup, would have been used to pour in the bronze.[56] The other tenon would ensure the venting, thus facilitating the flow of the melt and compensating for shrinkage during the solidification of the metal.

The actual technical role of the short cylinders within the gating system of cats **Nos. 55–56**, **61–62** in this catalogue is difficult to deduce. Their shape likely had a particular function, since their addition to the figure does not reconcile with the common pragmatic material-saving approach that is often seen in bronzes.[57] Since they were also fed by a sprue or gate,[58] it might be hypothesised that the cylinder was designed to make sure that the bronze would distribute evenly along the larger flat zones of the cat's rump, which, due to its size and flat volume, was difficult to cast. If only the front tenon was used as sprue,[59] the cylinder and its tenon would have acted as an integrated vent ducts and/or riser. Interestingly, the edge of the cylinders appears to be roundish in most areas. This shape could originate from the wax model or, more probably, could be the result of the mould cavity of the cylinder not entirely filling with the melt, leading the bronze to cool down in this shape. This would then indicate that the melt was poured in through the front sprue, while the cylinder and rear tenon acted as risers.

[55] Balsiger et al., *ZKK* 19.1 (2005), p. 108, fig. 6.
[56] See the arrows in Ambers et al., *BMTRB* 2 (2008), p. 5, fig. 6.
[57] See the short passage about material saving in the section above.
[58] Cf. the above mentioned tenon at the rear of the cylinder of **No. 56** in this catalogue.
[59] As is proposed in Ambers et al., *BMTRB* 2 (2008), p. 5, fig. 6.

Apart from that function, both tenons and cylinders offered suitable devices to fix the figures to any kind of bases having corresponding rectangular or cylindrical cut-outs. The same use can also be determined for the pegs left in place under the bases of the shrews **Nos. 77–79** in this catalogue**,** as well as the peg of the ichneumon figure **No. 69**, which originate in the original wax sprues (see *Table 8*, which includes further gating system and feeder channel evidence). All remaining tenons are rectangular or square in section, which suggests that they had this form in the wax model. Smaller tenons are also present at the soles of the two different feet of falcon **No. 134**, for which the original gating system location is difficult to assess. Given the long tail overhang of individual falcon figures, **No. 135** included, the main sprue, possibly separating into two gates, one for each leg, should be located below the legs. Another feeder channel was originally joined to the main sprue and reached towards the end of the tail to allow the metal to also fill this space. For example, a number of bronze falcon coffins – Berlin, ÄM 22605; Fondation Gandour pour l'Art FG-ARCH-EG-187; Cambridge, HAM 1957.165, Philadelphia, Penn E14287; Paris, Louvre E 3056; Milan, CMA inv. E 0.9.40323;[60] and Vatican City, MGE inv. 18512 and 18507 – have short pegs at the lower tail that represent the vestiges of the channel that fed the tail with the melt.[61] Such a channel disposition would then also attest to the fact that falcons (as well as other figures and boxes)[62] were commonly cast inclined and upside down (*Fig. 101*). For the falcons that surmount their boxes (**Nos. 129–133**), such a feeder channel was not absolutely necessary since the upper surface of the box acted as the feeder.

No.	Type	Description and Location
55	Seated cat	Connecting channel between left front paw and left hind paw; connector between hind leg paws
56	Seated cat	Connectors between front and hind feet; connector between the right front foot and the tail
69	Ichneumon on flat base	Central tenon under flat base
75	Shrew on box	Channel between end of box and tail end
77	Shrew on open base	Central tenon under base [channel branching off from main tenon to feed edge of base]
78	Shrew on open base	Central tenon under base [channel branching off from main tenon to feed edge of base]
79	Shrew on open base	Central tenon under base; channel between end of box and mid-tail
134	Falcon figure	Two feet each have a tang under the sole [now completely removed feeder channel between main gating system and base of tail]
135	Falcon figure	[Now completely removed feeder channel between main gating system and base of tail]

Table 8: Further gating system and casting channel evidence.

[60] Ceruti and Provenzali (eds.), *Sotto il cielo*, 2020, pp. 88–90.
[61] The reconstruction drawing of Maher, *RPC* 166 (2020), fig. 6 (https://doi.org/10.1016/j.radphyschem.2019.108475), lacks such a channel connecting the gating system with the tail. Thus, neither the wax could run out completely, nor would the melt fill the tail. The air present there would not have been forced out by the inrushing or rising bronze.
[62] Thum, "Creatures Compartmentalised", 2012, pp. 27–28, identifies some metal nubs in the centre bottom of the boxes that represent the remaining traces of the sprue. She also refers to a lizard box in the Brooklyn Museum (New York, BM 08.480.60) which still shows a short cut-off tang at its base. It is thus clear that these boxes were cast upside down.

Added channels are also evidenced for shrews **Nos. 75, 79**. In the case of the former, a diagonal connector is present between the rear base and the mid tail section. In the case of the latter, a small vertical rod connects the end of the tail with the box. Both ducts were necessary to ensure that the melt would properly reach those cavities, and thus avoid the risk of failed casts.[63] Further channels might have also been present at the open bases of shrews **Nos. 77–78**. They probably branched off from their main tenons to feed the protruding edges of the base.[64] Small bronze bars also connect the front paws with the hind feet of **No. 56**. The right front paw is linked with the tail by such a bar, too. They were made in the wax model to ensure – given the larger size of the figure – that the hind feet and the tail would properly fill up with the melt.

7.3.4 Core Support Remains

Several specialist studies of Egyptian hollow-cast bronze artefacts have reported on the presence, distribution, and material of core supports. For bronze coffins, research has mainly concentrated on cat[65] and falcon[66] figures. Recently, the dataset has been expanded by a study of lizard, eel, and hybrid creature bronze coffins in the British Museum.[67] The chaplets are typically made of iron, in the form of small wrought pins with square or rectangular sections.[68] This material feature often leaves small holes in the walls of archaeological bronzes, representing the corroded-away iron, or larger accretions of corrosion around the spots, which sometimes makes it difficult to identify the chaplets and their proper location. Removal of the core pins and subsequent plugging or patching of the holes they leave is not attested for Late Period bronzes.[69] Their traces on the finished outer surface thus had to be concealed by other means: their ends were mostly cut flush with the surface and the spots were polished.[70] *Table 9* provides an overview of the identified core pins and their locations in the Turin votive coffins. The comparison between the individual object types allows one to detect certain location patterns. The cat figures regularly have their core pins in the top of the head, in the shoulder area and along the rump. In the case of the boxes, the chaplets[71] are distributed quite consistently along the centre lines of the sides and in the centre of the front. The number of chaplets used for the side walls seems to depend on the size of the object, but generally two pins for each long side were employed.[72]

The locations of the core pins generally conform to the ones reported in other studies. For the bronze containers in the British Museum, the core support remains were only cautiously identified; however, their description confirms their purpose.[73] While the topic of chaplets is not touched upon in a further publication dedicated to lizard, eel, and hybrid creature boxes in the British Museum, the X-ray and CT reconstructions clearly show features that can be identified as chaplets.[74] A recent Neutron Tomography study of the same boxes has not only confirmed the presence of core supports but has also added more evidence in terms of their material (iron), form, number, and distribution.[75] The loca-

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[63] Since the tail end merges with the box's top, such a channel was not necessary for **No. 76.** In the case of shrew figures **Nos. 74, 77–78**, it is more difficult to say whether the tail was cast together with the animal body or only slotted in later.

[64] In the case of **No. 78**, there is a faint indication of such a channel on one side of the tenon. In the case of **No. 77**, the small protrusion on the lower front edge of the base might suggest a now worked-off feeder channel. The edge of its plinth, however, seems either not to have been properly worked in the wax model, or not to have been properly filled with bronze, as is suggested by the roundness of the edge.

[65] Schorsch, in Watkins and Brown (eds.), *Conservation of Ancient Egyptian Materials*, 1988, pp. 43–44; Schorsch and Frantz, *BMMA* 55.3 (1998), pp. 21–22, fig. 12; Nigro, *BMMGP* 19 (1999), esp. 60–63, fig. 3a–b and pp. 73–75, fig. 13; Balsiger et al., *ZKK* 19.1 (2005), p. 108; Ambers et al., *BMTRB* 2 (2008), pp. 5–6; Schorsch, in Roberts and Thornton (eds.), *Archaeometallurgy in Global Perspective*, 2014, p. 284, fig. 12.10.

[66] Schorsch, in Roberts and Thornton (eds.), *Archaeometallurgy in Global Perspective*, 2014, p. 285, fig. 12.12; Agresti et al., *MicJourn* 124 (2016), pp. 765–74, figs. 2–3: https://doi.org/10.1016/j.microc.2015.10.030; Maher, *RPC* 166 (2020), pp. 1–7, figs. 3–4: https://doi.org/10.1016/j.radphyschem.2019.108475.

[67] O'Flynn et al., *SciRep* 13 (2023), pp. 1–13: https://doi.org/10.1038/s41598-023-30468-4.

[68] Nigro, *BMMGP* 19 (1999), p. 60; Balsiger et al., *ZKK* 19.1 (2005), p. 108, fig. 7; Hill and Schorsch, *MMJ* 40 (2005), p. 174; Ambers et al., *BMTRB* 2 (2008), p. 4 and fig. 7; Schorsch, in Roberts and Thornton (eds.), *Archaeometallurgy in Global Perspective*, 2014, p. 255, fig. 12.22; O'Flynn et al., *SciRep* 13 (2023), pp. 1–10: https://doi.org/10.1038/s41598-023-30468-4.

[69] Schorsch, in Watkins and Brown (eds.), *Conservation of Ancient Egyptian Materials*, 1988, p. 43; Willer and Meijers, in Uelsberg et al. (eds.), *Gebrochener Glanz*, 2014, p. 173.

[70] Schorsch and Frantz, *BMMA* 55.3 (1998), p. 21; Balsiger et al., *ZKK* 19.1 (2005), p. 108.

[71] Not necessarily all chaplets were identified.

[72] The presence of chaplets in the figures, cat heads and boxes also attests to the fact that their main opening, later used to access the cavity and remove the core, was not meant to act as "window" for a connector made of investment material between the casting core and the mould layers; cf. Agresti et al., *JAAS* 30 (2015), p. 716: https://doi.org/10.1039/C4JA00447G; Fitzenreiter et al., in Fitzenreiter et al., *Materialien einer Gusswerkstatt*, 2016, p. 130.

[73] Thum, "Creatures Compartmentalised", 2012, p. 26: "Holes in the form of short diagonal lines observed in the bottom or sides of some of the BM examples [...] are probably from chaplets".

[74] Masson-Berghoff and O'Flynn, *BMSAES* 24 (2019), pp. 159–74.

[75] O'Flynn et al., *SciRep* 13 (2023), pp. 2–10: https://doi.org/10.1038/s41598-023-30468-4.

No.	Type	Identifiable Chaplet Locations and Number of Chaplets
55	Seated cat	Top of head between the ears, above (4 cm) hind feet on both sides, above (3.5 cm) right hind feet, right back side (3 cm above base of tail), left and right side of rump (right side present as hole); on both sides of arched back, between the legs in upper breast area (possibly)
56	Seated cat	Top of head, outer shoulder (right), centre of back (one), above stifle joints (left and right), centre of pelvis (left and right; now visible as larger corroded-away holes, particularly on the left)
57	Seated cat	Centre of shoulder (left and right), thorax (left and right), lower belly (left and right)
58	Seated cat	Top of head, outer shoulder (left and right), above hip (left and right)
59	Seated cat	Top of head, front shoulder (left), lower rump (left and right)
60	Seated cat	Thorax (left and right), central rump (right and left[?]), lower rump (right and left[?])
61	Seated cat	Back of nape, shoulder (left), belly (left), lower rump (left and right)
62	Seated cat	Top of head, behind cheekbones (left and right), below shoulders (left and right), lower rump (left and right) [all not fully secure]
63	Fragmented cat head	Top of head, behind ear (right), nape (two on same level), lower nape (only left side of neck remains)
64	Cat head	Top of head, in front of ears (left and right)
65	Cat head	Left centre of top of head, forehead (one), under ear (right)
66	Cat head	Top of head, under ear (right)
67	Kittens on box	Centre of front wall (one), along central axis of bottom (three), along central line of right wall (three), along centre line of left wall (two), along central axis of upper wall (two)
70	Ichneumon on box	Not identifiable
74	Shrew on box	Centre of front wall (one), centre of right wall (one), rear centre of left wall (one), rear of upper surface (four [?])
75	Shrew on box	Centre of front wall (one), along centre of both long sides (two), front upper surface (one)
76	Shrew on box	Centre of front wall (one), along central line of long sides (two [?])
129	Falcon on box	Centre of front wall (one), along central axis of upper wall (two), along central line of both left and right walls (two), along central axis of bottom (two)
130	Falcon on box	Off-centre of front wall (one), along central line of left wall (two), on central line of front right wall (one), along central axis of bottom (two)
131	Falcon on box	Upper centre of front (one), along central axis of top surface (two), along central axis of bottom (two), slightly above central line of right side (two), front of left side (one)
132	Falcon feet on box	Centre of front wall (one), along central line of left wall (two), along central line of right wall (two), along central axis of bottom (two), rear top surface (one)
133	Three falcons on box	Centre of right wall, off-centre rear wall, off-centre bottom
134	Falcon figure	Inner and outer thighs, centre of breast, upper back, centre of outer wings (left and right)
135	Falcon figure	Centre of breast, centre of back, wing (left)
136	Lizard on box	[Centre of right long side (one), under head of reptile (one)]
137	Lizard on box	Along central line of right wall (two), rear half of left wall (one), under back of animal (one), rear of bottom wall (one)
138	Lizard on box	Centre of front wall (one), rear of right wall (one)
147	Hybrid creature on box	Centre of front wall (one), along centre line of left side (two), along central line of right side (two), along central axis of bottom (two)
148	Hybrid creature on box	Centre of front wall (one), along central axis of bottom (three), along central line of left side (two), along central line of right side (two), in second coil of eel body on upper wall (one)
232	Osiris in front of obelisk	No remains discernible

Table 9: Locations of identifiable core supports.

tions of core pins in the bronze boxes in the Turin collection is consistent with other examples of such objects. While certain core pin placement regularities can be seen, every hollow cast is still a unique artefact and represents individual technological choices made by its maker(s). It has been argued for the British Museum bronze animal mummy containers that the number of core supports used in each case corresponds to the size of the artefact in question.[76]

7.3.5 Visible Casting Defects

Several casting flaws can be recognised. The most common structural defects that are also visible with the naked eye[77] are small cracks, fissures, deformations or cavities that are either the result of the different shrinkage rates of the individual parts of the cast during cooling down depending on their thickness, or of segregation (the partial de-mixing of alloy components either already during alloying or later during casting); and the interior of the mould was not filled completely with the melt.[78] Sometimes the structural flaws are hidden under corrosion, so conservation interventions could make them more visible. The most obvious flaws are when the melt did not fully reach all cavities. *Table 10* provides a breakdown of the main evidence including short descriptions. It is often not clear whether certain cracks or breaks can be traced back to a thin wax model wall (that was then also cast in this way, so it would not constitute a casting defect in the proper sense), which only later facilitated corrosion and resulting breakage. In the end, a combination of several production, use and deposition factors was responsible for the individual defects visible today.

7.3.6 Coldworking Evidence

The fettling of the cast comprises all the tasks of finishing the artefact. The cast is de-moulded (the mould is destroyed in this step) and then cleaned of any remaining adhesions. In the case of hollow objects, the casting core is removed if the interior was meant to function as a container. The parts of the gating system that are functionally not required (e.g., pouring cup, sprues, runners, and gates) are removed. Sometimes, smaller feeder channels are left in place (cf. *Table 8*). Casting surface features such as burrs and protrusions are levelled off and the endings of the core supports are cut flush with the outer surface. If necessary, fissures, bubbles and larger flaws are patched (see Chapter 7.4 below). No unequivocal evidence for chasing was found among the bronze coffins in the Museo Egizio. The presence and use of other materials such as gold, lead, and plaster is discussed below. The question of whether any of the Turin bronze coffins were re-heated, i.e. annealed, during the final working stage cannot currently be answered.[79] No traces of polychrome decoration were detected.[80]

7.4 Evidence for Ancient Repair

The most common type of surface repair on bronzes is evidenced by hammered in, or cast-in, patches.[81] Patching is a method of repairing flaws in the metal surface that occurred during casting.[82] Among the Turin bronze coffins, cat **No. 61** shows some irregular recesses at its lower back, which could represent the negative vestiges of now fallen out cast-in patches. However, they could also be the result of intense corrosion and resulting disintegration of the metal in these areas.

A further technique of repair and finishing is casting on,[83] which has been identified in only a few Egyptian

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[76] O'Flynn et al., *SciRep* 13 (2023), p. 10: https://doi.org/10.1038/s41598-023-30468-4.

[77] Radiographs would provide more detailed insights into the metal structure, revealing further flaws in the cast such as micro-bubbles and fissures next to ancient repair and modern conservation interventions; see, e.g., Schorsch, in Watkins and Brown (eds.), *Conservation of Ancient Egyptian Materials*, 1988, pp. 43–48, figs. 7, 13–14; Schorsch and Frantz, *BMMA* 55.3 (1998), pp. 22–23, figs. 11–14; Nigro, *BMMGP* 19 (1999), p. 63, fig. 4; p. 75, fig. 13; Balsiger et al., *ZKK* 19.1 (2005), p. 110, figs. 9–10; Ambers et al., *BMTRB* 2 (2008), p. 4, fig. 4; p. 7, fig. 10; Schorsch, in Roberts and Thornton (eds.), *Archaeometallurgy in Global Perspective*, 2014, pp. 284–85, figs. 12.10b, 12.12b and 12.14b; Agresti et al., *MicJourn* 124 (2016), pp. 765–74, figs. 2–3: https://doi.org/10.1016/j.microc.2015.10.030; Masson-Berghoff and O'Flynn, *BMSAES* 24 (2019), pp. 167–70, figs. 6–12.

[78] Fitzenreiter et al., in Fitzenreiter et al., *Materialien einer Gusswerkstatt*, 2016, pp. 129–32.

[79] See Schorsch and Frantz, *BMMA* 55.3 (1998), p. 27 for evidence of re-heating; Maher, *RPC* 166 (2020), p. 2 (https://doi.org/10.1016/j.radphyschem.2019.108475), thinks of the annealing of figurative bronzes as a method of repair, on the one hand, and to mitigate the probability of micro-cracks and other flaws, on the other.

[80] La Niece et al., *SC* 47.2 (2002), pp. 95–108: https://doi.org/10.1179/sic.2002.47.2.95.

[81] Garland and Bannister, *Ancient Egyptian Metallurgy*, 1927, p. 74; Hill and Schorsch, *MMJ* 40 (2005), p. 175; Schorsch, in Roberts and Thornton (eds.), *Archaeometallurgy in Global Perspective*, 2014, p. 296.

[82] Hill and Schorsch, *MMJ* 40 (2005), pp. 168–69, fig. 7; Ambers et al., *BMTRB* 2 (2008), p. 4; Agresti et al., *MicJourn* 124 (2016), p. 771: https://doi.org/10.1016/j.microc.2015.10.030; Schorsch and Frantz, *BMMA* 55.3 (1998), p. 23, fig. 11; Hill and Schorsch, *MMJ* 40 (2005), pp. 173–74, fig. 20; Schorsch, in Roberts and Thornton (eds.), *Archaeometallurgy in Global Perspective*, 2014, p. 284, fig. 12.10b.

[83] Garland and Bannister, *Ancient Egyptian Metallurgy*, 1927, pp. 69, 75; Raven, in *Sesto Congresso*, I, 1992, p. 531; Ogden, in Nicholson and Shaw (eds.), *Ancient Egyptian Materials and Technology*, 2000, p. 159; Maher, *JASRep* 46 (2022), pp. 1–14: https://doi.org/10.1016/j.jasrep.2022.103699.

No.	Type	Description
56	Seated cat	Lower front of right paw not fully cast; defects in right lower rump
57	Seated cat	Defects in belly of cat; right edge of cylinder not fully cast; several fissures (might also be post-casting)
58	Seated cat	Bottom parts of tail not fully cast; some round bronze protrusions under right hind foot
59	Seated cat	Part of left lower rump not fully cast; bottom parts of tail at rear not fully cast
60	Seated cat	Part of left lower rump not fully cast
61	Seated cat	Part of left lower rump not fully cast
62	Seated cat	Crack in front under belly (or post-casting?)
64	Cat head	Cracks around left eye (or post-casting?)
65	Cat head	Cracked rear wall of eye sockets (or post-casting?)
74	Shrew on naomorphous box	Crack in left wall above torus (or post-casting?)
78	Shrew on base	Lower edge of open base not fully cast
129	Falcon on box	Right rear edges of the box (or post-casting?)
130	Falcon on naomorphous box	Thin wall behind tail (or post-casting?)
134	Falcon figure	Upper part of beak (or post-casting?)
135	Falcon figure	Thin cracked broken wall behind left eye (due to lead?)
147	Hybrid creature on box	Thin wall in the left front of the box (or post-casting?)

Table 10: Casting defects (visible with the naked eye).

bronzes so far, but which might be more widespread than hitherto suspected, as attested by some examples in Turin.[84] Casting on has been described as the "process by which a deficient or missing area of a cast is moulded in wax onto the existing metal object and then the whole area coated with investment and new metal cast in."[85] It is a mechanical joining method, as it is an "agglomerative process achieved by pouring molten metal onto independently prefabricated [or, in the case of a repair, broken] components, result[ing] in mechanical joins, because the added metal engages the contours of the substrate, and interdiffusion, as a rule, does not occur."[86] It is different from soldering, brazing and welding, which are, as far as Egypt and copper alloy metals are concerned, not attested until Roman times.[87]

Recent research on a unique assemblage of Late Period casting moulds, mostly solid Osiris figures, shows evidence for the use of the casting-on technique to repair or re-join already-made elements.[88] Such repairs, including cast-on additions, are found on several solid- and hollow-cast Osiris figures in the Frankfurt Liebieghaus[89] and other museum collections.[90] This technique appears in two of the Turin bronze coffins: the hybrid creature **No. 147** and the large bronze cat coffin **No. 55**. The former shows a break at the left side and, at first sight, an odd agglutination of

[84] See, e.g., the standing Bastet Turin, ME Suppl. 18199 (unpublished), which shows casting on around the ankles, mending the break that occurred there, as well as the small Osiris figure Turin, ME Cat. 66 (unpublished), which presents a cast-on layer above the knees serving to attach the legs to the body. The eel-snake in Geneve, FGA-ARCH-EG-94 (Bianchi, *Egyptian Bronzes*, 2014, pp. 232–33, no. 67) also broke in two and was mended by casting on.

[85] Ogden, in Nicholson and Shaw (eds.), *Ancient Egyptian Materials and Technology*, 2000, p. 159.

[86] Schorsch, in Watkins and Brown (eds.), *Conservation of Ancient Egyptian Materials*, 1988, p. 43; Schorsch, in Roberts and Thornton (eds.), *Archaeometallurgy in Global Perspective*, 2014, p. 276.

[87] Garland and Bannister, *Ancient Egyptian Metallurgy*, 1927, p. 69; Ogden, in Nicholson and Shaw (eds.), *Ancient Egyptian Materials and Technology*, 2000, p. 159; Schorsch, in Roberts and Thornton (eds.), *Archaeometallurgy in Global Perspective*, 2014, p. 298; Willer, in Fitzenreiter et al., *Materialien einer Gusswerkstatt*, 2016, p. 139.

[88] Fitzenreiter et al., in Fitzenreiter et al., *Materialien einer Gusswerkstatt*, 2016, pp. 136–38; Auenmüller, in Rosati and Guidotti (eds.), *Proceedings of the XI International Congress*, 2017, pp. 23–24; Auenmüller, in Kahlbacher and Prigliner (eds.), *Tradition and Transformation*, 2018, pp. 57–58; Verly et al., *BIFAO* 122 (2022), pp. 541–71: https://doi.org/10.4000/bifao.12872.

[89] Droste zu Hülshoff et al., *Ägyptische Bildwerke*, II, 1991, pp. 253–56, cat. nos. 125–126; pp. 270–71, no. 149 and pp. 275–76, no. 157; Verly et al., *BIFAO* 122 (2022), pp. 546–50: https://doi.org/10.4000/bifao.12872.

[90] Raven, in *Sesto Congresso*, I, 1992, pp. 531; Maher, *JAS-Rep* 46 (2022), pp. 1–14: https://doi.org/10.1016/j.jasrep.2022.103699.

metal around the base, front and back of the uraeus, an unmistakable sign of an ancient cast-on repair of this piece. Clearly, the whole upper front part broke off. Craftspeople mended the break by casting a "reconstruction layer" around this element in order to re-attach it to the box and the eel body. The present agglomeration of bronze was put in place in the form of wax smeared around the broken-off front part. To perform a successful repair casting, the whole object and the wax additions were put into a new casting mould, and a new gating system, potentially directly targeted at the areas to be cast in anew, was created. The mould was then fired to let the wax run out. Then, the hot metal was poured into the cavities left by the molten wax. Since such new layers of bronze do not fuse with the original metal, several thinner gaps remained. Considerate distribution of the new cast-on bronze layer, however, ensured a strong fixation of the broken-off element. The cast-on technique was in this case employed to recreate a fully functional and complete object out of two parts that belonged together.[91] Similarly, the neck and head of **No. 55** were repaired with a cast-on element. Two other pieces in Turin also show traces of repair: the end of the tail of ichneumon figure **No. 69**, and cat **No. 56**.

7.5 Other Metals and Materials: Lead, Gold, Plaster, and Inlays

7.5.1 Lead

The lead filling in the head of falcon **No. 135** and the presence of lead in the upper compartment of falcon coffin **No. 132** are rare. Lead has sporadically been reported from other hollow-cast containers for animal mummies (see *Table 11*). Its technological significance, however, remains unclear; magical and ritual reasons have been discussed.[92] Based on the internal positioning of the lead in the interior of cats, it has been suggested that it "was placed in the cavity as a solid and was heated enough to fuse the lead in place."[93] This could also have been the case with falcon **No. 135**. The position of the lead suggests that the falcon was placed upside down and slightly tilted so that the lead, either added as solid or, more likely, poured in as liquid,[94] could solidify retaining its horizontal level. Possibly, the lead was added to provide stability and weight.[95] In the case of box **No. 132**, where the lead filling is present in the upper compartment, it is unclear whether this was cast in secondarily or whether it represents a technological feature such as a repair or an inner lining of the hollow interior.

The presence of lead in hollow bronzes also has conservation implications since a corroding lead filling could cause stress to the artefact's walls.[96] This might have been the reason for the fragmented head of falcon **No. 135**.[97] It might, however, also be hypothesised that the lead fill in this case was used to stabilise the thinly cast bronze walls of the falcon's head. The lead would then represent further evidence for an ancient repair, which has also been identified and argued for in a bronze coffin in the British Museum.[98] In view of the lead present in other hollow casts listed here in *Table 7*, its interpretation as part of an ancient repair, however, needs further study.

7.5.2 Gilding

In the Turin collection, two bronzes are gilded: the shrew figure surmounting a naomorphous box **No. 74** and the shrew standing on an open base **No. 78**. In both cases, the eyes of the animals are highlighted. The first shrew has gilded eyes. Both sides of the eyeball are covered in (or maybe filled with) gold foil, which also partly overlaps the surrounding eyelids. In the centre of the eye, a vertical space is left open to indicate the pupil. As to shrew **No. 78**,

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[91] The question of why those fragmented objects were not just melted down to cast them completely anew shall only be shortly touched upon here. For Late Period bronzes representing deities or animal forms of deities, an implicit non-recycling policy seems to have been in place preventing the melting down of already cast pieces, as they were imbued with the magical power of the deities represented. See also the hybrid creature box British Museum EA 36151, for which two ancient repairs are evidenced: a hole that appeared during casting was covered and a lead fill was used as an inner support to the bronze walls: O'Flynn et al., *SciRep* 13 (2023), pp. 7–8, fig. 7.

[92] O'Flynn et al., *SciRep* 13 (2023), p. 10.

[93] Schorsch, in Watkins and Brown (eds.), *Conservation of Ancient Egyptian Materials*, 1988, p. 46.

[94] Cf. O'Flynn et al., *SciRep* 13 (2023), p. 10.

[95] Balsiger et al., *ZKK* 2005, p. 114; O'Flynn et al., *SciRep* 13 (2023), p. 10.

[96] Schorsch, in Watkins and Brown (eds.), *Conservation of Ancient Egyptian Materials*, 1988, p. 46. Balsiger et al., *ZKK* 19.1 (2005), pp. 114, also discuss the effect of the lead fill in the head of a cat on the final break that originated in fissures caused by the corroding lead fill.

[97] For **No. 132** in this catalogue, the corroding lead might also have caused pressure to the upper rear of the compartment's top, leading to the larger break in this area.

[98] London, BM EA36151: O'Flynn et al., *SciRep* 13 (2023), pp. 8, 10.

Type	Provenance and Collection	Location of Lead	Reference
Falcon Figure	Museo Egizio, Turin, Provv. 5220	Head, completely filled, levelled surface	See catalogue entry **No. 135**
Falcon on Box	Museo Egizio, Turin, Cat. 2385	Upper compartment of box close to break	See catalogue entry **No. 132**
Falcon Figure	Saqqara Falcon Complex FCO–145; now London, Petrie UC 30495	Loose piece of lead "core" found inside the figure	Davies and Smith, *Falcon Complex*, 2005, p. 87, pl. XXXVIc
Falcon Figure	New York private collection	"Bundles" or "sheets" of unalloyed lead stuffed in cavity of falcon	Schorsch, in Watkins and Brown (eds.), *Conservation of Ancient Egyptian Materials*, 1988, p. 46, fn. 13
Cat Figure	New York, MMA 04.2.472	"Clump" in front of chest and head	Schorsch, in Watkins and Brown (eds.), *Conservation of Ancient Egyptian Materials*, 1988, pp. 46–47, fig. 13.2
Cat Figure	New York, MMA 10.130.1331	"Clump" in the head	Schorsch, in Watkins and Brown (eds.), *Conservation of Ancient Egyptian Materials*, 1988, pp. 46–47, fig. 13.4
Cat Head	New York, MMA 04.2.468	"Bundle" of unalloyed lead	Schorsch, in Watkins and Brown (eds.), *Conservation of Ancient Egyptian Materials*, 1988, p. 46
Ibis Coffin	New York, MMA 04.2.460	"Slab" in upper box	Schorsch, in Watkins and Brown (eds.), *Conservation of Ancient Egyptian Materials*, 1988, pp. 46–47, fig. 12
Cat Figure	Basel, MKB III 5528	Cylindrical lump in the head	Balsiger et al., *ZKK* 19.1, 2005, p. 110, fig. 9
Cat Figure	Vatican City, MGE 18277	A "lead lens" in front of the thorax	Nigro, *BMMGP* 19 (1999), p. 73
Lizard on Box	London, BM EA36167	Lead fill with central void in front of box	O'Flynn et al., *SciRep* 13 (2023), pp. 4–6, fig. 4, p. 10: https://doi.org/10.1038/s41598-023-30468-4
Hybrid Creature on Box	London, BM EA36151	Lead region in the front of the box	Masson-Berghoff and O'Flynn, *BMSAES* 24 (2019), pp. 169–70, 172, fig. 12; O'Flynn et al., *SciRep* 13 (2023), pp. 7–9, fig. 7, p. 10: https://doi.org/10.1038/s41598-023-30468-4
Hybrid Creature on Box	London, BM EA71428	One long lead object in the upper area, another flat rectangular lead object in power area	Masson-Berghoff and O'Flynn, *BMSAES* 24 (2019), pp. 169–70, fig. 11; O'Flynn et al., *SciRep* 13 (2023), pp. 6–8, figs. 5–6, p. 10: https://doi.org/10.1038/s41598-023-30468-4

Table 11: Lead in bronze coffins for animal mummies.

its upper and lower incised eyelids are gilded, so that t78 central almond-shaped eyeballs with notched round pupils are enclosed by golden lines.[99]

7.5.3 Incrustations

Incrustations in the form of white material, most likely lime plaster, filling the decorative lines are found on two shrew figures: **Nos. 77, 79**. In both cases, the plaster is incompletely preserved, but the present remains show that it was used to particularly accentuate incised animal imagery such as winged scarabs and vultures. The decorative lines of shrew **No. 74** were possibly also filled with similar material, as is suggested by their greyish appearance, which contrasts with the surrounding bronze surface.

[99] For details on gilding, see Oddy et al., in Watkins and Brown (eds.), *Conservation of Ancient Egyptian Material*, 1988, pp. 35–39; Scott and Swartz Dodd, *JCH* 3.4 (2002), pp. 333–45; Hill and Schorsch, *MMJ* 40 (2005), esp. pp. 177–78; Schorsch, in Hill and Schorsch (eds.), *Gift for the Gods*, 2007, pp. 193–94; Ghoneim, *Archaeometry* 57.S1 (2015), pp. 130–46; McArthur et al., *BMTRB* 9 (2015), pp. 113–15.

7.5.4 Inlays

The recesses that were meant to receive inlays were always made in the wax model.[100] In the case of the cat figure coffin **No. 55**, the rock crystal inlays for the eyes survive and were attached with a dark brown, slightly cracked organic material. Three feline figures present evidence for inlaid eyes, now lost: **Nos. 61**, **63, 65**. The materials used for the inlays varied: rock crystal (for the sclera, see **No. 55**) and black stones (for the pupils) are attested next to gold for the cornea and coloured glass for the eyelids.[101] In the case of the cat figures without inlays, the eyes might have been overlaid in white except for the central pupils (e.g., Berlin, ÄM 11385). One of the Turin cat heads, **No. 64**, has a socket for an inlaid scarab on its head that was made of ivory,[102] faience[103] or gold.[104] The falcon **No. 135** once had inlaid ear coverts and malar stripes, most probably of faience.[105] The round recess of its right eye retains a black substance, which represents an "inlay" of some sort of an as-of-yet undetermined material.

7.5.5 Additions

Several cat figures in this catalogue (**Nos. 56**, **58**–**59**, **61**–**62**) and cat heads (**Nos. 63**–**65**) have pierced ears suggesting that earrings of gold (some of which, however, might often be modern additions)[106] or bronze, as is the case for the earring in the left ear of **No. 60**, were once present.

7.6 Packing, Sealing and Wrapping

The faunal remains, in most cases wrapped in linen,[107] were put into the figures and boxes without any other packing material, though plaster is also known to have been used to encase the animal mummies within the metal boxes or figures.[108] Falcon coffin **No. 132** shows plaster with smaller dark grey patches as a filling inside the box. The falcon figure **No. 135** has some remains of plaster close to the opening, which, while they might be traces of such an encasing, are most likely vestiges of the sealant used to close the aperture with a metal panel. **No. 70** was most likely originally completely filled with plaster, with no mummy. This piece thus seems to have been a "dummy" bronze votive coffin.

While the openings of the cat figures were not closed,[109] as they were meant to be placed on a wooden base, the openings of the other figures and boxes had to be properly sealed after the mummies were put in. Corroded-away lead has been reported to be the most likely sealant for attaching a bronze plate to the aperture of a falcon figure in the Florence collection.[110] The use of plaster as a sealant for the panels of votive boxes has also been proposed.[111] In the case of hollow falcon figures, the usually rectangular openings were closed by metal panels that were attached to framed recesses that were already cut in the wax model.[112] The individual panels were tailored to the individual openings. Wood might have been used, too.

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[100] On inlays, see, e.g., Ogden, in Nicholson and Shaw (eds.), *Ancient Egyptian Materials and Technology*, 2000, p. 160; Hill and Schorsch, *MMJ* 40 (2005), esp. pp. 176–78; McArthur et al., *BMTRB* 9 (2015), p. 115; Mertah, in Franci et al. (eds.), *Rethinking Osiris*, 2021, pp. 77–88.

[101] See, e.g., Budapest, MFA 51.2536 (eyes inlaid in gold with rock crystal sclera); Paris, Louvre E 2533 (glass eyelids surrounding rock crystal sclerae) and Vienna, KHM AE Inv. 699 (black pupils with overlaid rock crystal). Two cat heads in Copenhagen, CG, have eyes inlaid with amber (AEIN 1546 and 1545) which is, however, thought to be modern: Mogensen, *Collection Égyptienne*, 1930, p. 57, cat.-nos. A 393 and 394, pl. LIII.

[102] Copenhagen, CG AEIN 1545 (cat head): Mogensen, *Collection Égyptienne*, 1930, p. 57, pl. LIII.

[103] New York, BM 37.1945E (wooden cat figure) and 37.1157E (faience scarab); see also Roeder, *Bronzewerke*, 1937, p. 47, §194k.

[104] Baltimore, WAM 54.403.

[105] See, e.g., Vatican City, MGE 18512: Grenier, *Bronzes*, 2002, pp. 151–52, pl. XXXVIII. The recesses left for the inlays of the falcon Philadelphia, PM E1 4287 are filled with a white substance that bonded the inlays to the recesses.

[106] Cf. Ambers et al., *BMTRB* 2 (2008), p. 9. In terms of original earrings different from the simple loops, see also the cat head New York, BM 36.114 with earrings in a style that was popular in Roman Egypt.

[107] See Chapters 1 and 3.

[108] See, e.g., the boxes surmounted by falcons from the North Saqqara Falcon Catacomb FCO-146 (Cairo JdE 91456) and FCO-153 (Bolton, A.32.1971): Davies and Smith, *Falcon Complex*, 2005, pp. 87–89. A plaster packing is also assumed for the hybrid creature FCO-43 (London, Petrie UC30501): Davies and Smith, *Falcon Complex*, 2005, p. 76. The snake box FCO-444 also has some plaster remains inside: Davies and Smith, *Falcon Complex*, 2005, p. 120. Maher, *RPC* 166 (2022), p. 2, reports on plaster inside the head of the falcon figure Cairo, EMC JdE 91922 (= FCO-470: Davies and Smith, *Falcon Complex*, 2005, p. 123).

[109] The openings of the cat heads also did not need to be closed as they were – as is suggested in the literature – used as heads for composite cat coffins.

[110] Agresti et al., *MicJourn* 124 (2016), p. 772: https://doi.org/10.1016/j.microc.2015.10.030 (Florence, ME inv. 8401).

[111] Thum, "Creatures Compartmentalised", 2012, *passim*; Masson-Berghoff and O'Flynn, *BMSAES* 24, 2019, pp. 162–63. The "pale sealant" mentioned in these two works could probably also be lead.

[112] Jett et al., *SC* 30.3 (1985), pp. 112, 115: https://doi.org/10.1179/sic.1985.30.3.112; Agresti et al., *MicJourn* 124 (2016), p. 6, fig. 3: https://doi.org/10.1016/j.microc.2015.10.030. Some further examples regarding sealed apertures of falcon figures: Baltimore, WMA 54.547 and 54.2120 are still sealed; Detroit, IOA 59.119, Philadelphia, PM E 14287, Cambridge, HAM 1957.165 and Moscow, PM I.1.a.6661 show the open aperture with the recessed rim; New York, MMA 25.2.11 has a long sealing plate all along the lower belly; the aperture of Paris, Louvre E 3056 is exceptionally round.

The panels sealing the votive boxes were also tailor-made. The use of plaster or lead as sealant is very likely for the Turin votive boxes, but only scientific analyses could establish which material was used. However, it also often seems that the tailor-made panels would fit into the apertures without a sealant. Only in the case of **No. 148**, a box with a hybrid creature on top, some pale greyish material was found next to the rear opening. The apertures of the Turin votive boxes show five different types:[113] the plain rear ends of the box constitute the frame into which a perfectly fitting panel would have been put (**Nos. 75–76, 129, 132**); three plain rear ends of the box constitute the frame into which a panel would have been slotted in from the fourth side (**Nos. 74, 147**); the rear of the box has a cut-out frame into which a fitting panel would have been put (**Nos. 70, 130, 133, 137–138**); the rear of the box has a cut-out frame with recesses as supports for the panel that would have been attached (**No. 131**); the rear of the box shows a circumferential recess around a protruding rim, into which the sealing cap would have been put (**No. 148**). The metal sheet inside the box of falcon **No. 129** is unlikely to be the original panel as it does not fit the now partly-warped rear opening of the box.

Not only the animals, but also the coffins were often wrapped in linen. This is common for figurative bronzes of all sorts found in sacred animal cemeteries[114] as well as known from the study of many museum pieces.[115] In the case of the Turin animal coffins made in bronze, no original linen wrapping is preserved, but its pattern can be identified in several outer corrosion zones of at least two cat figures: **Nos. 56–57**. The findings of the linen pattern conforms particularly well to the known practice of wrapping bronze cat sarcophagi.[116] The base of **No. 55** bears one smaller and one larger patch of linen on its wooden surface at the left rear edge, close to the circular cavity, suggesting that this base (and its original figure) were also originally wrapped. Remains of wrapped and mummified fauna are present in **Nos. 61, 130, 148** and visible through the aperture, while **Nos. 74, 132** are still sealed.

[113] Cf. also Thum, "Creatures Compartmentalised", 2012, p. 34.
[114] Kessler, in Spiekermann (ed.), *Zur Zierde gereicht*, 2008, pp. 153–63; Nasr el-Dine, *BIFAO* 117 (2010), pp. 242, 249, fig. 5.
[115] E.g. Hastings, *Sculpture*, 1997, pp. xxxiii–xxxiv, pl. XXXII; Davies, in Hill and Schorsch (eds.), *Gifts for the Gods*, 2007, pp. 174–87, figs. 76–77; Thum, "Creatures Compartmentalised", 2012, p. 96, no. A-03 (eel on a box London, BM EA71434); McArthur et al, *BMTRB* 9 (2015), pp. 115–16, figs. 5 and 7 (Osiris figure London, BM EA60718).
[116] E.g., Nigro, *BMMGP* 19 (1999), esp. pp. 66–69, figs. 6, 8, 9 (cat figures Vatican City, MGE 18311 and 18277 = Grenier, *Bronzes*, 2002, pp. 140–41, cat. nos. 277–78); Lichtenberg and Zivie, in Ikram (ed.), *Divine Creatures*, 2005, p. 109, fig. 5.2 (cat figure from the Saqqara Bubasteion).

8. INTRODUCTION TO THE CATALOGUE

The Turin collection of animal mummies provides a rich source of information for the study of animal mummies. The varieties of animals represented, their sheer number and diversity, the fact that many are provenanced, and the ways in which they have been studied provide a unique view into the world of the ancient Egyptians and their animals. The work presented here is interdisciplinary, with many individuals contributing their specific expertise to the data; the resulting publication has benefited from discussions among the authors. No doubt, the data (additional material will be available online) will engender further discussions and lead to different conclusions.

The catalogue is organised by animal type, starting with mammals. It is assumed that all the mummies, save the victual ones, are votive offerings, as there is nothing to indicate conclusively that any of these is a Sacred Animal. Thus, the victual mummies are presented at the end of the list of mammals, followed by what we call "masquerading mummies", and, finally, by a group of mummies that are found in containers in the shape of obelisks, often fronted by a figure of Osiris. These mummies are treated as making up their own group, based on their external appearance. Although their contents vary in terms of species, they share a commonality in that all the animals found within the containers are related to Re or Atum.

For each mummy or coffin its number within the current publication is provided, as well as images. These are followed by museum inventory numbers, dimensions (all measurements are in centimetres), acquisition history, provenance, dating, and the scientific analysis carried out. The entries then include descriptions of the mummy, coffins (as relevant), any analyses and their results, details of textiles, bibliography for the artefact, and *comparanda*. Please note that for the textiles, details concerning them are found in Chapter 3, and also, for colours we use terms such as pinkish, orange-pinkish, yellow-pinkish, red-orange, dark or light brown etc., to describe the current colour of the textile although these may not accurately reflect the original colours, which have faded upon exposure to light and over time. Within this book, "**No.**" (plural "**Nos.**") refers to the numbers associated with each catalogue entry in this publication.

Additional images to those available in this catalogue, particularly of the CT scans, are available in the Museo Egizio's online collection.

Several people have worked on all aspects of the catalogue. The main division of work was:

General descriptions and editing: Salima Ikram (American University in Cairo)
Archaeozoology: Salima Ikram (American University in Cairo) and Alberto Valazza (Università di Torino, Dipartimento di Scienze Veterinarie)
Textiles: Matilde Borla (Soprintendenza archeologia belle arti e paesaggio per la città metropolitana di Torino)
Conservation: Cinzia Oliva (Restauro Tessuti Antichi)
Scientific analyses: Debora Angelici† (Conservation scientist)
Museum information and editing: Sara Aicardi (Fondazione Museo delle Antichità Egizie di Torino)
Bronze coffins and editing: Johannes Auenmüller (Fondazione Museo delle Antichità Egizie di Torino)
Wooden coffins and editing: Federica Facchetti (Fondazione Museo delle Antichità Egizie di Torino)
Inscriptions on wooden coffins and editing: Federico Poole (Fondazione Museo delle Antichità Egizie di Torino).

8.1 Baboons

It is unclear if baboons ever inhabited Egypt, as this country's environment and landscape are not conducive to the survival of these creatures.[1] Yet it is very hard to explain their key role in Egyptian religion, where they were related to the various manifestations of the sun god as well as to Thoth, a lunar deity, and they were also a manifestation of Babi, a baboon god who guarded the sky and was known for his virility.[2] Baboons are most often shown with their arms raised in adoration at the base of obelisks, at the top of doorways touched by the sun, or on monuments praising the sun. Clearly, baboon behaviour must have been observed first-hand at some point for these animals to be so closely linked to the sun god, as in nature, upon waking, baboons stretch their arms out and cry out as they warm themselves in the sun's rays.

Early remains of baboons at Hierakonpolis dating to the Naqada Period (c. 4000–3500 BC) show that very early in Egyptian history they were imported and often kept in inappropriate conditions, which resulted in disease and trauma.[3] Baboons that served as cult animals or were offered as mummies must have been imported from further south. They comprise two species: the Anubis or Olive baboon, *Papio (cynocephalus) anubis*, and the Mantled or Hamadryas baboon, *Papio hamadryas*. Their presence at sites such as Saqqara,[4] Tuna el-Gebel,[5] and the Cemetery of the Monkeys (Gabbanat el-Giroud) in Thebes[6] attests to an active trade in exotic animals.[7] Unfortunately, the long trek of over several months by donkey (subsequently at least one month by camel, although these animals were not commonly used in Egypt until the fourth or fifth centuries BC, if not later) through the Sahara, kept in confined spaces with insufficient food and water, often was detrimental to their health. Quite possibly many became ill along the way, and some died soon after their arrival in Egypt. The health of those that survived might also have been affected by an inadequate understanding of their needs, and they might have been kept in dimly-lit, confined spaces, and fed an inappropriate diet, leading to disease and an early demise.[8]

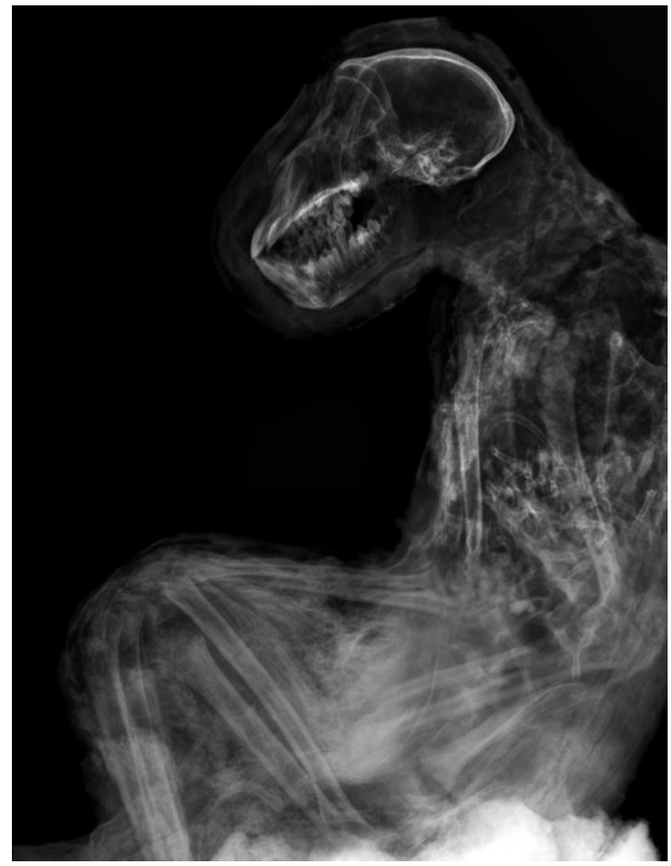
While the baboon mummies in the Turin collection show no evidence for disease, all but one died quite young. It is worth noting that the sole radiocarbon date of **No. 1** indicates that it was prepared at the very end of the Third Intermediate Period, or the start of the Late Period. This is an earlier date than what is more common with the other animal mummies in the Turin collection, and in keeping with the radiocarbon dates of four baboons from the Gabbanat el-Giroud that are now in Lyon.[9] It is possible that at least two of the Museo Egizio's baboons (**Nos. 1**–**2**) also came from the same site based on their position, method of mummification, and the materials found adhering to the bandages.

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[1] Lortet and Gaillard, *La faune momifiée*, 1905, pp. 207–39; Lortet and Gaillard, *La faune momifiée,* 1909, pp. 1–9.
[2] Wilkinson, *Complete Gods and Goddesses*, 2003, p. 196.
[3] Van Neer et al., in Hendrickx et al. (eds.), *Egypt at its Origins*, 2004, pp. 67–130; Linseele et al., *JARCE* 45 (2009), pp. 105–36; Van Neer et al., *IJO* 27 (2017), pp. 86–105; Van Neer et al., in Mashkour (ed.), *Archaeozoology of the Near East*, 2017, pp. 388–402.
[4] Ikram, in Raven et al. (eds.), *Memphite Tomb of Horemheb*, 2011, pp. 365–74.
[5] von den Driesch, *Sartoniana* 6 (1993), pp. 15–36; Boessneck and von den Driesch, in Boessneck (ed.), *Tuna El-Gebel 1*, 1987, pp. 37–207.
[6] Lortet and Gaillard, *La faune momifiée*, 1905, pp. 207–48.
[7] Smith, *A Visit to Ancient Egypt*, 1974; von den Driesch, *Sartoniana* 6 (1993), pp. 15–36; Goudsmit and Brandon-Jones, *JEA* 86 (2000), pp. 111–19; Van Neer et al., in Mashkour (ed.), *Archaeozoology of the Near East*, 2017, pp. 388–403.
[8] von den Driesch and Boessneck, *TierPrax* 13 (1985), pp. 367–72; von den Driesch, *Sartoniana* 6 (1993), pp. 15–36; Nerlich et al., *IJO* 3 (1993), pp. 189–98; von den Driesch et al., in Grupe and Peters (eds.), *Conservation Policy*, 2004, pp. 231–78; Ikram, in Raven et al. (eds.), *Memphite Tomb of Horemheb*, 2011.
[9] One is published in Richardin et al., *Radiocarbon* 59.2 (2017), pp. 595–607: https://doi.org/10.1017/RDC.2016.102, and three more have been reported by Wim Van Neer, personal communication.

1





Inventory number: Cat. 2345/1
Object: Baboon mummy
Dimensions: H: 52.2, W: 32
Acquisition: Acquired before 1882
Provenance: Unknown
Date: 740–400 BC (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating, Pyrolysis-GC/MS, UVF, Optical Microscopy
Description: Mummy of a baboon wrapped with the knees flexed in a seated position on what appears to be a low stool or cushion made of loosely woven and blackened (maybe by resin) textile reinforced with mud, coarse sand, and gravel. The right hand rests on its lap, while the left hand has slightly slipped down along the thigh. The tail curves around the right side of the body. Although the seated pose is fairly standard for baboon mummies,[10] seats are not known.

The animal is wrapped in a variety of linens. These are for the most part hidden under a coating of black oleo-resinous substances, so that only some fabrics (see table below) can be identified under the coatings. These fabrics are visible only through gaps at the shoulder, arms, and knees. Therefore, their layering cannot be adequately determined.

The foot area is broken. The toes are visible, but some bones are missing. There is no surface preserved that could support original paint, so it is unclear whether this baboon, like **No. 2**, bore an inscription.

Scientific examination

CT investigations

Based on the CT scans, the animal is a male juvenile baboon (probably *Papio anubis,* based on skull, morphology), as evidenced by the large size of the canines (cuspids) waiting to descend.[11] Its age at death was probably between 2.5 and

[10] Ikram and Iskander, *Non-Human Mummies,* 2002, pp. 27–28, 84, 86–87, nos. 29837–29839; Davis, *Tomb of Siphtah,* 1908, unnumbered plates; Raven and Taconis, *Egyptian Mummies*, 2005, pp. 241–42.
[11] Bramblett, *AJPA* 30 (1969), pp. 161–71: https://doi.org/10.1002/ajpa.1330300202.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	48 x 16	Undyed	
T2	Linen	S	Warp-faced	26 x 9	Undyed	
T3	Linen	S	Warp-faced	26 x 12	Dark brown (?)	
T4	Linen	S	Warp-faced	72 x 15	Dark brown (?)	

Textile notes: Four different qualities of textile were used to wrap the mummy.

4 years of age, based on its mainly deciduous dentition, as well as the state of epiphyseal fusion of the humerus.[12] The head is padded with bandages. A rope-type element (probably twisted linen) was wrapped around it, followed by more textile, wrapping also around the whole body of the animal. Finally, a generous coating of a dark resinous material was applied onto the textile, creating a tight carapace over it.

The lower section of the thoracic cavity appears to have been eviscerated. No thoracic or abdominal organs are preserved. After the evisceration, some bandages were introduced into the cavity, while other bandages were added for the arms. Inside the wrappings, the skeleton is incomplete and slightly disordered. The cervical rachis and the sternum are missing, the shoulder blades are disarticulated, and a dislocation of vertebral segments and pelvic bones is recognisable.

Radiocarbon dating (^{14}C)

Fur, calibrated age (95% probability): 740–400 BC.[13]

Analysis of organic residue

Pyrolysis-GC/MS was carried out on three samples from this mummy. The first was derived from the baboon's body and showed traces of coniferous resin. The second came from the "cushion" and contained beeswax, often found in mummification,[14] and gypsum, identified by XRF. The third was taken from the outermost textile layer covered with a black substance from the animal's left side. Its analysis showed that it was mainly composed of lipids (probably of animal origin). There is no discernible reason, at present, that would explain the presence of lipids on the outermost bandage layer, unless they are a modern contaminant.

Bibliography: Orcurti, *Catalogo illustrato*, 1855, p. 81, no. 58a; Fabretti et al., *Regio Museo*, 1882, p. 332, no. 2345 [4–5]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19.

Parallels: Valley of the Kings, Tombs 50 and 51 (Davis, *Tomb of Siphtah,* 1908, p. 17, unnumbered plates); Cairo, EMC CG 29838–39 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 84, 86–87); Leiden, RMO AMM 15 (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 241–42).

[12] Bramblett, *AJPA* 30 (1969), pp. 161–71: https://doi.org/10.1002/ajpa.1330300202; Raven and Taconis, *Egyptian Mummies*, 2005, p. 242.

[13] This is an earlier date than most of the animal mummies radiocarbon-tested in Turin and is in keeping with the dates for one of the monkey mummies in the Lyon collection (Richardin et al., *Radiocarbon* 59.2 [2017], pp. 595–607: https://doi.org/10.1017/RDC.2016.102).

[14] The beeswax was used during the mummification treatment (for example: Brettell et al., SC 62 [2017], pp. 68–82: https://doi.org/10.1179/2047058415Y.0000000027; Buckley et al., *Nature* 431 (2004), pp. 837–41: https://doi.org/10.1038/nature02849.

2





Inventory number: Cat. 2345/2
Object: Baboon mummy
Dimensions: H: 57, W: 32
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Probably late Third Intermediate Period-Late Period (722–332 BC), based on parallel with **No. 1**
Scientific analyses: X-ray, CT, XRF, UVF, IR-950 nm
Description: Mummy of a baboon wrapped in a seated position with its hands resting on its knees, with the external bandages covered with a thick layer of black resin-like substance that creates a kind of carapace. The mummy is fairly encrusted with a matrix of sand, chert pebbles, small limestone chips, and gravel in its base and along the back and left side. This mixture probably adhered to the mummy because the black resin-like substance was still sticky when the mummy came into contact with the matrix. It seems as if a sharp tool was used to cut it out of this matrix, as evidenced by the straight sides. Different qualities of linen have been used to wrap the animal, possibly impregnated with a black resin-like substance similar to that found in **No. 1**. These are, for the most part, hidden under a coating of black resin-like substances. Hence, only some fabrics can be identified under the coating. Textiles are still visible where the blackened surface is broken, particularly at the head and body. T1 is visible on the head and part of the rear body as bandages about 2.5 cm wide, while T2, which is very fine and compact, is visible on the head. The inner bandages are coloured dark brown by a substance that could be an oil, as in general the linen would be undyed. The outermost bandages are blackened by embalming agents, with a black resin-like substance creating a sort of carapace over the whole. A small break through the bandages at the back of the neck reveals the baboon's yellow fur. Based on its similarity to **No. 1**, it might also date to the Late Period.

A vertical inscription, bordered by a pair of lines in yellow, appears on the blackened bandages in the area of the baboon's lap.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	linen	S	Warp-faced	28 x 13	Dark brown (?)	
T2	linen	S	Warp-faced	100 x 37–40	Dark brown (?)	

Textile notes: Two different qualities of textile were used to wrap the mummy.

Inscription



It is difficult to assign a specific meaning to the signs as they are unclear. The first sign, which is not very clear, could also be the oar-glyph *ḫrw* (*GEG* P8) or a *nfr* (*GEG* F35). The sequence of the stool- and arm-hieroglyphs (*GEG* Q3 and G36) is suggestive of the beginning of a proper name (*pꜣ-dj*...). The reading of the last visible sign in the column remains doubtful.

Scientific examination

CT investigation

The CT scans show that the skeleton is incomplete, possibly due to tampering in modern times, though more likely in antiquity: the arms (radius/ulna down), portions of the legs, and the tail are present. The animal is a juvenile baboon (probably *Papio anubis*), presumably between 2.5 and 4 years of age, judging from the epiphyseal fusion of the radius and ulna.[15] The inner space corresponding to the skull, thorax, and abdomen is filled with an extremely hypodense and finely mixed material. Traces of fur show through the bandages at the neck. It is difficult to know whether the animal was originally mummified whole, and then, due to a break, portions fell out or were removed, and the mummy was subsequently restored in antiquity. It is also conceivable that the original mummy had an incomplete skeleton and was mummified thus. Another possibility is that the loss of the skull and parts of the skeleton are post-excavation and that the restorations at the neck level were made in the nineteenth century.

Analysis of the inscription

The vertical inscription was analysed non-invasively. Initial observation by digital microscopy indicated that it was made with a yellow pigment. The XRF-analysis confirmed the presence of orpiment (As_2S_3). In order to verify the presence of some parts of the inscription no longer observable in visible light, Infrared Reflectography (IR-950 nm) was applied, but no further details stood out.

UVF

Ultraviolet Fluorescence Analysis showed particularly fluorescent material (maybe plaster) in the neck area and on part of the head, probably from a previous restoration treatment. This material could confirm that the upper part of the mummy was detached in the past and reassembled at a (slightly) later time. Perhaps further analyses could elucidate this point.

Bibliography: Fabretti et al., *Regio Museo,* 1882, p. 332, no. 2345 [4–5]; Grilletto, *Materiali antropologici e zoologici,* 1991, pp. 12, 19.

Parallels: Valley of the Kings, Tombs 50 and 51 (Davis, *Tomb of Siphtah,* 1908, p. 17, unnumbered plates); Cairo, EMC CG 29838–39 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 84, 86–87); Leiden, RMO AMM 15 (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 241–42).

[15] Bramblett, *AJPA* 30 (1969), pp. 161–72: https://doi.org/10.1002/ajpa.1330300202.

3





Inventory number: Provv. 1485
Object: Baboon mummy
Dimensions: L: 36
Acquisition: Donation, 1952
Provenance: Unknown
Date: Undetermined
Scientific analyses: CT, Optical Microscopy
Description: Right forearm (radius, ulna and hand) of a mummy of a baboon; the soft tissue and fur is present. The arm was probably placed parallel to, and resting upon, the animal's thigh, with the hand curving over the knee and hanging down. The arm is wrapped spirally in dense bandages (width: 1.8–2 cm). The bandages on the top of the arm are stained black, probably from oil and dirt, while only some stains appear on the lower side that would have rested on the thighs. The hand is exposed and the bandages closest to the body are darker, while the ones further away are lighter. It is possible that it was buried in a different milieu than **Nos. 1**–**2**, as it has no encrustations. Perhaps it was buried in a rock-cut tomb (for such examples, see Cairo, EMC CG 29837–29839)[16] rather than originating from an animal catacomb, as the majority of the mummies coming from the Baboon Galleries of the Sacred Animal Necropolis at Saqqara and Tuna el-Gebel are largely skeletonised, and were often encased in plaster, while this specimen was not.[17] The burial matrix of the mummies from the Gabbanet el-Giroud is more similar to that of baboon mummies **Nos. 1**–**2** in this catalogue.

[16] Ikram and Iskander, *Non-Human Mummies*, 2002; cf. Davis, *Tomb of Siphtah*, pp. 4–5, 17–18.
[17] Perizonius et al., *EgArch* 3 (1993), pp. 31–33; von den Driesch et al., in Grupe and Peters (eds.), *Conservation Policy*, 2004, pp. 231–78; Brandon-Jones and Goudsmit, in Urbani et al. (eds.), *World Archaeoprimatology*, 2022, pp. 310–53.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	24 x 12	Undyed	

Textile notes: One quality of textile was used to wrap the mummy.

Scientific examination

CT investigation

The CT scan reveals that the right forearm belonged to a young baboon, approximately 7 years of age: the bones have reached their complete morphological development, but physeal cartilages are still present or in closure.[18] The carpus bends 110°. The radius, ulna, carpus, metacarpals, and phalanges are preserved.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 17, 19.

Parallels: Valley of the Kings, Tombs 50 and 51 (Davis, *Tomb of Siphtah,* 1908, p. 17, unnumbered plates); Cairo, EMC CG 29838–39 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 84, 86–87); Leiden, RMO AMM 15 (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 241–42).

[18] According to Bramblett, *AJPA* 30 (1969), pp. 161–72: https://doi.org/10.1002/ajpa.1330300202.

8.2 Cattle

Cattle (*Bos taurus*) played a crucial role in ancient Egypt.[19] On a practical level, they served as food (meat, marrow, and milk),[20] and provided raw materials for furniture, shelters, wrappings, clothing, tools, weapons, and vessels. On a spiritual and metaphysical level, bulls were associated with the king, who wore a bull's tail as a mark of office and one of whose titles was "Mighty Bull". Bulls were manifestations of various creator and solar deities, such as Ptah, Atum, and Re, and were manifested as the Apis, Mnevis, and Buchis bulls, whose cult persisted into the Roman Period.[21] Cows were identified with the goddesses Bat, Hathor, Hesat, Mehet-Weret, and Shentayet.[22] Egypt's wealth was often calculated in cattle[23] and the choice cuts that were placed in tombs as offerings were derived from cattle.[24] Clearly cattle played a key role in the secular and sacred life of the ancient Egyptians.

Young cattle mummies are attested from excavations as well as from several museum collections,[25] with Turin holding a significant number. Unfortunately, their provenance is unknown, so they cannot be linked to a particular cult centre. The presence of the triangle on their forehead evokes the Apis bull, as described by the fifth century BC Ionian historian, Herodotus (II: 153; III: 28). All the mummies in the Turin collection were prepared in an unusual way compared to other animal mummies: the bare bones were gathered together and then wrapped to resemble the animal. Such a method has also been noted in some sheep mummies, that are also similarly wrapped,[26] as well as other cattle mummies from other museums and excavations. It has been suggested that the animals were consumed or macerated, the bones gathered together, and then wrapped in a simulacrum of the animal, couchant.[27] It should be noted that adult cattle mummies have been found in Saqqara in the area of the Sacred Animal Necropolis (Mother and Brother of Apis Catacombs),[28] and in other parts of the site.[29]

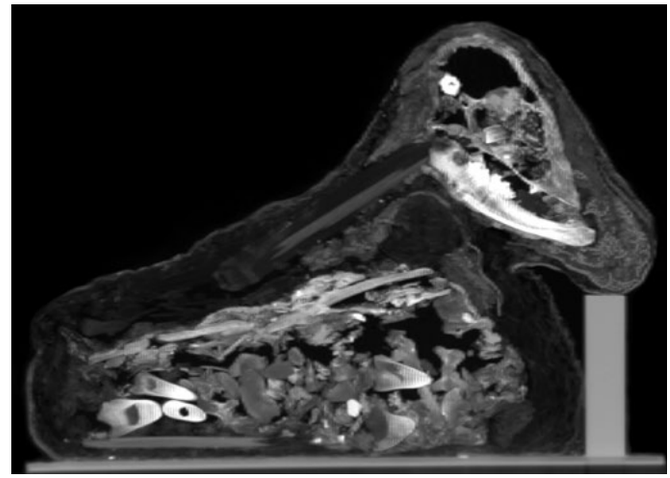
The age at death for cattle is based on tooth eruption and epiphyseal fusion.[30] Unfortunately, tooth wear could not be used as a criteria as, for the most part, the occlusal surfaces of the teeth could not be imaged. All the cattle mummies (or their remains) were of young animals, between 6 to 12 months of age, save the unwrapped and fragmentary mandible that was probably of an older animal.

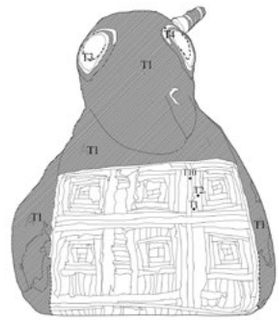
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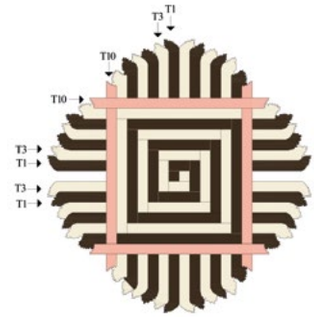
[19] Lortet and Gaillard, *La faune momifiée*, 1905, pp. 41–71, 254–68; Lortet and Gaillard, *La faune momifiée,* 1909, pp. 59, 86–88.
[20] Food mummies involving cattle appear under the rubric "Victual Mummies".
[21] Dodson, in Ikram (ed.), *Divine Creatures,* 2015, pp. 72–105.
[22] Wilkinson, *Complete Gods and Goddesses*, 2003, pp. 170–75.
[23] Wilkinson, *Rise and Fall of Ancient Egypt*, 2010, p. 59.
[24] Ikram, *Choice Cuts*, 1995.
[25] Brussels E.1870; Cairo, EMC CG 29676; Lortet and Gaillard, *La faune momifiée*, 1905, pp. 41–71, 254–68; Lortet and Gaillard, *La faune momifiée*, 1907, pp. 59, 86–88; Cailliaud, *Voyage à Méroé,* 1826, p. 13.
[26] Raven and Taconis, *Egyptian Mummies*, 2005, pp. 268–70; Louvre N2886.
[27] Raven and Taconis, *Egyptian Mummies*, 2005, pp. 268–70; Louvre N2886; Ikram and Iskander, *Non-Human Mummies*, 2002, p. 12, no. 29676; Charron et al., *BSEG* 33 (2022), pp. 5–23.
[28] Smith, *A Visit to Ancient Egypt*, 1974; Smith, in Lloyd (ed.), *Studies in Pharaonic Religion and Society*, 1992, pp. 201–25; Smith et al., *Sacred Animal Necropolis: Mother of Apis Inscriptions*, 2011.
[29] Charron et al., *BSEG* 33 (2022), pp. 5–23.
[30] Barone, *Anatomie comparée*, 1965, in conjunction with: Silver, in Brothwell and Higgs (eds.), *Science in Archaeology*, 1969, pp. 282–302; Schmid, *Atlas of Animal Bones*, 1972.

4









Inventory number: Cat. 2343/1
Object: Cattle mummy
Dimensions: L: 67, W: 43, H: 47
Acquisition: Acquired before 1882
Provenance: Unknown
Date: 540–210 BC (^{14}C date)
Scientific analyses: CT, ^{14}C dating, UVF, Optical Microscopy
Description: Cattle mummy representing the animal "seated" or couchant. The head is naturalistic while the body is rendered in a rough trapezoidal form. The head and forepart of the body are covered in a dark brown fabric (T1), while the rest of the animal is covered with an undyed cloth (T2). Underneath the undyed cloth, several other textile fabrics (T5, T6, T7, T8, T9) have been used as stuffing to give the mummy a more robust form.

On the head, only one horn (not an actual skeletal element) is preserved. It is made of linen, papyrus, and several linen bandages, which were then covered with a series of dark brown (T1) and undyed bandages (T2), wrapped around the cloth core in an alternating pattern. The other horn has broken off, as have both ears. Details of the muzzle are appliquéd or painted on the brown background, and a piece of textile (T1), also dark brown, with self-bands can be seen here.

The eyes were appliquéd, with parts missing now. Black pupils are painted on the white cornea and encircled with small strips, alternately bleached (T3) or red-brown (T4). One more bleached strip (T3) is added to indicate the eyebrow. The bib (frontal decoration) consists of six square meander coffers arranged in three rows and three columns. Only two rows are entirely visible as the lowest one is incomplete. Each coffer is made by interlacing twelve polychrome strips on each side, alternatively dark brown (T1) and undyed (T2), apart from one that appears white (T3) (maybe bleached). Additional strips (probably originally pinkish or orange) (T10) run on the sides of each row and column, in order to fix the composition to the body. Finally, the frontal decoration is enclosed on the top by a piece of dark brown textile (T1) that goes under the chin and is covered on its sides by another piece of the same dark brown fabric (T1) that surrounds the neck. The last fabric stretched over the mummy is the undyed linen (T2) that covers the posterior and base of the mummy.

Scientific examination

CT investigation

The CT scans show that the mummy bundle consists of a skull, with no horns, and an incomplete skeleton consisting of disarticulated bones. The form of the animal,

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	28 x 10	Dark brown	Self-bands
T2	Linen	S	Warp-faced	28 x 10	Undyed	Selvedge
T3	Linen	S	Warp-faced	48 x 15	Bleached (?)	
T4	Linen	S	Warp-faced	54 x 21	Red-brown	
T5	Linen	S	Warp-faced	32 x 10	Undyed	Self-bands
T6	Linen	S	Warp-faced	40 x 16	Undyed	Self-bands Rolled hem (sewing threads S-twisted)
T7	Linen	S	Irregular basket weave	3/2 (thread count not precisely determinable)	Undyed	
T8	Linen	S	Warp-faced	36 x 10	Undyed	
T9	Linen	S	Warp-faced	20 x 9	Undyed	
T10	Linen	S	Warp-faced	48 x 14	Pinkish/orange (?)	Self-bands

Textile notes: Ten different qualities of textiles were used to wrap the mummy and create the pattern.

though, is suggested by the wrappings. The rest of the animal is incomplete and consists of disarticulated and skeletonised bones in the body of the mummy bundle. From the remaining bones, it is possible to determine that the animal was juvenile, between 7 and 13 months of age judging from epiphyseal fusion. The incisors are not present, the mandible is unfused, and there is mild collapse of the maxillary bones. The calf was not excerebrated, as is normal with animal mummies (see Chapter 1).[31] The shape of the mummy is created by a structure.

This structure is made up of several different vegetal elements. One, probably a piece of wood, goes through what would be the cervical region and supports the head and is forked. The body rests on a base that might be made of reeds and papyrus. It is made up of five longitudinal sticks, about 1.5 cm in diameter, and three crossbars, 15–17 cm long. The loose skeleton is piled on top of this. The bones are secured by strips of papyrus pith. Fragments of stone and gravel are interspersed with the wrappings, and a thick layer of papyrus pith strips reinforces the bone bundle in the centre of the mummy.

Radiocarbon dating (^{14}C)

Plant element, calibrated age (95% probability): 540–210 BC.

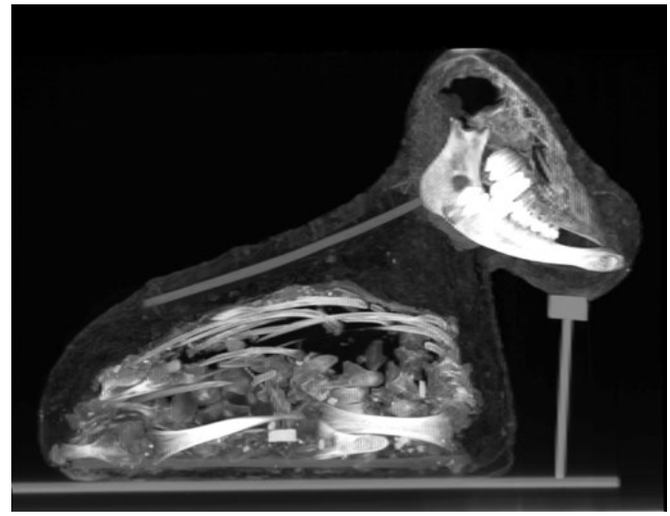
Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 332, no. 2343 [1–2]; Grilletto, *Materiali antropologici e zoologici*, 1991, p. 12.

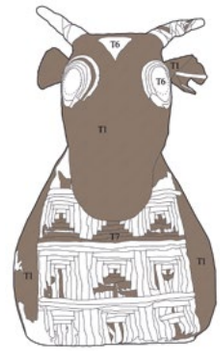
Parallels: Gaillard, *Contribution*, 1934, p. 30; Brussels, MRAH E.1870 (Francot et al. [eds.], *Les momies égyptiennes*, 1999, pp. 21–22, 50, figs. 27–28, p. 76, figs. 85–86); Cairo, EMC CG 29676 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 12, 77); London, BM EA6771–74, though the bib has a different pattern.

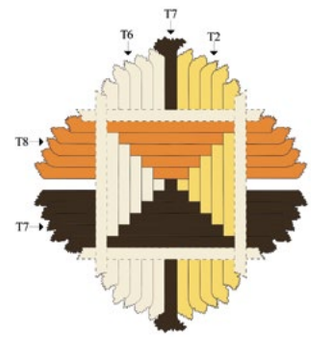
[31] Raven and Taconis, *Egyptian Mummies*, 2005, pp. 268–70; Louvre N2886; Ikram and Iskander, *Non-Human Mummies*, 2002, p. 12, no. 29676.

5









Inventory number: Cat. 2343/2
Object: Cattle mummy
Dimensions: L: 66, W: 26, H: 48
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Probably Late Period – Ptolemaic Period (722–30 BC)[32]
Scientific analyses: CT
Description: Cattle mummy representing the animal lying down on its legs folded under the body with the head defined and the body wrapped as a roughly trapezoidal bundle. The head and foreparts of the body are covered in a dark brown fabric (T1), while the rest of the animal is covered with an undyed cloth (T2). Under these cloth, several textiles (T3, T4, T5) have been used to stuff the animal to give it shape. Details of the muzzle are appliquéd and painted on the brown background. Four lines of self-bands running from ear to ear look like wrinkles on the animal's forehead. The area in between the eyes is decorated with an inverted triangle, reminiscent of the markings of the Apis bull, made with a piece of bleached textile (T9). Black pupils are painted on a bleached textile (T6) and encircled with small alternating undyed (T2) and red-brown (T7) strips. Two arched strips of bleached textile are added for the eyebrows. The horns are wrapped separately with bleached (T6), yellow-orange (T8) and red-brown bandages (T7). The ears have details in bleached appliqué within their exteriors that are dark brown (T1). The bib pattern is similar to the one of **No. 6** with four different colours (bleached, yellow-pink, brown and yellow-orange) creating square coffers with polychrome triangles. The bib consists of three coffers arranged in three rows. Only two of them are entirely visible, while the lower one is incomplete in the bottom section (difficult to say if this was intentional). Any single coffer is made by interlacing five bleached (T6) and undyed (T2) vertical strips with alternatively dark brown (T7) and yellow-orange (T8) horizontal ones on a dark brown background (T1). Each column and each strip is then fixed by a bleached strip (T6), now largely incomplete. Finally, the frontal decoration is enclosed on the top by a piece of dark brown textile (T1) that passes under the chin and is covered on its sides by another piece of the same brown fabric that surrounds the neck. The last

[32] The shape and the decorative pattern are similar to mummies **Nos. 4, 6** and these were probably obtained as a group.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	28 x 12	Dark brown	Self-bands
T2	Linen	S	Warp-faced	40 x 10	Undyed	Starting border Self-bands Warp fringe (fragment) Darning
T3	Linen	S	Warp-faced	24 x 12	Undyed	Rolled hem
T4	Linen	S	Basket, balanced	12 x 10	Undyed	
T5	Linen	S	Warp-faced	36 x 14	Undyed	
T6	Linen	S	Warp-faced	56 x 18	Bleached	Self-bands
T7	Linen	S	Warp-faced	52 x 14	Red-brown	
T8	Linen	S	Warp-faced	40 x 10	Yellow-orange	

Textile notes: Eight different qualities of textile were used to wrap the mummy and create the pattern.

fabric stretched on the mummy is the undyed linen (T2) that covers the posterior and base of the mummy.

Scientific examination

CT investigation

The CT scans show that the calf is between 6 and 10 months of age, judging from the proximal radial epiphysis that is in the process of fusing; the age of 9 months is feasible based on contemporary animals and breeds,[33] while an age of 12–15 months is more likely, based on other breeds.[34] The head is erect and is joined to the trunk by a set of five or six sticks of some sort. As with **No. 4**, the mummy bundle consists of a pile of disarticulated and skeletonised bones (two humeri, one distal epiphysis of a femur, ulna, radius, tibia, and no vertebrae), not in anatomical order, with the epiphyses and smaller bones scattered throughout the package, lying primarily in the area of the rump of the creature. The base consists of six longitudinal sticks and four crossbars, filled in with what is probably clayey material. Many pieces of linen envelop the bones and provide extra padding, and all of these are wrapped together in papyrus pith strips, filling out the package further, as well as securing the skeletal elements. Finally, the package is covered by a plain linen shroud.

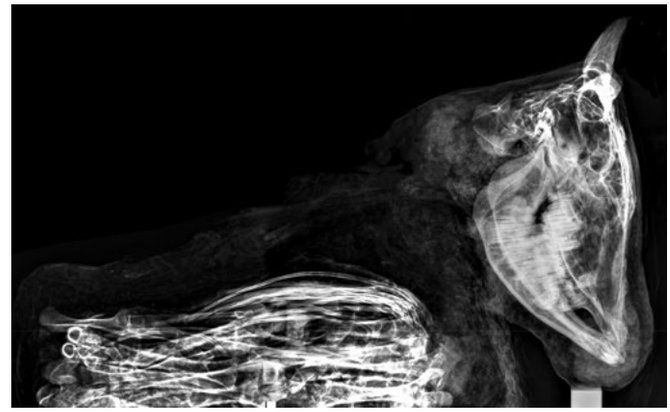
Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 332, no. 2343 [1–2]; Grilletto, *Materiali antropologici e zoologici*, 1991, p. 12.

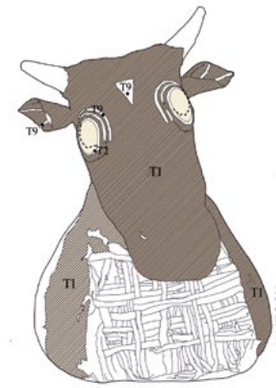
Parallels: Gaillard, *Contribution*, 1934, p. 30; Brussels, MRAH E. 1870 (Francot et al. [eds.], *Les momies égyptiennes*, 1999, pp. 21–22, 50, figs. 27–28, p. 76, figs. 85–86); Cairo, EMC CG 29676 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 12, 77); London, BM EA6771–74, though the bib has a different pattern.

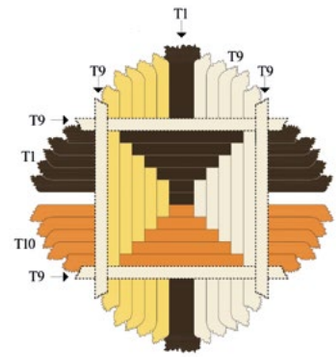
[33] Hoey et al., *VetRec* 179.21 (2016): https://doi.org/10.1136/vr.103689.
[34] Barone, *Anatomie comparée*, 1965, p. 76.

6









Inventory number: Cat. 2344
Object: Cattle mummy
Dimensions: L: 85, W: 43, H: 54.5
Acquisition: Acquired before 1882
Provenance: Unknown
Date: 410–360 BC (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating, UVF, Optical Microscopy
Description: Cattle mummy representing the animal lying with the legs folded under the body. As with the other similar examples, the head is naturalistic while the body is rendered schematically, in a rough trapezoidal form. The head and foreparts of the body are covered in a dark brown fabric (T1), while the rest of the animal is covered with an undyed cloth (T2) that secures textile padding. Some of these (T5–T6) are in the form of bandages. In a hole on the back, a rare piece of woollen fabric has been identified (T3), supporting the late date of this mummy. This is a unique find in animal mummies, and possibly in mummies in general, and attests to the fact that mummy wrappings were derived from a variety of sources – some examples of Roman date also include cotton.[35]

The horn-cores (the keratin is not present) are spirally wrapped separately in undyed linen (T2) covered with a dark substance. The dark brown (T1) ears have details in undyed fabric (T2) appliquéd within: a ball of cloth that helps them hold their shape, and lines depicting hair. Details of the muzzle are appliquéd on the brown background. On the head, appliquéd cloth (T9, bleached) provides details of the inverted white triangle between the eyes, reminiscent of the markings of the Apis bull. The eyes are made by appliquéd bleached textile (T9) with the pupils painted black and encircled by two concentric strips, one undyed (T2) and one dark brown (T1). Two arched strips of bleached textile (T9) are added to create the eyebrows. The bib is very badly preserved. The pattern is similar to **No. 5**, and made of four different colours (undyed, bleached, brown and yellow-orange) that are differently arranged in square coffers with polychrome triangles. There are three rows and three columns of coffers. Of these, only two are entirely visible, while the lowest one is incomplete as it was not visible. Each coffer is made by inter-

[35] Jones, in Rossi and Ikram (eds.), *North Kharga Oasis Survey*, 2018, pp. 541–54; Dunand et al., *El-Deir Nécropoles IV*, 2017; Letellier-Willemin, in Ikram et al. (eds.), *The Ancient Egyptians and the Natural World*, 2021, pp. 183–89.

	Material/ fibre type	Spin form	Weave	Thread count/ density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	40 x 15	Dark brown	
T2	Linen	S	Warp-faced	36 x 14	Undyed	Selvedge Self-bands Warp fringe (fragment)
T3	Wool	S	Balanced	13 x 13	Undyed	
T4	Linen	S	Warp-faced	46 x 15	Undyed	Rolled hem (sewing thread Z, 2s)
T5	Linen	S	Warp-faced	26 x 10	Undyed	Warp fringe (length cm 20)
T6	Linen	S	Warp-faced	26 x 10	Undyed	
T7	Linen	S	Warp-faced	32 x 9	Undyed	Selvedge Overlock stitching
T8	Linen	S	Warp-faced	36 x 11	Undyed	Self-bands
T9	Linen	S	Warp-faced	56 x 15	Bleached (?)	Self-bands not pictured
T10	Linen	S	Warp-faced	34 x 12 wefts	Yellow-orange	Not pictured

Textile notes: Ten different qualities of textiles were used to wrap the mummy and create the pattern.

lacing six bleached (T9) and five undyed (T2) vertical strips with alternately dark brown (T1) and yellow-orange (T10) horizontal ones, apart from one in the middle that is dark brown (T1). The poor state of preservation does not allow for the correct identification of the additional strips, which generally frame and separate the rows and columns. Finally, the bib is enclosed on the top by a piece of dark brown textile (T1) that goes under the chin and is covered on its sides by another piece of the same dark brown fabric (T1) that surrounds the neck. The shroud consists of undyed linen (T2) that covers the back and base of the mummy.

Scientific examination

CT Investigation

The CT scans reveal a calf between 8 and 11 months of age, judging from the closed proximal and distal radial epiphysis,[36] though an older age of 12 to 20 months is also possible, due to the differences in fusion reported for other breeds.[37] The skull is present within the wrappings and is joined to the trunk by a set of five or six sticks. The interior, as with the other cattle mummies, consists of a pile of skeletonised and disarticulated bones concentrated in the rump of the creature. No vertebrae are present. The bones are wrapped in many layers of linen, secured by bandages, and then papyrus pith strips held in place by the final shroud. The muzzle is large and reinforced by wads of linen, spiral bandages, vegetal elements, threads and more linen.

The base consists of six longitudinal sticks and four perpendicular ones, the spaces within filled with probably clayey material.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 410–360 BC.

Plant element, calibrated age (95% probability): 400–190 BC.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 332, no. 234 [3]; Ministero della pubblica istruzione (ed.), *Documenti inediti*, III, 1880, p. 260 [no. 20]; Orcurti, *Catalogo illustrato*, 1855, p. 82 [no. 64h]; Grilletto, *Materiali antropologici e zoologici*, 1991, p. 12; Tamburini et al., *HeritSci* 9 (2021), pp. 7, 13, Table 2.

Parallels: Gaillard, *Contribution*, 1934, p. 30; Brussels, MRAH E. 1870 (Franco et al. [eds.], *Les momies égyptiennes*, 1999, pp. 21–22, 50, figs. 27–28, p. 76, figs. 85–86); Cairo, EMC CG 29676 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 12, 77); London, BM EA6771–74, though the bib has a different pattern.

[36] Hoey et al., *VetRec* 179.21 (2016): https://doi.org/10.1136/vr.103689.
[37] Barone, *Anatomie comparée*, 1965, p. 76.

7



Inventory number: Provv. 6118
Object: Cattle mummy
Dimensions: Not applicable
Acquisition: Unknown
Provenance Unknown
Date: Undetermined
Scientific analyses: None
Description: Mandible and part of the skull, presumably from a bovid mummy. All the permanent teeth present indicate an age of the animal of at least 1 year; it was more likely 2 years old. A dark material seems to have been applied to it, particularly in the area of the premaxilla. It is possible that a black resin-like substance was used to embalm the animal, though it is not beyond the realm of possibility that this is in fact the melted remains of the animal's skin. However, there is a bit of paper attached to the skull, on top of which there is some of this black substance, suggesting that it might be a modern conservation treatment rather than an ancient substance.

Bibliography: Unpublished.
Parallels: Several cattle skulls have been recovered from all over Egypt, including the Sacred Animal Necropolis at Saqqara; for more recent finds see Charron et al., *BSEG* 33 (2002), pp. 5–23.

8.3 Gazelle

While gazelles provided food for early hunters, they were not a major component of the Egyptian diet. However, they feature in hunting and offering scenes, and their capture and slaughter in tomb and temple offering scenes[38] is symbolic of the triumph of order (*maat* in Egyptian) over the chaotic forces of nature (*isfet* in Egyptian). Until as recently as the early 2000s, gazelles were found in both the eastern and western deserts, although by the second decade of the twenty-first century they have almost vanished from both areas due to hunting and environmental depredation.[39] It is difficult to identify gazelle species, particularly from bones and radiographs, as these animals are being re-categorized taxonomically based on genetic research. It is most likely that Egypt hosted the Dorcas gazelle, *Gazella dorcas*, the mountain or Arabian gazelle, *G. gazella,* and the slender-horned gazelle, *G. leptoceros.*[40]

In addition to providing food, skin for leather, and horns used to fabricate ornaments, musical instruments, and hooks for clothing, gazelles also featured in the Egyptian pantheon. They were sacred to the goddess Anuket, a huntress and protector; Anuket was associated with Hathor as well, which, by extension, connects the gazelle to Hathor.[41]

[38] Lortet and Gaillard, *La faune momifiée*, 1905, pp. 78–81.
[39] Sarant, "Endangered Species–Egypt's Gazelles", *Egypt Independent*, October 21, 2011, https://egyptindependent.com/endangered-species-egypts-gazelles/, accessed 13 June 2024; Hoath, *Field Guide*, 2003, pp. 151–56.
[40] Lortet and Gaillard, *La faune momifiée,* 1905, pp. 78–81.
[41] Wilkinson, *Complete Gods and Goddesses*, 2003, p. 138.

8





Inventory number: Suppl. 1599
Object: Gazelle mummy
Dimensions: L: 40, W: 14.4
Acquisition: Purchased by Schiaparelli (1900–01)
Provenance: Unknown, probably Kom Mereh/Kom Ombo, based on parallels
Date: AD 10–380 (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating
Description: A small animal mummy package, wrapped to look like a gazelle. It is very flat and in some places the yellow-brown fur is visible, still adhering to the skin. The animal was wrapped in linen (T1, basket weave) after being eviscerated, desiccated, and anointed with a black resin-like substance. Some loose-weave, somewhat coarse pieces of linen have been used to pad the body. Then lengths of papyrus – a few of which were stripped of their outermost layer – were wrapped around it repeatedly, creating a cohesive supporting meshwork that would also make the artefact thicker and protect the skeleton. A shroud (T2) was then used to cover it. This was kept in place by a black resin-like substance. Some larger pieces of this shroud also cover the head. A possible trace of a drawn-on eye in paint is present on one side of the animal's head, which is also seen in other similar mummies (see the list of parallels below). The horns and ears are modelled out of cloth.

Scientific examination

CT investigation

It is difficult to clearly identify the animal. It is either a gazelle or a young ovicaprid, less than 11 months old based on epiphyseal fusion. No horns are visible on the radiographs, although it should be noted that the skull is very damaged. The absence of horns might reflect the age and sex of the gazelle (a young female) or might be indicative of a lamb/kid. However, where the bandages have worn away, the length, colour, and texture of the fur more closely resemble that of a gazelle. The CT scans show that the hind legs were forced into the seated position, probably by severing the tendons.

Radiocarbon dating (^{14}C)

Two ^{14}C samples from this specimen were taken: one of the papyrus and the other from the textile. The plant elements had a calibrated age (95% probability) of AD 80–330.

The textile's calibrated age (95% probability) is AD 10–240 and 130–220.

The dates from the textile were more confusing, as the same piece of textile yielded different date ranges: AD 10–240 and AD 130–380. Although the dates are different, there is a reasonable overlap between these dates: AD 130–220, which implies that this mummy was one of the most recently produced in the Turin collection; it is possible, however, that the dates are affected by the Hallstatt Plateau. The dates for this gazelle are in keeping with what has been found on another gazelle mummy in Lyon (90001291).[42]

[42] Richardin et al., *Radiocarbon* 59.2 (2017), pp. 595–607: https://doi.org/10.1017/RDC.2016.102.

	Material/ fibre type	Spin form	Weave	Thread count/ density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Basket	14 x 12	Undyed	
T2	Linen	S	Warp-faced	12 x 7	Undyed	Self-bands Sewing threads single, S-torsion

Textile notes: Two different qualities of textile were used to wrap the mummy.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19; Donadoni Roveri, *Art of Weaving*, 2001, p. 86.
Parallels: For similarities in wrapping and positioning, see Cairo, EMC CG 29511–12 (Gaillard and Daressy, *La faune momifiée,* 1905, pp. 12–13, pl. VI) and, with a different wrapping style, Cairo, EMC CG 29501–733, 29751–834 (Gaillard and Daressy, *La faune momifiée*, 1905, pp. 8–18); Cairo, EMC CG 29661 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 11, 72); Lyon, MdeC 90001623 (Richardin et al., *Radiocarbon* 59.2 [2017], pp. 595–607); London, BM EA35855, EA54062; Chicago, FMNH 111509 but with a slightly different wrapping style (spiral), with possible restorations; New Haven, YPM ANT 006925.001, ANT 006925.002, ANT 006434.

8.4 Dogs

Dogs (*Canis lupus familiaris*) were the first animals to be domesticated. They served as guardians, hunters, herders, and companions throughout Egyptian history. Dogs were often named,[43] and are frequently shown under the chairs of their owners in tombs, throughout Egyptian history.[44] Pet dogs were often buried with their owners or near them.[45] They, together with other canids (foxes, wolves, jackals, or animals with a morphological resemblance to that group (hyaenae), were most commonly dedicated to Anubis, god of mummification and travel (both through this world and to the next). They could also be associated with Wepwawet, a wolf-like deity whose name means "the opener of the ways", himself a deity associated with travel and transitions. Both these gods were conflated by the Ptolemaic Period, and Anubis became very popular with soldiers who had to brave the terrors of the desert paths.[46] Cemeteries associated with these gods are found throughout Egypt (see *Fig. 102*), and often included animals that were phenotypically dog-like: foxes of different types (*Vulpes* spp.), including the fennec (*Fennecus zerda*), jackals/Egyptian jackals/Egyptian wolves,[47] and hyaenae (*Hyaena hyaena*), rather than dogs proper.[48] Dog mummies are found throughout Egypt and clearly enjoyed an increased popularity in the Roman Period, when their cult was adopted by soldiers who had to traverse the unknown wild and deserted areas of Egypt.[49]

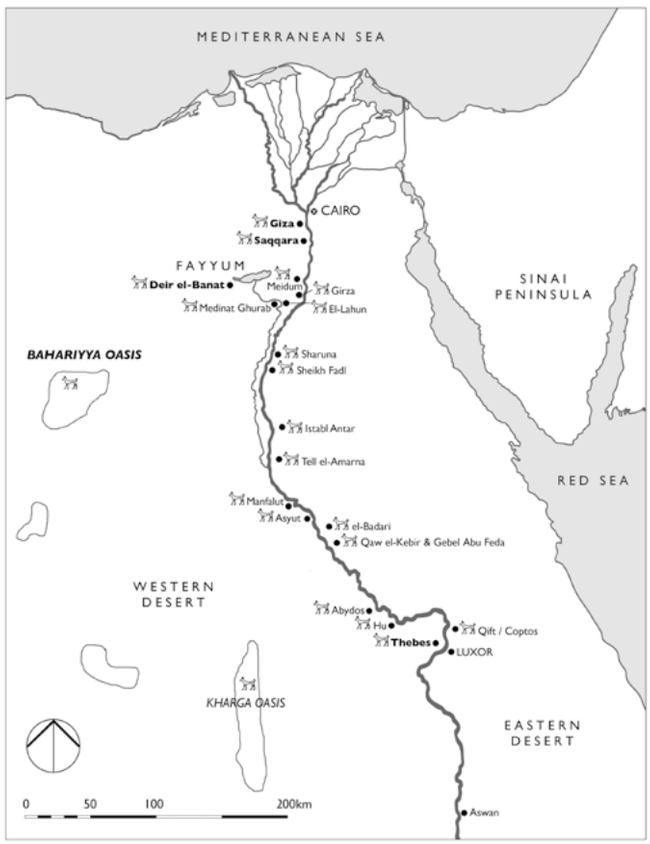


Fig. 102: A map showing the main sites with dog burials.

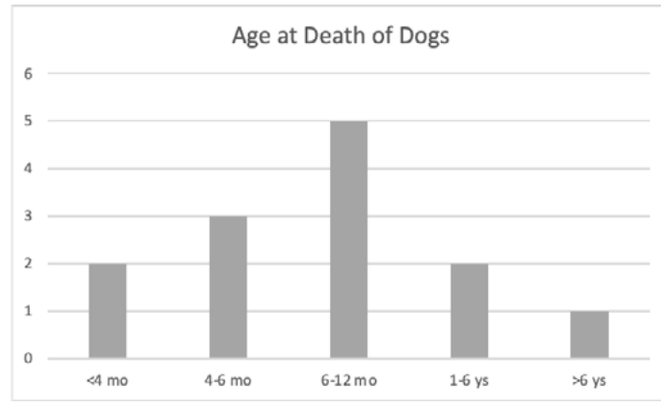


Fig. 103: Age of death of the dogs in the Museo Egizio collection.

The mummified dogs in the Turin collection do not, save for **No. 11**, show direct evidence of having been killed. However, the fact that even in this small group the majority of animals were under 1 year of age (*Fig. 103*) suggests that they might have been deliberately dispatched, perhaps by drowning, poison, or some other method.

[43] Janssen, *MDAIK* 16 (1958), pp. 176–82; Fischer, *JEA* 47 (1961), pp. 152–53; Fischer, *MMJ* 12 (1978), pp. 173–78; Handoussa, *GM* 89 (1986), pp. 23–41; Durr, *Ancient Egyptian Names for Dogs*, 1996; Schneider, in Rollinger and Truschnegg (eds.), *Altertum und Mittelmeerraum*, 2006, pp. 527–36; Nowack, *BNF* 50 (2015), pp. 233–54.

[44] Abdalla, *JGUAA* 2.1 (2017), pp. 86–103.

[45] Ikram, *Anthropozoologica* 48.2 (2013), pp. 299–307.

[46] Osborn and Helmy, *Contemporary Land Mammals*, 1980; Ikram, in Tallet and Zivie-Coche (eds.), *Le myrte et la rose*, 2014, pp. 349–55; Dunand, in Ikram et al. (eds.), *Egyptian Bioarchaeology*, 2015, pp. 169–76.

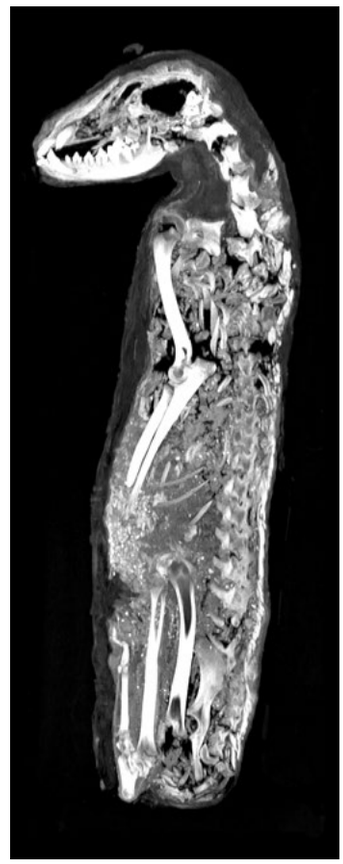
[47] New DNA work on these animals has resulted in changes in how they are understood zoologically, with the DNA results linking the jackal-type animals found in Egypt more closely to wolves than to jackals (*Canis aureus*); see Kitagawa, *Tomb of the Dogs*, 2016, and Ikram and Bertini, in Nicholson (ed.), *Catacombs of Anubis*, 2021, pp. 135–88, for a discussion of this issue.

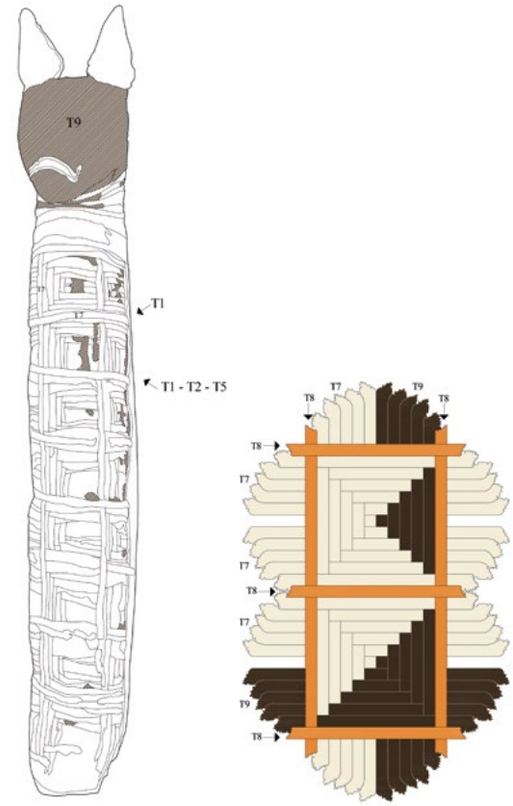
[48] Also see Lortet and Gaillard, *La faune momifiée*, 1903, pp. 1–16, 17–31; Lortet and Gaillard, *La faune momifiée*, 1905, pp. 1–18, 249–50; Lortet and Gaillard, *La faune momifiée*, 1907, pp. 260–94, for a discussion and examples.

[49] Ikram, *Anthropozoologica* 48.2 (2013), pp. 299–307; Ikram, in Tallet and Zivie-Coche (eds.), *Le myrte et la rose*, 2014, pp. 349–55.

9







Inventory number: Provv. 1464
Object: Dog mummy
Dimensions: L: 74, Base circ.: 38.4
Acquisition: Unknown
Provenance: Unknown
Date: 380–200 BC (^{14}C date)
Scientific analyses: CT, ^{14}C dating, Pyrolysis-GC/MS, Optical Microscopy
Description: Dog mummy of the skittle type with a long slightly-flattened cylindrical body and a large, pronounced, naturalistic head. The erect ears are separately modelled and are attached to the head by a bandage, the cloth that creates the back of the head, and some black resinous material. Each ear is made of six to eight layers of bandages. The outermost ones are painted dark brown, while the innermost one is of undyed linen (T1). A thick, brownish-black, painted line runs between the ears, along the back of the head and down to the neck. The back of the head is covered by an undyed bandage (T1) painted with concentric semi-circles in the same dark paint from the neck up. The muzzle is reinforced with lots of crude bandages and strips, as well as thread to keep them in situ. This level of bandaging was covered with a piece of linen that is painted dark brown and was possibly covered with a plant gum material. The mouth was created by undyed strips (T1) appliquéd on a bleached (?) textile (T7). The neck is reinforced by a minimum of seven strips that are neatly folded to provide clean edges, with an undyed textile (T2) alternating with dark brown (T9) ones (they only survive on the front, under the chin).

The ventral side of the body is decorated with a polychrome coffer pattern, distributed over three columns and eight rows. It consists of alternating single-sided coffers and diagonal coffers. Each coffer is constructed by crossing ten vertical bandages with ten horizontal ones. The original colours of the bandages are no longer visible. Nevertheless, the pattern can be reconstructed as a combination of bleached (T7), yellow-orange (T8) and dark brown (T9) strips. The back is covered with a large piece of textile (T1). Where it has

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	28–30 x 13–14	Undyed	
T2	Linen	S	Warp-faced	34–38 x 9–11	Undyed	Selvedge Self-bands
T3	Linen	S	Warp-faced	24 x 9	Undyed	Overlapped seam (sewing threads Z, 2s)
T4	Linen	S	Warp-faced	16 x 9	Undyed	
T5	Linen	S	Warp-faced	44 x 18	Orange (?)	Selvedge Rolled and whipped hem (sewing threads Z, 2s)
T6	Linen	S	Basket	16 x 14	Undyed	
T7	Linen	S	Warp-faced	54 x 14	Bleached (?)	
T8	Linen	S	Warp-faced	44 x 10	Yellow-orange	
T9	Linen	S		Too badly preserved for thread count	Dark brown	

Textile notes: Nine different qualities of textiles were used to wrap the mummy and create the pattern.

been worn away, a series of wide spiral-wrapped bandages is visible (T2, T3, T4, T5, T6).

The base of the mummy bundle is broken, revealing that little textile padding was used in that area. The right side of the mummy is damaged and darkened, indicating that after preparation it was laid on its right side, so that some of the black resin-like substance used in the embalming seeped through on that side. Some of the leg bones, covered with the black resin-like substance, are visible through the opening in the bottom due to a break in the wrappings.

Scientific examination

CT investigation

The CT scan shows the remains of a juvenile dog, between 8 and 10 months at death judging from the epiphyseal fusion. It is a male since the baculum is visible. The skeleton (length 66 cm) is for the most part slightly disarticulated, which contributes to the object's length. Some of the bones are broken, probably the result of post-mortem activity, while parts of the vertebral column are displaced, as are the ribs. The cranium is mesaticephalic with a dislocation in the occipital region. The skull has collapsed; it can be assumed that head trauma was the cause of the death of the animal. This has been noted most commonly in cat mummies.[50] The animal appears to have been eviscerated and the belly area was stuffed with linen to ensure that the mummy did not lose its shape. Along the right side of the bundle, among the bandages, are four twigs, which might have served as supports.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 380–200 BC.

Analysis of organic residue

Pyrolysis-GC/MS analysis carried out on the dark/blackish substance impregnating the textile used for the fashioning of the muzzle revealed the presence of proteinaceous and polysaccharide materials. This data suggests that plant gum (gum arabic?) was the main component.

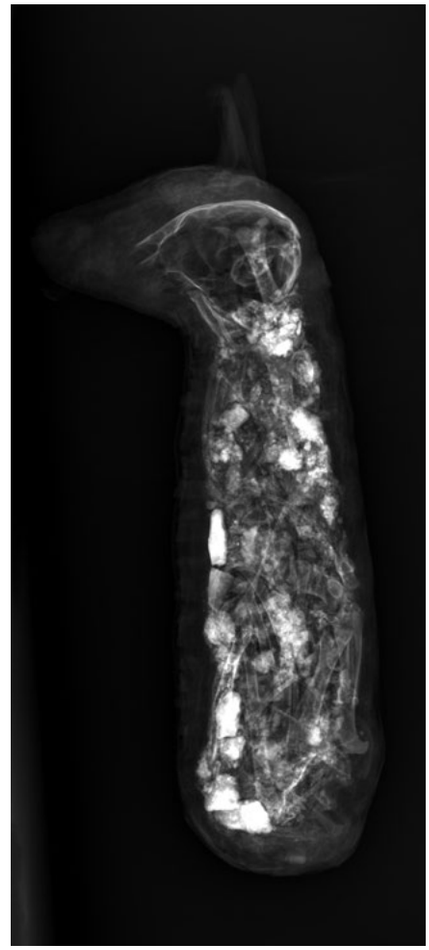
Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 14, 19, 21.

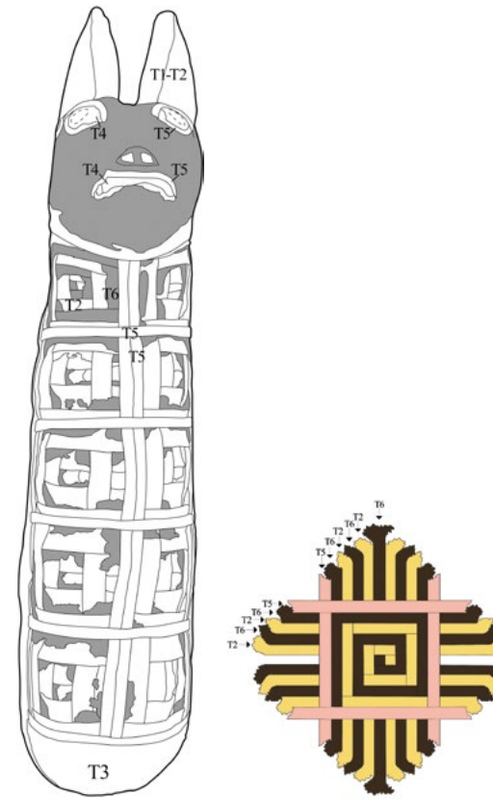
Parallels: Leiden, RMO CI 256 (Raven and Taconis, *Egyptian Mummies*, 2005, p. 244); New York, BM 37.1984E (Bleiberg et al. [eds.], *Soulful Creatures*, 2013, p. 65); **No. 52**.

[50] Armitage and Clutton-Brock, *JAS* 8 (1981), pp. 185–96: https://doi.org/10.1016/0305-4403(81)90023-6; Zivie and Lichtenberg, in Ikram (ed.), *Divine Creatures*, 2015, pp. 106–19.

10







Inventory number: Cat. 2347/1
Object: Dog mummy
Dimensions: H: 32, Base circ.: 24.5
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT
Description: Dog mummy of the skittle type with a cylindrical body and naturalistic head with the details picked out in textile. The eyes, nose and mouth are appliquéd, and its ears are erect. The interior of the ears are made of two different undyed bandages (T1, T2) that are folded. The head is painted black, as are the exterior of the ears, and the roughly almond-shaped eyes are painted on a possibly bleached textile (T4). They are white with black pupils (T4) and encircled with possibly orange-pinkish thin strips (T5). The nostrils are indicated by two unpainted triangles. The mouth, which is slightly open, is outlined by orange-pinkish (T5) bandages appliquéd on a possibly bleached textile (T4). The front has an elaborate meander pattern flanking a double central dividing line, with five squares arranged on two columns. Each square is made by interlacing five vertical and four polychrome strips, alternatively undyed (T2) and dark brown (T6). Additional orange-pinkish (?) strips (T5) run along the sides of each row and column, in order to fix the composition to the body. The base is reinforced with undyed linen (T3). The last fabric stretched over the body is the undyed linen (T1) covering the back.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	24 x 8	Undyed	
T2	Linen	S	Warp-faced	40 x 11–12	Undyed	
T3	Linen	S	Warp-faced	30 x 13	Undyed	
T4	Linen	S	Warp-faced	40 x 14	Bleached (?)	
T5	Linen	S	Warp-faced	40 x 14	Orange-pinkish	
T6	Linen	S	Warp-faced	28 x 10	Dark brown	

Textile notes: Six different qualities of textiles were used to wrap the mummy and create the pattern.

Scientific examination

CT investigations

The CT scan shows the remains of a juvenile dog, probably less than six weeks old at death. The skeleton (length about 25.8 cm) is disarticulated: the bones are not in the correct anatomical position. The mesaticephalic cranium is incomplete. No viscera are present.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 332, no. 2347 [7–8]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19.

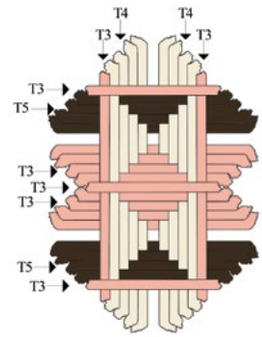
Parallels: Leiden, RMO CI 256 (Raven and Taconis, *Egyptian Mummies*, 2005, p. 244).

11









Inventory number: Cat. 2347/2
Object: Dog mummy
Dimensions: H: 37, Base circ.: 27
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT
Description: Dog mummy of the skittle type with a cylindrical body and a naturalistic head, somewhat similar to **No. 10**. The head of the dog is very elaborately created: it is painted black (save for the back), the ears are erect, and the outline of the eyes, nose and mouth are appliquéd. The interior of the ears is made of two different bandages, one undyed (T1) and one orange-pinkish (T2). The almond-shaped eyes are white, with black pupils, both painted on a possibly bleached textile (T4) and encircled with orange-pinkish (?) strips (T2) of linen. The proper right pupil is painted on a separate piece of textile on a lower level than the rest of the eye. Similarly, the slightly open mouth is delineated by orange-pinkish (T2) bandages appliquéd on a bleached (?) textile (T4). The nostrils are indicated by two unpainted rectangles. Many of the original bandages on the front are missing, leaving a series of rectangular coffers, divided in two by bands. Originally, a series of brown bandages, now mainly disintegrated, created a polychrome coffer, containing a meander. The coffers are arranged in three columns and five rows. Each square is made by interlacing eight vertical bleached (?) (T4) strips with eight horizontal strips, alternatively dark brown (T5) and orange-pinkish (T3). The colour sequence of each square is mirrored in the following ones. Additional orange-pinkish strips (T3) run on the sides of each row and column, in order to fix the composition to the body. The neck is reinforced by two folded bandages of undyed (?) linen (T1). The back of the dog was covered with a plain bandage that has largely worn away (T1). Where it has worn away, one can see spiral bandages below that are held in place with an abundance of linen thread. The base is reinforced with the same undyed linen (T1) as the back.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	28 x 11	Undyed	
T2	Linen	S	Warp-faced	24 x 11–12	Orange-pinkish	
T3	Linen	S	Warp-faced	36 x 12	Orange-pinkish	
T4	Linen	S	Warp-faced	52 x 12	Bleached (?)	
T5	Linen	S		Too badly preserved for thread count	Dark brown	

Textile notes: Five different qualities of textiles were used to wrap the mummy and create the pattern.

Scientific examination

CT investigations

The CT scans show the skeleton (length 31.7 cm) of a juvenile dog, between 2 and 7 months of age at death. The bones are too jumbled to distinguish the presence of a baculum; thus, the sex of the dog cannot be determined, though it is possibly female. The cranium is mesaticephalic. The animal is placed in the usual seated position with flexed hind paws. The forelimbs are extended along the body and the tail runs between the limbs close to the belly. It has been eviscerated. The position of the cervical vertebrae might be indicative of strangling, but it is also possible that they became disordered postmortem.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 332, no. 2347 [7–8]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19; Heimann (ed.), *Ägyptens Schätze entdecken*, 2012, p. 64, fig. 8; Grewenig (ed.), *Ägypten*, 2014, p. 248.

Parallels: Leiden, RMO CI 256 (Raven and Taconis, *Egyptian Mummies*, 2005, p. 244).

12





Inventory number: Provv. 1442
Object: Dog mummy
Dimensions: L: 32, Base circ.: 32.3
Acquisition: Unknown
Provenance: Unknown
Date: 370–200 BC (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating, Optical Microscopy
Description: Dog mummy of the skittle shape with a cylindrical body and round head without naturalistic details (it lacks ears). The outermost wrappings are somewhat damaged (T2) and show dark spots; possibly some embalming material that has seeped through the wrappings from the body. The shroud only covers one side of the animal. It goes around the base, is knotted, and a cord made of twisted linen threads (Z-spun) is tied around the knot and extends to the head. This cord is broken off, but probably connected to the knot at the head end. The outermost shroud-like textile (T2) is kept in place by a (or a series of) thin folded bandages that create a criss-cross pattern; parts of the bandages are missing, but the pattern is discernible by the shadowy marks that are still visible. These bandages seem to be made of the same fabric as the shroud (T2). Another broad (2.5–3.5 cm) spiral bandage (T1) covers the head and body beneath T2.

Scientific examination

CT investigations

The CT scans show an incomplete skeleton (length 30 cm) of a juvenile dog, probably between 1 and 4 months of age judging from the diameter-length ratio of the long bones, which have a maximum length of about 3.5 cm. The animal is placed in the usual seated position with flexed hind paws, the forelimbs extended along the body, and the tail resting on the belly, with pieces of fabric used to flesh out the body. As one might expect with a puppy mummy, the bones are not all well-preserved and some are dislocated, while others are fractured, probably due to the mummification process. The mummy also contains extra limbs: there seem to be three front limbs and four mandibular bones of similarly aged dogs.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	30–34 x 10	Undyed	
T2	Linen	S	Warp-faced	30 x 17	Undyed	
Thread	Linen	Z			Undyed	

Textile notes: Two different qualities of textile were used to wrap the mummy.

Lastly, no internal organs are discernible, but there are no clear signs of an evisceration incision – possibly due to the state of preservation, though it is clear that some textile is located within the body cavity. The animal is not centred within the wrappings.

Radiocarbon dating (^{14}C)

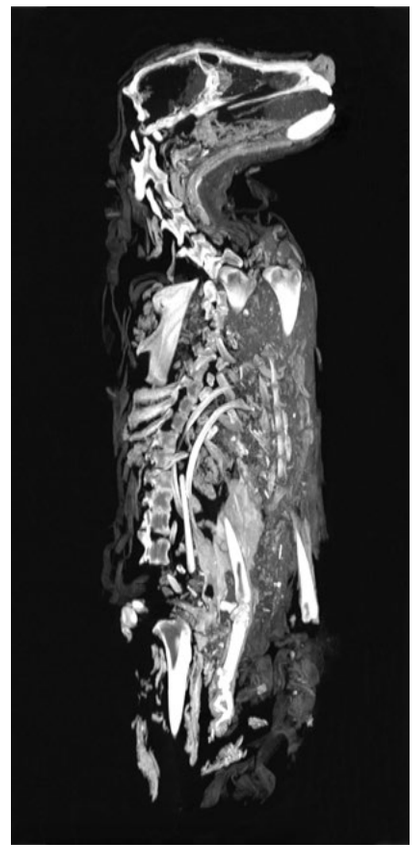
Textile, calibrated age (95% probability): 370–200 BC.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, p. 14 (as "babbuino"), p. 19 (as "babbuino o cinocefalo"), p. 21; Donadoni Roveri, *Art of Weaving*, 2001, p. 86.

Parallels: Leiden, RMO AMM16f (Raven and Taconis, *Egyptian Mummies*, 2005, p. 243).

13





Inventory number: Provv. 1455
Object: Dog mummy
Dimensions: L: 66, W: 20
Acquisition: Unknown
Provenance: Unknown
Date: 360–90 BC (^{14}C date)
Scientific analyses: CT, ^{14}C dating, Optical Microscopy
Description: Dog mummy with a flattened body and a protruding head without naturalistic details. The body was first wrapped in a textile fragment (T1) kept in place by one layer of bandages (T2), 6 cm wide, which were spirally wrapped around the body, starting from the head. The muzzle was secured by a bandage wrapped around it to keep it shut, though some teeth are visible. A third textile (T3), is present on the shoulder and on the back, a portion of which has a rolled hem secured with whip stitches. The original colours of the textiles are not verifiable due to cellulose degradation and/or their impregnation by embalming substances.

The mummy is badly preserved, particularly at the base. An abundance of a hot, black resin-like substance that was used to preserve the animal has burnt the dog's body in places. Embalming agents have darkened the colour of the dog's fur, but it was probably brown or yellowish originally.

Scientific examination

CT investigations

The CT scan reveals a young adult dog of about 12 months of age. The age at death is confirmed by the epiphyseal fusion and the presence of all complete teeth, except a broken upper incisor with evidence of apical bone resorption. The morphology of the skull suggests that it is a male, although the baculum is not visible. The skeleton (length 63 cm) is incomplete: it is missing most of the tail, the pelvic bones, and both hind paws. The remainder of the skeleton shows that it is positioned in the common seated pose with the legs folded against the body and the tail pulled up between the legs, showing some post-mortem dislocations, proba-

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	20–24 x 10–12	Undyed	Self-bands
T2	Linen	S	Warp-faced	12 x 6	Undyed	Warp fringe
T3	Linen	S	Warp-faced	14 x 8	Undyed	Rolled hem

Textile notes: Three different qualities of textiles were used to wrap the mummy.

bly due to the desiccation process; in particular, a left scapulohumeral subluxation, an occipito-atloid dislocation, and a cervico-thoracic dislocation. It was eviscerated, possibly preserved with natron, and then anointed with black resin-like substances that are the source of discoloration. Some probably sandy material is visible in the mouth, orbits, and skull.

Radiocarbon dating (^{14}C)

Biological tissue, calibrated age (95% probability): 360–90 BC.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 14, 19, 21.

Parallels: Kitagawa, *Tomb of the Dogs*, 2016, pp. 105–09, 130–31.

14





Inventory number: Suppl. 11004
Object: Dog mummy
Dimensions: L: 71, W: 24
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: 360–200 BC (^{14}C date)
Scientific analyses: CT, ^{14}C dating, Pyrolysis-GC/MS, Optical Microscopy
Description: Dog mummy with a flattened body and a prominent head. The entire body is crudely wrapped in a large fragment of textile (T1), possibly a re-used textile from a cloth (there is a yoke sewing on the front side, near the forelegs). A bandage (T2) (3.8 to 4.3 cm wide) that was wound around the neck, at about shoulder level and then to the forelegs, was used to secure the shroud to the body. No trace of any other elaborate wrapping was detected on the outermost textile (T1).

Scientific examination

CT investigation

The CT scans show that the animal is an adult dog with a mesaticephalic skull. Its age is probably in the range of 1 to 6 years since all the epiphyses are completely fused, and initial signs of ventral spondylosis are evident, while no signs of degenerative arthropathy are present. In addition, the teeth are slightly worn. The dog is a male, as evidenced by the baculum and the size/shape of the occipital bone. The skeleton (length 69 cm) is arranged in the usual position of a seated animal with flexed hind paws, with the tail flat against the belly. The dog was eviscerated, except for the descending colon and rectum. The body cavity was filled with a package made up of loosely wrapped textile and sand.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	20 x 8–9	Undyed	Self-bands Rolled hem Sewing
T2	Linen	S	Warp-faced	30 x 10	Undyed	

Textile notes: Two different qualities of textiles were used to wrap the mummy.

The body of the animal was not very well mummified, as it is odoriferous, even though plentiful black resin-like substances were used to embalm it, as is attested by visible residues, which also contribute to its weight. Possibly, it was not well desiccated before wrapping.

Radiocarbon dating (^{14}C)

Biological tissue, calibrated age (95% probability): 360–200 BC. The date is similar to **Nos. 9, 18**, though those analyses were carried out on the wrappings.

Analysis of organic residue

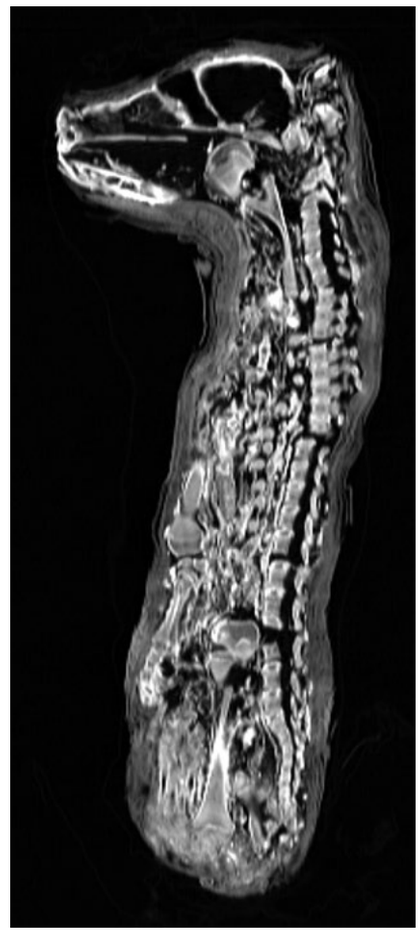
Pyrolysis-GC/MS analysis on dark organic material sampled from the mummy's body provided evidence of proteinaceous and lipid markers, with the presence of fatty acids and cholesterol derivatives (possibly related to the animal itself). No trace of resin or other specific markers were detected.

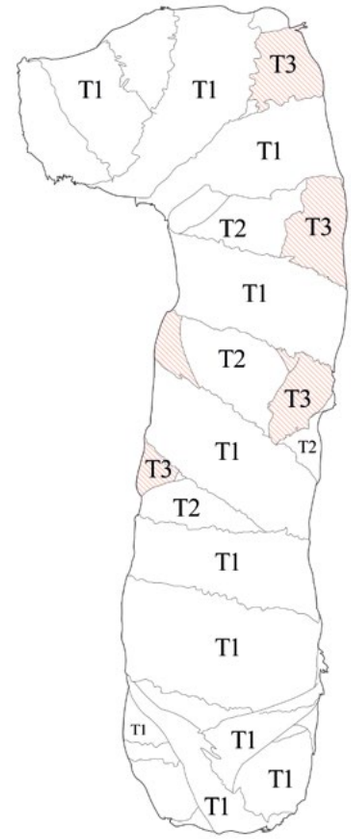
Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19, 33.

Parallels: Leiden, RMO AMM16f (Raven and Taconis, *Egyptian Mummies*, 2005, p. 243).

15







Inventory number: Suppl. 11005
Object: Dog mummy
Dimensions: L: 44, Base circ.: 28
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: Probably early Ptolemaic Period (c. 332–300 BC), based on ^{14}C of others in the Asyut group
Scientific analyses: CT, UVF, Optical Microscopy
Description: Dog mummy with a cylindrical body (a crude skittle shape) and a prominent head with no detailing. It is tidily wrapped with basket-weave bandages (T1) covered by another textile (T2) that is visible only on the back of the animal. Another textile (T3) probably dyed red and showing a starting border, is kept in place by bandages (T1) wrapped around it spirally and secured with a knot. A black resin-like substance was used to secure the external bandages, which are made of coarse linen. The proper right side is slightly flatter than the left side, and the fibres are less degraded on the right than on the left side; this indicates that it had been placed on its right side, allowing grime to adhere to the exposed side.

Scientific examination

CT investigation

The CT scan reveals a juvenile dog, less than 6 months old judging from epiphyseal fusion and the eruption of the first lower molars. It has a mesaticephalic cranium. It is probably a female, since no baculum is visible. The skeleton (length 41.3 cm) is partially disarticulated, with the left mandible lying on its side and the proximal part of a humerus inserted between the mandibular branches as a cervical support. One occipital condyle is fractured (probably post-mortem) and the rachis is aligned, but characterised by several points of distancing among the spinal segments.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Basket	28–30 x 14	Undyed	
T2	Linen	S	Warp-faced	37 x 11	Undyed	
T3	Linen	S	Warp-faced	24 x 11	Red (?)	Starting border (?)

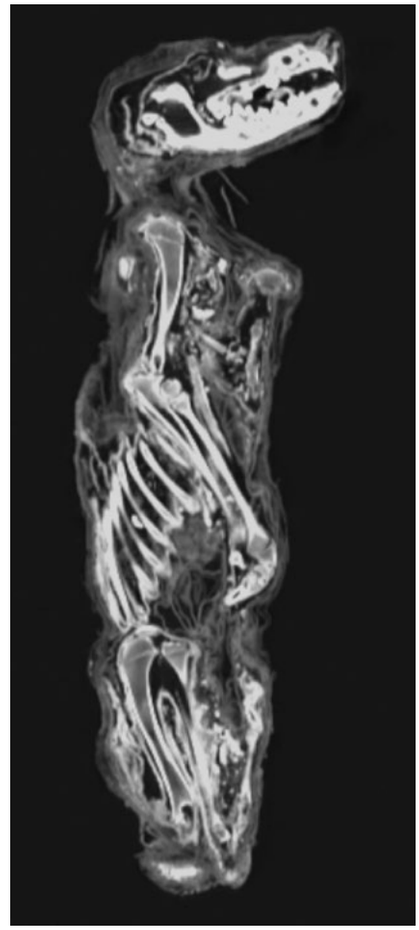
Textile notes: Three different qualities of textiles were used to wrap the mummy.

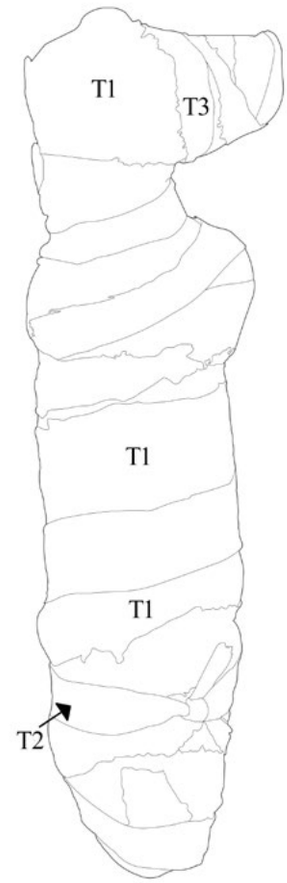
The animal was eviscerated as there is no trace of internal organs.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19, 33.
Parallels: Leiden, RMO AMM16f (Raven and Taconis, *Egyptian Mummies*, 2005, p. 243).

16







Inventory number: Suppl. 11007
Object: Dog mummy
Dimensions: L: 55.5, W: 12
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: Probably early Ptolemaic Period (c. 332–300 BC), based on ^{14}C of others in the Asyut group
Scientific analyses: CT, UVF, Optical Microscopy
Description: Dog mummy with a flattened cylindrical body and a prominent head without naturalistic details. The body is covered by a shroud (T1). It is kept in place by three different spiral bandages (T1, T2, T3). One of them is knotted (T2). The face has a spiral bandaging around the muzzle and the neck (T1, T3), that also served to keep the jaws secured and as a reinforcement. The cloth is brown due to the use of some black resin-like substance, with some areas on the back and feet showing splotches where an excess of embalming agents seeped out. One side of the mummy is flatter than the other. The flat side has far less external discoloration on the bandages, possibly because it was the side the mummy was laid upon, exposing the other side to dirt that adhered to the substances used in the mummification process.

Scientific examination

CT investigation

The CT scan shows a juvenile dog, probably in the range of 6 to 11 months of age judging from the still unfused olecranon of the ulna and complete dentition. The presence of a baculum identifies it as a male. The skeleton (length 53.6 cm) is in a good state of articulation and is in the usual position, seated, with the paws pushed up and the tail lying flush on the belly. It was eviscerated and the pelvic cavity is empty, while the thoracic cavity is filled with bandages.

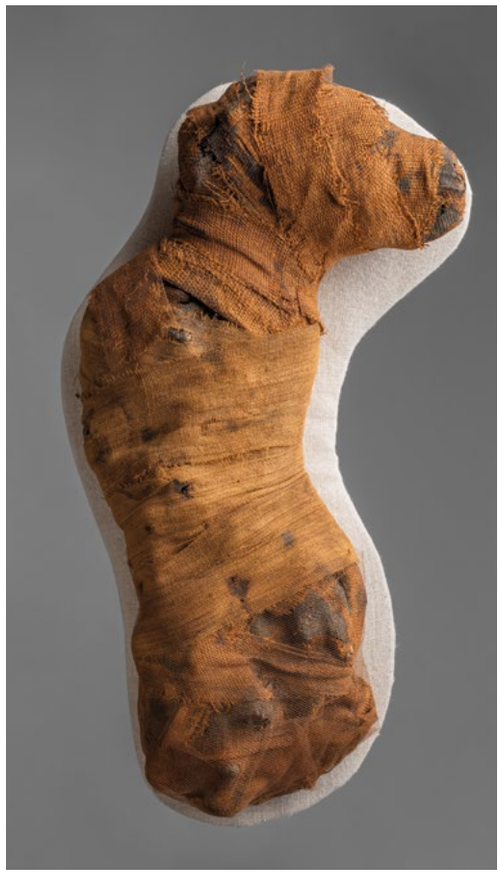
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	24 x 8–11	Undyed	Selvedge Self-bands Sewing threads
T2	Linen	S	Basket	20 x 12	Undyed	
T3	Linen	S	Warp-faced	30 x 7	Undyed	

Textile notes: Three different qualities of textiles were used to wrap the mummy.

The cranium is mesaticephalic; a crystalline lens is identifiable on the left orbit.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19, 33.
Parallels: Leiden, RMO AMM16f (Raven and Taconis, *Egyptian Mummies*, 2005, p. 243); Kitagawa, *Tomb of the Dogs*, 2016, pp. 105–09, 130–31.

17





Inventory number: Suppl. 11008
Object: Dog mummy
Dimensions: L: 38, W: 13
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: Probably early Ptolemaic Period (c. 332–300 BC), based on ^{14}C of others in the Asyut group
Scientific analyses: X-ray, CT, Optical Microscopy
Description: Dog mummy with a flattened body and a prominent head. The animal is wrapped in several layers of bandages of the same type of textile (T1) kept in place by another spiral bandage (T2), which is knotted with the first one on the back near the legs. These bandages vary widely in width, measuring from 3.1 to 5 cm. The mummy is heavily stained all over with a black resin-like substance.

Scientific examination

CT investigation

The CT scan shows a juvenile dog, about 5 months old, since the lower molars have not yet erupted, and the distal humerus is unfused. The cranium is mesaticephalic and some residues of meningeal/brain tissue are present in the cranial cavity. It is probably a female as no baculum is visible. The skeleton (length 36.6 cm) is placed in a seated position with the hind paws slightly pushed up and the tail positioned flat against the belly. A few vertebral fragments appear misaligned, while fractures are present at the scapula and tibia levels. No thoracic or abdominal organs are visible; presumably it was eviscerated.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Basket	28–30 x 14	Undyed	
T2	Linen	S	Warp-faced	36–37 x 10	Undyed	

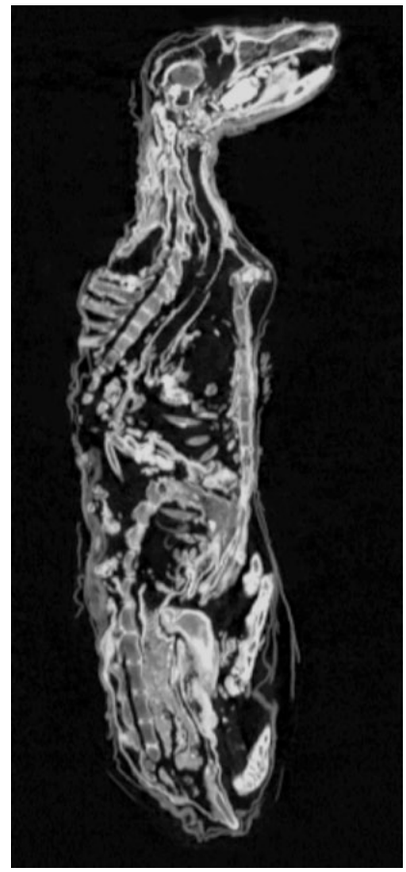
Textile notes: Two different qualities of textiles were used to wrap the mummy.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19, 33.

Parallels: Leiden, RMO AMM16f (Raven and Taconis, *Egyptian Mummies*, 2005, p. 243); Kitagawa, *Tomb of the Dogs*, 2016, pp. 119, 130–131.

18





Inventory number: Suppl. 11009
Object: Dog mummy
Dimensions: L: 77.5, W: 20
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: 370–200 BC (^{14}C date)
Scientific analyses: CT, ^{14}C dating, Pyrolysis-GC/MS, UVF, Optical Microscopy
Description: Dog mummy with a flattened body and a prominent head without naturalistic details. The faunal remains are wrapped in a single piece of textile (a shroud) (T2) which is kept in place by spiral bandages knotted into position (T1). On average, the bandages are 5 cm in width. The outermost ones show evidence of being painted over with a coniferous resin, and resin was used to keep them in position. Some of the bandages have warp fringes (T1). Possibly only one garment was torn up to wrap the animal, as both textiles (T1, T2) seem to be of the same quality.

Scientific examination

CT investigation

The CT scan reveals an adult dog with a mesaticephalic skull that is quite large (skeleton's length 74.5 cm). The animal was positioned as if seated within the package, with the hind legs pushed up toward the belly and the tail lying along the belly. It is over 6 years of age, judging from the presence of mild intervertebral degenerative spurs. It is most likely a female, since no baculum was detected. Both the epiphyses of the long bones and the vertebral bodies show several punctiform foci of calcification (possible infarctions) and some rounded hypodense areas with net edges are present in the vertebral bodies, probably consistent with degenerative adipose deposits. The vertebral column presents an anomaly: the caudal vertebral lamina of the tenth thoracic vertebra appears to be eroded, possibly due to an infection, and there are also post-mortem dislocations/fractures. Residues of brain tissue are visible in

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	28 x 7–8	Undyed	Selvedge Starting border Warp fringes
T2	Linen	S	Warp-faced	34 x 9	Undyed	Self-bands

Textile notes: Two different qualities of textiles were used to wrap the mummy.

the cranium, and the spinal cord is present until the fourth cervical vertebra. The entire trachea is present. A piece of the lung can be distinguished, so probably it was only partially eviscerated.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 370–200 BC.[51]

Analysis of organic residue

Pyrolysis-GC/MS of the blackened textile showed traces of coniferous resin and saccharides of undetermined origin.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19, 33.

Parallels: Leiden, RMO AMM16f (Raven and Taconis, *Egyptian Mummies*, 2005, p. 243); Kitagawa, *Tomb of the Dogs*, 2016, pp. 130–31; Ikram and Bertini, in Nicholson (ed.), *Catacombs of Anubis*, 2021, pp. 135–88.

[51] Similar to **No. 9**.

19





Inventory number: Provv. 7938
Object: Dog mummy
Dimensions: L: 46, W: 14
Acquisition: Unknown
Provenance: Unknown
Date: Undetermined
Scientific analyses: CT
Description: A rectangular linen-wrapped package that is dark in places due to dust and black resin-like substances. It was spirally wrapped (T1), then thread was used to fix the bandages. The package was further covered with different pieces of textile. Two pieces of basket-woven textiles are perpendicularly overlapped (T2). They are covered by another piece of textile (T3). Additional bandages (T1) are wrapped around one end.

Scientific examination

CT investigation

It is difficult to clearly identify the juvenile animal that is seen in the radiographs, but it appears to be a dog aged under 3 months when it died. The animal is placed in the usual position with forelimbs extended, the hindlimbs flexed and pushed against the body, and the tail lying along the belly. It is missing its skull and the skeleton is damaged.

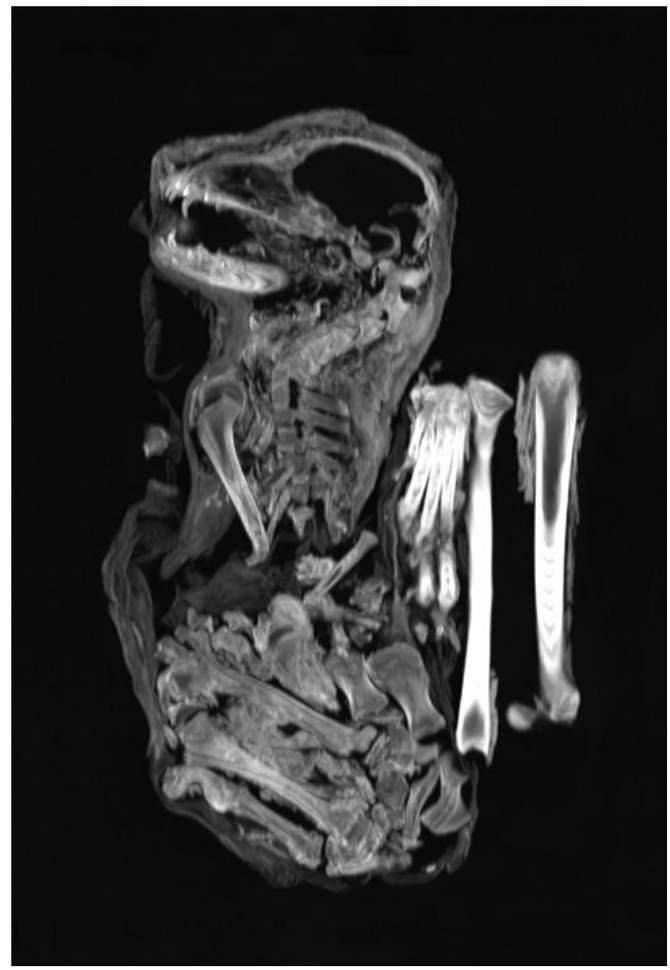
Bibliography: Unpublished.
Parallels: New York, MMA 13.182.49, 13.182.50.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	26 x 8	Undyed (?)	
T2	Linen	S	Basket	14 x 7	Undyed (?)	Selvedge
T3	Linen	S	Warp-faced	22 x 14	Undyed (?)	
Thread	Linen	S				

Textile notes: Three different qualities of textiles were used to wrap the mummy and create the pattern.

20





Inventory number: Suppl. 11006
Object: Dog mummy
Dimensions: L: 35, W: 18
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: 200–50 BC (^{14}C date)
Scientific analyses: CT, ^{14}C dating, Pyrolysis-GC/MS, Optical Microscopy
Description: The flattened mummy bundle contains the remains of two animals. They were first loosely wrapped in bandages (T1), then covered with a large piece of textile that can be considered to be a shroud (T2), which was kept in place by bandages (c. 4.2 cm wide) that were criss-crossed around the bodies. The presence of a black substance on the visible bones suggests that the material was applied when it was hot, and it has burnt through the fur and flesh.

Scientific examination

CT investigation

Two animals are wrapped together in this bundle. The main bundle contains an incomplete skeleton of a juvenile dog, less than 6 months of age judging from the presence of the occipitotemporal junction and the first lower molar that has not yet erupted. It is probably a female, since the baculum is not visible. It was presumably originally positioned as if seated with the tail tucked between the legs, and the paws slightly upturned. The mesaticephalic cranium is fractured in the temporal region, with a bone portion dislocated in the cranial cavity, which might have been the cause of death or due to a post-mortem event. Vertebral fractures (probably post-mortem) are visible in different locations, the pelvis has collapsed, and a portion of the femur is missing. It has been eviscerated.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	34 x 11	Undyed	
T2	Linen	S	Warp-faced	20 x 10	Undyed	Fringes Fragment of a starting border (?)

Textile notes: Two different qualities of textiles were used to wrap the mummy.

Next to the bundle described above, some skeletal elements of another dog are present: the end of a humerus, one femur and one tibia, which definitely do not belong to the main mummy as they are much larger. They are probably parts of another mummified dog, about a year or slightly older, as all the epiphyses are fused.

Radiocarbon dating (^{14}C)

Biological tissue, calibrated age (95% probability): 200–50 BC.

Analysis of organic residue

Pyrolysis-GC/MS analysis on dark organic material sampled from the mummy's bones provided evidence of proteinaceous and lipid markers, with the presence of fatty acids and cholesterol derivatives. These might be derived from the animal itself, but are more likely to be from a vegetable oil or animal fat used during the embalming process.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19, 33.

Parallels: Leiden, RMO AMM16f (Raven and Taconis, *Egyptian Mummies,* 2005, p. 243).

21





Inventory number: Suppl. 17016
Object: Dog mummy in a jar

MUMMY

Dimensions: Unverifiable for mummy as disarticulated
Acquisition: Italian Archaeological Mission (1910)
Provenance: Gebelein
Date: 2870–2490 BC (^{14}C date)
Scientific analyses: CT, ^{14}C dating
Description: Disarticulated bones of a canine, skin, fur and some fragments of basketry/matting are preserved in a jar.[52] The fur appears as light brown to yellowish, a common colour for Egyptian street dogs (pariah dogs). The fur is unevenly coloured over the dog, suggesting that this was probably a piebald dog. It seems as if the dog was eviscerated and desiccated with natron, but it does not seem to have been anointed with oils. The textile is very degraded and fragmented and does not show clear indications of its use as a wrapping material. At least one piece was knotted, which might indicate some sort of use on the dog in terms of securing its position: the animal was possibly tied into position with stripes of linen, before being put into the basketry bag and, finally, placed in the pot. The presence of a seam along one side suggests that it was either a re-used article of clothing or a small bag. The linen had been in contact with the animal as traces of fur were found attached to the bag's interior surface.

[52] The study of this find was particularly complex due to the confusing overlap of material inside the vase. The stratigraphy is not original due to post-excavation handling on-site, during the transit to Turin, and within the museum.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	23–25 x 8	Undyed	Sewing threads

Textile notes: One quality of textile was used to wrap the mummy.

The basketry bag, made of skeins of halfa grass, is broken into two parts; the estimated width is approximately 20 cm. It was rectangular, woven from double ropes, each consisting of a bundle of Z-twisted fibres. They are arranged parallel to each other and fixed by other double fibres, perpendicular to the previous ones, placed at regular intervals of approximately 4 cm.

Scientific examination

CT investigation

The CT scan, combined with an examination of the bones, shows a juvenile dog, between 6 and 9 months of age, judging from the size of the bones and the epiphyseal fusion (the humeral condyle is unfused), as well as the presence of thin corticals and a very large medullary cavity.

The skull and mandible are fragmented and scattered; the lower molars have not yet erupted.

Radiocarbon dating (^{14}C)

Fur, calibrated age (95% probability): 2870–2490 BC.

Plant elements, calibrated age (95% probability): 2840–2340 BC.

JAR

Dimensions: H: 34; D max: 22, D mouth: 6.4, D rim: 8

Acquisition: Italian Archaeological Mission (1910)

Provenance: Gebelein

Date: Old Kingdom (2592–2118 BC), based on parallels[53]

Scientific analyses: CT

Description: The vessel is an ovoid jar with a slightly flat base, a short cone neck, and a straight and recurved rim. The fabric is Nile B2 and the exterior surface is burnished. In the lower part, the burnishing marks are vertical, in the upper part, horizontal. This was no doubt due to the position of the potter relative to the pot. The vessel dates to the Fourth Dynasty based on parallels with type A-IIb in Reisner's typology, though this type of vessel is also known as early as the Second Dynasty, as confirmed by ceramicist Anna Wodzinska (personal communication). According to Reisner's typology, this sort of pot was used to contain wine. The black coating inside the vase supports this hypothesis.

This dog mummy is unique as it dates to the Old Kingdom. Its wrapping in both textile and basketry as well as being placed in a pot attests to its importance. Aside from a possible pet burial (but without any known associated human body or a clear burial context),[54] no other dog mummies have survived from this era. The Gebelein dog could have been a pet of some sort, found associated with the early Old Kingdom tombs at Gebelein, although it is possible that this is an early manifestation of some sort of religious or magical ritual. In any event, it is probably the earliest surviving example of a dog burial in a pot.

Bibliography: Unpublished.

Parallels: Ikram, in Flossmann et al. (eds.), *Kleine Götter – Große Götter,* 2013, p. 267, fig. 3.

[53] Reisner, *A History of the Giza Necropolis*, 1942, pp. 480–81.
[54] Reisner, *AKCGazette* 55.5 (1936), pp. 7–9.

8.5 Cats (Felines)

Cats are closely associated with the ancient Egyptians and Egypt was a major centre of dispersal of cats throughout the world.[55] They provided companionship and pest control,[56] and in Egypt were primarily associated with the goddess Bastet, as well as with other feline deities, such as Sekhmet, Pakhet, and even Mut, though lionesses were more closely associated with these goddesses than cats.[57]

Cat mummies were very popular offerings.[58] The main cemeteries for cats were at Bubastis in the Delta, the Bubasteion at Saqqara, and Stabl Antar, near Beni Hasan, which housed a shrine dedicated to Pakhet. However, cat mummies have been found at other sites in Egypt as well, including Thebes. Cats, like dogs, were sometimes simply wrapped, or provided with elaborate coffins. Many of the cats in the Turin collection were buried either in coffins or in cat-shaped containers. These special containers suggest that the cats were of either a different status (Sacred Animals, perhaps, although as many are kittens, this is less likely) or that people paid extra for these offerings.

Many of the mummified cats appear to belong to wild species, such as *Felis chaus* or *Felis silvestris lybica*, not only in the Museo Egizio's collection, but also those of other museums.[59] A lion skeleton was identified at the Bubasteion,[60] and also from the Bubasteion the mummy of a lion cub was identified initially by Ikram via radiography in 2019; the lion was subsequently studied in detail and its identification confirmed – quite possibly more large cat remains will be found in this area.[61] Although several adult animals were given as offerings, the majority of cat offerings are of kittens, and many of the animals were deliberately killed by strangulation or by a blow to the head.[62]

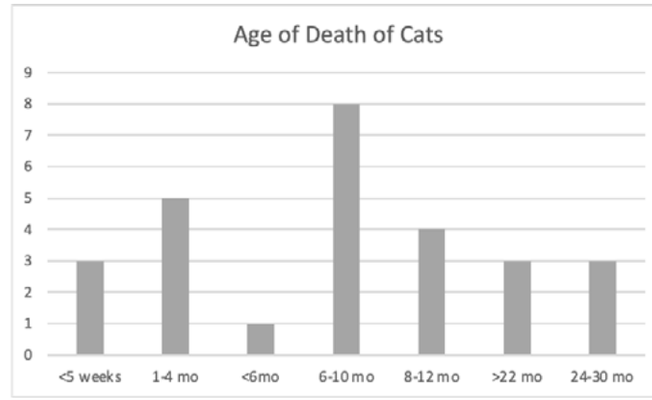


Fig. 104: Age of death of the cats in the Museo Egizio collection.

It is possible that at least four of the cat mummies in the Museo Egizio collection (**Nos. 27, 30, 33, 36**) were deliberately strangled. However, given that the age of death profile for the cat mummies in the Museo Egizio's collection shows a preponderance of young animals (see *Fig. 104*), it is more than possible that the young cats were dispatched by means that left no signs on their bones. It should be noted that this age profile differs slightly from that of the cat mummies now held in the Natural History Museum in London, where the two peaks for the age of death are between 1 and 4 months and 9 and 12 months. The Museo Egizio's cats' age of death peaks at 1 and 4 months, and then 6 and 10 months, rather than within the 9 to 12 month range.

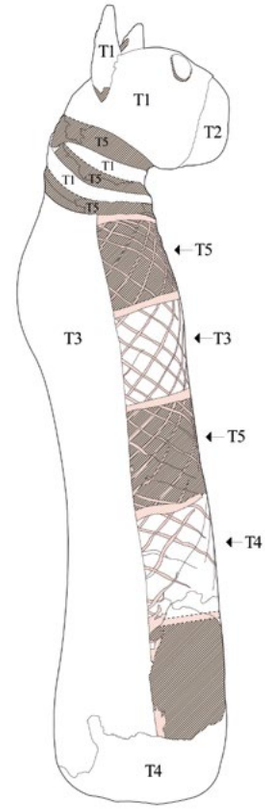
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[55] Ottoni and Van Neer, *NEA* 83.1 (2020), pp. 38–45.
[56] Málek, *The Cat*, 2016.
[57] Wilkinson, *Complete Gods and Goddesses*, 2003, pp. 177–83.
[58] See Lortet and Gaillard, *La faune momifiée,* 1905, pp. 19–31, 251–53, for an early discussion of cat mummies, and Málek, *The Cat*, 2016, for the role of cats in Egypt in general.
[59] Armitage and Clutton-Brock, *JAS* 8 (1981), pp. 185–96: https://doi.org/10.1016/0305-4403(81)90023-6.
[60] Callou et al., *Nature* 427 (2004), pp. 211–12: https://doi.org/10.1038/427211a.
[61] For the lion and a selection of cat mummies from the excavation directed by Mostafa Waziry, see Waziry, *Vestiges of Ancient Egypt*, 2023.
[62] Armitage and Clutton-Brock, *JAS* 8 (1981), pp. 185–96: https://doi.org/10.1016/0305-4403(81)90023-6; Ikram and Iskander, *Non-Human Mummies,* 2002, pp. 8–10, 20, CG 29645, 29657, 29658, 29776, possibly 29655, and 29782; Zivie and Lichtenberg, in Ikram (ed.), *Divine Creatures*, 2015; Brussels, MRAH E-07091.

22







Inventory number: Cat. 2348/1
Object: Cat mummy
Dimensions: H: 54, Base circ.: 42
Acquisition: Acquired before 1882
Provenance: Unknown
Date: 400–200 BC (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating, Optical Microscopy
Description: Cat mummy of the skittle type with a naturalistically modelled head. Its erect ears are outlined with brown bandages, most of which have disintegrated or been lost. The muzzle and head are constructed of rags that were then covered to form the cat's face. These disparate pieces of fabric are covered by a single piece of cloth (T2); the area of the eyes and above the nose is then covered with a second textile that is used also for the ears (T1). It separates the eye area from the muzzle. The face has button-shaped appliquéd eyes outlined by a few linen threads, dipped in a black, resin-like substance, which are arranged around the eyes (T5). The neck is reinforced by five folded horizontal bands, alternating in dark brown (T5) and undyed (T1) linen. The body has a banded net pattern. It is divided into five broad zones of alternating dark brown (T5) and undyed (T3 and T4) textiles of different qualities, each zone being c. 7 cm in height, with the uppermost zone being brown. This is created by first placing the brown cloth on the front, and then superpositioning the undyed zones over it. The whole of the front of the body is covered by a pattern of interlaced linen strings creating a net. The net is made of strings of at least three threads each, probably originally pinkish, fixed by at least ten strands of thread wound horizontally at the neck, with different colours creating a pattern of six horizontal divisions. Some of the threads were probably originally pink, rather than undyed, but have faded so that they currently look plain. Thus, originally the front of the mummy would have boasted horizontal bands of coloured bandages covered with a pink net pattern. The sides and back are plain, as they are covered with two

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	24 x 9	Undyed	
T2	Linen	S	Warp-faced	30 x 11–12	Undyed	
T3	Linen	S	Warp-faced	18–20 x 10	Undyed	
T4	Linen	S	Warp-faced	44 x 15	Undyed	
T5	Linen	S	Warp-faced	28 x 13	Dark brown Hydrolysable tannins	
Thread	Linen	S			Pinkish	

Textile notes: Five different qualities of textile were used to wrap the mummy and create the pattern.

overlapping pieces of folded undyed linen (T3) (one for each side). Beneath them lies the somewhat chaotic system of bandages, cloth and thread that enveloped the cat itself. The base was reinforced with undyed linen (T4).

Scientific examination

CT investigation

The CT scans reveal a complete skeleton (length 47 cm) of an adult cat (possibly *Felis silvestris lybica*, based on the ratio between body and tail lengths), about 22 months of age at death judging from epiphyseal fusion. The animal was positioned in the usual fashion, with the legs flexed towards the body and the tail against the belly. One femoral head is dislocated; no signs of trauma are visible. It was neither excerebrated nor properly eviscerated as parts of the lung are visible and the abdomen and pelvis display uneven oval bodies (probably faeces). The textile packing of the animal is clearly visible.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 400–200 BC.

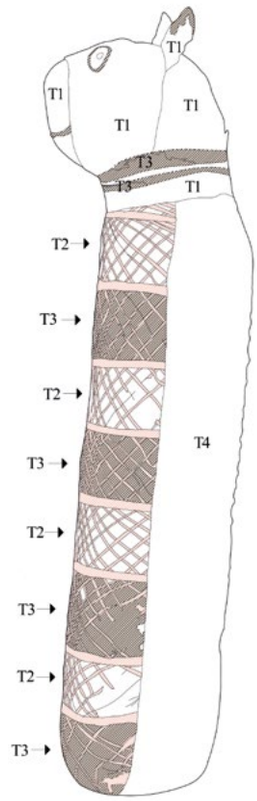
Bibliography: Fabretti et al. 1882, *Regio Museo*, p. 332, no. 2348 [9–11]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19; Ciccopiedi (ed.), *Archeologia invisibile*, 2019, pp. 60–63, figs. 16–17; Tamburini et al., *HeritSci* 9 (2021), p. 5, Table 1, p. 10, Tab 2.

Parallels: For the facial details, cf. Leiden, RMO AMM 16b, AMM 16c, EG-ZM64 (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 252–53, 258); Paris, Louvre N2678B, similar banded net pattern; **No. 23**.

23







Inventory number: Cat. 2348/2
Object: Cat mummy
Dimensions: H: 54, Base circ.: 36
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Probably Late Period – Ptolemaic Period (722–30 BC), based on parallel with **No. 22**
Scientific analyses: X-ray, CT, UVF, Optical Microscopy
Description: Cat mummy of the skittle type with a naturalistically modelled head. The ears are edged with brown bandages. The face is made in the usual manner, with the skull padded out with bits of linen, bandages, and thread. Good quality linen (T1) is used for the face, upon which the round eyes are appliquéd. These are outlined with brown linen threads and provided with brown linen pupils. The nose is very pronounced in its modelling, more so than the muzzle. The mouth is outlined in brown bandages/threads. The neck is reinforced by a series of four dark brown (T3) and undyed (T1) horizontal bands.

This animal's front is covered by a band of a fine undyed linen bandage (T2), over which four bands of dark brown bandages (T3) are placed horizontally. They are secured by the string net pattern (three threads), which is held in place with horizontal wrappings of string – at least fifteen encirclements. Some of the thread in the net pattern is a bit pinkish. There are a few dabs of a black resin-like substance on the net thread and on the brown bandages, probably to keep them all in place. The sides are reinforced with a folded undyed bandage (T4) that overlaps in the back. It was secured with glue or resin. Where it is broken, a jumble of bandages is visible beneath it.

Scientific examination

CT investigation

The CT scans show a complete skeleton (length 50 cm) of a juvenile cat (maybe *Felis silvestris lybica* based on the ratio of the body and tail length), between 8 to 11 months of age judging from epiphyseal fusion. Its sex could not be de-

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	48–50 x 14–15	Undyed	
T2	Linen	S	Warp-faced	41 x 17	Undyed	
T3	Linen	S	Warp-faced	22–24 x 9	Dark brown	
T4	Linen	S	Warp-faced	26 x 10	Undyed	Self-bands
Thread	Linen	S			Pinkish	

Textile notes: Four different qualities of textile were used to wrap the mummy and create the pattern.

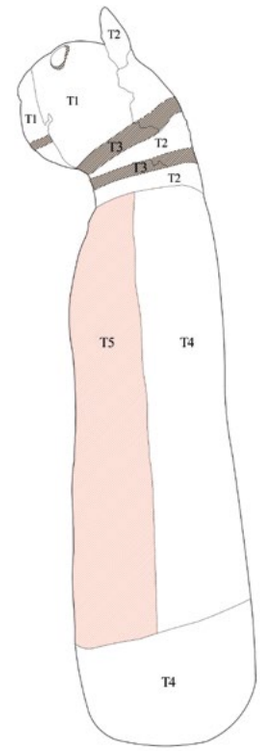
termined. The animal was positioned in the usual fashion, with the legs flexed towards the body and the tail against the belly. It was eviscerated. In most cats (and dogs), no embalming cuts are visible even though they are eviscerated. This might be due to the thinness of the skin, which would make it difficult to discern any cuts, the slice thickness of the CT scans, or perhaps because the animals were eviscerated using an enema of cedar oil.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 332, no. 2348 [9–11]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19.
Parallels: For the facial details, cf. Leiden, RMO AMM 16b, AMM 16c, EG-ZM64 (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 252–53, 258); **Nos. 22, 24**.

24







Inventory number: Cat. 2348/3
Object: Cat mummy
Dimensions: L: 62, Base circ.: 48.5
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Probably Late Period – Ptolemaic Period (722–30 BC), based on parallel with **No. 22**
Scientific analyses: X-ray, CT, UVF, Optical Microscopy
Description: Cat mummy of the skittle type with a naturalistically modelled head and a plain – at least now – body. The head is made of rags and pieces of cloth that are then covered by a single piece of cloth (T1). The ears are carefully modelled and are coloured brown at the edges by what is possibly a black resin-like substance used to define and strengthen them. The large appliquéd button eyes, which are of undyed linen (T2), are surrounded by brown thread (T2), identical to that used on the ears, with small brown dots for the pupils. The nose is long. The mouth is very detailed, consisting of two roughly parallel lines of brown thread with the linen between it slightly coloured dark with a black resin-like substance. The neck is reinforced by alternating dark brown (T3) and undyed bandages (T4), kept in place with smears of a black resin-like substance. The body of the cat is covered with a plain pinkish shroud (T5) secured by large, folded bandages along the sides (T4), kept in place with smears of the dark, black resin-like substance spread on the sides and along the spine, where they overlap. The bottom is reinforced with linen (T4). Beneath the front shroud, one can see neat spiral-bound bandages, at least five layers in thickness. They are very tidy, and no string is visible. Some smears of a red colourant, perhaps ochre, appear on the proper left side at haunch level. Several layers of linen bandages and rags were used to flesh out the cat.

Scientific examination

CT investigation

The CT scans show a complete skeleton (length 53.6 cm) of an adult cat (possibly *Felis silvestris lybica*, based on

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	36 x 11–13	Undyed	
T2	Linen	S	Warp-faced	44 x 14–16	Undyed	Self-bands
T3	Linen	S	Warp-faced	42–44 x 14	Dark brown	
T4	Linen	S	Warp-faced	28–30 x 10	Undyed	Selvedges
T5	Linen	S	Warp-faced	38–40 x 12	Pinkish	Self-bands

Textile notes: Different qualities of textile were used to wrap the mummy and create the pattern. It is possible that T2 (undyed) and T3 (dark brown) come from the same fabric.

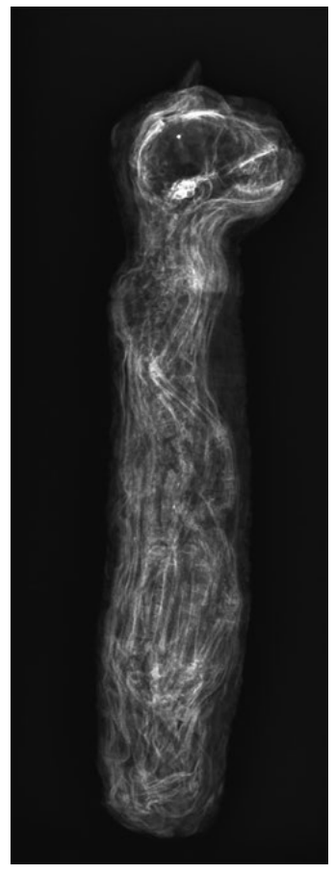
measurements),[63] between 2 and 3 years of age based on epiphyseal fusion. The animal was positioned in the usual fashion, with the legs flexed towards the body and the tail against the belly. Remnants of the brain and spinal cord are visible, together with the trachea and remnants of lung tissue. The abdomen and pelvis display uneven oval bodies (probably faeces), but no visceral remains.

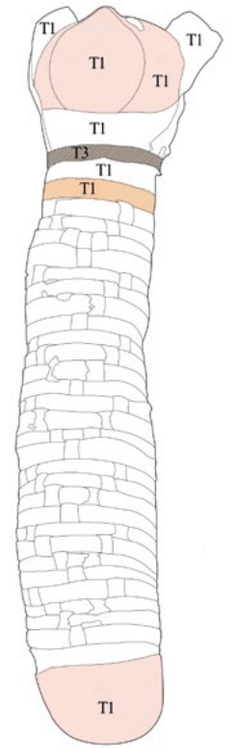
Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 332, no. 2348 [9–11]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19.
Parallels: For the facial details, cf. Leiden, RMO AMM 16b, AMM 16c, EG-ZM64 (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 252–53, 258); **Nos. 22–23**.

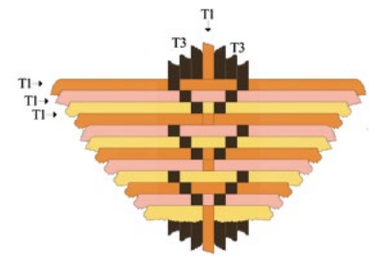
[63] Osborn and Helmy, *Contemporary Land Mammals*, 1980.

25









Inventory number: Cat. 2349/1
Object: Cat mummy
Dimensions: H: 30.3, Base circ.: 6.4
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT, UVF, Optical Microscopy
Description: Cat mummy of the skittle type, with naturalistically modelled head and erect ears. The muzzle is modelled using disparate pieces of fabric covered by a single piece of cloth, dyed pink (T1). The edges of the close-set appliquéd eyes are outlined in dark brown thread. Cloth "buttons" emphasise the muzzle. Further details of the mouth and whiskers are added in thread and brown textile. The back of the head is covered by a different fabric (T2). The outermost bandages on the body are spiralled with a woven-in V-shaped decoration picked out in dark brown bandages (T3) amidst the orange, pinkish and undyed horizontal ones (all from T1). The base is reinforced with pinkish linen secured by a black resin-like substance. Unlike many other similar mummies, the elaborate frontal bandaging is not placed over a shroud, but directly over the bandages that cover the animal and then run around to the back, where they are tidily tucked in. It is unclear if there was a piece of linen affixed to the back; it seems unlikely, given the nice spiral finish of the bandages.

Scientific examination

CT Investigation

The CT scans show a complete skeleton (length 23 cm) of a juvenile cat (possibly *Felis silvestris lybica,* although this is very difficult to judge), less than 5/6 months of age based on unfused distal and proximal humeri and femurs and the deciduous dentition. The animal was positioned in the usual fashion, with the legs flexed towards the body and the tail against the belly. It was not excerebrated, and though a few remnants of the lungs survive, no other visceral organs are present.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	34–36 x 12–14	Undyed Pinkish Orange	
T2	Linen	S	Warp-faced	26 x 10	Undyed	
T3	Linen	S		Too badly preserved for thread count	Dark brown	

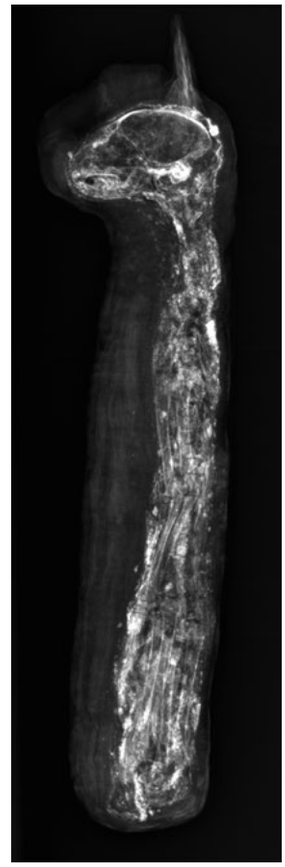
Textile notes: Three different qualities of textile were used to wrap the mummy and create the pattern.

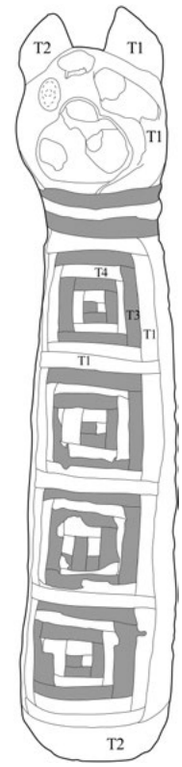
Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 332, no. 2349 [12–19]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19.

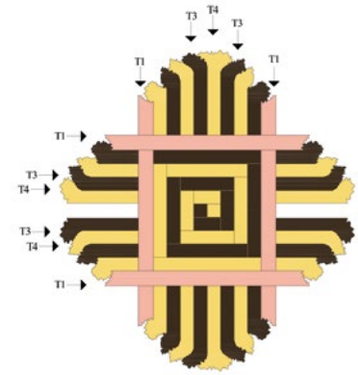
Parallels: Leiden, RMO AMM 16d, BA 216d (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 254, 256); Liverpool, NML 42.18.2: different pattern, but face similarly made.

26









Inventory number: Cat. 2349/2
Object: Cat mummy
Dimensions: H: 37, Base circ.: 22
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT
Description: Cat mummy of the skittle type with a naturalistically modelled head and erect ears. The head is made of a large piece of cloth stuffed with smaller ones in order to model the head. Pieces of the coarse filler textiles are visible through breaks in the final surface of the head. A folded bandage (T1) separates the ears from the face. The erect ears are outlined in brown and the interiors are made of two different textiles (T1 and T2). The eyes are appliquéd as circles with brown circumferential paint and a brown central dot as the pupil. The muzzle is made of textile and paint. The textile used underneath and on the back of head (T2) is of a coarser quality than that used on the rest of the mummy. Six bandages (three brown and three undyed) support the neck. The front of the mummy is enhanced with a meander pattern picked out in four coffers in dark brown (T3) and undyed (T4) fabric, with the base reinforced by undyed bandages (T2). The bandages that form the coffers are pulled back and tidily hidden by the textile piece that covers the back of the mummy.

Scientific examination

CT Investigation

The CT scans show a complete skeleton (length 32.5 cm) of a kitten (possibly *Felis silvestris lybica* based on the body-to tail-length ratio) aged 7 to 10 months, as indicated by epiphyseal fusion. The animal was positioned as usual, with the legs flexed towards the body and the tail against the belly. It was eviscerated. Some bits of sand and gravel and possibly drops of resin are scattered amongst the textiles wrapping the animal.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1 (muzzle and pattern)	Linen	S	Warp-faced	38–40 x 13–14	Orange-pinkish	
T2 (back of the head and sides)	Linen	S	Balanced	16 x 15	Undyed	
T3 (pattern)	Linen	S	Warp-faced	40 x 10	Dark brown	
T4 (pattern)	Linen	S	Warp-faced	32 x 9	Undyed	

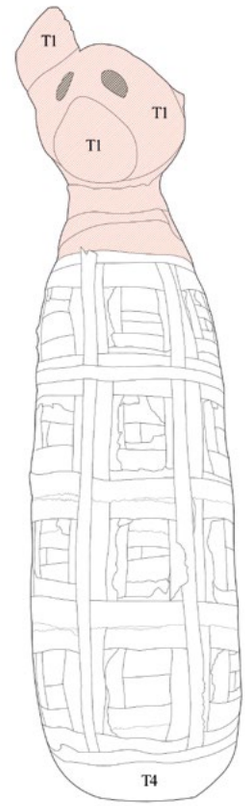
Textile notes: Four different qualities of textile were used to wrap the mummy and create the pattern.

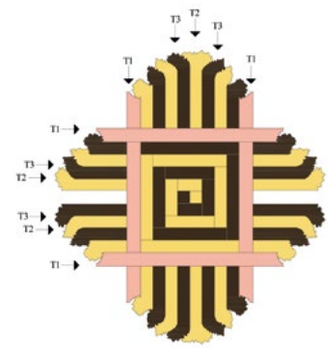
Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 332, no. 2349 [9–11]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19; Grewenig (ed.), *Ägypten*, 2014, p. 248.
Parallels: Leiden, RMO AMM 16d, BA 216d, CI 254 (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 254, 256–57); Liverpool, NML 42.18.2: different pattern, but face similarly made; Stockholm, Medelhavsmuseet MM 19237; **No. 27**.

27









Inventory number: Cat. 2349/3
Object: Cat mummy
Dimensions: H: 39, Base circ.: 28.6
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT, UVF, Optical Microscopy
Description: Cat mummy of the skittle type with a naturalistically modelled head and one surviving erect ear. The ear is outlined with a brown colour (a black resin-like substance or paint). A folded pinkish bandage (T1) separates the ears and muzzle. The face is enhanced by appliquéd round eyes, coloured brown. The details of the face are mainly missing, but there are faint indications that the nose was pink, and traces of thread impregnated by a black substance (either resin or paint) were used to outline the mouth and whiskers. Three (originally perhaps more) bandages (T1) reinforce the neck area in a spiral pattern. The front is enhanced by coffers of dark brown (T3) and undyed (T2) textile creating a meander pattern; the dark brown bandages (T3) are mostly destroyed, possibly due to the tannins used as mordant for dyeing. The bottom and the back are reinforced by undyed linen (T4). The back is covered by two pieces of undyed linen (T4) that are folded neatly, and overlap. These are browner and coarser than the other textiles used on this mummy. One of them has a double line of a thicker weave. The whole of the coffering is framed by pinkish (T1) linen bandages that are tidily folded.

Scientific examination

CT Investigation

The CT scans show a complete skeleton (length 33 cm) of a kitten, at least 6 months of age, but less than 10 months, according to epiphyseal fusion.

The animal was positioned as usual: the legs flexed towards the body, and the tail placed against the belly. The cause of death cannot be ascertained, but the collapsed skull and broken neck might indicate trauma to the skull –

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	38–40 x 13–14	Pinkish Safflower	
T2	Linen	S	Warp-faced	48 x 12	Undyed	
T3	Linen	S	Balanced	20 x 15	Dark brown Possible tannins	
T4	Linen	S	Warp-faced	20 x 9	Undyed	Self-bands

Textile notes: Four different qualities of textile were used to wrap the mummy and create the pattern.

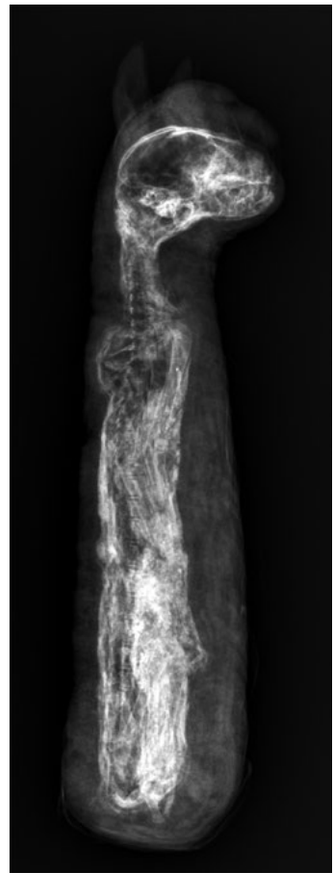
there are indeed examples of cats whose necks were wrung or heads hit in order to kill them.[64] The cervical vertebrae up to C5 are unidentifiable and appear to be replaced by an amorphous hyperdense material. The pelvis has collapsed, and the femoral heads are dislocated. The animal was eviscerated.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 332, no. 2349 [9–11]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19; Tamburini et al., *HeritSci* 9 (2021), p. 5, Table 1, p. 10, Table 2.
Parallels: Leiden, RMO AMM 16d, BA 216d (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 254, 256); **No. 31**.

[64] Armitage and Clutton-Brock, *JAS* 8 (1981), pp. 185–96: https://doi.org/10.1016/0305-4403(81)90023-6; Zivie and Lichtenberg, in Ikram (ed.), *Divine Creatures*, 2015, pp. 106–19.

28









Inventory number: Cat. 2349/4
Object: Cat mummy
Dimensions: L: 30.2, Base circ.: 25
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT, UVF, Optical Microscopy
Description: Cat mummy of the skittle type with a naturalistically modelled head. The ears are upright and edged with brown textile. The head is covered with a folded piece of linen (T2) that separates the ears and muzzle (T1). The eyes are only indicated by cavities on the surface; it is possible that they were appliquéd, but the glue failed and they fell off. Details of the nose or muzzle are missing, as the bandages are damaged in that area. The neck is reinforced with alternating dark brown (T5) and undyed (T4) bandages. The cat mummy is covered in the front with a herringbone pattern of dark brown (T5), undyed (T6), and possibly bleached (T4) bandages. A few pinkish threads can be seen in between the bleached bandages. It is also possible that the pattern of brown and undyed was originally more regular and the brown bandages, which are prone to disintegration, have crumbled. The base of the cat mummy is reinforced with undyed bandages (T3). There are some linen threads that emerge from the front. These are possibly the remains of reinforcement herringbones made with seven to ten pinkish threads that appear after every five herringbones. The bandages form almost horizontal stripes along the back, which might have been covered by another piece of linen. They are very tidy. Beneath this pattern, spiral bandages and swatches of cloth cover the animal, with string holding them in place, visible through holes in the back surface.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	60 x 18	Undyed	
T2	Linen	S	Warp-faced	34 x 14	Undyed	Self-bands
T3	Linen	S	Warp-faced	26 x 12	Undyed	
T4	Linen	S	Warp-faced	50 x 14	Bleached (?)	
T5	Linen	S	Warp-faced	46 x 12	Dark brown	
T6	Linen	S	Warp-faced	60 x 16	Undyed	
Thread	Linen	S			Pinkish	

Textile notes: Six different qualities of textile were used to wrap the mummy and create the pattern.

Scientific examination

CT Investigation

The CT scans show a complete skeleton (length 27 cm) of a kitten (possibly *Felis silvestris lybica*, based on the ratio of body length to tail length), between 6 and 9 months of age based on epiphyseal fusion and tooth eruption. The animal was positioned in the usual fashion, with the legs flexed towards the body and the tail against the belly. Osteolysis can be determined for the right nasal bone and right nasal cavity, in which the architecture of the turbinates can no longer be recognised, but which appears to be occupied by hyperdense material. In addition, lysis is also observed at the right ventromedial orbital wall, possibly related to a nasal neoplasm (tumour) that might have been the cause of death. The animal was poorly eviscerated but not excerebrated, as is usual in animal mummies. Some faecal residue is visible in the body.

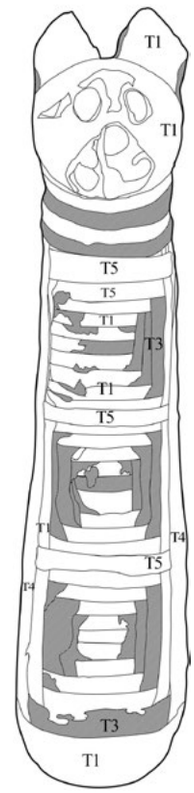
Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 332, no. 2349 [12–19]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19.

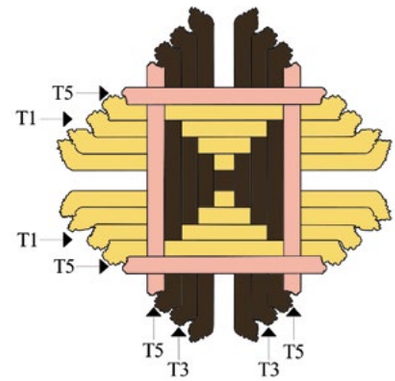
Parallels: No parallels.

29









Inventory number: Cat. 2349/5
Object: Cat mummy
Dimensions: H: 41, Base circ.: 24.3
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT
Description: Cat mummy of the skittle type with a naturalistically modelled head. A folded bandage (T1) separates the ears and face. The erect ears (T1) are outlined by a brown bandage. The interiors of the ears are a faded pink. The eyes are appliquéd and outlined with a brown linen thread, and have a dot in the middle that has almost completely vanished. The mouth and muzzle are detailed in brown thread and bandages. They are partially affixed using some black resin-like substances. The textile used on the back of the animal (T2) is of a coarser quality than the fabric used to wrap the mummy inside and cover the hips (T4). A break in the muzzle shows linen threads used to fix the inner textile. The neck is reinforced by four bands of alternating undyed (T1) and dark brown (T3) bandages. The front of the mummy is enhanced by a column of three coffers made of vertical dark brown (T3) and horizontal undyed (T1) bandages. The brown ones are somewhat destroyed. The coffers are set within a frame made of folded undyed bandages (T1 and T5). The base is reinforced with undyed coloured linen (T1).

Scientific examination

CT Investigation

The CT scans show a complete skeleton (length 35 cm) of a kitten (possibly *Felis silvestris lybica*), between 6 and 8 months of age based on epiphyseal fusion. The animal was arranged in the usual pose, with the legs flexed towards the body and the tail placed against the belly. It was eviscerated.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	30–32 x 11–12	Undyed	
T2	Linen	S	Balanced	13 x 9	Undyed	
T3	Linen	S	Basket (2/2)	16 x 7	Dark brown	
T4	Linen	S	Warp-faced	40 x 14	Undyed	
T5	Linen	S	Warp-faced	24 x 10	Undyed	
Thread	Linen				Undyed	

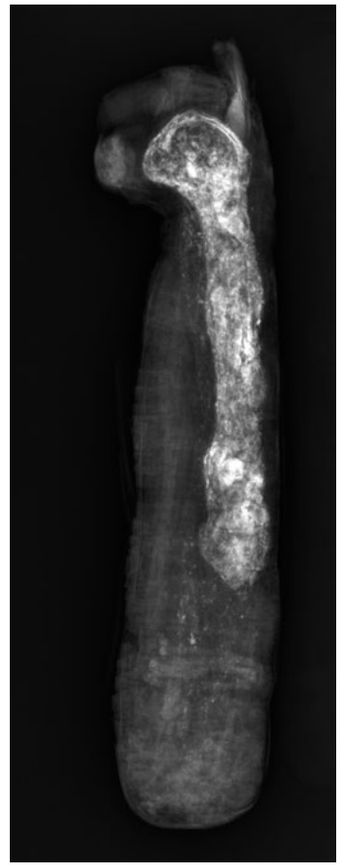
Textile notes: Five different qualities of textile were used to wrap the mummy and create the pattern.

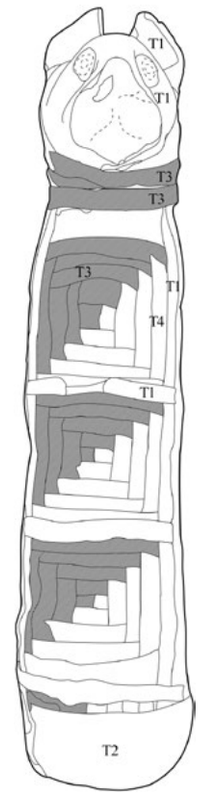
Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 332, no. 2349 [9–11]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19.

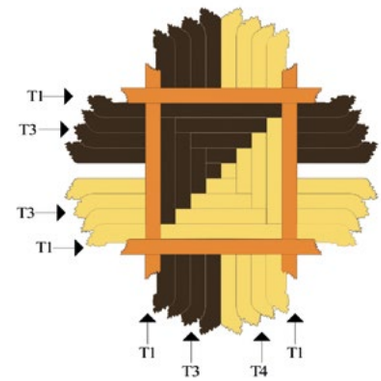
Parallels: Leiden, RMO AMM 16d, BA 216d (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 254, 256); Liverpool, NML 42.18.2.

30









Inventory number: Cat. 2349/6
Object: Cat mummy
Dimensions: H: 35, Base circ.: 22
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT
Description: Cat mummy of the skittle type with a naturalistically modelled head sporting a pronounced face and muzzle. A folded piece of undyed linen (T1) constitutes the main part of the face, with round eyes appliquéd and outlined in dark brown paint, with brown dots for the pupils. The ears are separately made of reinforced linen and secured to the head by bandages. Two brown bandages (T3), separated by an undyed one (T1), are wrapped around the neck of the creature. The front of the mummy is decorated with three (diagonal-type) coffers, the upper halves of which are diagonally filled by brown-coloured (T3) and undyed (T4) bandages. The base is reinforced with more linen that is covered by a folded bandage (T1), while the back and sides are tidily covered by undyed cloth (T2) that is secured by a resin-like black substance. A break in the T2 fabric allows to see far less tidy bandages secured by thread.

Scientific examination

CT Investigation

The CT scans show a complete skeleton of a very young kitten, maybe only a few weeks old. The skeleton is in a very poor condition and disarticulated. The body position cannot be determined. The skull appears fractured, which might be the possible cause of death. The body was covered with a black resin-like substance, then wrapped, together with some radiopaque matter scattered throughout the bandages. It was eviscerated. The lower part of the mummy bundle consists entirely of textile; indeed, the kitten occupies very little space within the bundle.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	41–42 x 13–15	Orange-pinkish	
T2	Linen	S	Balanced	20 x 15	Undyed	
T3	Linen	S	Warp-faced	20 x 9	Dark brown	
T4	Linen	S	Warp-faced	32 x 14	Undyed	
Thread	Linen				Undyed	

Textile notes: Four different qualities of textile were used to wrap the mummy and create the pattern.

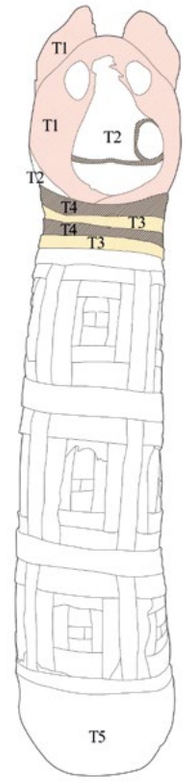
Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 332, no. 2349 [12–19]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19.

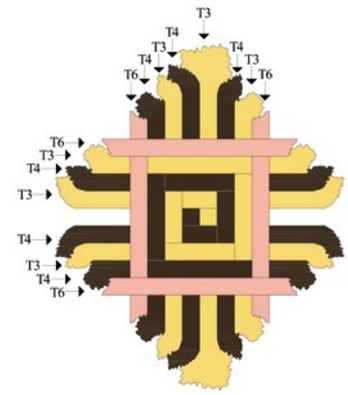
Parallels: Leiden, RMO AMM 16d, BA 216d (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 254, 256); Liverpool, NML 42.18.2: different pattern, but face similarly made.

31









Inventory number: Cat. 2349/7
Object: Cat mummy
Dimensions: H: 36, Base circ.: 23.4
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT, Optical Microscopy
Description: Cat mummy of the skittle type with a naturalistically modelled head. The ears are erect, modelled in linen and outlined with a brown bandage that has largely worn away. The round eyes are appliquéd in a cruder linen, attached to a folded bandage (T1) that separates the ears from the rest of the face. This pinkish bandage (T1) is of finer quality than the one used to form the muzzle (T2). A dark brown linen thread outlines the eyes, and a brown dot at the centre serves as a pupil. The details of the face are picked out in brown thread that forms the mouth and the twirl of the whiskers on the left side, which are broken off on the right side. The neck is reinforced with a series of dark brown (T4) and undyed (T3) bandages.

The front of the body is covered with three large columns of three coffers in a meander pattern made of dark brown (T4) and undyed bandages (T3), set within a large rectangular frame of pinkish bandages (T6). The ends of the bandages that were used to create the pattern are gathered up and covered by an undyed bandage (T5), which not only tidies these up, but also serves to reinforce the base. The sides are neatly covered by a folded bandage (T2) that extends along the back of the mummy.

Scientific examination

CT Investigation

The CT scans show a complete skeleton of a kitten (possibly *Felis silvestris lybica*) in very poor condition, probably about 4 months of age based on epiphyseal fusion. The body position cannot be determined with certainty. The

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	46 x 11	Pinkish	
T2	Linen	S	Warp-faced	22 x 9	Undyed	
T3	Linen	S	Warp-faced	26 x 10	Undyed or bleached	
T4	Linen	S	Warp-faced	24 x 12	Dark brown	
T5	Linen	S	Warp-faced	44 x 14	Undyed	
T6	Linen	S	Warp-faced	34 x 12	Pinkish	

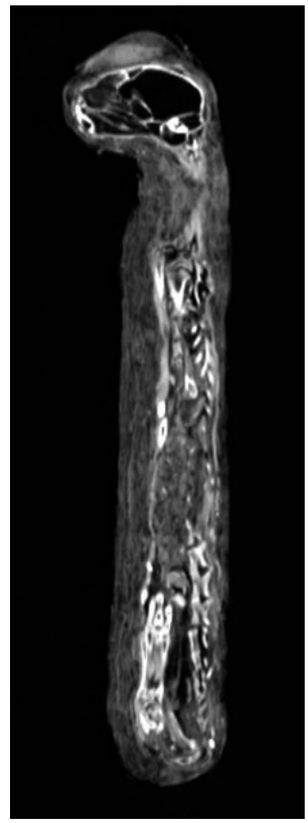
Textile notes: Six different qualities of textile were used to wrap the mummy and create the pattern.

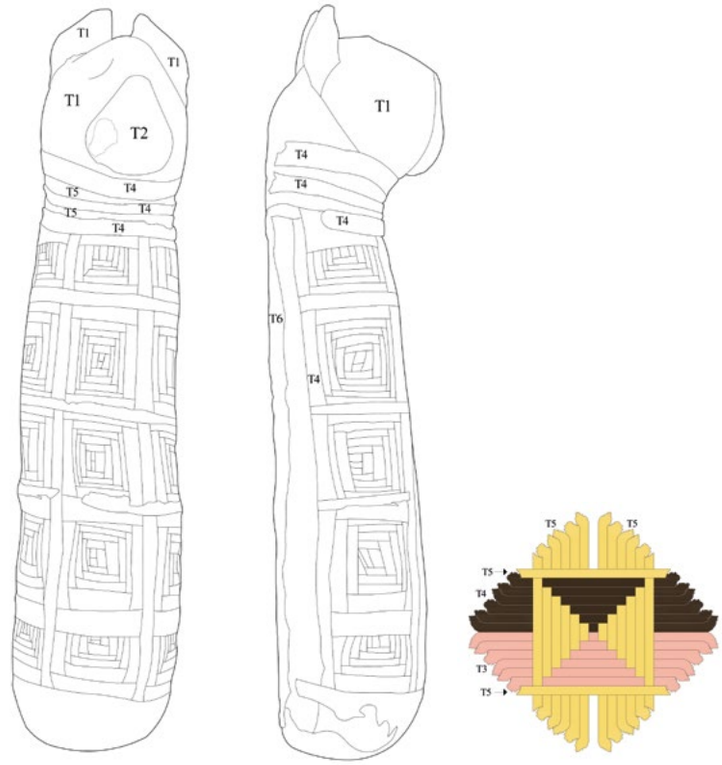
neck is disjointed, but this might be an artefact of post-mortem handling rather than a cause of death. This is also the case for the crack on the back of the head. The body was covered with some resin, then wrapped, together with some radiopaque matter scattered throughout the bandages. It was eviscerated.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 332, no. 2349 [12–19]; Rossi and Strinati (eds.), *Gatti nell'arte*, 1987, p. 107, fig. 24; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19; Xiaolin (ed.), *Egypt*, 2018, p. 108; Marini and Tjabbes (eds.), *Egito Antigo*, 2020, pp. 120–21.
Parallels: Leiden, RMO AMM 16d, BA 216d (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 254, 256); Liverpool, NML 42.18.2: different pattern, but face similarly made; **No. 27**.

32







Inventory number: Cat. 2349/8
Object: Cat mummy
Dimensions: H: 36.5, Base circ.: 23
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT, UVF, Optical Microscopy
Description: Cat mummy of the skittle type with a naturalistically modelled head. The upright ears (T1) are edged with brown bandages, the face is well defined (T1), and the muzzle (T2) is large. There are indents where the eyes should be. No details of any colour are present on the muzzle, but it is possible that it is missing a piece of textile. The neck is encircled and reinforced with five dark brown (T4) and undyed (T5) bandages. The front is decorated with an elaborate square coffering in three columns of five rows. These alternating double- and single-sided coloured coffers create an overall diamond pattern. The horizontal strips dividing the central three coffers are pinkish (T3). The dark bandages (T4) are in a poor state of preservation. The edge bandages extend to the back and are covered by a central strip of cloth. The base is made of reinforced undyed bandages (T6).

Scientific examination

CT Investigation

The CT scans show a complete skeleton (length 31 cm) of a kitten (possibly *Felis silvestris lybica*), between 5 and 8 months of age at death based on dentition and epiphyseal fusion. The animal was placed in the usual pose, with the legs flexed towards the body and the tail placed against the belly. It was eviscerated.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	52 x 15	Undyed	
T2	Linen	S	Warp-faced	44 x 18	Undyed	
T3	Linen	S	Warp-faced	48 x 12	Pinkish	
T4	Linen	S	Warp-faced	28 x 11	Dark brown	
T5	Linen	S	Warp-faced	50 x 15	Undyed	
T6	Linen	S	Warp-faced	26 x 12	Undyed	

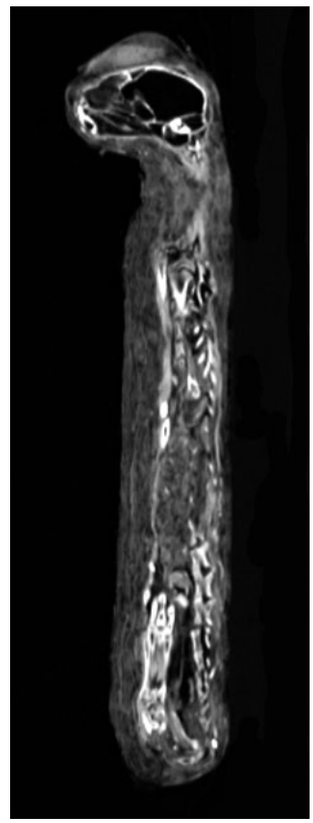
Textile notes: Six different qualities of textile were used to wrap the mummy and create the pattern. It is possible that T1 and T5 come from the same fabric.

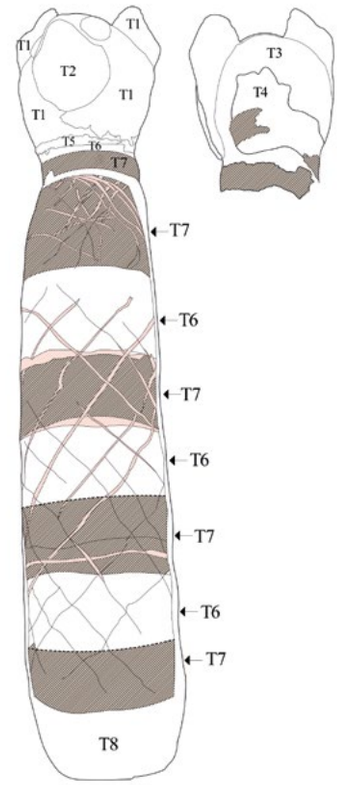
Bibliography: Fabretti et al., *Regio Museo,* 1882, p. 332, no. 2349; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19; Xiaolin (ed.), *Egypt*, 2018, p. 108, fig. 57; Marini and Tjabbes (eds.), *Egito Antigo*, 2020, pp. 120–21.

Parallels: Donadoni Roveri, *Art of Weaving*, 2001, p. 87; Leiden, RMO AMM 16d, BA 216d (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 254, 256); Liverpool, NML 42.18.2: different pattern, but face similarly made.

33







Inventory number: Cat. 2350/3
Object: Cat mummy
Dimensions: H: 43.3, Base circ.: 23.6
Acquisition: Acquired before 1882
Provenance: Unknown
Date: 370–200 BC (^{14}C date)
Scientific analyses: CT, ^{14}C dating, UVF, Optical Microscopy
Description: Cat mummy of the skittle type with naturalistically modelled head and ears (T1) outlined in brown paint. The appliquéd eyes are painted brown around the edges and have a painted brown central pupil. The whiskers are made of brown thread. The face is modelled and wrapped with two different undyed textiles (T1 face and T2 muzzle). The neck was reinforced by horizontal bandages of dark brown (T7) and undyed linen (T5 and T6), some of which are now missing, revealing a coarse, loosely woven textile underneath. The front of the cat mummy is damaged, but was decorated with seven broad bands of alternating dark brown (T7) and undyed (T6) bandages. The bottom is covered with an undyed reinforced cloth (T8), while undyed bandages border the decoration and cross over onto the back (T8). The front was further decorated with a string net of pinkish threads. The net was, as with other examples, quite possibly held in place with rows of horizontal pinkish thread.

Scientific examination

CT Investigation

The CT scans show a complete skeleton (length 39.5 cm) of a juvenile cat (probably *Felis silvestris lybica*), between 8 and 12 months of age based on epiphyseal fusion. The animal was positioned in the usual fashion, with the legs flexed towards the body and the tail resting against the belly. The neck is a bit disjointed, but this possibly happened post-mortem. Remnants of peripheral encephalic tissue and the spinal cord are present. It is eviscerated, and some filling material, possibly textile, is present in the thorax and abdomen.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 370–200 BC.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	40 x 16	Undyed	
T2	Linen	S	Warp-faced	46 x 16	Undyed	Self-bands
T3	Linen	S	Warp-faced	20 x 10	Undyed	
T4	Linen	S	Warp-faced	34 x 14	Undyed	Self-bands
T5	Linen	S	Basket	24 x 12	Undyed	
T6	Linen	S	Warp-faced	48 x 13	Undyed	
T7	Linen	S	Warp-faced	48 x 18	Dark brown	
T8	Linen	S	Warp-faced	40 x 12	Undyed	Darning
Thread	Linen	S			Pinkish	

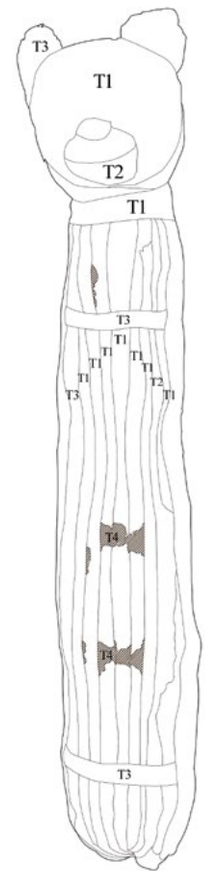
Textile notes: Eight different qualities of textile were used to wrap the mummy and create the pattern.

Bibliography: Fabretti et al., *Regio Museo,* 1882, p. 332, no. 2350 [20–24]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 14, 19; *Aegyptica Animalia*, 2000, p. 87, no. 52a.
Parallels: Leiden, RMO AMM 16d, BA 216d (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 254, 256); **Nos. 22**–**23**.

34







Inventory number: Cat. 2350/4
Object: Cat mummy
Dimensions: H: 41.5, Base circ.: 22.7
Acquisition: Acquired before 1882
Provenance: Unknown
Date: 440–240 BC (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating, UVF, Optical Microscopy
Description: Cat mummy of the skittle type with a modelled head. The textile (T3) ears are upright. The face lacks detailing, except for the nose, made of a cloth "button". A broad bandage extending from the base of the ears to the top of the nose (T1) secures the facial bandages, leaving the muzzle (T2) exposed. The eyes are either missing or were not added in either paint or appliqué; neither were the whiskers. A bit of dark brown dyed bandage (T4) is visible in the area of the mouth, but it is not possible to tell if it was meant to be visible or if it shows through as the outer bandages are damaged. A single (originally there were perhaps more) folded undyed bandage is wrapped around the neck (T1).

The pattern of bandages in the front is incompletely preserved. A broad bandage secures the frontal bandages at the neck. Now, only a central bandage flanked by alternating undyed (T1 and T2) and dark brown (T4) bandages survives, giving the impression of pleats. They were secured by a narrow bandage that survives a little way down from the neck and another similar one at the base. Impressions on the body of the cat suggest that originally there were more of such bandages. The bandages that are present are all gathered together at the bottom and tucked in at the verso. Larger folded bandages provide a frame to the front,

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	32 x 11	Undyed	
T2	Linen	S	Warp-faced	40 x 20	Undyed	
T3	Linen	S	Warp-faced	24 x 12	Undyed	
T4	Linen	S		Too badly preserved for thread count	Dark brown	

Textile notes: Four different qualities of textile were used to wrap the mummy and create the pattern.

and extend along the back, where they are secured with a black resin-like substance, glue or gum Arabic. At the base, a small bone, perhaps a tiny caudal vertebra, protrudes from the wrappings. The base was probably reinforced, but nothing remains of it. The verso of the mummy is quite dark, as if the black resin-like substance had seeped out, staining the bandages.

Scientific examination

CT Investigation

The CT scans show a complete skeleton (length 38.7 cm) of a juvenile cat (probably *Felis silvestris lybica*), about 8 months of age based on epiphyseal fusion.

The animal is positioned in the usual fashion, with the legs contracted towards the body and the tail placed against the belly. The right forelimb is slightly flexed, while the left one is straight, as is usual, and there is a considerable amount of packing the limbs with linen. There are numerous fractures and dislocations of the skeleton, most probably post-mortem. The animal was eviscerated. Bits of sand or dirt appear in the wrapping.

Radiocarbon dating (^{14}C)

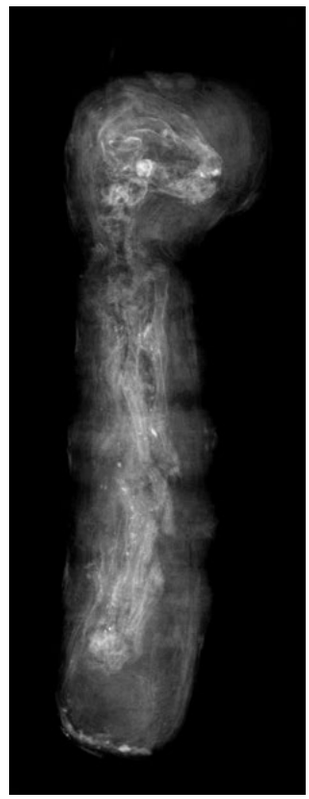
Textile, calibrated age (95% level of probability): 440–240 BC, similar to **No. 22**.

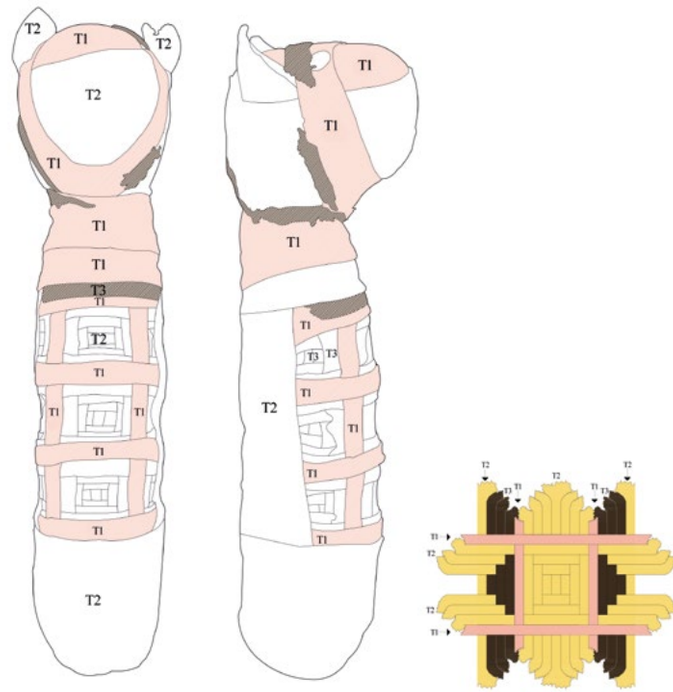
Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 332, no. 2350 [20–24]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 14, 19.

Parallels: Leiden, RMO AMM 16b (Raven and Taconis, *Egyptian Mummies*, 2005, p. 252).

35







Inventory number: Cat. 2350/5
Object: Cat mummy
Dimensions: H: 25.2, Base circ.: 15.9
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT, Optical Microscopy
Description: Small cat mummy of the skittle type with a very basically modelled head. The small ears (T2) are erect and might have been edged with brown paint or a black resin-like substance. A strip of dark brown folded linen (T3) is affixed to the top of the head, stretching between the base of the ears and over a narrower pinkish band (T1) that separates the face from the ears, and upon which the appliquéd eyes are placed. The eyes are very high up on the head. The overly large left eye is intact and consists of a cloth button around which a piece of brown thread has been twisted. Only the button part of the right eye remains. Another broad band of cloth (T2) that looks like a gag reinforces the front of the face. There is no real modelling of the muzzle, but there are dark marks on it that suggest that originally brown bandages were attached with a black resin-like substance or adhesive of some sort to give details of the mouth and whiskers. Fragments of a dark brown bandage (T3) surround the neck. A broader pinkish bandage (T1) was below, followed by another one, then a thinner dark brown bandage (T3), and yet another pinkish one (T1). The front of the mummy consists of three columns of (single) concentric coffers of three rows each, with only the central column being completely visible. The main framing bands for each coffer were pink (T1). The internal coffering is made of plain undyed linen. The flanking columns are made of brown and undyed linen half-coffers. The sides of the coffers are covered by a large piece of folded undyed linen (T2) that extends around the back, and is somewhat threadbare. All of the fabric is covered at the bottom with another bit of folded undyed linen (T2), creating a sort of cup. Dots of black resin-like substance indicate where the different layers were stuck together. Behind the head at the base of the neck there are big brown-black smudges from black resin-like substances.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	36 x 12	Pinkish	
T2	Linen	S	Warp-faced	28 x 11	Undyed	
T3	Linen	S	Warp-faced	28 x 9	Dark brown	

Textile notes: Three different qualities of textile were used to wrap the mummy and create the pattern. It is possible that T2 and T3 come from the same fabric.

Scientific examination

CT Investigation

The CT scans show a complete skeleton (length 20.5 cm) of a kitten, between 1 and 4 months of age based on the size of the bones and what can be seen in terms of epiphyseal fusion. The animal was posed in the usual fashion, with the front legs extended and the hind legs flexed towards the body and the tail resting against the belly. The skull has collapsed; only a few vertebrae are recognisable in the thoracic area, which contains dislocated remnants of the spinal cord. The pelvis might be missing, as it cannot be identified in the scan. The animal was eviscerated.

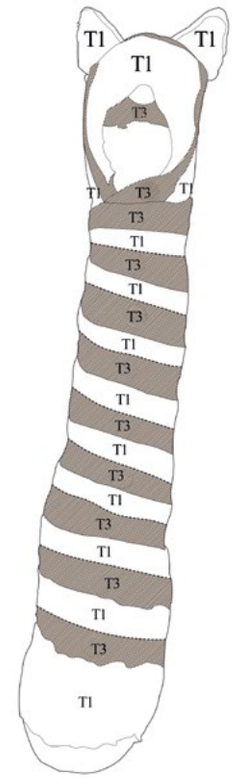
Bibliography: Fabretti et al., *Regio Museo,* 1882, p. 332, no. 2350 [20–24]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 14, 19; *Aegyptica Animalia*, 2000, p. 87, no. 52b; Xiaolin (ed.), *Egypt*, 2018, p. 109, fig. 59; Marini and Tjabbes (eds.), *Egito Antigo*, 2020, p. 122.

Parallels: Leiden, RMO AMM 16d, BA 216d (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 254, 256).

36







Inventory number: Cat. 2350/7
Object: Cat mummy
Dimensions: H: 43, Base circ.: 16.5
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT, UVF, Optical Microscopy
Description: Cat mummy of the skittle type with a naturalistically modelled head. The ears are erect and made with an undyed bandage (T1). The modelled face was made of undyed linen (T1). Details of the eyes and nose are provided by brown paint or, in the case of the nose, a smudge of a black resin-like substance. The back of the head and the back of the ears are made with a different undyed textile (T2). The mouth is indicated by a horizontal dark brown bandage (T3), giving it a sort of bad-tempered expression. Another dark brown bandage (T3) encircles the face and rests at the base of the ears, keeping the components of the head together.

The body is wrapped in a series of spiral bandages, dark brown (T3) alternating with undyed linen (T1); most of the brown ones have disintegrated. The brown ones at the neck are of a loose weave, but the others are denser. They were partly kept in place by black resin-like substance. The bottom is reinforced (T1). Where the bandages have worn away, one can see underlying disorganised bandages and linen thread ("S"-spun) that holds the mummy bundle together.

Scientific examination

CT Investigation

The CT scans show a complete skeleton (length 18.7 cm) of a kitten, probably between 3 and 6 weeks old judging from the size of the bones. The kitten was positioned with the right foreleg slightly flexed and the left one hanging down, and both hindlegs flexed, with the tail probably lying against the body. The bones are not well articulated in the lower portion of the bundle. The skull has collapsed,

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	50 x 17	Undyed	Self-bands
T2	Linen	S	Warp-faced	24 x 12	Undyed	
T3	Linen	S	Warp-faced	52 x 13	Dark brown	
Thread	Linen	S			Undyed	

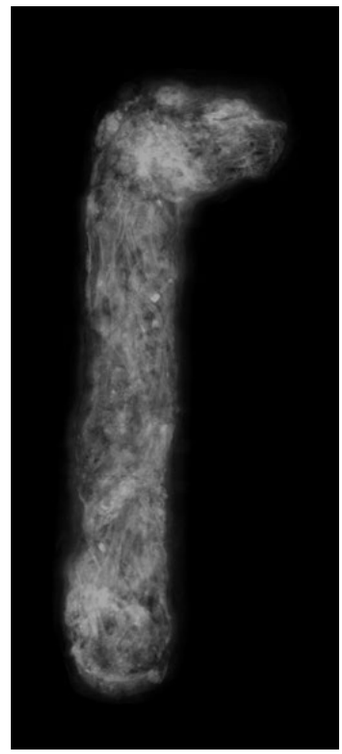
Textile notes: Three different qualities of textile were used to wrap the mummy and create the pattern. It is possible that T1 and T3 come from the same fabric.

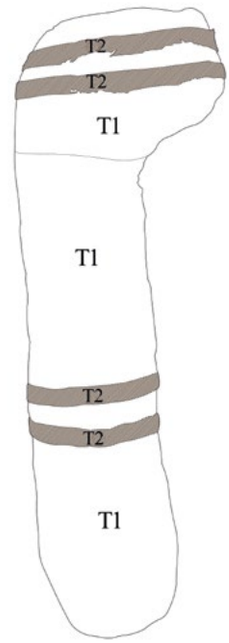
but this might be due to post-mortem activities, though it could also be due to a head trauma that resulted in the animal's death. It was eviscerated. A twig, 8 mm long and 2.5 mm thick, lies along the back of the mummy, within the bandages. It is perhaps an accidental inclusion, though it might also have been included to provide support to the body. There are radiopaque materials in the muzzle area, probably a black resin-like substance.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 332, no. 2350 [20–24]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 14, 19; *Aegyptica Animalia*, 2000, p. 87, no. 52c; Xiaolin (ed.), *Egypt*, 2018, p. 109, no. 58; Marini and Tjabbes (eds.), *Egito Antigo*, 2020, p. 122.
Parallels: No parallels.

37







Inventory number: Cat. 2350/6
Object: Cat mummy
Dimensions: H: 27, Base circ.: 17.5
Acquisition: Acquired before 1882
Provenance: Unknown
Date: 400–50 BC (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating, Optical Microscopy
Description: Cat mummy of the skittle type with a prominent head, which is poorly defined and slightly tilted up. Neither the ears nor the eyes are modelled. The head is covered with a plain undyed shroud (T1). The face is defined by two horizontal folded dark brown bandages (T2), the upper one longer than the lower one, although originally they both went around the entire circumference of the head. Perhaps these were meant to indicate the mouth and whiskers. The remains of one folded undyed linen bandage, somewhat discoloured by a black resin-like substance on the left side, are secured around the mummy's neck. The body is covered with a plain undyed shroud (T1) with two parallel folded brown bandages wrapped horizontally around the body, about two-thirds of the way down. Beneath it, through breaks in the fabric at the front, at least three layers of broad bandages of tight weave can be seen. On the back, the shroud is secured with a long smear of the black resin-like substance. The bottom was further reinforced with bandages and is well covered and tidy. A few spots of the black resin-like substance dot the right side of the muzzle, and there are dark marks at the base where all the textile was gathered and stuck together.

Scientific examination

CT Investigation

The CT scans show a skeleton in poor condition of a kitten whose age cannot be determined with confidence, though it seems to be between 3 weeks to just over a month old. The long bones, although morphologically complete, are of the size and shape typical for a very young animal. The animal seems to have been posed with the legs contracted towards the body; the tail is not identifiable. There does not seem to be any viscera present. There is an abundance of radiopaque material in the head and body, within the wrappings.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 400–50 BC.

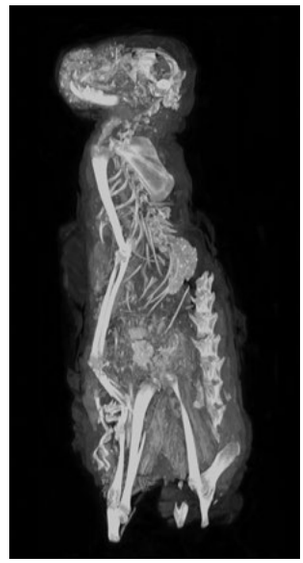
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	26 x 13–14	Undyed	Self-bands
T2	Linen	S	Warp-faced	48 x 12	Dark brown	

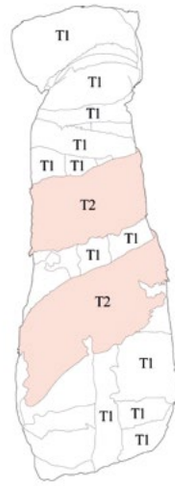
Textile notes: Two different qualities of textile were used to wrap the mummy and create the pattern.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 332, no. 2350 [20–24]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 14, 19; Xiaolin (ed.), *Egypt*, 2018, p. 108, fig. 55; Marini and Tjabbes (eds.), *Egito Antigo*, 2020, p. 125.
Parallels: No parallels.

38







Inventory number: Provv. 6117
Object: Cat mummy
Dimensions: L: 45.5, Base circ.: 37.5
Acquisition: Unknown
Provenance: Unknown, probably Asyut[65]
Date: 350 BC – 0 (^{14}C date)
Scientific analyses: CT, ^{14}C dating, Optical Microscopy
Description: Cat mummy in a slightly flattened skittle form with modelled ears. The wrappings are in a poor state. The left ear remains standing, while the right ear is damaged, and the final covering of the head is destroyed. The body is covered with a piece of fabric (T1) kept in position by a series of spiral undyed bandages of the same textile. Some other fragments of red-brown (?) textile (T2) are placed on the surface. The bandages on one side are darker than on the other.

Scientific examination

CT Investigation

The CT scans show a complete skeleton (length 44.5 cm) of a young cat, between 8 and 12 months of age based on epiphyseal fusion. It was embalmed in the usual fashion, with the forelegs extended along the body and the hindlegs flexed toward the body, with the tail lying along the belly. The skull was crushed and the skeleton shows evidence of disarticulation, both probably due to post-mortem handling. The animal was eviscerated. Some sandy mud adheres to the fur in places where it became wet from the embalming materials.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% level of probability): 350 BC – AD 0.

Bibliography: Unpublished.
Parallels: No parallels.

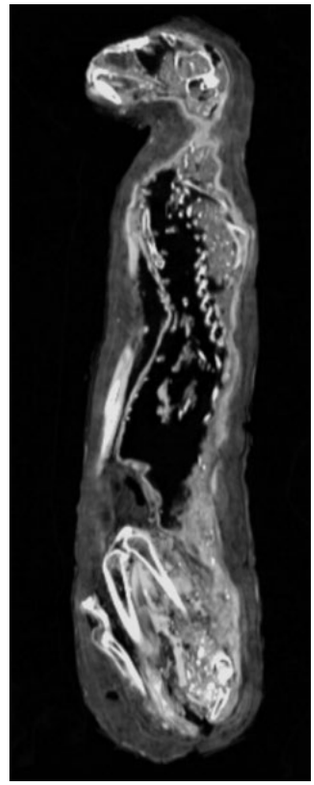
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	32–28 x 12–11	Undyed	Self-bands
T2	Linen	S	Warp-faced	28 x 11	Red-brown (?)	

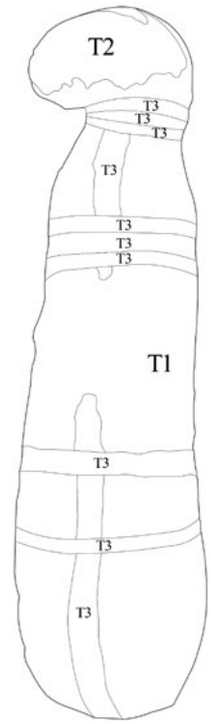
Textile notes: Two different qualities of textile were used to wrap the mummy. It is possible that T1 and T2 come from the same fabric.

[65] The wrapping technique, in which the body is covered by a piece of cloth used as a shroud, is very similar to that of some cat mummies from Asyut, like **No. 40** in this catalogue.

39







Inventory number: Suppl. 11010
Object: Cat mummy
Dimensions: L: 49.3, Base circ.: 34.8
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: 540–230 BC (^{14}C date)
Scientific analyses: CT, ^{14}C dating, Optical Microscopy
Description: Cat mummy with a flattened body and a prominent head without naturalistic details. The outer bandages of the head are missing, so it is not possible to tell if it was once more elaborately modelled than it is now. The ears are missing – it is possible that it was never intended to have them. The face was covered by many layers of bandages of different qualities that are not completely intact, as the cat's head, a bit of its fur, its nose and right incisor are visible. Fragments of bandages that were once wound around the neck are visible. The body itself has been first covered with one red-brown shroud (T2) interspersed by thread to keep it in place and then covered by a second shroud (T1) kept in place by a series of horizontal and vertical undyed linen bands (T3). The left side of the mummy is very dark, probably because it was laid on its side when still wet with black resin-like substances that have seeped out through the bandages.

Scientific examination

CT Investigation

The CT scans reveal a complete skeleton (length 46.8 cm) of an adult cat, older than 22 months based on epiphyseal fusion. It might be a wild cat rather than the usual domestic type found as a votive offering, as the tail is a bit short – in *Felis chaus* the tail is one third the length of the head and body, while in the more common *Felis silvestris lybica* it is two-thirds the length of the head and body; however, the skull is more in keeping with *F. s. lybica*.[66] It was positioned in the usual fashion, with the forelegs extended along the body, the hind legs flexed toward the body, and the tail lying along the belly. It was eviscerated and filled with radi-

[66] Osborn and Helmy, *Mammals of Egypt*, 1980, p. 435.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	30 x 10–11	Undyed	
T2	Linen	S	Warp-faced	60–62 x 16–18	Red-brown (?)	
T3	Linen	S	Warp-faced	40 x 11	Undyed	Self-bands

Textile notes: Three different qualities of textile were used to wrap the mummy.

opaque materials of some sort (possibly resin-based and/or gravel) and some sand. Some radiopaque material (maybe metal fragments) of irregular shape and different sizes are present in the area of the eyes.

Radiocarbon dating (^{14}C)

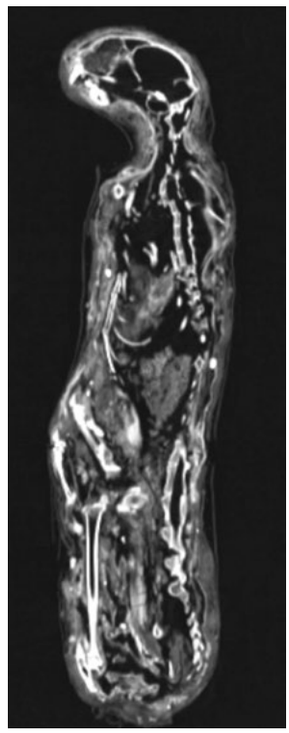
Textile, calibrated age (95% level of probability): 540–230 BC.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19, 33.

Parallels: Leiden, RMO CB 4–9 (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 261–66).

40





Inventory number: Suppl. 11011
Object: Cat mummy
Dimensions: L: 49.5, Base circ.: 29.7
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: 740–400 BC (^{14}C date)
Scientific analyses: CT, ^{14}C dating, Optical Microscopy
Description: Cat mummy with a flattened body and a prominent head without naturalistic details. The mummy has lost some of its final wrappings. The head is modelled in a rudimentary manner. The linen around the neck is lighter, as if it had been once covered by a bandage or series of bandages to support the neck. The mummy is first wrapped with a bandage (T2) secured with threads and then covered by a piece of cloth (T1), serving as a shroud. Through a hole in the wrappings, a bit of greyish-yellow fur is visible.

Scientific examination

CT Investigation

The CT scans reveal a complete skeleton (length 48.2 cm) of an adult cat (*Felis silvestris lybica*), older than 22 months based on epiphyseal fusion. It was positioned in the usual fashion, with the forelegs hanging down, the hindlegs flexed towards the body, and the tail lying along the belly. The animal was eviscerated. The lower part of the body cavity is filled with what might be a mixture of natron, pebbles and a black resin-like substance, the upper part of the chest with bandages.

Radiocarbon dating (^{14}C)

Fur, calibrated age (95% probability): 740–400 BC (similar to **Nos. 52–53, 42, 44, 46**).

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19, 33.
Parallels: Leiden, RMO CB 4–9 (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 261–66).

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	30 x 12–13	Undyed	
T2	Linen	S	Warp-faced	40 x 11–12	Undyed	

Textile notes: Two different qualities of textile were used to wrap the mummy.

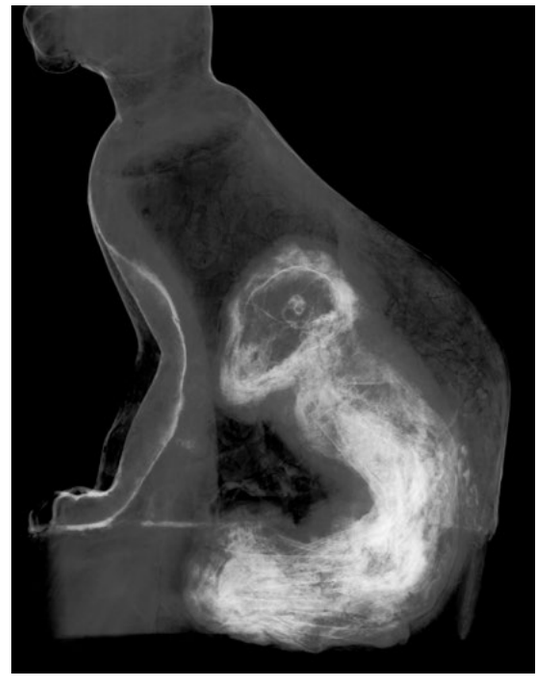
41



Inventory number: Provv. 6125/1
Object: Cat mummy
Dimensions: Not applicable
Acquisition: Unknown
Provenance: Unknown
Date: Undetermined
Scientific analyses: None
Description: The head and assorted bones from a cat mummy, with deciduous dentition.
Bibliography: Unpublished.
Parallels: No parallels.

42





Inventory number: Cat. 2358
Object: Cat mummy in a coffin

MUMMY

Dimensions: Unavailable due to the mummy's position
Acquisition: Acquired before 1882
Provenance: Unknown
Date: 740–400 BC (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating
Description: A linen-wrapped package inserted into a cat-shaped wooden statue/coffin. Additional textile (T2) was inserted in the base of the statue to keep the mummy in situ. The animal was wrapped in undyed textiles (T1), with oil spots, a residue of the embalming process.

Scientific examination

CT Investigation

The CT scans show a complete skeleton (length 36 cm, calculated using the "open polygon" function that takes the curvature of the spine into account) of a kitten (possibly *Felis silvestris lybica*), less than 8 months old based on the morphology of the bones and epiphyseal fusion. The kitten is in a curved position at the bottom half of the wooden sculpture. The position may be due to a shifting over time of the animal or a disarticulation of the body due to its being forced into the cavity. Additional damage to the mummy is due to the fact that part of the wrapped animal was put into the coffin vertically and the rest was inserted into the base horizontally: the bones have consequently moved

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	28–30 x 13	Undyed	Selvedge
T2	Linen	S		Too badly preserved for thread count	Undyed	

Textile notes: The textiles are observable only from the bottom side. Only one can be inspected. The fragments used for bedding empty space cannot be investigated, and a density count is hence not possible on them.



around, and the animal is not properly articulated. The cat was eviscerated. Mud and sand were introduced either into the body cavity or between the wrappings to "flesh" it out and provide more support.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 740–400 BC (this is the same as **Nos. 40, 44, 46, 52–53**).

COFFIN

Dimensions: Base L: 37.5, W: 18, H: 12; Depth (recess for cat sculpture): 6.6; cat sculpture H: 43.4; D (opening for mummy): 13.5

Acquisition: Acquired before 1882

Provenance: Unknown

Date: 730–380 BC (^{14}C date)[67]

Scientific analyses: X-ray, CT, ^{14}C dating

Description: A wooden coffin in the shape of a seated cat on a base that is shaped like the hieroglyph ***sḥ***, which means "to protect". The base is made of a single piece of wood, with a deep recess (depth 5.6 cm) to hold the figure of the cat. The cat itself is carved in two halves that were joined vertically and covered with plaster and white paint. Each half is made of two pieces of wood. A tail is indicated on the right side. The inside of the right ear still shows some paint; the left ear has little left. Aside from the overall white colour, no painted details are visible on the face, although they may have once existed. The muzzle is well-modelled, so that even without paint all the details are clearly recognisable: the eyes, the nose, the mouth and all the muscles of the face.

Scientific examination

Radiocarbon dating (^{14}C)

Wood, calibrated age (95% probability): 730–380 BC.

Bibliography: Fabretti et al., *Regio Museo,* 1882, p. 333, no. 2358 [36]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19; *Aegyptica Animalia*, 2000, p. 87, no. 53; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 39–40, fig. 3B.

Parallels: Brussels, MRAH E 7069 (Gaillard and Daressy, *La faune momifiée*, 1905, p. 20; Francot et al. (eds.), *Les momies égyptiennes*, 1999, p. 23, p. 52, fig. 30, p. 77, fig. 88); Cairo, EMC CG 29773–76 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 19–20); Leiden, RMO L.XII.4 (Raven and Taconis, *Egyptian Mummies*, 2005, p. 247).

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Theriomorphic container on base	Yes	Yes	White	Body: two halves (each made of two pieces of wood) Base: one piece of wood	No	No	No

Coffin technical notes

[67] The style does suggest that the date for this object might be closer to the 400 BC mark than the 740 BC one.

43







Inventory number: Cat. 2359
Object: Cat mummy and its coffin
Dimensions: Base L: 32.6, W: 16.3, H: 5.8; D. (recess for cat sculpture): 2.6; Cat sculpture H: 50; D (opening for mummy): 7.8
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined

Scientific analyses: X-ray, CT
Description: A hollow wooden coffin in the shape of a seated cat, made in two halves and mounted on a base. Each half is carved from a single piece of wood. The wood was plastered lightly, then covered with textile, after which another layer of plaster was spread over it, which was painted black. The tail, made separately and affixed to the base, curves to the right. The hind paws are affixed to the base and are not part of the main cat statue. The forepaws rest on a thin piece of wood set horizontally into the base to fill a gap. The base is made from reused wood as evidenced by two rectangular depressions in front of the forepaws that now are filled in with wood. These might be repairs or might have held something else originally. The coffin contains a wrapped package visible only from the hole below the cat statue.

Scientific examination

CT Investigation

The CT scans show that the wrapped package contains a skeleton (length 32.3 cm) of an adult cat (possibly *F. s. lybica*)

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Theriomorphic container on base	Yes	Yes	Black	Body: two halves Base: one piece of wood	No	No	No

Coffin technical notes

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S		Too badly preserved for thread count	Undyed	

Textile notes: Textile is observable only from the bottom side.

that was between 18 and 22 months of age at death, based on epiphyseal fusion. The cat was originally positioned with the forelegs extended and the hindlegs contracted towards the body, but now the left (?) forelimb is disarticulated and the radius and ulna lie at the back of the mummy. The head is inclined to one side (about 40° to the right). The skeleton appears incomplete, missing its cervical vertebrae, pelvis and tail. It was eviscerated.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 333, no. 2359 [37].
Parallels: Leiden, RMO AH 80c (Raven and Taconis, *Egyptian Mummies*, 2005, p. 246); Paris, Louvre E 18920.

44



Inventory number: Cat. 2360 (other numbers: 270)
Object: Coffin for a cat
Dimensions: W: 7.9, H: 24
Acquisition: Acquired before 1882

Provenance: Unknown
Date: 750–390 BC (^{14}C date)
Scientific analyses: ^{14}C dating
Description: A wooden coffin in the shape of a seated cat; the base into which it once was inserted is missing. The cat is made of a large piece of wood that constitutes most of the animal, with a smaller piece added to make up the end of the back and bottom. The two pieces are consolidated with textile and stucco, and might have been glued together once. The whole cat was covered with plaster. The plaster is covered with a (now) black substance, with a speck of gilding over it on the right side at the base, where the tail would have been. Possibly it was once all gilded and the black substance was some type of adhesive to hold the gilding in place. The gilding emphasises the cat's solar nature as well as its transformation into a divine entity. The body of the cat has a hole with a diameter of 3.5 cm, which was meant for a small mummy; the remains of its textiles, covered in a black resin-like substance, still survive. The forelimbs rest on a large tenon that would have fit into the original base.

Scientific examination

Radiocarbon dating (^{14}C)
Textile, calibrated age (95% probability): 750–390 BC (like **Nos. 40, 42, 46, 52–53**).
Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 333, no. 2360 [38].
Parallels: No parallels.

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Theriomorphic container on base	Yes	No	No	Body: two halves Base: one piece of wood	No	No	No

Coffin technical notes

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen			Too badly preserved for thread count	Undyed	

Textile notes: Fragments of tissue covered in a brown substance can be glimpsed from the bottom.

45





Inventory number: Cat. 2361
Object: Cat mummy and its coffin
Dimensions: Base L: 36.5, W: 14, H: 14; cat sculpture H: 48
Acquisition: Acquired before 1882
Provenance: Unknown
Date: 390–180 BC (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating
Description: Wooden coffin in the shape of a schematically carved cat seated on a circular base set into a rectangular base. The whole is covered with white plaster and the cat's head, which is disproportionately small for the body, is gilded. Conceivably the head's diminutive size was to save on the gilding that emphasised the cat's solar nature. Unusually, the tail curves around the left side. The coffin was made in four parts, each of a single piece of wood: the base, the two vertical halves that form the body of the cat (which may be carved from the same piece of wood), and a separate piece for the head that connects with the body via two dowels. Possibly the head is made of finer and more expensive wood than the rest of the body. The outlines of the eyes seem to be made of glass or a black resin-like substance. The pupils are painted and gilded and covered with a piece of plain glass that makes the eyes reflect and shine. The coffin contains a wrapped package visible only inside the hole below the cat statue.

Scientific examination

CT Investigation

The CT scans show that the wrapped package contains a complete skeleton (length 41.5 cm) of a cat (possibly *Felis silvestris lybica*), almost a year old. It was embalmed in the usual fashion, seated, with the tail lying against the belly. The head is inclined to the right. Its bones are somewhat disorderly, and it was not very well wrapped. It was eviscerated.

Radiocarbon dating (^{14}C)

Wood, calibrated age (95% probability): 390–180 BC.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 333, no. 2361 [39]; Rossi and Strinati (eds.), *Gatti nell'arte*, 1987, p. 104, fig. 21; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, p. 41.
Parallels: No parallels.

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Theriomorphic container on base	Yes	Gilded	White	Body: two halves (each one from the same piece of wood) and the head Base: one piece of wood	Two to connect head and body	No	The outlines of the eyes seem to be made of glass or a black resin-like substance

Coffin technical notes

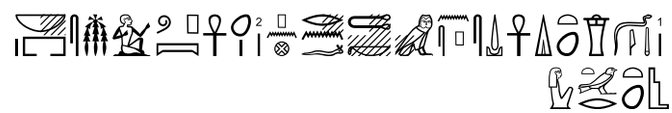
46





Inventory number: Cat. 2362
Object: Cat mummy and its coffin
Dimensions: Base L: 27.4, W: 14.8, H: 37; Depth (recess for the cat sculpture): 3.6; cat sculpture H: 34.8; D (opening for the mummy): 8.8
Acquisition: Acquired before 1882
Provenance: Unknown
Date: 750–400 BC (mummy), 980–810 BC (coffin) (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating
Description: A hollow coffin carved in the shape of a seated cat on a rectangular base, with a curved back. It is made from five pieces of wood: two for each vertical half of the body, two for the tail of the cat, which curves around the right side of the animal, and another piece for the base into which the cat was set. The tail was attached separately to the base. The wood is covered with plaster, and the face is painted yellow. Eyebrows consisting of double lines are painted over the eyes, and the eyes themselves are rendered in black, with a triangular pupil and yellow iris. A small downward tick extends from the tear duct toward the cheek. The mouth is picked out in red paint, and red lines are painted inside the ears. The base has a recess, 4 cm deep, to accommodate the body of the cat, with two holes to fit the tenons of the forelegs. The base is plain, save for the front and the right proper side, where there is an inscription in black ink, going from right to left. The coffin contains a package wrapped in linen that is visible only from the hole at the bottom of the cat statue. The mummy's bandages are darkened, probably due to the embalming agents. In addition to the wrapping, undyed fabric is used as a filling material.

Inscription



(1) *ḏd-mdw j<n> Bɜst.t dì ꜥnḫ wḏɜ snb n Psmṯk rn=f Pɜ-n-nì-w.t* (2) *sɜ ꜥnḫ-pw-p.t* (*?*) *ms* (*n*) *nbt-pr ɜst-wr.t.*
"Saying the words by Bastet, who gives life, well being and health to Psamtik whose (nick)name is Penniut, son of Ankhpupet (?), whom the lady of the house Asetweret has borne."

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Theriomorphic container on base	Yes	Yes	Yellow Black Red	Body: two halves (each one from the same piece of wood) and two pieces for the tail Base: one piece of wood	No	No	No

Coffin technical notes

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	26 x 11	Undyed	Self-bands

Textile notes: The textile used to fill the inner space is the same fabric used to wrap the animal.

Comment

The round sign with hatching inside it in the nickname could also be interpreted as the sun-disk, and the name hence read ***P3-n-Rˁ***. The attestations for this name in Ranke, *PN* I, 109.13 are all in the New Kingdom, while those for ***P3-n-niw.t***, 108.20, range from the New Kingdom to the Ptolemaic Period.

There are no attestations in Ranke, *PN* for the name ***ˁnḫ-pw-p.t***. A possible template for it could be ***ˁnḫ-pw-Ptḥ*** (*PN* I, 63.22).

Scientific examination

CT Investigation

The CT scans show that the wrapped package contains a complete skeleton (L: 24 cm) of a kitten, about 4 months of age at death based on epiphyseal fusion. The skull appears fractured: a head trauma could be the cause of the animal's death, as has been found with other cat mummies.[68] The cat was positioned as usual with the forelegs extended along the body, the hind legs contracted towards the body and the tail extended against the belly. It was eviscerated. The hind paws are a bit jumbled, and some sand and mud are sticking to the fur. The cat is oriented in the same way as the coffin, but occupies only half of its inner space, the other half being filled with rolled bandages.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 750–400 BC (similar to **Nos. 40, 42, 52–53**).

Wood, calibrated age (95% probability): 910–810 BC (probably older wood was [re-]used to carve this).

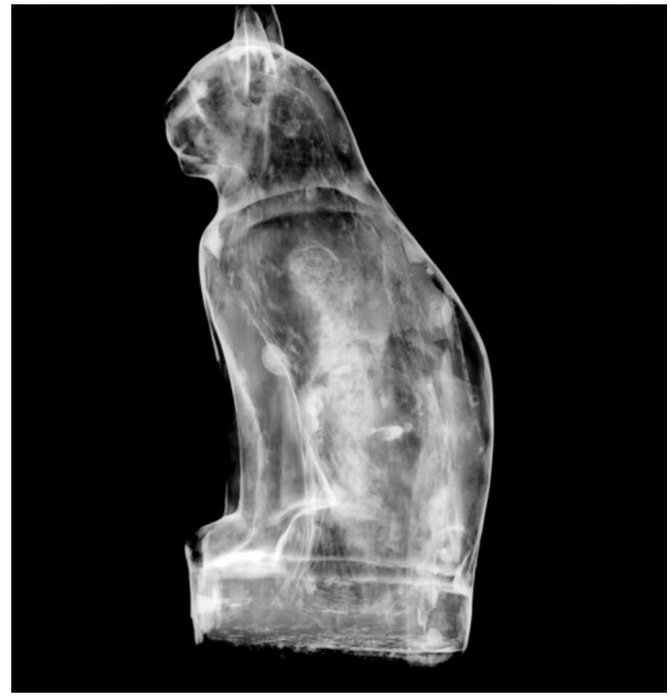
Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 333 no. 2362 [40]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19; Donadoni Roveri, *Art of Weaving*, 2001, p. 87; Heimann (ed.), *Ägyptens Schätze entdecken*, 2012, pp. 66–69.

Parallels: Leiden, RMO L.XII.4, L.XII.5 (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 247–48); Heimann (ed.), *Ägyptens Schätze entdecken*, 2012, p. 65; London, BM EA6761, EA20725; Paris, Louvre E 85; **No. 43** (similar, but without inscription).

[68] Armitage and Clutton-Brock, *JAS* 8 (1981), pp. 185–96: https://doi.org/10.1016/0305-4403(81)90023-6; Zivie and Lichtenberg, in Ikram (ed.), *Divine Creatures*, 2005, pp. 106–19.

47





Inventory number: Cat. 2363
Object: Cat mummy and its coffin
Dimensions: L: 10, W: 13.5, H: 36.3
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: CT
Description: A wooden coffin carved in the shape of a cat with a curved back and straight front, seated on a base. The well-shaped body of the cat lists slightly to the left, with its tail wrapped around the right side. It is covered with plaster and the face is gilded, evoking the animal's transformed state into a deity and the sun. The coffin is made from two pieces of wood, a main one divided into two halves, held together by five dowels on the front, and a small piece of wood making up the back and haunch, which is itself dowelled to the main body. There are traces of resinous material on the back.

Scientific examination

CT Investigation

The CT scans show that the wooden sculpture contains a skeleton (length about 18 cm) of a kitten, probably no more than a month old, based on the size and morphology of the bones. The animal is upright, with forelimbs flexed at the elbow and the paws directed upward; the hind limbs are probably flexed. The skull appears fractured: head trauma could have been the cause of the animal's death. The back of the mummy faces the front of the carved cat. It occupies about one-third of the inner space of the wooden statue.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 334, no. 2363 [41]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19.
Parallels: No parallels.

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Theriomorphic container on base	Yes	Gilded	No	Two halves from the same piece of wood	Five	No	No

Coffin technical notes

48



Inventory number: Cat. 2364
Object: Coffin for a cat
Dimensions: Base L: 45, W: 19, H: 6.3; Depth (recess for the cat sculpture): 4; Cat sculpture: H (including its own dowel): 52
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: CT

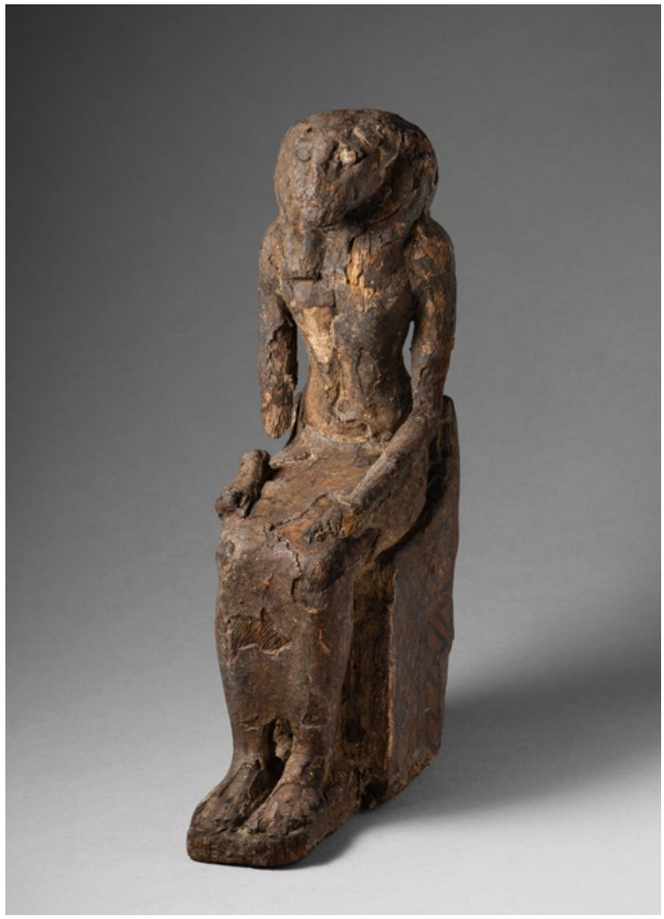
Description: A wooden coffin in the shape of a seated cat, set into a rectangular base with a rounded side. The tail, made of a separate piece of wood, curves around the animal's right side. The cat was plastered and then painted in green, to resemble a more expensive bronze container. It is possible that a yellow undercoat with blue on top was used to create the green. There is some gilding at the neck on the right side; possibly the entire head was once gilded, adding value to the object. The ears are outlined in black paint. The eyes are made of inset limestone and the pupils painted onto the flat surface. A faience scarab, rather flat, is set into the head (as seen engraved on bronze cat figures/containers) and there is a faience quadruple *wedjat* (eye of Horus) amulet, with the two pairs of eyes looking out. This cat copies a bronze cat in many details, including the colour, inset eyes, and the scarab. The hollow cat is now empty, but would have once contained a cat mummy. It is possible that the amulets were later (nineteenth-century) additions to enhance the value and appeal of the piece.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 334, no. 2364 [42].
Parallels: No parallels.

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Theriomorphic container on base	Yes	Yes and gilded	Green Black	?			Faience scarab Quadruple *wedjat*-eye amulet

Coffin technical notes

49



Inventory number: Cat. 2368
Object: Coffin
Dimensions: L: 10.2, W: 4.7, H: 19
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: None
Description: A carved wooden image, plastered and painted, of a seated female with a lion's head wearing a tripartite wig, with both hands clenched on her lap. The eyes are inlaid in plaster. Based on parallels in bronze, the figure can be identified as the goddess Wadjet. The base of the throne is now empty, but it is possible that a shrew, mongoose, snake or cat mummy was once housed here. The base is missing, but was once covered by a textile of which fragments survive. There is some black resin-like substance on parts of the figure. The throne is brightly painted on the side and back with criss-cross patterns and a doorway in green, yellow, and red. It is possible that this was an "improvement" made by a dealer.

Bibliography: Fabretti et al., *Regio Museo,* 1882, p. 334, no. 2368 [46].
Parallels: London, BM EA11482; New York, BM 36.222; a bronze coffin in Plymouth, PHM 12.8.

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Seated goddess	Yes	Yes	?	One piece of wood	No	No	Eyes in plaster

Coffin technical notes

50



Inventory number: Cat. 2369
Object: Coffin for a cat
Dimensions: L: 51.2, W: 25, H: 28
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Late Period (722–332 BC) or later, based on onomastics and style
Scientific analyses: CT
Description: Wooden plastered and polychrome *qeresu*-type coffin for a cat (now empty), made out of thirty-two pieces of wood that were painstakingly dowelled and glued together. The bottom, which is longer and wider than the trough, is white. The base of the sides of the coffin has a red edging. The long sides are decorated with a red band set in a white rectangle with a yellow frame. The topmost section of the long sides is graced with a green stripe. The posts of the coffin are green on the outside and red on the inner side. The lid is white with a central raised section bearing a hieroglyphic inscription painted in black against a yellow background framed in red. On the head short side there is a yellow frame surmounted by a red semi-circle outlined in yellow, evoking the sun. Within the frame, against a green background, are two yellow and black cats with elaborate facial features, facing one another, with a *nefer* (goodness, beauty) sign between them and *wedjat* eyes behind them. The other short side is decorated with a *nefer* sign between facing polychrome *wedjat* eyes on a white background.

Inscription



(The inscription runs in a single column; it is shown here split in four)

[*Bꜣst.t*] *dì*(*.t*) *ʿnḫ snb ʿḥʿ.w ḳꜣ jꜣw ʿꜣ nfr* (*n*) *Sšmw-Ḥp sꜣ Pꜣ-dì-Ḥr-nsw.t-tꜣ.wj msì nb.t-pr Tꜣ-dì-Ḥr-*(*n*)*-P ʿnḫ ḏ.t*
"[Bastet], who gives life, health, a long lifetime and a great and good old age to Seshemuhapi, son of Padihornesuttawi, whom the lady of the house Tadihorenpe has borne, life eternally."
Comment
The *pr* in *nbt-pr* is rendered as *p* (Gardiner O3).
The name Seshemuhapi is not registered in Ranke, *PN*.
The names Padihornesuttawi and Tadihorenpe are both attested in the Late Period (722–332 BC).[69]

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 334, no. 2369 [47]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19; Rossi and Strinati (eds.), *Gatti nell'arte*, 1987, p. 105 (as Cat. 2372); Kessler, *Die heiligen Tiere*, 1989, pl. 3; Heimann (ed.), *Ägyptens Schätze entdecken*, 2012, p. 65; Xiaolin (ed.), *Egypt*, 2018, pp. 114–15, fig. 65; Marini and Tjabbes (eds.), *Egito Antigo*, 2020, pp. 126–27.
Parallels: No parallels.

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Qeresu-coffin	Yes	Yes	Red White Yellow Green Black	Lid: thirty-one pieces of wood Base: three pieces of wood	Base: four Lid: not ascertainable	No	No

Coffin technical notes

[69] PN I, 125.10 and PN I, 374.9, respectively.

51







Inventory number: Cat. 2371
Object: Cat mummy in a coffin

MUMMY

Dimensions: L: 15.4, W chest: 14.1, W head: 13.8
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: CT
Description: A cat mummy with a flattened body lying within its wooden coffin. The upper and lower ends of the mummy are flattened and look compressed inside the box. It is wrapped (T1) spirally with eight to twelve layers of bandages, 6–7 cm wide, that are darkened with oils, and fairly brittle now. Some pieces of textile (T2) were placed in the coffin to cushion the mummy. It is possible that T1 and T2 come from the same fabric. A small faience amulet in the form of a human body, but missing the head, was found inside the coffin between pieces of the textile T2.

Scientific examination

CT Investigation

The CT scans show a complete skeleton (length 45.3 cm) of an adult cat, eviscerated, lying on its right side in the coffin. It was about 2 years old at death, based on epiphyseal fusion. While the skull morphology resembles that of a wild cat (*Felis chaus*), being somewhat elongated, the ratio between the body and tail lengths identifies it as a *Felis silvestris lybica*. The animal was positioned in the usual manner, with the forelimbs extended along its body, the hind limbs flexed towards the body, and the tail lying along the belly.

COFFIN

Dimensions: L: 49.7, W: 24.7, H: 23.5; Lid H: 15.7; Box H: 7.8
Acquisition: Acquired before 1882
Provenance: Unknown; most certainly from the Theban region (based on prosopography)
Date: 770–430 BC (^{14}C date)
Scientific analyses: CT, ^{14}C dating
Description: A *qeresu* coffin for a cat with an elaborately painted lid and a more schematically decorated body. The sides of the box are decorated with a white rectangle set within a red frame. Inscriptions painted in black set within a frame grace the short sides. The lid is painted on the outside. The four posts are painted red. The sides are decorated with a yellow rectangle outlined in light red and set within a frame of a deeper red. On the vault are images on a white background and columns of hieroglyphic texts painted in black on a yellow background and framed by black lines on the sides. A long line of text in black occupies the top of the coffin, with four columns of text running down from it along the curved sides of the coffin creating a frame for the image of the dedicator, Hersenef, with his head shaved and his arms raised in worship, standing before a grey cat.

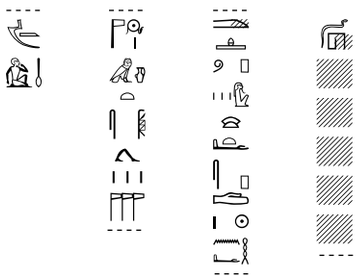
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	34–32 x 12	Undyed	
T2	Linen	S	Warp-faced	31 x 14	Undyed	Self-bands Rolled hem Fringes

Textile notes

Hersenef wears a long kilt, a symbol of high-ranking officials, secured by a fringed knotted band, and sandals. The short sides are painted white and on one of the short sides the sun disk is depicted between two uraei, framed in yellow. The other short side is enhanced by a pair of *wedjat* eyes over *neb* signs, framed in red and green. Above them, in the curve of the coffin that acts as a lunette, a series of concentric half circles in white, red and green evokes the roof of a naos.

Inscription

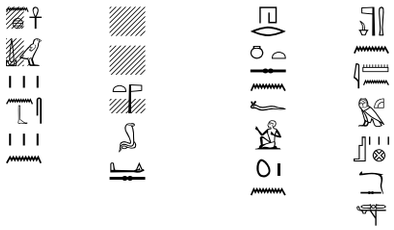
A column down the top of the lid, five columns on either side of the lid, a line on each short end of the box.



(The inscription runs in a single column; it is shown here split in four)

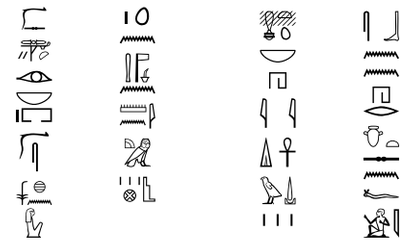
Top of lid: *Ḏd mdw h*[*y Mjw.t nṯr.jt*] […] *m ḥtp.w ḫ*ˁ*.t psḏ hn*ˁ *R*ˁ *ḫnm.t šms.w nṯr.w m*ɜˁ*-ḫrw*

"Saying the words: 'Ha[il divine Miut (female cat) …] with offering-bearers, who appears and shines with Re and joins the followers of the gods, justified'."



Right side of lid: […] *Mjw.t*] *nṯr.jt dỉ.s* ˁ*nḫ wḏɜ snb n Hr=s-n=f sɜ n jt-nṯr ḥm-nṯr n Jmn m Jpt-swt Ns-Mn.w*

"[…] divine [cat]: may she give life, prosperity and health to Hersenef, son of the divine father and priest of Amun in Karnak, Nesmin."



Left side of lid: *Mjw.t nb*(*.t*) *hy dỉ* ˁ*nḫ wḏɜ snb n Hr=s-n=f m*ɜˁ *<ḫrw> sɜ n jt-nṯr ḥm-nṯr n Jmn m Jpt-swt Ns-Mn.w ỉr nb*(*.t*) *pr Ns-Ḫnsw*

"Miut (female cat), lady of jubilation, who gives life, prosperity and health to Hersenef, son of the priest and prophet of Amon in Karnak Nesmin, and whom the lady of the house Neskhons has borne."



Box, head end: *Wḏɜ.t wḏɜ.t ṯs-pḥr sp sn m*ɜˁ*-ḫrw*

"Be well, be well, vice versa and twice, justified."



Box, foot end: *Wbn=k psḏ=k ḥr=s m*ɜˁ*-ḫrw*

"May you rise and shine because of it, justified."

Comment

The verb *dỉ* is followed by the suffix pronoun *=s* on the right side of the lid, by no pronoun on the left side. It is therefore translated here as a *sḏm=f* on the right side and an active participle on the left.[70] Since one would expect the same form on either side, it is legitimate to leave the possibility open that the same form is meant although the pronoun remains unwritten in one case.

The inscriptions on the foot-end short side of the box could possibly be an extremely abbreviated version of an expression found in Chap. 17 of the Book of the Dead: *wḏɜ wsỉr* N *wḏɜ=f ṯs-pḥr*, "The Osiris N is well, he is well, and vice versa". Compare also the inscriptions in a wall relief from the Second Court of the temple of Ramesses III at Medinet

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Qeresu-coffin	No	Yes	Red Yellow Black White Grey	Base: five pieces of wood Lid: thirteen pieces of wood	No	Four	No

Coffin technical notes

Habu: *ꜥbw.k ꜥbw Ḏḥwty ṯs pḫr sp-sn*, "your purification is the purification of Djehuty and vice versa, (to be repeated) twice" and *ꜥbw=k ꜥbw Ḥr ṯs-pḫr sp-sn*, "your purification is the purification of Horus and vice versa, (to be repeated) twice".[71]

It has been proposed that this coffin could belong to a member of the Theban family of another Hersenef son of Nesmin known from several sources, who is mentioned in a document with a date in Year 6 of Alexander IV (311 BC).[72] This Hersenef had a different mother, Tamit, but, as the reconstructed family tree shows, the names Hersenef and Nesmin were borne by several individuals in the family, and may have been handed down for several generations. Our Hersenef could be a forebear of the other.

There is an interesting divergence between the generic fourth-century chronological horizon suggested by the above prosopographical information and the ^{14}C dating of the coffin. Of course, the coffin may very well have been made of reused boards from earlier artefacts. The differences in their measurements would speak in favour of this hypothesis. In this case, assuming a date for the wood closer to the lower range of the ^{14}C date, theoretically this chronological evidence, although divergent, could be accommodated within a single coherent picture.

Scientific examination

Radiocarbon dating (^{14}C)

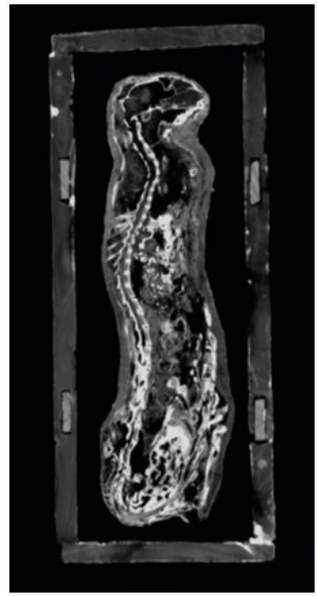
Coffin wood, calibrated age (95% level of probability): 770–430 BC.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 335, no. 2371 [49]; Kessler, *Die heiligen Tiere*, 1989, pp. 173–74, pl. 1; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 39–40, fig. 2B; 42–45, fig. 4.
Parallels: Boston, MFA no. 2008.808, on loan to Houston Museum of Sciences.

[70] Cf. general discussion in Weiß, *Tier- und Götterbronzen*, 2012, pp. 482–86, esp. p. 484.
[71] Epigraphic Survey, *Medinet Habu IV*, 1940, pl. 234; Gardiner, *JEA* 36 (1950), pp. 3-12; Shanley, "God of Confusion?", 2015, pp. 108–09.
[72] Gill, *RiME* 3 (2019), p. 3, note 11, with further literature.

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Inventory number: Cat. 2372
Object: Cat mummy in a coffin

MUMMY

Dimensions: L: 50.5, W: 14
Acquisition: Acquired before 1882
Provenance: Unknown
Date: 740–400 BC (^{14}C date)
Scientific analyses: CT, ^{14}C dating
Description: The coffin contains a cat mummy with a flattened body. Only two kinds of bandages are visible. The inner layer of bandages (T1) emerging from a gap is undyed. The outer layer of bandages (T2) is very dark, probably because it is soaked with embalming materials and dirt.

Scientific examination

CT Investigation

The mummy is lying on its left side, at the bottom of the coffin. The CT scans show a complete skeleton (length 49 cm) of a kitten (*Felis silvestris lybica*, probably), between 6 and 8 months of age at death, based on epiphyseal fusion. It was positioned in the usual fashion, with the forelegs extended and the hindlegs flexed towards the body, with the tail lying along the belly. It appears to have been eviscerated.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% level of probability): 740–400 BC (consistent with **Nos. 40, 42, 44, 46, 53**).

COFFIN

Dimensions: L: 59.2, W: 23.5–24, H: 20; Lid H: 14–13; Box H: 5.8–6
Acquisition: Acquired before 1882
Provenance: Unknown, most certainly from the Theban region (based on prosopography)
Date: Late Period to Ptolemaic Period (722–30 BC), based on the names and titles
Scientific analyses: CT
Description: A wooden *qeresu*-type coffin for a cat consisting of a trough and a vaulted lid, containing a cat mummy. As with other coffins, this one is made of several wood fragments joined together by dowels and tenons. All of the interior and exterior of the coffin is covered with plaster, while only the exterior is painted. The coffin was painted when it was shut. The pillars are painted red. A red net is painted on the lid, save for the top central axis, which is red with a yellow column framed in black that contains a hieroglyphic inscription, partly damaged. The net on the lid was painted when the box was already shut, as is evidenced by the pattern of the dripped paint extending from it onto the sides. The long sides of the lid and trough are

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	30 x 12	Undyed	
T2	Linen	S	Warp-faced	29–30 x 12	Undyed (?)	

Textile notes

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Qeresu-coffin	Yes	Yes	Red Yellow Black White	Base: five pieces of wood Lid: thirteen pieces of wood	Base: 16 Lid: 12	Four	Two pegs on the upper part of lid

Coffin technical notes

graced with a red frame enclosing a white rectangle. One of the short sides of the lid is painted in yellow, with alternating concentric arches of green, yellow, and red evoking the top of a naos. The motif is completed on the trough with horizontal red, white, and green bands, with vestiges of arched lines in other colours extending onto these. The central guideline marking the apex of the arches is still visible. On the other short side, are eyes on *neb* signs, framed in green against a yellow background.

Inscription



(The inscription runs in a single column; it is shown here split in three)

ḏd-mdw jn Bꜣst.t dỉ ꜥnḫ n ḥm-nṯr wr-nḫt Jwꜥf-ꜥꜣ.w, sꜣ ḥm-nṯr wr-nḫt Mnṯw-m-ḥꜣ.t mꜣꜥ-ḫrw, msỉ n nb.t-pr […]*m(?)-rdỉ.t mꜣꜥ-ḫrw*

"Saying the words by Bastet, who gives life to the prophet of *Wer-Nakht*[73] Iufaau, son of the prophet of *Wer-Nakht* Mentuemhat, justified, whom the lady of the house […] em(?)redit, justified, has borne."

Comment

As De Meulenaere has shown, *Wer-Nakht*, the "Very Powerful One", is an epithet of Horus of Edfu and the title designates a cult of this particular form of Horus in the Theban region.[74] The several examples he cites are late, including one in the third and another in the second century BC.[75] The name Iufaa, var. Iufaaw, *PN* I, 14.2, 14.3, is also late.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 335, no. 2372 [50]; De Meulenaere, *CdE* 57 (1982), pp. 227-28 (referred to as a shabti-box, reproducing the error in Fabretti et al., *Museo Egizio*, 1882); Kessler, *Die heiligen Tiere*, 1989, p. 174; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19.

Parallels: Cairo, EMC CG 29783.

[73] For the title, see De Meulenaere, *ChronEg* 57 (1982), pp. 227–29, and Traunecker, in Clarysse (ed.), *Egyptian Religion*, II, 1998, pp. 1215–29.
[74] De Meulenaere, *ChronEg* 57 (1982), pp. 229–30.
[75] De Meulenaere, *ChronEg* 57 (1982), pp. 227–29.

53







Inventory number: Cat. 2370 (other numbers, label on the coffin: 872)
Object: Cat mummy in a coffin

MUMMY

Dimensions: L: 23, W: 12
Acquisition: Acquired before 1882
Provenance: Unknown
Date: 730–410 BC (^{14}C date)
Scientific analyses: CT, ^{14}C dating
Description: The mummy is very flat and oddly shaped and fits tightly into the bottom of the coffin. It is wrapped in bandages that are browned from oil or some other embalming agent and that are about 2.5 cm wide, on average. The animal is spirally wrapped with a few bandages crossing diagonally to keep the other bandages in place.

Scientific examination

CT Investigation
The CT scans show what is probably a complete skeleton (length 20.7 cm) of a kitten, about 3 months old, based on the morphology of the bones and epiphyseal fusion. The skeleton appears fragmentary, and thus it is impossible to ascertain if the collapsed skull is due to a trauma or just the disarticulation of the animal's very young skeleton. It appears to have been eviscerated.

Radiocarbon dating (^{14}C)
Textile, calibrated age (95% level of probability): 730–410 BC (similar to **Nos. 40, 42, 44, 46, 52**).

COFFIN

Dimensions: Box L: 39.1, W: 17, H: 12; Lid L: 30 W: 14; Cat sculpture W: 13.2, H: 20
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: CT
Description: A rectangular wooden coffin with an extended base supporting a statue of a cat. The recess for the coffin takes up three quarters of the space, and was sealed by a lid that slides on horizontally, supported by the front and back edge of the box. The front of the lid is pierced by two slanting dowels that secure it to the box. The remaining space is occupied by a carved wooden figure of a seated cat with its tail painted onto its right side. A tenon carved into its base slots it into the main body of the coffin. While the cat's hindquarters are set into the solid part of the box, its forepaws rest on the lid. The cat is crudely carved and painted. Over a base coat of yellowish paint, the facial features are picked out in black, the ears are similarly outlined, and the rest of the face and neck is spotted black and red. From the neck down the pelt is indicated by dots and dashes in red paint, and the outlines of the cat's body, including the legs,

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	26 x 12	Undyed	

Textile notes

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Rectangular box surmounted by animal	No	Yes	Red Yellow Black White	Two pieces from three pieces of wood	No	No	No

Coffin technical notes

paws, and claws, are picked out in red. Its stomach is red and white. The top of the box is plain save for a red line bordering the short edge opposite the cat. The left and right sides of the box are also decorated in red paint over a white background. On the front of the box, a red frame contains an image of a seated cat on the left proper. It either faces another cat or an offering stand – as the image opposite it is very faded, it is hard to establish this. The proper right side of the box is painted with a crude, fence-like motif consisting of two rows of nine squares. The motif is repeated on the left side, but with only eight squares. The back was painted white, with no visible vestiges of red paint.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 334–35, no. 2370 [48]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19.
Parallels: No parallels.

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Inventory number: Cat. 2450
Object: Coffin for a cat
Dimensions: L: 44.5, W: 10.3, H: 15.9–18.8; Lid H: 7–9; Box H: 9.5
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Late Period to Ptolemaic, based on style and onomastics
Scientific analyses: None
Description: A rectangular coffin with a flat lid. The trough is internally stuccoed. The sides of the box are painted white. The top of the lid is decorated with a very faded image of a seated cat in profile, facing left, outlined in black. The sides of the lid were painted white and then more decoration was added. Red bands enhance the upper and lower portions of the four sides of the lid. On both vertical sides of the lid there is a horizontal line of hieroglyphic text in black on a yellow background framed in a greenish-blue colour.

Inscription



(1) *ḏd-mdw jn Bꜣst.t ꜥnḫ tꜣ.wy nb.t mꜣꜥ.t ꜥšꜣ.t jr.t* (2) *dì ꜥnḫ wḏꜣ* [...] (3) [...] *Sṯꜣ-Jmn-mr.tj* (sic) *Jmn-*(4)*jr-dì-s* (?) *ms ꜣs.t-wr.t Ns{f}-ḥr sꜣ* [...] *msì nb.t-pr Nfr-rnp.t ḥḥ ḏ.t*
"Saying the words by Bastet, life of the Two Lands, mistress of truth, the doer of many things, who gives life, prosperity [...] [...] Setja-amun-merti (?), Amenirdis (?) whom Asetweret bore, Neshor son [...], whom the lady of the house Neferrenpet bore, eternally forever."
Comment
The inscription begins as a standard well-wishing formula, but after *wḏꜣ* the scribe seems to be copying loosely from his model and using signs randomly to fill the available space, until the personal names at the end. One discerns garbled traces of the word *snb*, "health", and of the phrases *ꜥḥꜥw ḳꜣ* and *ỉꜣw nfr.t* ("a long lifetime" and "a good old age"). The sequence of signs  , for which we cannot offer a reading, is repeated twice.

A name beginning with the element "Setjaamun" is recorded (cf. *PN* I, 322.25, *Sṯꜣ-jmn-pw*,[76] late), but here it seems to be followed by the element *mr.tj*; then comes the name Amenirdis (or the unrecorded *Jmn-jr-nḫt*). Here one would expect a single name rather than two in a row. Amenirdis, Asetweret and Neshor are common Late-to-Ptolemaic Period names.[77]

Bibliography: Fabretti et al., *Regio Museo,* 1882, p. 348, no. 2450 [127]; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 39–40, fig. 2A.
Parallels: No parallels.

[76] For an alternative reading as *Šṯꜣ-Jmn-gꜣw*, see Backes, *BMSAES* 3, p. 23 = Thirion, *RdE* 37 (1986), p. 132.
[77] *PN* I, 26.25, 4.1, and 178.7, respectively.

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Inventory number: Cat. 873 (other numbers: P2)
Object: Coffin for a cat
Dimensions: Body (including tube and without head) L: 23.4, W: 13.8, H: 29.2; Head L: 9.2, W: 9.4, H: 9.8; Wooden base L: 34, W: 13.3–13.4, H: 6.9–7.3
Acquisition: Donation Bussa (1850)
Provenance: Unknown
Date: Probably Late Period (722–332 BC) or later, based on parallels and general typology
Scientific analyses: pre-restoration X-ray, thermography, XRF[78]
Description: Large partly fragmented hollow-cast copper alloy figure of a seated cat with the tail on its right, situated on a wooden base.

Currently, the cat's head is detached from the body after recent conservation and cleaning that also reversed some earlier nineteenth century conservation treatment. Organic remains indicate that it once contained a cat mummy.[79] The metal around the neck is particularly thin, resulting in fractures that were repaired in both ancient (see below) and modern times. The eyes are inlaid with rock crystal[80] that is kept in place by a brown, probably organic, substance. The left eye shows a small and faint circle on the backside of the inlay indicating the pupil. The left ear has a hole for a now-missing earring, and the whiskers and ear tufts are detailed. The cat's paws are asymmetrical and the left fore and hind paws are connected with bronze junctions, while the outer side of the right paw is joined with the tail. The condition of the outer bronze surface differs between the two sides: the left is thicker than the right, which is generally rougher and battered.

Technical notes

The cat figure is hollow cast with evidence of an ancient rework in the form of a "cast on" layer at the right side of the neck and face (see below). Dark black casting core remains are present in the head, particularly along the left side, and in the curve of the breast. In addition, small rectangular wooden rods stuck together in a brownish matter and white plaster are found inside the right part of the head.[81]

Traces of the original wax model working are evidenced by the differing wall thicknesses at the break at the neck and the rough and partly dressed bottom surfaces of the tail and the paws. The lines of the mouth, whiskers and ear tufts were all made in the wax model, while the tube seems to have been added as an individual element. Economy was practised by creating hollow forelimbs. The gating system elements are identified by the remains of the tubes at the lower left and the tenon under the forepaws. The connecting bars between the hind leg paws and between the left front and hind paws are casting channels created in the original wax model.

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[78] Internal report of the Laboratorio Thierry Radelet, Turin, 29 October 2019.
[79] For a comparable case with similar evidence for modern repair in the neck section, see the "Gayer Anderson cat" London, BM EA64391 (Ambers et al., *BMTRB* 2 [2008], pp. 6–7, figs. 4 and 10).
[80] Rock crystal eye inlays are, e.g., known from the cats Paris, Louvre E 3807 (Étienne [ed.], *Les portes du ciel*, 2009, p. 328, no. 289); Paris, Louvre E 2533 (Ziegler and Rutschowscaya, *Louvre. Antiquités égyptiennes*, 2002, p. 78); and Vienna, KHM inv. 699.
[81] Those wooden rods and the filling material are remains of the nineteenth century conservation and restoration.

Two core supports on the inside, visible as rusty protrusions protruding from the inner bronze wall for up to 0.5 cm, are present on the same level in the front of the belly c. 4 cm above the hind legs. Only one corresponding chaplet survives in the right rear of the rump at the same level, while another one sits above the base of the tail. A small hole indicative of an original chaplet is present between the legs in the lower breast. Two chaplets without corresponding ones on the opposite left side can be located in the belly behind the right front leg. Two corresponding core supports can be found at the left and right side of the rump above the knee. The one on the right appears as a 0.5 x 0.3 cm hole, while the left chaplet, almost unrecognisable externally, is visible internally as a bent-down protrusion. Two rusty spots on the back's interior indicate further chaplets. The only other securely identifiable core support is in the centre of the skullcap between the ears.

The neck and particularly the head were repaired by a cast-on element. As the bronze wall on this side was cast very thin, and the right side of the head was maybe fully miscast in the original manufacturing process, it seems likely that this is an ancient repair. The cast-on bronze element, apparently less corroded and only roughly formed following the general form of the cat's ear, covers the right side of the face including the front of the ear. At the tip of the ear, a further part of the white plaster fill is visible between the original ear and the cast-on layer in the front. In order to mechanically fix the cast-on element to the cat's ear, a small bronze bar running behind the tip of the ear was introduced. The two bronze layers are clearly recognisable on the inside. The lower end of the cast-on is straight and in parallel with the upper part of the bronze wall of the cat's body. Based on this, it seems likely that the cast on was meant to overlay and repair the originally miscast right side of the head. The too-thin bronze wall at the right neck might have contributed to the subsequent break of the head that was repaired in modern times.

Bibliography: Fabretti et al., *Museo Regio*, 1882, p. 68, no. 873 [278].

Parallels: Type T 32 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 297–98, 783–91, Nos. 992–1034, Pls. 49a–f); in terms of size: Paris, Louvre E 2532 (Guichard [ed.], *Des animaux*, 2014, pp. 34–35); Christie's New York, Antiquities, 12 April 2022, Live Auction 20677, Lot 28 (dated to the Ptolemaic Period),[82] and the 33.6 cm tall cat Paris, Louvre N 4538 (AF 344).

[82] https://www.christies.com/lot/lot-6363392.

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Inventory number: Cat. 874 (other numbers on old wooden base: B3)
Object: Coffin for a cat
Dimensions: L: 11.5, W: 7.5, H: 22.5
Acquisition: Donation Bussa (1850)
Provenance: Unknown
Date: Probably Late Period (722–332 BC) or later, based on parallels and general typology
Scientific analyses: None
Description: Hollow-cast copper alloy figure of a cat sitting in attentive pose with the tail running straight along the right side. Its size suggests that it was most likely used to hold a kitten mummy.

The whisker pads with thin grooves indicating hair and the large round chin form a diagonally inclined area. Sharp grooves marking the oral fissure connect with the philtrum and deep dents indicate the nostrils. The upper eyelids transition into the forehead and the lower eyelids appear in the form of a projecting rim. The now-empty eye sockets were once inlaid.

Two faint ridges run towards the medial border of the erect ears starting at the nasal root. The ears have a solid scapha and a flat recess along the outer pinna. Both are pierced at their outer lower end. The top of the head is flat, the neck runs down steeply towards the two prominent shoulder blades, below which the body constricts. The hip bones and femurs are clearly defined and textile impressions are visible here. The short, semi-circular hind legs project from under the flat belly with the rear foot being visible along the sides; the hind paws are joined with the front ones through small bridges on both sides. The rough tail, semi-circular in section, starts at the back and runs straight along the right, and ends – in contrast to the other cat coffins – a few centimetres in front of the right paw. The spandrel between the tail and the right hind leg is filled with metal.

The cat sits on a larger round tube with an upper recessed line running around. Towards the front, the tube has a hole. The lower edge of the tube seems partly irregular, its inner transition to the body is marked by a collar. There is a cut-off projection of a tenon at the tube's back and a few other protrusions. There are several fissures and holes in the surface on the back and the belly. The fissure in the front legs continues into the body, smaller cracks are also present on the opposite side. The overall surface is smooth due to a conservation treatment, only smaller rougher and corroded patches are present. The larger openings present along the lower rump and belly are probably traces of now corroded core support. Chaplets survive on the outer shoulders as well as on the top of the head.

Technical notes

The entire cat was hollow cast. The tenon under the front feet and the tube under the torso (including the hind tenon and smaller projections) are the sole remaining elements of the gating system. The larger openings present along the lower rump and belly can be identified as traces of now corroded core supports.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 68, no. 874 [279]; Donadoni Roveri, *Museo Egizio*, 1990, p. 14; *Nefertari*, 2017, p. 133.
Parallels: Type T 32 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 297–98, 783–91, nos. 992–1034, pls. 49a–f); Barcelona, MEB E 205 (Guichard [ed.], *Des animaux*, 2014, p. 239); **No. 61**.

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Inventory number: Cat. 875
Object: Coffin for a cat
Dimensions: L: 10.08, W: 5.55, H: 19.75
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Probably Late Period (722–332 BC) or earlier, based on parallels and general typology
Scientific analyses: None
Description: Hollow-cast copper alloy figure of a seated cat with its tail on the right side. It once might have contained a cat or kitten mummy, although it is possible that it functioned as a bronze votive figure only.

The cat wears an incised necklace with a wedjat-eye at its centre, flanked by six ovoid beads reminiscent of cowrie-shells on the left and five on the right side. On top of the skull, the cat has an incised scarab with long hind and front legs, underlining its solar nature.[83] The number 280 is written twice in white on the torso: once in the centre of the back and a second time at the lower right rump.

The front paws rest next to each other on a tenon. The legs form a narrow V when seen from the front. The elbows form a small protruding angle. The chest is slim, the shoulder blades modelled.

The round head rests on a short neck. The right cheek is receding, the left shows some surface defects. The mandibles are short, the chin is pointed and pronounced. The protruding nose has a triangular nasal plane, the nostrils are marked as curved lines. The whisker pads present thin parallel lines marking the whiskers. The mouth is formed as two convex curved lines meeting in an apex under the nose. The small and closely positioned eyes are separated by a high nasal bridge, the upper left eyebrow runs more horizontally than the right one. The large ears stand upright, both their apexes show corrosion. The medial border of the right ear's helix is separated from the tuft zone through a recessed line. The furnishings are indicated as a thin solid area bearing fine parallel incisions, while the inner pinna is shown as a larger recess.

The torso is less arched than that of other cat figures. The hind legs and stifle joints are subtly modelled. The hip bones are not indicated at the back. The lower front of the abdomen is flat. The hind feet stick out from the lower belly and rest flat on the ground. The toes are indicated by three incised lines. The base of the tail is flat and transitions into a tenon. The tail is bent around the right side and connected to both the rump and the right hind foot. Its tip rests in front of the right paw.

The outer surface shows light to dark green corrosion patches and discolorations, the inside is also corroded. The corrosion on the right front leg and shoulder bears distinct textile impressions suggesting that the cat figure was once wrapped in linen. The left side of the face also shows corrosion, one larger patch also presents textile impressions. The left ear is more intensely corroded. At the right side of the torso is a large, elevated patch of corroded accretion seemingly originating from the original deposition. Next to it, there is a further, small area with textile impressions. On the back, the surface also exhibits some corrosion patches. The area round the base of the tail has a blue hue that seems to lie under the corrosion.

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[83] For the meaning of the scarab see Satzinger, in Aksamit (ed.), *Essays in Honour of Prof. Dr. Jadwiga Lipińska*, 1997, pp. 399–407.

Technical notes

The object was hollow cast; the lower opening is 3.4 x 3.95 cm wide. The two tenons indicate the original location of casting channels. The tenon under the solid front feet, that now appears partly in fresh bronze colour, was broken off and sanded in modern times. It was originally 1.4 x 1.0 cm wide and has a length of now 1.4 cm. The tenon under the base of the tail that was also partly sanded in modern times was originally wider; it is now 1.2 x 0.75 cm at the base, while it remains 1.1 cm in length. The hind feet are solid cast, the thickness of the bronze at the lower opening measures between 0.2 and 0.25 cm. The chaplets necessary for casting a hollow object are visible both internally and externally. There is one larger rusty pin bent upwards at the right lower belly, at 1.8 cm above the tail, that is also externally visible. On the opposite side, internally, there is another smaller rusty spot that appears as a tiny irregularity on the outside. Two further chaplets are located at almost the centre of the body at the rib cage on both sides. Internally they manifest as thin rusty marks, and externally they appear as darker irregular elevations. A third set of chaplets are located at the centre of the shoulders. Both are more difficult to determine from the outside. Next to several larger corrosion areas, inside are remains of a sandy brownish and black inorganic material with white speckles at the inner back, the left belly, the chest, and the front of the head. They represent the remains of the original casting core.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 68, no. 875 [280].

Parallels: Type T 32 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 297–98, 783–91, nos. 992–1034, pls. 49a–f). For the characteristic slender body, dated to the Twenty-second Dynasty or later, see Philadelphia, Penn E 14284 (Silverman [ed.], *Searching for Ancient Egypt*, 1997, pp. 64–65); Paris, Louvre E 5749 (Guichard [ed.], *Des animaux*, 2014, p. 239); undecorated see London, Petrie UC 8199 (Tiribilli, *Bronze Figurines*, 2018, p. 188); Berlin, ÄM 2598.

58



Inventory number: Cat. 876 (other numbers written on torso in white: 518)
Object: Coffin for a cat
Dimensions: L: 8.6, W: 5.1, H: 14.7
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Probably Late to Ptolemaic Period (722–30 BC), based on parallels and general typology
Scientific analyses: None
Description: Hollow-cast copper alloy figure of a seated cat with the tail curved around the right. The cat might have contained a feline mummy or parts thereof, but it could also have been a bronze votive only.[84]

The number 518 is written in white on the back of the torso, the other number 281 can be found on the lower right rump.

The cat's head turns slightly towards the left. The muzzle is small and flat, the whisker pads are arched, and the round chin is short. The mouth is modelled as flat S-curved lines meeting under the central groove under the snub nose which runs towards the forehead in the form of a strong nasal root. The cheeks transition into strong cheekbones. Two round eyes are set into deep orbits with hardly any indication of eyebrows. The ears are positioned at the sides of the head and are oriented forwards; the left one has lost its tip. The recessed pinna shows punctures on both sides that do not fully penetrate the ears, thus the earrings were seemingly slotted in on either side.

The front feet are close to each other on top of a short tenon. The paws and toes are individually modelled. The dewclaws are shown in the space under the wrists. The long front legs run upwards in a narrow V-shape. At the outside, a recessed vertical bar runs along the leg representing the rear tendons and the pelvis and hind legs are modelled. The elbows merge with the body in a short groove. The short neck is round in section.

The small solid hind feet peek out from under the belly, the long toes are separated by three parallel grooves. At the right side of the rump are some bronze irregularities and a small hole above the tail. At the underside of the tail, whose base rests on a tenon and at the right hind foot, there are more surface irregularities and some minor casting defects. The right side of the cat is better preserved than the left, which is more corroded.

Technical notes

The cat is a small hollow cast; the lower ellipsoid opening is 2.8 x 3.85 cm wide. The short tenon under the solid front feet (0.97 x 0.6 cm wide and 0.5 cm long) is irregularly broken. The larger tenon under the tail base (1.1 x 0.6 cm wide and 1.6 cm long) tapers towards the end and shows a clear break, too. Both tenons represent the remains of the gating system for casting the figure. The bronze itself is compact and generally more affected by corrosion on the left. The largest area with casting impurities is at the lower right. At the base, the bronze is between 0.2 and 0.25 cm. Internally, only two clearly recognisable chaplet remains are visible: on the right side of the body one is above the hips and another at the front of the shoulders. The corresponding

[84] Cf. Schorsch, in Brown and Watkins (eds.), *Conservation of Ancient Egyptian Materials*, 1988, p. 41, on the varying sizes of cat sarcophagi from 10 to 50 cm.

chaplets on the opposite sides are less clearly recognisable due to the fine finish of the bronze. A last little rusty spot, indicative of a chaplet, is located at the top of the skull.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 69, no. 876 [281]; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 47–48, fig. 7A.

Parallels: Type T 32 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 297–98, 783–91, nos. 992–1034, pls. 49a–f); Florence, MAF 8427 (Rossi and Strinati [eds.], *Gatti nell'arte*, 1987, p. 96); London, Petrie UC 42564 (Tiribilli, *Bronze Figurines*, 2018, p. 190 [with quite different modelling of the face with a less receding chin]); Aix-en-Provence, MG 999.0.2243 (Barbotin, *Collection égyptienne*, 2020, p. 138, no. 61); New York, MMA 66.99.145.

59



Inventory number: Cat. 877
Object: Coffin for a cat
Dimensions: L: 7.45, W: 4.5, H: 13
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Probably Late Period (722–332 BC), based on parallels and general typology
Scientific analyses: None
Description: Hollow-cast copper alloy figure of a sitting cat with the tail running along the right side, possibly used as container for a kitten mummy or as standalone votive figure mounted to a base.

The figure of the animal is stout. The small forward-looking head has a short muzzle. The round whisker pads are plain. The chin is small and flat, the cheeks sunken, and curved grooves mark both sides of the mouth. The nostrils of the snub nose appear as shallow triangular dents connected to the philtrum. The short dorsum of the nose narrows in the centre to end in a bulging forehead. The eye sockets are almond shaped. A thin line continues from the outer commissure on the left. Round forward oriented ears flank the flat top of the head. The left ear appears larger. The medial border of the ears has the form of a rim marked by an incised groove. The solid zone of the scapha portrays the ear tufts, the small recess behind it represents the inner auricle. A larger cavity is present in the lower left ear. Behind the ears, there is a rough zone running in parallel with the base of the ears, suggestive of a trace of working the original wax model. The back of the head is round.

The shoulder blades are faintly delineated. The round stout rump widens towards the hips, thigh and pelvis, the hip bones are only cursorily defined. The torso constricts again at the lower end. Below the number 282, the tail starts in relief, situated above the rectangular back tenon (0.8 x 1.1 x 0.55 cm) whose tip is rounded. The tail, round in section, runs around the right side in a shallow S-bend, its first centimetres after its base show some casting (or wax model?) defects. The tip of the tail, projecting a little bit in relation to the feet, is connected with a metal bridge to the right front paw. The hind legs with round paws and marked claws project from under the flat belly. Their underside shows flat grooves to save material. The right hind foot and tail are connected by a metal bridge.

The front feet rest close to each other on a tapering forward bent tenon (1.55 x 1–0.65 x 0.56–0.53 cm), the claws are indicated by grooves. The metacarpals zone is narrow, a faint collar marks the wrist bones. A recess is present at this height at the back from which the tapered back side rises. A shallow groove runs along the leg's outer sides. The generally uniform legs form a narrow V seen from the front; their inner surfaces appear cut and not fully smoothed. The legs transition gently into the narrow chest, the breast line continues as a marked curve from the elbow bend to the back of the neck. The slender breast leads to a short neck.

A larger casting defect is present on the left underside: the metal seems to not have filled the mould completely, as is indicated by the round irregular edge of the metal. An as yet undetermined organic reddish-brown to black material is present between the feet, the grooves along the legs, at the outer shoulders, the mouth, the nostrils, the eye sockets, the inner auricles, the back sides of the ears, and the area between the rump and the tail including the bridge

connecting to the hind foot. It seems to be the remains of an ancient coating of the whole figure that survived, particularly in cracks. There are a few traces indicative of the wax model finishing. The inner surface is rough and shows some corrosion and accretions.

Technical notes

The cat was hollow cast, the tenons are the remnants of the gating system. Some casting core remains are present in the chest and muzzle. One chaplet can be identified in the centre top of the head (a small dent on outside, a rusty protrusion on the inside), two more are present on the lower rump. They are properly visible only in the interior as small rusty projections. One further rusty spot is present on the inside where the left front leg connects to the body. Whether this is indeed a chaplet cannot be determined; its position would also be unusual.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 69, no. 877 [282]; Grewenig (ed.), *Ägypten*, 2014, p. 192; Xiaolin (ed.), *House of Eternity*, 2018, p. 106, fig. 54; Marini and Tjabbes, *Egito Antigo*, 2020, pp. 118–19.
Parallels: Type T 32 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 297–98, 783–91, nos. 992–1034, pls. 49a–f); Edinburgh, NMS1904.163; **Nos. 58, 63**.

60



Inventory number: Cat. 886 (other numbers written on back of torso: 516)
Object: Coffin for a cat
Dimensions: L: 11.55, W: 7.2, H: 20.58
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Probably Late Period (722–332 BC), based on parallels and general typology
Scientific analyses: None
Description: Hollow-cast copper alloy figure of a cat sitting in an attentive pose, with the tail along the right side, probably used as a container for an animal mummy.

On the top of the head is an image of a scarab. The striae of the scarab's elytra are indicated with incised lines, its thorax and head are only cursorily marked; its legs are missing. The incised aegis on the breast of the cat consists of a broad collar with ornamental dots in two half-round segments, an indistinct animal head (presumably of a cat [Bastet]) and a sun disc. The aegis hangs down on thin incised straps that start at the cat's shoulders. The facial elements are modelled in detail: the round chin is separated from the upper muzzle by a curved groove on each side of the face, indicating the jaws. The nasal planum with the nostrils sits between two round pads that show fine lines indicating the whiskers. The almond shaped eyes are recessed above pronounced cheekbones that transition into half-circular protruding eyebrows. Starting at the transition of the nose bridge and forehead, two raised lines run along the forehead to continue into large ears. The inner pinna is shown as an angled recess. Both ears are pierced with a c. 0.2 cm wide hole. The left ear wears a little earring made of bronze wire bent together at its tips.

The back of the head transitions smoothly towards the articulated bend at the shoulders. They form a pronounced curve starting at the chest. The back line of the torso forms, below the neck and the shoulder blades, a continuous arched curve towards the tail base. The cat's belly is flat. The torso widens towards the lower end. A rounding represents the bent stifle (knee joint) between the shin- and thigh-bone on both sides. The hip bones appear as small bulges. The hind feet rest flat on the heels, the toes of the long paws are marked by three grooves.

The front paws rest on an irregularly broken rectangular tenon (1.35 x 0.75 x 0.5 cm). The toes are indicated with parallel grooves, the transition from the paws to the tapering forelegs is characterised by a collar-like thickening.

The cat's back shows some smaller and larger dents, particularly at the right upper side of the torso and at the back above the hip bone. There is a larger fracture at the back (see below). Left of the base of the thin tail is another dent in the surface, to the right is an elongated hole between the inner tail side and the cat's rump. At the base of the tail, some bronze defects are visible.

Technical notes

The figure was cast as one piece, the torso and head are hollow, the forelegs are solid. The roughly triangular opening (5 cm wide measured from between the legs and the base of the tail and 4.6 cm wide in the other direction) allows for insights into the torso. There are remains of the dark grey and coarse sandy casting core inside the head (particularly at the back of the head and the muzzle) and in the chest area. Small chaplets are visible on both sides at

chest height directly underneath the casting core remains. Their presence is not visible externally. One small cavity inside the centre-right (not visible from the outside) might be a trace of a chaplet and the sealing of its mark. Further chaplet traces are present in the centre of the right inner rump. The corresponding chaplets on the other side are more difficult to trace. Some small bronze protrusions appear on the inner side along the left.

The bronze shows no casting impurities or vesicles. At the edges of the hind feet, the bronze is max. 0.4 cm thick, at the back it is only 0.08–0.1 cm. The break in the rump was seemingly caused by a rectangular object of 1.1 x 0.75 cm that pierced the bronze wall. While three sides of the fracture are clear-cut at a 90° angle, the object's impact caused a dent resulting in a smaller fissure on one side and a larger break on the other. Here, the bronze skin is irregularly broken. The fracture at the base of the tail was possibly created when the tenon once present was broken off. Aside from the incised scarab and the aegis, all further iconographic details including the whiskers were created in the original wax model, while the back sides of the forelimbs were seemingly not fully smoothed either in the wax model or in the finished bronze. The tenon under the front paws indicates that the figure was meant to be mounted on a base; it also indicates the position of one of the casting sprues (another one would have been positioned at the base under the tail).

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 69, no. 886 [291]; Ministero della pubblica istruzione (ed.), *Documenti inediti*, 1888, III, p. 211 no. 381; Rossi and Strinati (eds.), *Gatti nell'arte*, 1987, p. 102, no. 19; Donadoni Roveri, *Museo Egizio*, 1990, p. 14; Boot (ed.), *L'Égypte, une description*, 1998, p. 83, no. 11; Díaz Fernández and Cabano Vázquez (eds.), *Facies deitatis*, 2000, p. 251; *Aegyptica Animalia*, 2000, pp. 18, 87, no. 56.
Parallels: Type T 32 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 297–98, 783–91, nos. 992–1034, pls. 49a–f). For more parallels see Roeder, *Bronzewerke*, 1937, pp. 46–50, pls. 30–32; Roeder, *Bronzefiguren*, 1956, pp. 346–50, pls. 50–51m; Brussels, MRAH E.06750; Oxford, Ash. AN1933.1694. This type is mainly associated with Bubastis and the Memphite region, particularly the Saqqara Bubasteion, however, Naukratis and Tanis are also well attested find-spots.

61



Inventory number: Cat. 887
Object: Coffin for a cat
Dimensions: L: 10.77, W: 6.5, H: 18.5
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Probably Late Period, 26th Dynasty (664–525 BC), based on parallels and general typology
Scientific analyses: None
Description: Hollow-cast copper alloy figure of a seated cat with the tail curling around the right side, the tip surrounding both front paws in a curve.

The figure rests on a short tube at the back and a tenon under the front feet. The number 292 is written in white on the lower back of the torso above the base of the tail.

The cat's head rests high on a tapering neck. The cheeks transition into a wide muzzle. The pronounced chin leads to a flat snout which is divided in two parts by a thin horizontal line indicating the mouth. The lower section is plain, the upper one shows eight (right) and nine (left) thin lines indicating the whiskers. A protruding nose with two indentations marking the nostrils sits in the centre of the snout. The dorsum runs towards the forehead in a concave form. The recesses for the once inlaid, wide almond-shaped eyes are quite deep. Their inner back is rough and plain; at the outer sides, the upper and lower eyelids end in small commissures. A ridge starts on each side of the nasal root and runs towards the helix's inner side. There is a small hole in each ear (diam. c. 0.14 cm) for earrings.

A necklace is modelled in relief around the cat's neck. It consists of eight narrow cowrie-shells (the ones on the left are less detailed) with a pendant aegis with incised lines marking the parts of the broad collar and an animal face (presumably a cat or lioness) sporting a wig and a sun disk on the head. A counterpoise in the form of a cow-head hangs between the shoulder blades.

The front feet rest next to each other on a tapering tenon. The tip of the tail overhangs the outer side of the left foot. The left paw is larger than the right, both stick together up until the metacarpus. There is a short irregular protrusion at their back side. The toes are indicated by grooves. A cuff protrudes at the transition from the narrower metacarpus to the legs. The carpal pad is summarily marked in the form of an emerging bend. The slender legs are oval in section. The left leg not only gets wider towards the breast, but it also is less well worked particularly at its rear. The lower part exhibits a flat trimmed zone that transitions into a sharper burr. There are also traces from working the original wax model in the armpit of the right foreleg. When seen from the front, the legs form a narrowing V. The short hind feet stick out from under the flat belly. The right foot shows two grooves marking the toes. The left foot is less well made, only the upper side of the paws is distinguishable. The short hollow tube on which the figure rests is recessed under the hind quarters. Its lower edges are irregular, and there are also a few larger bronze protrusions.

Much of the outer bronze surface of the cat is corroded. Along the front side of this zone, it seems that the shallow cavity was secondarily filled with bronze to patch the surface. The figure's inside is light green and shows corrosion. The body contains a linen package stuffed into the upper torso (in the centre, the package is c. 5 cm away from the lower rim of the tube), presumably containing the mummified remains of a cat that has not been imaged.

Technical notes

The cat figure was hollow cast. There are several irregularities, particularly in the lower area including the hind feet, probably casting defects or flaws of the wax model. It seems that the tube and the upper body were made separately in wax and then joined together. The inner lip could represent the joint of both parts. The tube also represents one remaining part of the gating system. The tube is slightly oval, with an inner diameter of 3.5 (side to side) to 3.7 cm (front to back) and an outer one of 4.1–4.35 cm. The thickness of the bronze is irregular (between 0.2–0.35 cm). Several larger protrusions exist on the outer rim of the tube. The tenon under the front feet is the second remaining element of the gating system and is rectangular in section (1.2 x 0.8 cm), 1.9 cm long and tapering (0.7 x 0.6 cm). The tenon and tube suggest that the figure was once fixed to a base of some sort.

The core supports are difficult to identify and their positioning is less regular than it is in other cat/bronze figures. A pair of chaplets seems to be present at the widest point of the lower rump at the stifles (knees), another is in the left shoulder, and others are on the right side in between the shoulder and the chest area. Along the front side of a highly corroded zone with areas of chipped/peeled away bronze, it seems that the shallow cavity was secondarily filled with bronze to patch the surface, perhaps evidence of an ancient repair. The dark brown and silty material in the inner side of the tail base is the remains of the original casting core.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 69, no. 887 [292]; Ministero della pubblica istruzione (ed.), *Documenti inediti*, III, 1888, p. 211, no. 382; Donadoni Roveri, *Museo Egizio*, 1990, p. 14; Tode (ed.), *Gli animali e il sacro*, 2005, p. 198.

Parallels: Type T 32 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 297–98, 783–91, nos. 992–1034, pls. 49a–f). The closest parallel in terms of size and iconography, especially regarding the aegis in relief hanging on a cowrie-shell necklace with a cow-head counterpoise, is in a Swiss private collection (Page-Gasser and Wiese, *Ägypten*, 1997, pp. 274–75, no. 185, dated to Twenty-sixth Dynasty); Washington, DO S.21.01 (Schorsch and Frantz, BMMA 55.3 [1998], p. 18, fig. 6); Paris, Louvre E 2533 (Ziegler and Rutschowscaya, *Louvre*, 2002, p. 78 [inscribed with the name of King Wahibre Psamtik I]) also shows such an aegis and cowrie-shell necklace in relief while the counterpoise seems to have the particular cow-head form as well in Bryn Athyn, GM E60 (Houser Wegner, *GlenMus* 7 (2015), front figure, figs. 16, 18); Barcelona, MEB E-205 (Guichard [ed.], *Des animaux*, 2014, p. 239, cat.-nos. 260a, 260d); Geneva, FGA EG-25 (Bianchi, *Egyptian Bronzes*, 2014, pp. 194–95); London, Petrie UC 8196 (Tiribilli, *Bronze Figurines*, 2018, p. 186); Paris, Louvre E 4255.

62



Inventory number: Suppl. 18201
Object: Coffin for a cat
Dimensions: L: 6.61; W: 3.9, H: 10.8
Acquisition: Donation 1973
Provenance: Unknown
Date: Probably Late Period (722–332 BC), based on parallels and general typology
Scientific analyses: None
Description: Hollow-cast copper alloy figure of a well-modelled seated cat with the tail along its right side. The figure might have contained a kitten mummy, but it is possible that it was solely a small bronze votive.[85]

The top of the head is flat, two faint lines start at the nasal root at the forehead and run towards two small round ears. The tip of the right ear is cut (or sanded), details such as the furnishings and pinna are only summarily modelled. Both ears are pierced, the left ear with a smaller hole than the right. The outer rims of both holes are missing.

Technical notes

The cat figure was hollow cast. The inner opening of the tube measures 2–2.1 cm in diameter, the outer maximum diameter of the cylinder is 2.8 cm, the thickness of the bronze is 0.3–0.4 cm. The outer rim of the tube is partly irregular and corroded, other parts seem to have been cut and/or sanded. The transition between the tube and the torso is characterised by a distinct recess, suggesting that the tube was separately made in wax and then joined to the body. The interior of the hollow piece can be seen through the tube. There are two larger bronze elevations at the height of the stifle joints whose significance and functionality remain uncertain. While the lower parts of the inner surface are more reddish, the upper part at the chest shows more typical green corrosion. Remains of the casting core do not seem to be present.

The rectangular tenon under the front feet tapers slightly downwards (1.66–1.3 x 0.73–0.5 cm in width) and is broken off (now 1.45 cm in length) with its bottom polished. Both tube and tenon are constructional means to attach the statuette to a base; in addition, they represent the remains of the gating system. While the position of one of the feeder channels at the front tenon is quite certain, the structural layout of the sprue(s) for the back including the tube is less clear since indicative traces are lacking due to the working of the tube. Remains of the necessary chaplets cannot be spotted with certainty on the inside. Only faint chaplet traces are identifiable at the usual positions (at the widest extension of the lower body, below the shoulders, possibly behind the cheek bones and at the centre of the occiput), which can, however, not always be verified from the outside due to the compact corrosion on the surface.

Bibliography: Unpublished.
Parallels: Type T 32 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 297–98, 783–91, nos. 992–1034, pls. 49a–f); Florence, MAF 5656 (Rossi and Strinati [eds.], *Gatti nell'arte*, 1987, p. 97); in terms of technology see Barcelona, MEB E-205 (Guichard [ed.], *Des animaux*, 2014, p. 239, no. 260d); **Nos. 56, 61**.

[85] Cf. Schorsch, in Brown and Watkins (eds.), *Conservation of Ancient Egyptian Materials*, 1988, p. 41, on the varying sizes of cat sarcophagi from 10 to 50 cm.

63



Inventory number: Cat. 893
Object: Coffin (fragmented) for a cat
Dimensions: L: 10.5, W: 9, H: 10.3
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Probably Late Period (722–332 BC), based on parallels and general typology
Scientific analyses: None
Description: Fragmented hollow-cast copper alloy head of a cat with a socket for a scarab on the head, containing substantial casting core remains. Its size and iconography suggest that it was the head of a larger seated cat figure that was not entirely cleared from the casting core and used as a container for a cat mummy.

The erect ears are incised with lines representing hair. The recessed outer pinnae are pierced (diam. 0.3 cm) at their lower end. The tip of the right ear is broken, the other ear's apex is complete. A rectangular recess of 1.5 x 1.1–2 cm to accommodate a scarab is located between the ears.[86] The back of the cat's head is incised with parallel lines indicating the animal's fur. The recessed eye sockets once contained inlaid eyes. While the lower eyelids are straight and part of the upper cheekbone, the upper eyelids form a protruding curve. The tip of the nose protrudes from the muzzle, the two nostrils are shown as circular recesses. The recessed mouth form small curves towards the philtrum. Both upper lips bear thin horizontal lines indicating the whiskers. The cat's neck is irregularly broken and a fragmentary sticky label with the old number now missing is stuck to it.

Technical notes

The casting core fills the entire head and is responsible for the weightiness of this object, together with the relatively thick bronze walls. The casting core is mainly dull grey with brown and whitish zones in the front under the throat, suggesting that the material was a mixture of quartz, clay, organic fibres (now burnt out) and plaster.[87] A few black spots seem to be charcoal inclusions. In addition, several clusters of dark green corroded bronze and small copper alloy prills are mixed in with the material. They seem to either represent spillages of older casting runs that got mixed in with the sand and clay material in the workshop to be used as core material. Alternatively, they could be run-offs of the bronze into cracks or porosities in the core during casting. They might also be one possible reason why the head was not emptied from the casting core since they are tightly packed with the casting core and thus not easily removable.

On the left side of the neck, the narrowest section of bronze is 0.2 cm thick, widening to a maximum of 0.56 cm at the opposite side. The differing thickness of the wall at the break suggests that in the model, the wax was not equally spread around the core, and ultimately responsible for the breaking off of the head. Due to the almost complete fill of the head, the location of chaplets is difficult to determine. Externally, there are a few dents that could be traces of core supports. The irregular surface and the random positioning of the dents render their identification, however, less clear.[88] One chaplet sits in the protrusion just behind the socket on the head, another one might exist under the nicely smoothed (thus retouched) area under the right ear.

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[86] Satzinger, in Aksamit et al. (eds.), *Essays in Honour of Prof. Dr. Jadwiga Lipińska*, 1997, pp. 399–407.
[87] Riederer, *SAK* 6 (1978), p. 164.
[88] Common locations for chaplets are in the upper centre of the skull and at the sides under the ears.

At the nape, there are two small corresponding dents at the same level and another is oriented on the same line as the left one, located just above the break at the neck. Here, the outer surface is pitted, while on the inside a 0.1 x 0.3 cm rusty iron pin sticks out, embedded in green corrosion. It is worth noting that the ears seem to have been added to the wax head as separate elements. There is a small dent along the back of the pinna that seems to have been formed while attaching the wax ears to the wax head. All further iconographic elements on the head such as the lines indicating the whiskers, furnishings and fur also were detailed on the original wax model.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 70, no. 893 [298].

Parallels: As a single cat head, it would be Type T 35 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 300–01, 793–96, nos. 1041–59, pl. 50c). However, it is the broken off head of a large, seated cat classified as type T 32 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 297–98, 783–91, nos. 992–1034, pls. 49a–f). For a complete cat with an inlaid scarab see Paris, Louvre E 4255 (Guichard [ed.], *Des animaux*, 2014, p. 239). Parallels for the characteristic ridges leading towards the ears can be found in London, Petrie UC 42558 (Tiribilli, *Bronze Figurines*, 2018, p. 204, no. 296 [also with recess on the head for a scarab]); London, BM EA11562 (originally with inlaid eyes, from Bubastis); Paris, Louvre E 2533 (inlaid eyes, dating to Twenty-sixth Dynasty).

64



Inventory number: Cat. 894 (other numbers: 531 and 299)
Object: Coffin for a cat
Dimensions: L: 4.7, W: 4.4, H: 6.5
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Probably Late Period (722–332 BC), based on parallels and general typology
Scientific analyses: None
Description: Hollow-cast copper alloy head of a cat with socket for a scarab on the top, mounted on a wooden base with the number 299 on a sticky label at the front and number 531 on a further sticky label on the back.

The ears are erect, the left one is smaller than the right one. Both pinnae are plain; both ears are pierced (c. 0.13 cm diam.). A raised rim appears on the top of the head for an inlaid scarab of c. 0.73 cm length and 0.5 cm width. The front and left sides of the socket are partly missing. The lower right eyelid is marked as a small, raised line, the upper eyelid forms a bulge. Two larger holes next to the left eye are either casting defects or later corrosion results. The eye sockets are separated by a wide nose bridge. The nasal root bulges slightly and the broad nose has two dents, indicating the nostrils. The flat muzzle is tilted downwards, the mouth is summarily indicated. The back of the cat's head is flat and wide, its surface transitions smoothly into the nape and the lower neck. Recesses and folds, such as the medial eye commissures, one nostril and the pierced holes in the ears are filled with dark material.

Technical notes

The piece was hollow cast. Some chaplets can be identified from the outside in front of both ears in the form of slightly recessed darker coloured and partly rusty (on the right) spots. A tiny irregularity in the surface is present also in the centre of the scarab socket. Since this spot is usually a chaplet location, one could assume a core support here, which, however, would be at odds with the potential chaplets in front of the ears. No definite traces for core supports are present along the right and left side.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 70, no. 894 [299].
Parallels: Type T 35 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 300–01, 793–96, nos. 1041–59, pl. 50c). Many parallels with or without socket for a scarab are known; see Roeder, *Bronzewerke*, 1937, pp. 52–53; Roeder, *Bronzefiguren*, 1956, pp. 344–46; Florence, MAF 7402 and 7403 (Rossi and Strinati [eds.], *Gatti nell'arte*, 1987, pp. 94–95); Petrie Museum, London, UC16460, UC36422, UC42557, UC42558, UC42561, UC42563, UC42565, UC42566–68, UC56049, UC62221, UC62222 (Tiribilli, *Bronzes Figurines*, 2018, pp. 203–09, cat. Nos. 291–305); New York, MMA 04.2.596.

65



Inventory number: Cat. 895 (other numbers: 592 and 300)
Object: Coffin for a cat
Dimensions: L: 3.55, W: 3.2, H: 5
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Probably Late Period (722–332 BC), based on parallels and general typology
Scientific analyses: None
Description: Hollow-cast copper alloy head of a cat with a scarab in relief on the head, mounted on a wooden stand with number 300 on sticky label at the front and number 592 on another sticky label on the back. Due to its small size, it is more likely that this cat head was a votive object of its own than a part of a composite cat statuette.

The head is now filled with wax or mastic to fix it to the stand and to stabilise it. Since the lower base of the neck rests tightly on the stand, its rim is hidden for the most part; a concave indentation is compensated by further wax or mastic at the back.

The base of the neck (3 x 2.2 cm) is pushed in at the front and back, forming a flat front and a triangular dent at the back. The neck narrows and gets more circular in diameter towards the head. The nape is straight, the head generally spherical.

The upper back presents dents and irregularities in the surface, the traces of thin parallel lines on the left occiput could either be original indications of fur or traces of an earlier conservation treatment. The lower right jaw presents an opening of 0.46 x 0.27 cm (a casting defect or secondary break) clogged by inner fill material. The chin protrudes from the flat cheeks, the mouth is formed as deep indentation below the rounded muzzle pads, the nose sits prominently above them with indented nostrils. The cheeks transition into quite large eye sockets. In contrast to the arched upper eyelids, the lower ones form straight lines. The eyes were once inlaid, the medial commissures have small holes at the internal canthus. The left eye's upper eyelid is missing, revealing the inner fill of wax/mastic. Two raised lines run above the nasal root towards the back to transition into the medial borders of the round erect ears. The area of the furnishings is raised, the outer pinna is slightly recessed, both ears are pierced (0.1 cm diam.). The head and the line dividing the thorax and elytra of the small scarab in relief are only summarily indicated. The bronze shows some minor irregularities and imperfections at the right of the neck, along the indentations at the back side and above the eyes.

Technical notes

The piece was hollow cast. Since the inside is filled with wax/mastic, no details in terms of the secure presence of chaplets can be reported. Externally, however, a few small protrusions that can possibly be identified as core support remains: a green corroded protrusion sits in the left centre of the head, another is located under the right ear. Other corrosion patches on the head might also indicate chaplets.

Bibliography: Fabretti et al., *Regio Museo*, 1882, 70, no. 895 [300].
Parallels: Type T 35 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 300–01, 793–96, nos. 1041–49, pl. 50c). For more parallels, see Roeder, *Bronzewerke*, 1937, pp. 52–53; Roeder, *Bronzefiguren*, 1956, pp. 344–46; Florence, MAF 7402, 7403 (Rossi and Strinati [eds.], *Gatti nell'arte*, 1987, pp. 94–95); among the thirteen cat heads in the Petrie Museum, London, particularly UC42561 (Tiribilli, *Bronze Figurines*, 2018, p. 205, cat. no. 297).

66



Inventory number: Suppl. 2917
Object: Coffin for a cat
Dimensions: L: 6.3, W: 5, H: 8.7
Acquisition: Italian Archaeological Mission (1903–06)
Provenance: Heliopolis
Date: Probably Late Period (722–332 BC), based on parallels and general typology
Scientific analyses: None
Description: Hollow-cast copper alloy head of a cat with well-modelled facial features. Due to its size, it could either have been a part of a composite cat statuette, a cover for a cat mummy, or a votive offering of its own.

The rough surface of the bronze is partly deep reddish with dark- and light-green patches and speckles. The muzzle seems to have been more intensely exposed to corrosion, since chin and whisker pads appear rougher in comparison to the remaining surface.

Technical notes

The piece was hollow cast. Several chaplets can be identified: the most prominent one sits in the centre of the head in between the ears; another seen as a shallow and square dent of 0.2 x 0.2 cm, visible from the outside, sits in the centre of the right side of the neck under the ear. On the inside, only a larger flat corroded patch is discernible. Some other protrusions could well represent chaplet remains, however, their identification as such is not secure. The thickness of the bronze along the base of the neck measures between 0.3 and 0.4 cm. There are no remains of the casting core inside the head. The darkened band around the outside rim of the neck could be the remains of either the deposition or the original mounting of the piece.

Bibliography: Unpublished.
Parallels: Type T 35 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 300–01, 793–96, nos. 1041–59, pl. 50c). For more parallels, see Roeder, *Bronzewerke*, 1937, pp. 52–53 §§216–21; Roeder, *Bronzefiguren*, 1956, pp. 344–46, §445; London, Petrie UC 16460, UC 35422, UC 42557, UC 42558, UC 42561, UC 42563, UC 42565–68, UC 56049, UC 62221, UC 62222 (Tiribilli, *Bronze Figurines*, 2018, pp. 203–09, cat. Nos. 291–305); in terms of the round forehead and sagging eyebrows see particularly New York, MMA 04.2.592, MMA 86.1.80, MMA 04.2.596.

67



Inventory number: Cat. 892
Object: Coffin for a cat
Dimensions: L: 14.5, W: 6.5–6.65, H: 8.1
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Probably Late Period (722–332 BC), based on parallels and general typology
Scientific analyses: None
Description: Rectangular hollow-cast copper alloy box surmounted by two small felines in the front and three larger felines in the back. The front of the box bears an oval sticky label with the faded number 297 and the catalogue number written smaller above it in blue ink. This label covers another blue sticker.

The box is not quite rectangular, but is a slightly askew parallelogram in section. One outer corner of the back is partly cracked, there is an irregular opening next to a fissure. The front of the box is uneven and has a large dent at its lower right side causing the edge to bulge towards the base. Both long sides are smooth and show only a few irregularities and fine, mostly horizontal striation marks. The bottom has more irregularities: corroded areas, small dark-brown patches with possible textile impressions and small flat ridges running along the surface. The box's surface bears tiny striation marks running mostly across in between the two animal groups. Such striation marks are also present along the cat's tails in the outer positions. The inner surface of the bronze wall is rough and covered with soft dark-grey dust.

The first group of two kittens sits c. 3.4 cm away from the front in a slight depression. The left feline appears to be a little bit taller, both lean in toward each other. Both are seated; their paws rest close to each other; the toes are indicated as short grooves. The kittens' heads, which are large in comparison to the body, sit high on long necks. The mouth is indicated with a groove around the muzzle, the whisker pads are round, and the nostrils are indicated as thin diagonal dents. The round eyes sit in wide recesses, the large ears are erect and oriented forward. The round back of the head transitions into a vertical neckline. The slender bodies sit on small hind legs, their backs form gentle curves. The tails, one quite straight, the other more curved, lie to the right and run a little bit further than the paws.

The three cats in the back sit abreast c. 3.6 cm behind the kittens in another shallow depression, the outer cats slightly leaning in towards the central, largest, one. The space between the front legs of the left proper cat is fully cut out. The front legs of all three cats are differently modelled in terms of form and volume. There are several marks from tools producing a less round modelling of the legs of the central and right feline. The front legs of the leftmost cat are particularly sharp-edged. The paws with two grooves rest elevated on small, unsmoothed bronze patches.

The cats' heads are large in comparison to the body and sit on long necks. The jaws of their round muzzles are indicated with horizontal grooves, the nostrils with tiny dents. The almost vertically positioned eyes are round and sit in half-cordiform recesses between the wide nose bridge. The tip of the left ear of the outer left feline is pushed in, the other ears are erect and oriented forward. The backs of all three cats have a distinct line that marks the spine's curvature. This line, which renders the section of the cats' rump angular, transitions into the tails. The tail of the two right cats is positioned to the right, the tail of the other feline runs along the left side, which is unusual. The hind legs of the cats are different in size and volume. The bellies and inner sides of the front legs are rough.

The back of the box is open to insert the mummy. The edges of the open back are formed as inward-looking rims, the ones of the narrow sides are larger, the upper one is partly pushed in in the centre. The opening seems to have been cut out from the box, since the inner lip of the rim shows sharp cut marks forming minute recesses. This opening would have been the fitting frame of the panel to be set in after putting the animal remains inside.

Technical notes

The box was hollow-cast, the walls are c. 0.2–0.3 cm thick, the felines are solid-cast. There is no evidence that the kittens and cats were cast separately and then pinned onto the box; there is only one larger protrusion under the back of the rightmost cat that could represent a pin to fix the animal onto the box, but it seems to be a protrusion without technical significance. The bodies of the kittens and cats are tightly fused with the upper surface of the box, sitting on thin areas of rougher unsmoothed bronze which represents the original wax for connecting them with the top of the separately made wax model of the box.

The positioning of the chaplets can be seen quite distinctly from the inside. There are three protrusions along the central axis of the bottom. Two of them are also discernible from the outside as small elevations. There are three such elevations along the central line along the right-side wall which are on the same level as those in the bottom; two of the chaplets of the right-hand side wall are visible from the outside. The opposite wall shows only two chaplet remains, both of which are on the centre line on the same level as the others and appear rusty in colour. They appear as small surface irregularities also on the outside.

There are two further rusty chaplets in the central axis of the upper side. It thus appears that they were made of iron, a typical material for such elements. The front side of the box not only has a hole in the upper left (which seems to be a small casting defect), but there is also a larger opening in its centre (now covered by the sticker[s]), that indicates the original position of a casting pin.

In addition to the chaplets, internally, there are a few technologically insignificant bronze protrusions. One burr appears internally, probably a ridge caused by a crack in the casting core of the original wax model. The irregularities of the base externally indicate that the wax model was not smoothed perfectly, while the other sides were nicely worked.

The wax models of the solid kitten and cats were made based on the same iconographic scheme, but with several variations because they were most likely modelled by hand aided by tools.[89] The space between the front legs of the kitten in the front was not cut away, there are, however, distinct lines which indicate that this was originally intended, but not executed. The rightmost cat also has the space between its front legs not cut away, while the others have. At the breast of the leftmost cat and the belly of the rightmost, there are also elements that should have been removed before casting. The surfaces of the bellies and between the hind legs were also not smoothed entirely. Some areas of the original wax models, especially the front sides of the forelegs of the leftmost cat, seem to have been cut and worked with a sharp flat tool.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 70, no. 892 [297]; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 47–48, fig. 7B.

Parallels: None identical; it is an amalgam between Weiß's type G 25 and type T 33, adding more cat figures on a joint votive box (Weiß, *Tier- und Götterbronzen*, 2012, pp. 345–46, 841, no. 1228, pl. 59e [group of two seated cats]; pp. 298–99, 792, nos. 1035–37, pl. 50a [single cat in attentive position on a rectangular box]). Type G 25, not a votive coffin, is typologically based on a piece found in the cachette at the Pyramid of Userkaf (El-Khouli, *JEA* 64 [1978], p. 39, no. 47) and the cat group Langton collection no. 121 (Weiß, *Tier- und Götterbronzen*, 2012, p. 345, fn. 1475, pl. 59e).

[89] One partly comparable wax model of such a small cat figure is known from the collection of casting materials from Qubbet el-Hawa (see Fitzenreiter et al., *Materialien*, 2016, pp. 173–74, no. QH 207/21, pl. 12d–e; the object was recently relocated to the Egyptian Museum in Cairo).

8.6 Mongooses/Ichneumons

The mongoose or ichneumon (*Herpestes ichneumon*) is still present in Egypt, in the Delta and Fayum;[90] and in the sixteenth century AD was known as "pharaoh's rat".[91] Ichneumons are frequently pictured in Egyptian tombs, particularly in scenes involving the marshes, where they often are shown hunting birds' eggs. The mongoose is associated with Atum(-Re) and Re, both creator gods, and also with Horus of Letopolis,[92] and, like these gods, has solar connotations. Some scholars have posited that the animal of the goddess Mafdet, a protective goddess, particularly against snakes, was an ichneumon.[93] The mongoose is most famous for its propensity to hunt and kill snakes, and in Egyptian mythology this translated into its ability to defeat Apophis (or Apep), who manifested himself as a giant snake and was the arch-enemy of the sun god Re; this is why the mongoose was associated with the sun god.

Mongooses can be tamed and used to keep spaces clear of snakes, as is the case in Pakistan and India today. In ancient Egypt there are a few depictions of leashed animals that have been interpreted by some scholars as ichneumons, tamed for hunting snakes and frightening birds into the air where hunters could kill them with throw sticks or bows and arrows.[94] It is sometimes difficult to identify images of ichneumon, and some have been confused with otters,[95] with the debate ongoing.

Mongoose mummies have been found at Saqqara,[96] Abu Rawash,[97] Abydos,[98] and Dendera,[99] to name but a few sites.[100] It is worth noting that some bronze containers in the shape of the goddess Wadjet in her lioness form contain mongooses, which were dedicated to her – together with snakes, paradoxically.[101]

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[90] Hoath, *Field Guide*, 2003, p. 90.
[91] Osborn and Osbornova, *The Mammals of Ancient Egypt*, 1998, p. 92.
[92] Where it was twinned with the shrew; Brunner-Traut, *NAWG* 7 (1965), pp. 153–63; Junker, *Der sehende und blinde Gott*, 1942; Brunner-Traut, in Helck and Otto (eds.), *LÄ*, III, 1980, col. 122–23; see also Vernus and Yoyotte, *Bestiaire des pharaons*, 2005, pp. 610–11.
[93] Wilkinson, *Complete Gods and Goddesses*, 2003, p. 196.
[94] Osborn and Osbornova, *The Mammals of Ancient Egypt*, 1998, pp. 94–95.
[95] Brunner-Traut, in Helck and Otto (eds.), *LÄ*, III, 1980, col. 122–23.
[96] Waziry, *Vestiges of Ancient Egypt*, 2023, fig. 29a-b.
[97] Ikram, personal observation.
[98] Whittemore, *JEA* 1 (1914), pp. 248–49.
[99] Petrie, *Dendereh*, 1900, p. 59.
[100] Boessneck, *Haustiere*, 1953, p. 31.
[101] Bothmer, *JNES* 8.2 (1949), pp. 121–23: https://doi.org/10.1086/370922; Ikram, *KMT* 27.1 (2016), pp. 68–73.

68



Inventory number: Cat. 928
Object: Coffin for an ichneumon
Dimensions: L: 8.45, W: 3.8, H: 3.5
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Probably Late Period (722–332 BC) or later, based on parallels and general typology
Scientific analyses: None
Description: Solid-cast copper alloy image of an ichneumon standing on a thin base and wearing a necklace or collar, perhaps alluding to tamed animals that might be used to kill serpents.

The feet of the ichneumon are summarily modelled; the right front leg and the hind legs merge with the bronze accumulations at the base that represent the original wax that joined the legs to the base. The left front leg is thinner and bends backward above the ankle. The surface of the other three legs appears not to be fully finished. The right hind foot is slightly advanced, as if the animal were walking. The body is tubular. The belly is rough and shows some irregular grooves. The animal's penis seems to be represented by a small, elongated protrusion, clearly indicating its gender. A few parallel lines indicating fur are visible on the left side of the pelvis and on the tail.

The necklace, starting at the shoulders and rendered as a raised band, is graced with a circular element with a round fill, most likely a sun-disk, on the breast. The pointy, pyramid-shaped head is characterised by pronounced lower cheekbones, small laid-back ears and summarily indicated eyes. A faint straight line indicates the mouth, two dents the nostrils. The base is broken twice at its front and more severely at the back, which is also warped upwards. The slightly curved outer sides of the base are partly still intact. The surface of the piece is worn, with rougher areas alternating with smoother zones.

Technical notes

The animal was cast together with the base. The bronze thickenings around the legs and at the end of the tail represent the wax that was used to connect them with the base. The finish is not thorough, being limited to the rendering of the fur in places. Since no tenon is present, the piece may have been a sliding cover for a wooden box containing mummified animal remains.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 72, no. 928 [311].
Parallels: Types T 40 and T 41 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 307–09, 800–02, nos. 1077–82, pls. 51d–f); no direct parallel for the design of the animal is known to the author. Loose parallels include: Boston, MFA 18.581, 25.2465, from Giza G 7510; Boston, MFA 25.2465 (Weiß, *Tier- und Götterbronzen*, 2012, p. 800, no. 1077); Paris, Louvre E 30942; New York, MMA 1995.434.

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Inventory number: Cat. 929[102] (= Provv. 3310)
Object: Coffin for an ichneumon
Dimensions: L: 9.1, W: 1.9, H: 2.47
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Probably Late Period (722–332 BC) or later, based on parallels and general typology
Scientific analyses: None
Description: Solid-cast copper alloy image of an ichneumon striding, left feet forward, on a small platform set on a plinth.

The plinth has a tenon and is mounted on a rectangular wooden bar, in the centre of which a hole was made to accommodate the tenon. The tenon's remaining length is 1.68 cm (the same as the wooden bar), and it measures 0.35 x 0.15 cm at the tip. The flat plinth tapers from the front to the back, echoing the form of the ichneumon.

The head has rounded cheeks. The pinna of the laid-back round ears is separated by two grooves. The small almond-shaped eyes sit below a bulging forehead. The tapering muzzle displays an accentuated nasal bridge, a thin horizontal line marks the mouth. The neck is short. The long tail curves slightly upward at the tip. Short incised lines indicate fur on the body and the legs. The toes are indicated.

Technical notes
The animal and the base were cast as an ensemble. The tenon under the plinth is a remaining trace of the gating system. The small "platforms" under the feet represent the wax used to join them with the plinth. The thin grooves around them are the result of the modelling of these joins. The rump of the ichneumon has patina traces; the tail end is less patinated. The end of the tail could be an ancient cast-on or modern repair element, as there is a marked difference between the surface of the tail with fur lines and its end part without such lines. Both are tightly connected to each other, thus an earlier miscast element of the tail could stick into the cast-on element, thus providing the tight joint.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 72, no. 929 [312].
Parallels: Type T 40 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 307–08, 800–01, nos. 1077–80, pls. 51d). In terms of body modelling, posture and indication of fur, comparable pieces on boxes or bases, with or without a loop at the back, are, e.g., Copenhagen, CG 261 (Mogensen, *Collection égyptienne*, 1930, p. 59, pl. LVI); Hildesheim RPMH 70 (Roeder, *Bronzewerke*, 1937, p. 57, pl. 34h); Berlin, ÄM 2621 (Roeder, *Bronzefiguren*, 1956, p. 383, §512e, pl. 55d); Vatican City, MGE 18641 (Grenier, *Bronzes*, 2002, p. 161, no. 338, pl. XLV); Leiden, RMO F 1949/12.7, F 1952/9.7; London, BM M.1074; Paris, Louvre N 5241.

[102] It was originally assigned the number Cat. 931 incorrectly.

70



Inventory number: Suppl. 19134/A
Object: Coffin for a mongoose
Dimensions: L: 5.8, W: 2.37, H: 3.4; Base H: 2.16
Acquisition: Donation Keller (1970)
Provenance: Unknown
Date: Probably Late Period (722–332 BC) or later, based on parallels and general typology
Scientific analyses: None
Description: Hollow-cast copper alloy coffin of a mongoose standing on an open box, which is partly filled with brittle light green-blue material visible at the back on the right proper side.

The front and back of the box are damaged, with parts missing, and there is a large crack on the left proper wall. The right outer wall has a triangular defect in the back part, which continues into the rear of the bottom. A small bit of plaster fill at the inner left rear side seems to be a vestige of the sealant of the rear panel. The back of the box curves in a little, creating the frame for the closing piece. The bottom of the box is coated with a brownish material, while a shiny varnish covers the outer right side.

The mongoose rests low on the box. The feet are not individually modelled, the space between the legs and the belly is occluded (it was probably never cut out) and the surface around it appears greyish. The neck is short and the head small with a stout tubular muzzle, reminiscent of that of a feline. The nose and chin are pronounced, the bulge of the forehead is subtle, and the ears present quite large inner cavities. The stubby front legs transition into a pronounced shoulder ridge. The round and compact back rests on short hind legs connecting to the wide hip. The tapering rear transitions into the tail that ends flat on the upper side of the rear of the box. Accretions of greyish material are found close to the tail. The inner walls of the box show light green corrosion.

Technical notes

The animal was cast together with the box. The wax model of the animal was tightly connected with the wax box; the junction is now represented by the clogged and potentially never fully cut-out space between the belly and the box, as well as between the legs. The corrosion obscures details of the finishing. Chaplet spots are not identifiable. The plaster in the box seems to have once filled the entire cavity and there is no evidence for a mummy. The box was seemingly originally sealed, as suggested by the small white recessed plaster element at the rear.

Bibliography: Unpublished.
Parallels: Types T 40 and T 41 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 307–09, 800–02, nos. 1077–82, pls. 51d–f). No direct parallel for the design with the particularly short muzzle, the shoulder ridge and the stout round torso is known to the author. Parallels for the body modelling include, e.g., London, Petrie UC79111, and Cambridge, HAM 1932.56.6, both of which are, in fact, shrews.

8.7 Shrews

Shrews were associated with the nocturnal aspect of the sun god[103] (Re and Atum, as well as Horus of Letopolis) as they live in underground burrows and were thought by the ancient Egyptians to be adept at "seeing" in the dark. Their subterranean existence also linked them to Osiris.[104] In fact, shrews have poor eyesight but amazing whiskers that they use to "see". Due to their association with solar deities they were often gilded (for example, Cairo, EMC CG 29815 and two examples excavated at Abydos – encompassing the imagery of both Re and Osiris)[105] and their images in bronze on coffins were decorated with solar symbols (scarab beetles, in particular, for example as seen on **Nos. 68, 74, 78–79**). There were more shrew species in ancient Egypt than are found there today, and possibly with a greater range throughout the country; they can thus be used as a proxy to gauge environmental change.[106] It is quite possible that shrew mummies were buried at more sites than have been noted by archaeologists, because their tiny, fragile bones can be overlooked or confused with those of rodents by the uninitiated, especially if they are buried in small numbers and without coffins, or if their wrappings have disintegrated.

[103] Brunner-Traut, *NAWG* 7 (1965), pp. 123–63; Brunner-Traut, *LÄ*, V, 1984, col. 1160–61.
[104] Vernus and Yoyotte, *Bestiaire des pharaons*, 2005, p. 614.
[105] Ikram, personal observation; Ikram, in Janosi (ed.), *Structure and Significance*, 2005, pp. 335–40.
[106] Woodman et al., *Zootaxa* 4341.1 (2017), pp. 1–24: https://doi.org/10.11646/zootaxa.4341.1.1; Woodman et al., *Journ Mamm* 100.4 (2019), pp. 1199–210; Woodman and Ikram, *QuatRes* 100 (2021), pp. 21–31; Woodman et al., *PLOS ONE* 16.4 (2021), e0249377: https://doi.org/10.1371/journal.pone.0249377. For contemporary shrew populations, see Osborn and Helmy, *Contemporary Land Mammals*, 1980; Hoath, *Field Guide*, 2003.

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Inventory number: Suppl. 8191
Object: Shrew mummy
Dimensions: L: 18, W: 4.8, Max circ.: 11
Acquisition: Italian Archaeological Mission (1906)
Provenance: Asyut
Date: Undetermined
Scientific analyses: X-ray, CT

Description: Shrew mummy, wrapped spirally in undyed (T1) and orange-pinkish bandages on the exterior (T2), with a small head with a pointed nose. The bandages are covered with black resin-like substance and are for the most part dark brown, save at the neck area. The head is dark brown and the snout is long, as it is in nature. The eyes are appliquéd in dark brown.

Scientific examination

CT investigations

The CT scans show that this animal is a shrew, probably *Crocidura olivieri*.[107] Some details were measured: a cervical vertebra, 0.5 cm in diameter and two long bones (with articulations), 2.3 mm in diameter. The entire skeleton is wrapped in the body of the mummy bundle, the head consisting only of textile.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, p. 11; *Aegyptica Animalia*, 2000, pp. 70, 85, no. 39.
Parallels: New York, BM 14.653 (Bleiberg et al. [eds.], *Soulful Creatures*, 2013, p. 81, fig. 68); Philadelphia, Penn Museum E12435.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S		Too badly preserved for thread count	Undyed	
T2	Linen	S		Too badly preserved for thread count	Orange-pinkish	

Textile notes: Two different qualities of textile were used to wrap the mummy and create the pattern.

[107] An identification kindly confirmed by Neal Woodman of the Smithsonian National Museum of Natural History.

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Inventory number: Suppl. 8190
Object: Shrew mummy
Dimensions: L: 12.7, W: 3, Max circ.: 9.7
Acquisition: Italian Archaeological Mission (1906)
Provenance: Asyut
Date: Undetermined
Scientific analyses: X-ray, CT

Description: A shrew mummy shaped as a bundle. The animal is covered by coarse and dense linen bandages (T1) that are secured by thread, then covered by another larger piece of cloth (T2), which is secured by a black resin-like substance and also by a narrow folded bandage (T3) (0.6 cm wide as folded) that is wrapped spirally around the object, and secured, it seems, by dots of the black resin-like substance.

Scientific examination

CT investigations

The CT scans reveal that the bundle contains a small, juvenile shrew. The animal's tail is bent and the hind limbs are stretched backward. Unfortunately, the images are not clear enough to identify the precise species, but it is possibly *Crocidura religiosa* (formerly *C. nana*), based on its size and morphology.

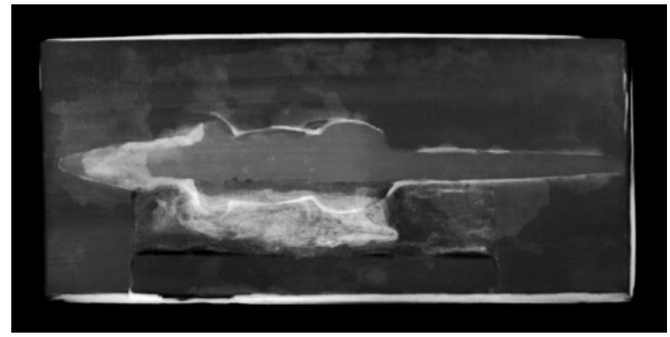
Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 20.
Parallels: Woodman et al., *Zootaxa* 4341 (2017), pp. 89–101; Woodman and Ikram, *QuatRes* 100 (2021), pp. 21–31; Woodman et al. *PLOS ONE* 16.4 (2021), https://doi.org/10.1371/journal.pone.0249377.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	28 x 10	Undyed	
T2	Linen	S		Too badly preserved for thread count	Dark brown	
T3	Linen	S		Too badly preserved for thread count	Undyed	

Textile notes: Three different qualities of textile were used to wrap the mummy and create the pattern.

73





Inventory number: Cat. 2399
Object: Coffin for a shrew
Dimensions: L: 13.5, W: 6, H: 3.5
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT
Description: The shrew coffin consists of a wooden box surmounted by the image of the animal in high relief. The coffin was made from a single piece of wood. The animal, positioned in the centre, has the back of its body slightly raised. The surface is very damaged, but the four legs, the long tail, the muzzle and two small hollows for eyes, possibly once filled, are clearly delineated. Originally, the coffin and image of the shrew were covered by plaster and then painted brownish black; much of the plaster and paint have eroded away. There is an opening on the left proper side, which is well sealed.

Scientific examination

CT investigations

CT scans show that the box contains a textile bundle with bones that seem to belong to a shrew (*Crocidura spp.*), though it is not beyond the realm of possibility that the animal is actually a rodent.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 338, no. 2399 [76]; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 39–40, fig. 3D.
Parallels: Cairo, EMC CG 29786–89 (Ikram and Iskander, *Non-Human Mummies*, 2002, p. 55).

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Rectangular box surmounted by animal	Yes	Yes	Brownish black	One piece of wood	No	No	No

Coffin technical notes

74



Inventory number: Cat. 926
Object: Coffin for a shrew
Dimensions: L: 13.9, W: 3.67–4, H: 5.8
Acquisition: Acquired before 1882
Provenance: Unknown, but the inscription indicates it is from Buto or Saqqara
Date: Probably Late Period (722–332 BC), based on parallels
Scientific analyses: None
Description: Rectangular hollow-cast, sealed and inscribed copper alloy box in the form of a naos with a cavetto cornice and torus moulding, surmounted by the image of an anatomically correct male shrew.

The back of the shrew is decorated with a vulture holding the *shen* sign of eternity in its claws, followed by a net pattern, and a scarab on its rump. The shrew's tail is broken off, but it originally would have extended to the end of the naos. The shrew stands toward the front of the box. It has a sensitively modelled face and oblique lines delineating the whiskers. The eyes are covered with gold leaf; the pupils are left blank. An unusual feature is a half-moon between the ears, which might be indicative of a ruff, which actually does not occur on these animals in nature and might be an evocation of the shrew's solar nature. The front and hind feet are short and stubby, with the toes indicated with four lines. The original wax model was not properly finished in this area, so in the final cast the hind legs are not completely separated.

There is a hieroglyphic text on the front and the right proper side of the naos. The back end of the naos is sealed with a flat, slightly bulging panel. While three edges are set in flush, one side of the panel forms the back end and includes the torus moulding. The panel sits firmly in place, yet its edges are not fully flush to the frame. Textile remains of the mummy wrappings are visible through the break at the front part of the left side.

Inscription



(1) *Ḥr nb-Ḫm jm.j-Pj* (2) *dj ꜥnḫ Jj-m-ḥt{t}<p> sꜣ Wꜣḥ-jb-Rꜥ*
"Horus, the Lord of Letopolis, who is in Pe (= Buto), gives life to Imhotep, son of Wahibre."

Comment

The inscription follows the known format of such texts.[108] The text first mentions the deity associated with the object at the front, while its continuation on the right includes the name of the commissioner of this object. The toponym *Ḫm* "Letopolis" is written abbreviated with Gardiner sign-list O43 (bolt) and O49 (settlement classifier), with O43 substituting R22 (the Min emblem), as is well attested from the Middle Kingdom onwards.[109] The *jm.j* consists of a little cross followed by its phonetic complement, the *m*-owl. The toponym Pe lacks a classifier. *dj ꜥnḫ* is to be understood as continuation of the front text mentioning Horus of Letopolis with *dj* as active participle and *ꜥnḫ* as object.[110] The name Imhotep[111] is well attested in the Late and Graeco-Roman Periods. It is written here with peculiar forms of M18 (flowering reed on walking legs), M17 (flowering reed looking like S29 [folded cloth]) and D54 (walking legs). Regarding the *ḥtp*, the last consonant Q3 was wrongly written as X1. The father's name *Wꜣḥ-jb-Rꜥ*, being the *sꜣ-Rꜥ* (personal) name of King Apries, suggests a Twenty-sixth Dynasty date for the piece; however, this name is also well attested later.[112] The epithet of Horus of Letopolis, the deity typically mentioned on votive coffins

[108] Weiß, *Tier- und Götterbronzen*, 2012, pp. 483–84.
[109] Gardiner, *Egyptian Grammar*, 3rd ed., 1957, pp. 496, 503.
[110] Weiß, *Tier- und Götterbronzen*, 2012, p. 484.
[111] *PN*, I, 1935, p. 9, no. 2.
[112] *PN*, I, 1935, p. 72, no. 28.

with shrews[113] as *jm.j-Pj*, "who is in Pe", could indicate a provenance of this artefact from Buto, but North Saqqara is also a candidate.[114]

Technical notes

The coffin was hollow cast; the shrew is most probably solid. The thickness of the bronze walls of the naos seems to be between 0.2 and 0.35 cm. The small dents on the naos' upper surface, particularly the two in the centre behind the tail stub and the other two at the back end, could be remains of core supports. The latter might also be traces of feeder channels that were used for the bronze to reach the tail during casting. One chaplet is present in the front centre. Its rusty corrosion conceals the right end of the hieroglyphs *jm.j*. One further core support can be found above the *t* of *ḥtp*. On the opposite side there is another one in the area below the shrew's rear. The slightly rusty appearance of the chaplets suggests that they are ferrous.

The group of dents next to the right fore and hind feet might be the remains of finishing the original wax model of the box when the figure of the shrew was put in place. The box and the feet were "glued" together with wax smeared around the paws, which was then smoothed with a small tool whose striated traces are discernible. It is curious that, despite the high quality of production, the space between the fore and hind limbs was not cut out and finished. The horizontal striation marks are traces of the smoothing of the original wax model. The inscription was, together with its lower and upper framing lines, most probably already incised in the wax model surface with a sharp pointed tool.[115] The upper delineating line on the right side seems to have been made in several movements, given its irregular character. The lower line is more consistent.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 72, no. 926 [309]; Grewenig (ed.), *Ägypten*, 2014, pp. 190–91; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 47–48, fig. 7G.

Parallels: Type T 44 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 312–13, 801–02, nr. 1082, pp. 806–15, nos. 1099–1141, pls. 52f–j); New York, BM 37.411Ea-b[116] (Roeder, *Bronzefiguren*, 1956, p. 382, §512c, pl. 84d); New York, MMA 1985.14; Geneva, FMD (Aubert and Aubert, *Bronzes*, 2001, p. 248, pl. 35); London, BM EA59056, EA64370 (Thum, "Creatures Compartimentalised", 2012, p. 123, nos. X-07 and 08); Vatican City, MGE 18650 (Grenier, *Bronzes*, 2002, p. 164, no. 344, pl. XLV); Vienna, KHM 645 (Roeder, *Bronzefiguren*, 1956, p. 383, §512c, fig. 549); North Saqqara Falcon Complex FCO-164, H5-2226a+b [4328] (Davies and Smith, *Falcon Complex*, 2005, p. 90 [no figures, both with winged bird on back and scarab on rump – H5-2226a bears an unrecorded inscription]); FCO-331, H5-2457 [4663] (Davies and Smith, *Falcon Complex*, 2005, p. 110, pl. LVIIIa [not cleaned, so the details are not visible]; FCO-163, H5-2225 [4327] (Davies and Smith, *Falcon Complex*, 2005, pp. 90–91 pls. XLb and XLIc [Manchester, MM 1971.29 {13007}; no decorative details]) and FCO-165 H5-2227 [4329] (Davies and Smith, *Falcon Complex*, 2005, pp. 90–91, pls. XLId-e [London, BM EA67195; body and tail are pecked to indicate fur; Weiß, *Tier- and Götterbronzen*, 2012, pp. 801–02, nr. 1082, identifies the animal as ichneumon]); Rovigo, AC (Musso and Pettachi, *GM* 220 [2009], p. 83, fig. 9); Lyon, MdC D979-3-1714/90001880 (Emmons et al., *Musée des Confluences*, 2010, pp. 95, 110, no. 103 [identified as ichneumon]); Munich, ÄS 1385 (Weiß, *Tier- und Götterbronzen*, 2012, p. 960, no. 1752, pl. 77n); New York, BM 37.410Ea-b (Bleiberg et al. [eds.], *Soulful Creatures*, 2013, p. 49, no. 39); Boston, MFA 18.581.

[113] Weiß, *Tier- und Götterbronzen*, 2012, p. 311, with fn. 1332.
[114] Weiß, *Tier- und Götterbronzen*, 2012, pp. 312–13, 391.
[115] If this indeed were the case, it would mean that the piece was made individually based on the "order" of the client, i.e., inscribed and personalised.
[116] Inscribed for Pahapy and Horus of Letopolis.

75



Inventory number: Suppl. 18098
Object: Coffin for a shrew
Dimensions: L: 5.4, W: 2, H: 3.2; Box H: 1.8–2; Shrew figure L: 5.2
Acquisition: Donation around 1970
Provenance: Unknown
Date: Most probably Late Period (722–332 BC), based on parallels and general typology
Scientific analyses: None
Description: Empty rectangular hollow-cast copper alloy box with an open back surmounted by the image of a summarily modelled standing shrew.

No details of the face are discernible, except for the right ear, rendered as a small protruding curvature with a dent inside. The animal stands high on straight and tubular legs that transition into its body with a slight inward bend. The feet are only cursorily indicated. Due to corrosion, no further iconographic details can be detected. The small scale of the piece suggests that no decoration was ever present. The tail has a slight downward bend and is supported by a bar. All surfaces are covered by dark green corrosion. The closest parallels are from Athribis and Saqqara.[117]

Technical notes

The box was hollow cast together with the solid figure of the animal. Both were probably prefabricated as individual models and then joined together. The vertical pin at the box's rear is not only intended to support the tail, but is also left over from an original wax channel that was necessary during casting so that the liquid bronze could reach all parts of the figure in the mould. At least four thin protruding core support remains are discernible inside the box: one in the centre of the front side, two in the centre of the long sides, and one in the top side, directly between the front legs. While the chaplet sheet in the front side is oriented vertically, the ones at the sides are positioned horizontally, with the right one possibly being ferrous as it has a reddish hue. The orientation of the core support under the feet cannot be determined. The gating system for casting was most likely placed at the bottom so that the whole piece could be cast upside down.

Bibliography: Unpublished.
Parallels: Type T 44 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 312–13; 806–15, nos. 1099–1141, pls. 52f–j). Examples of shrews on plain boxes with their tails supported by small vertical bars are frequent in the North Saqqara Falcon Complex (FCO-101 H5-2163 [4233] [one exemplar Birmingham, BM&AG B53071], FCO-102 H5-2164 [4234], FCO-157 H5-2219 [4321], FCO-159 H5-2221 [4323], FCO-167 H5-2229 [4331], FCO-223 H5-2316 [4507], FCO-325 H5-2451 [4657], FCO-327 and 328 H5-2453/4 [4659, 4660], FCO-438 H5-2704 [4984] [Cambridge, MAA Z 45795]: all Davies and Smith, *Falcon Complex*, 2005, pp. 82–83; 88–119, pls. XXXXIIIb–c, XXXIVa, XXXIXd, XLa & d, LVd); the boxes are, however, larger in most cases and the shrews sometimes modelled in more detail; Paris, Louvre N 5144, N 3779 A; Budapest, MFA 79.12-E. The most likely sites of origin for such objects are Athribis or Saqqara (Weiß, *Tier- und Götterbronzen*, 2012, pp. 310–13). See also Kessler, *Heilige Tiere*, 1989, pp. 17–43 for a list of animal necropoleis where shrews (letter code "N" in the tables) were buried.

[117] Weiß, *Tier- und Götterbronzen*, 2012, pp. 310–13. See also Kessler, *Die heiligen Tiere*, 1989, pp. 17–43 for a list of animal necropoleis where shrews (letter code "N" in the tables) were buried.

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Inventory number: Suppl. 18099
Object: Coffin for a shrew
Dimensions: L: 4.85, W: 1.75, H: 2.7; Box H: 1.6; Shrew figure L: 4.2
Acquisition: Donation around 1970
Provenance: Unknown
Date: Probably Late Period (722–332 BC), based on parallels and general typology
Scientific analyses: None
Description: Empty rectangular hollow-cast copper alloy box with open back surmounted by a statuette of a standing shrew.

The head extends forward and is slightly raised. The nose is pointy, the muzzle conical, curving at the top. The eyes are indicated by indentations and the small ears run flat along the triangular skullcap, which is separated from the body by a short recess. The shrew stands on legs bending forward at the knees; the feet are not indicated. The thick tapering tail slopes down towards the end of the box where it merges with its top. The front edges and the lower edge of the right side of the box are sharp, all other edges are round. The edges of the back opening are straight; the lower one is partly damaged. There is no recess for a panel for sealing the opening. The thickness of the bronze walls of the box is 0.03–0.06 cm.

Technical notes

The figure of the shrew was cast together with the box. The particular form of the box's edges seems to indicate that it was made from a sheet of thin wax that was folded in place with the two opposite rims joining and thus creating the straight angle at the lower right edge. The front part was then inserted, and its edges straightened. Due to corrosion, the presence of chaplets is difficult to determine. One chaplet is distinguishable externally due to a protrusion; the others are not visible. There are no conclusive indications as to where the gating system was positioned. It might have been attached to the box's bottom or rear so that the whole piece could be cast upside down.

Bibliography: Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 47–48, fig. 7C.
Parallels: Type T 44 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 310–13; 806–15, nos. 1099–141, pls. 52f–j); Vatican City, MGE 37232 (Grenier, *Bronzes*, 2002, p. 164, pl. XLV); examples of shrews on plain boxes with their tails sloping down to join the box's lid are well known from the North Saqqara Falcon Complex (FCO-19 H5-1781 [3731], FCO-44 H5-1942 [3905] [Oxford, Ash 1971.130], FCO-45 H5-1943 [3906] [Toronto, ROM 972.51.5], FCO-46 H5-1944 [3907], FCO-101 H5-2163 [4233] [Birmingham, BM&AG B.52'71], FCO-103 H5-2165 [4235], FCO-157 H5-2219 [4321], FCO-159 H5-2221 [4323], FCO-160 H5-2222 [4324], FCO-162 H5-2224 [4326], FCO-166 H5-2228 [4330], FCO-168 H5-2230 [4332], FCO-222 H5-2315 [4506], FCO-224 H5-2317 [4508], FCO-225 H5-2318 [4509], FCO-226 H5-2319 [4510], FCO-227 H5-2320 [4511], FCO-229 H5-2322 [4513], FCO-233 H5-2326 [4517], FCO-324 H5-2450 [4656], FCO-325 H5-2451 [4657], FCO-326 H2452 [4658], FCO-329 H5-2455 [4661], FCO-330 H5-2456 [4662] and FCO-460 H5-2728 [5008] [London, BM EA68292]: all in Davies and Smith, *Falcon Catacombs*, 2005, pp. 73–132, pls. XXVd, XXVIIIa–c, XXXIIIb–c, XXXIXd, XLa–c & LXId); London, Petrie UC8205, UC79111; Stockholm, Medelhavsmuseet MM 19258 and 30143; Kessler, *Heilige Tiere*, 1989, pp. 17–43 (letter code "N" in the tables).

77



Inventory number: Cat. 927[118]
Object: Coffin for a shrew
Dimensions: L: 10.9, W: 2.5, H: 4.1
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Probably Late Period (722–332 BC), based on parallels and general typology
Scientific analyses: None
Description: A solid-cast copper alloy image of a male shrew standing on a rectangular base from which a central tenon projects downwards. Possibly this tenon indicates that the shrew is not from an animal mummy coffin, but a votive figurine.

The head is round. A subtle groove running along the bulging forehead creates the impression of a head cap. The pinnae of the round ears project forwards. The inner ears are divided into two by subtle depressions. The bases of the ears bear parallel lines indicating fine hair. Small rounded pupils sit in almond-shaped eyes. The long tapering muzzle points slightly downwards. The philtrum is separated by two bulging ridges and the mouth is indicated by a line. The neck is narrow and the body solid.

A winged scarab with long legs is incised on the shrew's shoulders; on the left proper side, the lines are highlighted by a white fill. The tibial teeth of the scarab's front legs are made as staggered zig-zag lines. Additional lines are present on its thorax and elytra; the mouth is also indicated. A vulture looking towards the right and spreading its wings down to the shrew's thighs is incised on the pelvis. The bird has long legs, and each claw holds a *shen*-ring that is positioned right above the heel. The vulture is also filled with white substance, which is only preserved on the left. The shew's large forefeet are firmly joined to the plinth, set back slightly from the front. The toes are indicated by incised lines, four on the left, three on the right. There is a small agglomeration of bronze in between the ankles representing wax that was not completely removed in the original model. The hind feet are larger and placed closer to the left of the base; four lines mark the toes. The back of the legs is rough, indicating that they were not finally finished. The small, elongated protrusion between the hind legs indicates the penis of the shrew (no testicles are present). The tail sweeps downward, flaring slightly at the tip. The plinth is uneven and was once embedded in a wooden base, as attested by old photographs.

Technical notes

The plinth and the shrew were solid cast as one ensemble originally made in wax. The tenon represents one remaining element of the original gating system for casting. The small lump in the centre of the rear rim seems to be a remaining trace of a feeder channel that was later removed. Since the tail is an integral part of the object, a feeder channel should also have existed here to enable the metal to fill it. The lower surface of the plinth retains the viscous appearance of the original wax. Since it and the lower rim were not meant to be seen, they were not further worked. The lower edge of the rim is irregular and round, indicating that it does not represent a broken-off lid of a box, but was cast as a plinth to be mounted on a wooden base. The round smooth lines of the decoration were incised with a pointy tool in the original wax model. They were then filled with white material (plaster?) accentuating the lines and highlighting the iconography of both animals during the finishing of the piece.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 72, no. 927 [310]; Poole (ed.), *Il Nilo a Pompei*, 2016, p. 130, no. 98 (as Cat. 928).
Parallels: **No. 78**.

[118] It was originally assigned the number Cat. 928 incorrectly.

78



Inventory number: Cat. 931[119]
Object: Coffin for a shrew
Dimensions: L: 16, W: 3.4, H: 5.3
Acquisition: Acquired before 1882
Provenance: Probably Letopolis (Ausim) based on the inscription
Date: Probably Late Period (722–332 BC), based on parallels and general typology
Scientific analyses: None
Description: Solid-cast copper alloy image of a male shrew, bending slightly forward, on an inscribed pedestal open at the bottom and equipped with a tenon.

The tip of the small nose is round. Two bulges on either side divided by a thin groove mark the upper side of the muzzle. The mouth starts under the level of the eyes and extends until the narrow point between the muzzle and the nose. Almond-shaped eyes with circular pupils, surrounded by a groove with inlaid gold eyelids sit under the flat brow bulge of the receding forehead. The inner details of the small round ears are marked with small cavities. The pinna of the left ear is fragmented. A short groove runs down from behind the right ear. The shoulders, lower legs, and pelvis are modelled. Faint traces of incised decoration in the form of a winged sun-disk (or scarab?) appear on the left shoulder and a vulture on the back. The belly is round. The small circular bulge behind the hind legs represents the testicles. The tapering rear end of the rump ends in a small flat circle, in which the slightly warped tail is set. The tail was broken at least once and was repaired, perhaps in modern times. The legs are bent forwards at shoulder and knee height. The feet are flat. The front feet are smaller than hind ones. The toes are indicated by four long notches.

Contrary to the information by Fabretti et al.,[120] the pedestal is inscribed on its front and right side. The plinth is rectangular. Its left upper front edge and top are slightly rounded. The sides are straight, the lower edges of the open bottom irregular. A small blob of metal is present at the right back of the lower edge. The thickness of the long sides minutely narrows towards the back. The tapering rectangular tenon, which is cut-off at its tip, sits a little bit off-centre towards the back.

The surface is corroded, most dramatically on the left side and the back of the plinth, as well as inside it. A small surface defect is present on the left shoulder, and a larger one on the right of the rump.

Technical notes

The shrew and the pedestal were cast together as an ensemble. The lines marking the transition of the legs into the body could either be simple iconographical details or indicate the place where the individually formed wax legs were joined with the torso. The rim thickness of the pedestal is not fully consistent. Its lower edges were not cut; they rather appear to have been left rough in the original wax model. The cut-off tenon is the main remaining element of the gating system, indicating that the object was cast upside down. The small round protruding spot on the upper right side of the tenon and other blobs seem to be further traces of the gating system. Since the pedestal was not hollow, core supports were unnecessary. The few smaller dents on the outer narrow sides of the pedestal seem to be corrosion or casting defects. The text was most likely already incised in the original wax model.

[119] It was originally assigned the number Cat. 927 incorrectly.
[120] Fabretti et al., *Regio Museo*, 1882, p. 72 (“senza iscrizione”).

Inscription



(1) *Ḥr nb-Ḥm dj ꜥnḫ Dj*-[...] (2) [blemish or erasure] *msi*(*.n*) *nb*(*.t*)*-pr Ḥr-n-nfr-Sbk*

"Horus, the Lord of Letopolis, gives life (to) Di[...], born by the Lady of the House Horennefersobek."

Comment

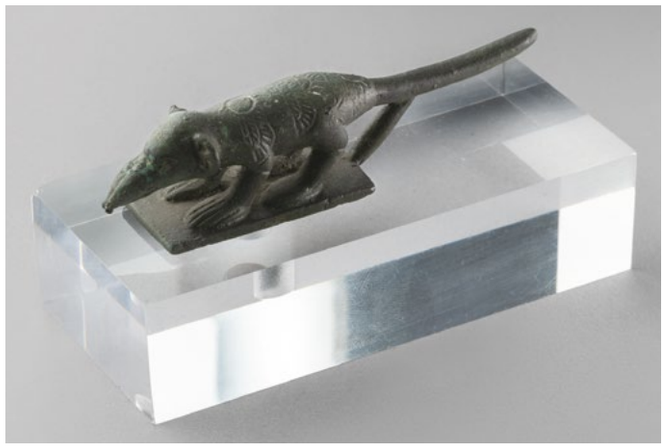
The front part of the inscription was only revealed during the recent conservation treatment of the object. The inscription is framed by two horizontal lines. Since the text follows a typical format,[121] it can be read with reasonable certainty. The sign of the falcon is barely visible, the following clearer signs, however, help to determine its presence. The placename *Ḥm* "Letopolis" is written in the abbreviated form with Gardiner sign-list R22 (Min emblem) and O49 (the settlement classifier). The name of the donor/beneficiary after *dj ꜥnḫ* is difficult to read. The group resembles a *dj* (D37) above an *r* (D21), however, the lower element appears to consist of two parallel lines, which makes one think of either *mɜꜥ* (Aa11) or *m* (Aa15). Names of this type beginning with *dj* are well known in the Late Period onomasticon,[122] however none can be identified as the present one.[123] Potentially, this name was followed by the name of the father in the initial space on the left side. The final cast object did not show this name properly, or it was erased, as suggested by the vertical grooves there. The name of the donor's mother, *Ḥr-n-nfr-Sbk*, is introduced after *msi*(*.n*) and her title *nb*(*.t*)*-pr*. While this name is also not attested in the corpus, it seems to follow known patterns.[124] The final name-classifier looks like the seated elite male sign.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 72, no. 931 [314]; Ministero della pubblica istruzione (ed.), *Documenti inediti*, III, 1888, p. 211, no. 34; Meri (ed.), *Egypten. Fisken i sarkofagen*, 2000, pp. 192, 206, no. 102.

Parallels: Shrew figures of this type are – apart from **Nos. 78–79** – inter alia known from the Saqqara North Falcon complex: FCO-47 H5-1945 [3908] (Davies and Smith, *Falcon Complex*, 2005, p. 77 [no figure]); FCO-104 H5-2166 [4236] (Davies and Smith, *Falcon Complex*, 2005, p. 83, pl. XXXIVa); FCO-230, H5-2323 [4514] (Davies and Smith, *Falcon Complex*, 2005, p. 98, pl. XLVIa–b [Birmingham, BM&AG B.46'71, undecorated shrew on pedestal with vertical tenon]; FCO-448, H5-2716 [4996] (Davies and Smith, *Falcon Complex*, 2005, p. 120, pl. LXIb [Cambridge, FM E.65.1975, undecorated large shrew on base with flat tang on its front and rear]). Further similar examples[125] can be found with Hildesheim, RPMH 0048, 0329, 0330, 0331 (Roeder, *Bronzewerke*, 1937, pp. 56–58, §§239–42, figs. 139–44, pl. 34g, i, l and k); Vienna, KHM ÄS 643 (Roeder, *Bronzefiguren*, 1956, p. 380, §509b, fig. 537);[126] Berlin, ÄM 2620 and ÄM 2619 (Roeder, *Bronzefiguren*, 1956, pp. 380–81, §509c and §519b, fig. 543, pls. 54g, 55e); Hannover, KM B 20 (Roeder, *Bronzefiguren*, 1956, pp. 380–81, §511a, fig. 545); Antwerp, AV 79.1.80 from Memphis (Roeder, *Bronzefiguren*, 1956, p. 380, §510, fig. 539; Weiß, *Tier- und Götterbronzen*, 2012, p. 802, no. 1084, pl. 52d); Tübingen, MUT 1101 (Brunner-Traut and Brunner, *Ägyptische Sammlung*, 1981, p. 65, pl. 135); Munich, ÄS 7101–03 (Schoske [ed.], *Staatliche Sammlung*, 1995, pp. 63, 128, backcover); Paris, Louvre E 5146 from the Saqqara Serapeum (Weiß, *Tier- und Götterbronzen*, 2012, p. 805, no. 1096, pl. 52e); Paris, Louvre E 3809 (Guichard [ed.], *Des animaux*, 2014, p. 39, no. 21). In addition, see Milan, CMA E.0.9.41109; London, BM EA26434, EA61604; Boston, MFA 01.105; New York, BM 05.368; New York, MMA 04.2.465 (dated to the Ptolemaic Period); Philadelphia Penn E 12552; Budapest, MFA 2019.1E; Brussels, MRAH E.7496. A large bronze shrew on a plinth with a tenon was excavated in the falcon necropolis at Quesna (Rowland et al., in *JEA* 99 [2013], pp. 79–80, fig. 29, SF 53).

[121] Weiß, *Tier- und Götterbronzen*, 2012, pp. 483–84.
[122] *PN*, I, pp. 396–98.
[123] In Backes and Dresbach, *BMSAES* 8 (2007), pp. 44–45, no similar name is referenced.
[124] *PN*, I, p. 249, §§3–9; Backes and Dresbach, *BMSAES* 8 (2007), p. 30.
[125] With similar body modelling and winged sun-discs, scarabs and/or vultures incised on their back, standing on plinths or flat open boxes, and sometimes also mentioning Horus of Letopolis.
[126] Roeder identifies all the Hildesheim and Berlin pieces as ichneumons; see, however, the iconographic criteria for their identification as defined by Brunner-Traut, *NAWG I.7*, 1965, followed by Weiß, *Tier- und Götterbronzen*, 2012, pp. 304–13; see also Aubert and Aubert, *Bronzes*, 2001, p. 248.

79



Inventory number: Cat. 930
Object: Coffin for a shrew
Dimensions: L: 9.1, W: 2.1, H: 3.62
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Probably Late Period (722–332 BC), based on parallels and general typology
Scientific analyses: None
Description: Small solid-cast copper alloy image of a male shrew standing on a flat rectangular base from which a tenon projects downwards, suggesting that it was mounted on a base and used as a votive offering in its own right, rather than as a coffin.

The head rests on a short neck. The tips of the round heads are lower than the top of the head. The pinna is marked by two dents in the front. A subtle recess starts in front of the ears and runs along the lower neck as a ridge. The skull is round, the forehead bulged, and the eyes are incised. The downward pointing snout is marked by a central groove separating two bulging ridges. The mouth is indicated by a slanting line. The snout ends in a small, recessed nose with two separate protrusions. The body of the shrew is tubular and thickened at the shoulders and the pelvis.

The shrew bears an incised image of a winged sun-disc on its shoulders, the wings of which reach down towards the upper legs. The image of a vulture behind it holding *shen*-rings in its claws is not fully centred on the pelvis. Another vulture is incised on the upper rear of the shrew. Due to the limited space there, it is smaller; its head, however, is indicated and looks towards the right. There are remains of a white substance (plaster?) in the lines accentuating the animal images.

The rear of the shrew tapers towards the base of the thick round tail, which projects rearwards, becoming thinner at the tip. The tail is joined with the base by a diagonal support bar. This round element narrows where it is connected to the base and tail. The protrusion on the underside behind the shrew's legs indicates its testicles. The shrew does not stand centrally on the base. Except for the right hind foot, all other feet have toes marked by grooves.

There are a few casting irregularities on the surface of the animal, one small bump on the top of the head and another one on the left pelvis. The belly of the shrew is less well smoothed than the remainder of the surface. The base on which the shrew stands is 4.28 x 2.1 cm large and 0.25 cm thick. The tenon sits off centre and is angled forwards.

Technical notes
The piece is a solid cast. Both the shrew and the base were formed in wax as a joint wax model. The tenon at the base is a remaining part of the original gating system that was left in place as a device to fasten the piece to a most likely wooden base. The support of the tail represents a feeder channel that was created in the original wax model to ensure the liquid bronze to successfully reach the tip of the tail during casting. Amongst the parallels for this object, a few also show this channel still in place.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 72, no. 930 [313]; Ministero della pubblica istruzione (ed.), *Documenti inediti*, III, 1888, p. 220, no. 336.
Parallels: **No. 78**.

80



Inventory number: Cat. 2422
Object: Coffin for a shrew
Dimensions: L: 9.3, W: 6.3, H: 8.9
Acquisition: Donation Bussa (1850)
Provenance: Unknown
Date: Probably Ptolemaic Period (332–30 BC), based on parallels and general typology
Scientific analyses: None
Description: Polychrome naomorphous limestone coffin with cavetto cornice and torus moulding that rests on a plinth, with an inner cavity opening from the left proper. The lid is surmounted by a small, crudely sculpted image of a standing shrew, missing its head. A schematic striding shrew that looks a bit like a mongoose is painted on the right proper side in black on a red ground line.[127] The original red outline sketch is visible in some places through the black paint. The leg positions of the two animals differ in a way that it is possible that the painted animal might be identified as an ichneumon with striding legs, whereas the sculpted one, also due to its body form, is clearly a standing shrew. However, it is most likely that both images were intended to represent a shrew.

The sculpted shrew is disproportionately small in comparison to the naos-like base and to its painted counterpart. The feet are not individually defined. The long tail merges with the naos top. The animal appears plain white, while the base on which it stands was painted red over the white primer. The red is missing in some areas.

The naos is painted with the cavetto cornice indicated by hastily painted vertical lines and the torus moulding picked out in black. At the front, which is faded, there seems to be a central line dividing the space into two. The outline of the black elements resembles either the depiction of seated deities with animal heads (like Gardiner sign-list C 6) or of erect ichneumons (or shrews) with their front limbs raised in adoration (cf. Turin Cat. 932) towards the centre. The parts in between the two animal representations are too worn to be identified. The back of the naos is painted red brown. The right side of the naos opens to accommodate the mummy.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 340, no. 2422 [99]; Grewenig (ed.), *Ägypten*, 2014, p. 210 (identified as naos model with ichneumon representations); Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, p. 46, fig. 6.
Parallels: Quite close parallels are Cairo, EMC CG 29888 from the Sacred Animal Necropolis at Saqqara (Ikram, in Janosi [ed.], *Structure and Significance*, 2005, pp. 335–40, figs. 1–4, and Davies and Smith, *Falcon Complex*, 2005, p. 118, pl. LVIIIc), and at least four limestone coffins excavated at Abydos, one surmounted by a single gilded shrew and the other by two (Abuel-Yazid, in O'Connell [ed.], *Abydos*, 2020, pp. 57–77, fig. 11).

[127] Bunner-Traut, *NAWG* 7 (1965), esp. pp. 138–40; see, e.g., the wooden shrew coffins Vienna KHM INV ÄS10068 (https://www.khm.at/de/object/323963/) and ex-Leo Mildenberg collection, Christie's London, 26–27 October 2004, lot 401 (https://www.christies.com/en/lot/lot-4364677).

8.8 Ibises

Birds are the most numerous mummified creatures in the Turin collection.[128] The majority of these are ibises dedicated to Thoth, god of wisdom and writing (generally the sacred ibis, *Threskiornis aethiopicus*, though at some sites, such as the complex in TT 11–12 in Dra Abu el-Naga[129] and Tuna el-Gebel[130] significant numbers of the glossy ibis, *Plegadis falcinellus*, are also found). It should be noted that sacred ibis disappeared from Egypt by about 1850, though they continue to thrive in other parts of Africa. As with cats, dogs, and crocodiles, in addition to adults, juveniles and eggs were also given as offerings.[131] Ibises were associated with Thoth due to their bills that resembled pens; an ancient Egyptian text, *The Instructions of Amenemope* (Ch.15, l. 13) notes that "the finger of the scribe is the beak of the ibis".[132] Also, their propensity to bend over and investigate the dirt for food, perhaps evoking the idea of questing for knowledge, also contributed to this identification with the god of wisdom.

One curious feature of some of the ibises found in Asyut is that they were buried with their gizzards full of food so that they would not go hungry in the afterlife. This has been observed in a few other examples of ibises as well as raptors,[133] but the Turin collection is notable for having so many examples from a single archaeological site. It is unclear if the birds were eviscerated and the gizzards then reintroduced in the body, though this is possible – this was done in victual mummies (see Chapter 8.14) as well as in human mummies intermittently, after the Twenty-first Dynasty. The fact that these birds consumed snails might also associate them with destroying snails that carried schistosomiasis (though the exact species of snails that host schistosomiasis have not yet been positively identified in the ibises), and hence link them to Thoth as a healer.

Ibis mummies were sometimes placed just as wrapped bundles into the tombs, but often they were placed in containers: large pots (longer ones at Saqqara,[134] wider-mouthed and shorter ones at Tuna el-Gebel),[135] and stone and wooden coffins. Some of the mummies in the Turin collection that are now without a container might once have had one, and thus been more elaborately buried.

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[128] See Kessler, *Die heiligen Tiere,* 1989, pp. 17–43, for a list of avian necropoleis.
[129] Ikram and Spitzer, in Daujat et al. (eds), *Archaeozoology of Southwest Asia*, 2022, pp. 245–54.
[130] Kessler and Nur el-Din, in Ikram (ed.), *Divine Creatures*, 2015, pp. 120–63.
[131] von den Driesch et al., *ÄgLev* 15 (2005), pp. 203–44.
[132] Lichtheim, *Ancient Egyptian Literature II*, 1976, p. 156.
[133] Wade et al., *JAS* 39 (2012), pp. 1642–47: https://doi.org/10.1016/j.jas.2012.01.003; Ikram et al., *JAS* 63 (2015), pp. 72–77.
[134] Emery, *JEA* 51 (1965), pp. 3–8.
[135] Lortet and Gaillard, *La faune momifiée,* 1903, pp. 118, 121; Kessler, *Die heiligen Tiere,* 1989; von den Driesch et al., *ÄgLev* 15 (2005), pp. 203–44.

81





Inventory number: Provv. 1440
Object: Ibis mummy
Dimensions: L: 29.3, W: 10, H: 5.6
Acquisition: Unknown
Provenance: Unknown
Date: 460–350 BC (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating, Optical Microscopy
Description: An ibis mummy in a teardrop-shaped bundle held together by a rectangular plain linen shroud that overlaps in the back (T1), possibly secured by a black resin-like substance or gum Arabic. If originally it had more decoration on the front, this no longer survives. Only three fragments of horizontal strips remain on the wider end: two undyed (T1) and one dark brown (T3). The whole is edged by a wide folded bandage (T2) held in place by spots of a black resin-like substance and a second, narrower one, with the fragmentary remains of a third one surviving only in places. Breaks in the outer wrappings show a textile of a different quality (T4) beneath.

Scientific examination

CT Investigation

The CT scan shows a bundle of feathers about 25 cm long and the entire lower portion of the beak of a sacred ibis, broken off from the skull, wrapped in several layers of bandages and coarse pieces of linen. Perhaps the parts symbolised the whole (see discussion in Chapter 2).

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 460–350 BC.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, p. 20.
Parallels: Cairo, EMC CG 29702, CG 29865 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 16, 37, 79).

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	44 x 10	Undyed	
T2	Linen	S	Warp-faced	30 x 11	Undyed	Rolled hem Sewing threads
T3	Linen	S	Basket	24 x 16	Undyed	
T4	Linen			Too badly preserved for thread count	Dark brown	

Textile notes: Four different qualities of linen were used to wrap the mummy.

82





Inventory number: Cat. 2354/1 (≡ Provv. 1484)
Object: Ibis mummy
Dimensions: L: 39, W: 12
Acquisition: Acquired before 1882
Provenance: Unknown
Date: 370–200 BC (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating, UVF, Optical Microscopy
Description: A teardrop-shaped ibis mummy. One side of the package is flat and the other is domed. The bird is tightly wrapped in bandages (T2) (width: cm 6), then covered by a kind of pinkish shroud (T1) that is kept in place by a bandage along the side. A rolled hem that was incorporated as a decorative element on the front side of the mummy suggests that the fabric is reused. The flat side is smeared with a black resin-like substance and a fragment of a plant is attached to it.

Scientific examination

CT investigation

The CT scans show an adult bird, resting on its back, with wings folded, neck folded back, and head between the wings, pressed down so that it rests on the chest and belly. The beak is not totally aligned to the centre of the body, but veers to the left. The gizzard was either never removed or was reintroduced into the body cavity. It contains some mineralized and radio opaque elements, possibly a few stones, and some shell fragments (gastropods, possibly *Bithynia neumanni* or, less likely, *Cleopatra bulimoides*). Similar deposits have been noted in other ibis mummies.[136]

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 370–200 BC (similar to **Nos. 83, 91, 114, 122**).

Bibliography: Fabretti et al., *Regio Museo,* 1882, p. 333, no. 2354 [30–31]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19, 21.
Parallels: Cairo, EMC CG 29702, CG 29865 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 16, 37, 79); Darmstadt, HLMD A-2463 (Keefer, in Von Recklinghausen [ed.], *Ägyptische Mumien*, 2007, p. 312); for parallels for gizzards being full and from Abydos, see Wade et al., *JAS* 39 (2012), pp. 1644–45.

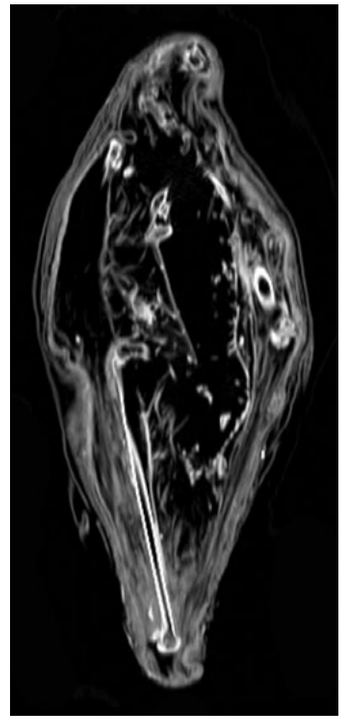
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	24–26 x 15–16	Pinkish	Rolled hem
T2	Linen	S	Warp-faced	40 x 16	Undyed	

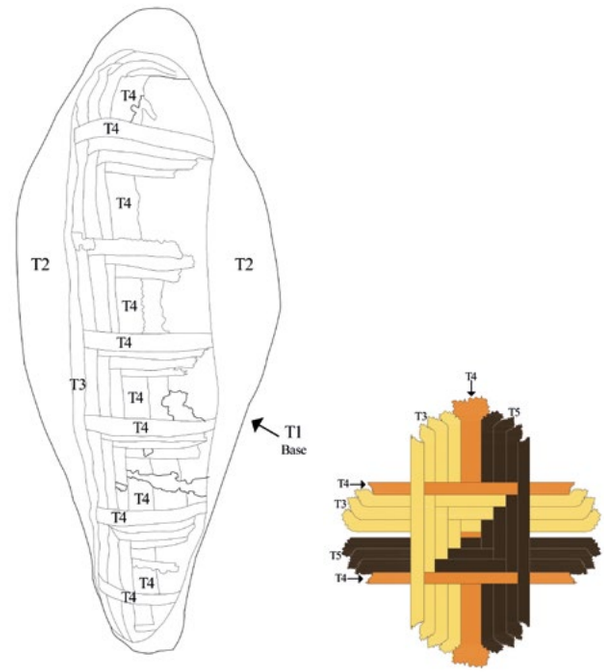
Textile notes: Two qualities of textile were used to wrap the mummy.

[136] Wade et al., *JAS* 39 (2012), pp. 1642–47: https://doi.org/10.1016/j.jas.2012.01.003.

83







Inventory number: Suppl. 11025
Object: Ibis mummy
Dimensions: L: 32.5, W: 12
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: 360–200 BC (^{14}C date)
Scientific analyses: CT, ^{14}C dating, UVF, Optical Microscopy
Description: A sacred ibis mummy in an elongated teardrop shape. The body would have been wrapped with undyed bandages (T1), visible only from one side, kept in place with thread, and soaked with black resin-like substance. The top (front) is enhanced with a line of seven square coffers (five central complete, plus two partial at the ends) made of alternating undyed (T3), dark brown (T5), and orange-pinkish (T4) linen bandages. Folded broad undyed bandages (T2) run around the perimeter of the body, holding the coffer bandages in place, and supporting the mummy. They do not cover the back, just overlap it slightly.

Scientific examination

CT investigation

The CT scans show a complete skeleton of an adult sacred ibis. The bird is positioned so that its neck is pushed down hard at its junction with the rest of the body, and the head and neck are tucked under the left wing. The body was eviscerated but, unlike other mummies, the gizzard was not reinserted into the peritoneal cavity.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 360–200 BC, as is the case with **Nos. 86, 91, 114, 122** mummies from other cemeteries.[137]

Bibliography: Grilletto, *Materiali antropologici e zoologici,* 1991, pp. 13, 20, 33.
Parallels: New York, BM x1179.4 (Bleiberg et al. [eds.], *Soulful Creatures.* 2013, p. 125, fig. 104); Cairo, EMC CG 29867 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 37–38, 92); **No. 86** (pattern).

[137] Similar to several of the ibis mummies in Lyon: Richardin et al., *Radiocarbon* 59.2 (2017), pp. 595–607: https://doi.org/10.1017/RDC.2016.102.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1 (base)	Linen	S	Balanced	14 x 10	Undyed	
T2 (side)	Linen	S	Warp-faced	32 x 10	Undyed	
T3	Linen	S	Warp-faced	36 x 11–12	Undyed	
T4	Linen	S	Warp-faced	40 x 13	Orange-pinkish	
T5	Linen			Too badly preserved for thread count	Dark brown	

Textile notes: Five different qualities of linen were used to wrap the mummy and create the pattern.

84





Inventory number: Suppl. 11026
Object: Ibis mummy
Dimensions: L: 30.5, W: 10.5
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: Undetermined
Scientific analyses: X-ray, CT, Optical Microscopy
Description: An ibis mummy in an elongated teardrop shape. Two pieces of the same textile (T1), overlapping, cover the ventral side. One part extends from the broad part of the teardrop to halfway up, about leg level, with three lines of self-bands. Another piece of the same linen overlaps this piece; it also has three lines of self-bands. It is secured to the first piece of cloth by dots of a black resin-like substance or what is possibly glue. The last piece of cloth covers the tip or pointed part of the teardrop shape and consists of a folded bandage (T2) that is wrapped around it a few times, serving to reinforce this fragile section. This portion of the mummy is stained by a combination of black resin-like substances. A folded piece of cloth creates an edge along the teardrop and extends over part of the base. The base is flat and not very tidy, revealing the spiral bandages (± 3.7 cm wide) that were wound around the contents of this mummy bundle.

Scientific examination

CT investigation

The CT scans show that the contents of the package are not a complete ibis. Within there are the lower part of a beak and a bundle of feathers of different sizes, all of this immersed in a compact radiodense matrix, containing elements of inorganic and mineral nature, possibly gravel.

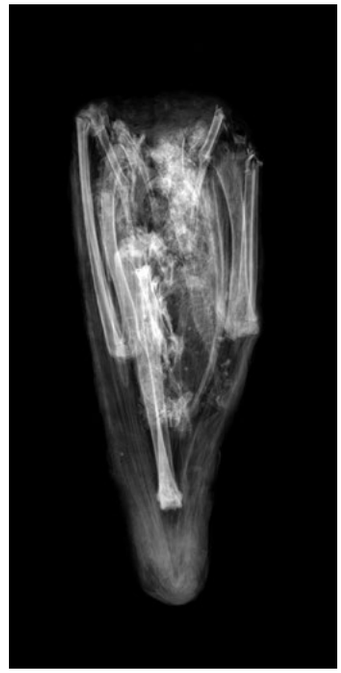
Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 20, 33.
Parallels: Leiden, RMO CB 10 (Raven and Taconis, *Egyptian Mummies*, 2005, p. 292).

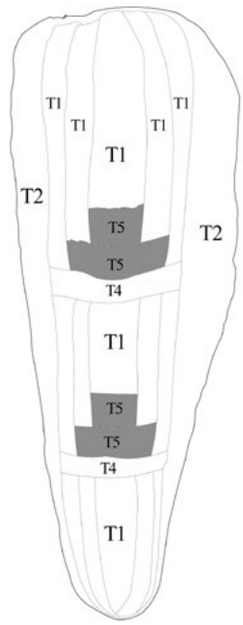
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	40–44 x 15–16	Undyed	Self-bands
T2	Linen	S	Warp-faced	40 x 13	Undyed	

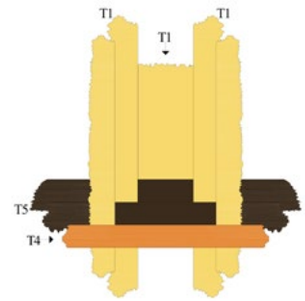
Textile notes: Two qualities of linen were used to wrap the mummy and create the pattern.

85









Inventory number: Suppl. 11027
Object: Ibis mummy
Dimensions: L: 31, W: 11
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: 410–200 BC (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating, Optical Microscopy
Description: An ibis mummy in an elongated teardrop shape with wide coffers that are probably missing pieces of textile. The front is covered by a large piece of textile (T1). The pattern over it is made with longitudinal bandages of the same undyed textile (T1), with transverse orange-brown (T4) and dark brown (T5) bandages. The resulting pattern consists of three rectangular coffers in the middle, longitudinally edged by three overlapping bandages. The third and largest of these bandages (T2) secures the edges. These bandages just extend beneath the body, but do not cover the back, where one can see the broad spiral bandages (T3) (c. 5 cm wide) in which the body was wrapped, all of which are secured with thread. At the pointed end the bandages are untidy, and thread is also used to keep them in place. The mummy bundle is quite dark, possibly stained with black resin-like substances.

Scientific examination

CT investigation

The CT scans show that the package contains an incomplete skeleton of a sacred ibis, a juvenile, since its proximal tibiotarsal epiphysis is still open. It is somewhat disarticulated, but it was originally positioned with its neck pushed around to lie along its back. The skull is missing. Only the beak, whose lower portion (mandibular) is under the right wing, survives, while the upper portion of the beak lies on the bird's left. The body was eviscerated, but the peritoneal cavity is empty, unlike that of other mummies.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 410–200 BC.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 20, 33.
Parallels: No parallels.

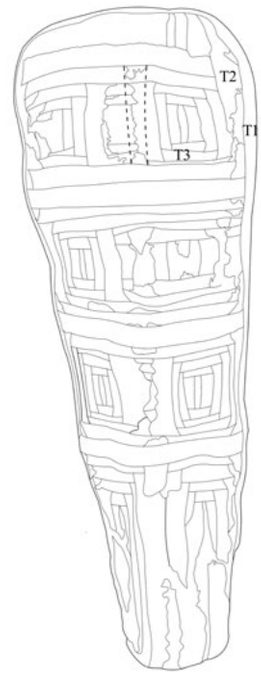
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	36 x 10	Undyed	
T2	Linen	S	Warp-faced	20 x 7–9	Undyed	Self-bands
T3	Linen	S	Warp-faced	28–36–11–15	Undyed	Self-bands
T4	Linen	S	Warp-faced	36 x 10	Orange-brown	
T5	Linen	S	Warp-faced	36 x 10	Dark brown	

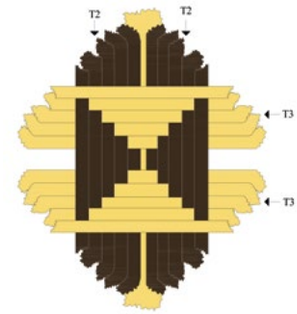
Textile notes: Five different qualities of linen were used to wrap the mummy and create the pattern. Textile T1, T4 and T5 seem to come from the same fabric (same count/density) and to have been later dyed in four different colours.

86









Inventory number: Suppl. 11037 (other number on the back: 8191)[138]
Object: Ibis mummy
Dimensions: L: 33, W: 10.6
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: 370–90 BC (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating, UVF, Optical Microscopy
Description: A teardrop-shaped ibis mummy with a row of elaborate mirrored triangle coffers that are a combination of dark brown (T2), and undyed or pinkish (T3) fabric. The pointed end of the teardrop is missing some of the bandages. The coffered cover is kept in place by a large folded undyed bandage (T1) that runs along the perimeter of the mummy. The back is plain, save for spots of a black resin-like substance, as the bandages and string that are beneath are covered by large swatches of linen that are kept in place by a black resin-like substance or glue.

Scientific examination

CT investigation

The CT scans show that the package contains a bundle of plant materials and possibly feathers, augmented by mud, stone, or bits of black resin-like substance scattered amongst the textile and feathers.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 370–90 BC.

Bibliography: Grilletto, *Materiali antropologici e zoologici,* 1991, pp. 13, 20, 28, 33; Tamburini et al., *HeritSci* 9 (2021), pp. 6, 11, table 2.
Parallels: New York, BB x1179.4 (Bleiberg et al. [eds.], *Soulful Creatures*, 2013, p. 125, fig. 104); Cairo, EMC CG 29867 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 37–38, 92).

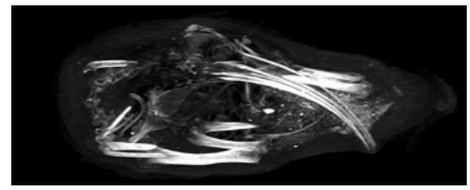
[138] The number 8191 is wrong. In the Schiaparelli inventory it is a shrew mummy.

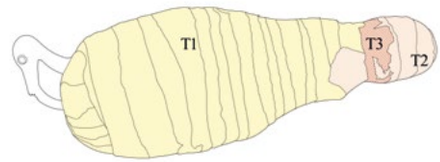
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	34 x 10	Undyed	Self-bands
T2	Linen	S	Warp-faced	20 x 9	Dark brown	
T3	Linen	S	Warp-faced	48 x 14	Undyed or pinkish (?)	

Textile notes: Three different qualities of linen were used to wrap the mummy and create the pattern.

87







Inventory number: Suppl. 11038
Object: Ibis mummy
Dimensions: L: 40, W: 14.6, H: 10.4
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: 750–370 BC (^{14}C date)
Scientific analyses: CT, ^{14}C dating, UVF, Optical Microscopy
Description: An ibis mummy shaped as a slightly malformed domed teardrop. It had a false head and neck made of rolled and resined textile that is inserted into the teardrop. The eyes are cunningly appliqued in white and dark brown. One side of the head is black and elegant, but the other side has some sort of chaff attached to it. The body is spirally wrapped with tightly woven bandages (T1) varying between 1.7 and 3.2 cm in width. There is a concentration of bandages at the pointed end to reinforce the contents. Traces of oils and embalming agents are visible throughout. Under the final spiral wrappings there are at least fifteen layers of vertical bandages and two different type of cloth with varying densities (T2–T3). There is a hole in the more rounded end where the false head was inserted. In this hole, one can see that it was constructed with a rolled bandage that was doubled over and then covered with more linen that was painted with the black resin-like substance.

Scientific examination

CT investigation

The CT scans show a complete but disjointed skeleton of an adult ibis within the wrappings. The head is folded to the left, resting along the sternum and forced under one wing. The ribcage has collapsed and rotated about 60° from its correct orientation. Inside the gizzard there are fine, non-homogeneous materials, and a few more radiopaque fragments (possibly snail shell fragments?) that also are scattered in the wrapping.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 750–370 BC, potentially pushing back the use of the necropolis as a burial place for ibises. Of course, it is also possible that older linens were used to create this mummy.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19; *Aegyptica Animalia*, 2000, pp. 46, 84, no. 28.
Parallels: No absolute parallels; the closest example is from Abydos Cairo: EMC CG 29868.

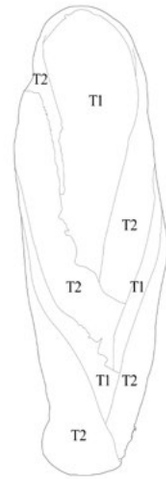
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	34 x 13–15	Undyed	
T2	Linen	S	Warp-faced	40–42 x 17–18	Undyed	
T3	Linen	S	Warp-faced	26 x 10	Undyed	

Textile notes: Three different qualities of linen were used to wrap the mummy and create the pattern.

88







Inventory number: Provv. 1515/1
Object: Ibis mummy
Dimensions: L: 14.5, W: 4
Acquisition: Unknown
Provenance: Unknown
Date: 360–200 BC (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating, Optical Microscopy
Description: Small bird mummy in a roughly wrapped bundle. The animal is encased in spiral bandages of coarse linen (T1), secured with string, and then covered by a crude herringbone pattern created using four folding bandages to obtain clean edges, which are then overlapped to form the herringbone. The linen for the final bandages is kept in place by dabs of a black resin-like substance. At least two qualities of linen (T1, T2) are used overall.

Scientific examination

CT investigation

The CT scans show a juvenile ibis, based on skeleton size and beak length (2.5 cm). The animal is resting on its back, with wings folded, neck folded back, and head between the wings. The skull has collapsed. Inhomogeneous material is visible within the peritoneal cavity, possibly foodstuffs, indicating that either it was not eviscerated or certain internal organs had been returned to the body after having been desiccated separately.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 360–200 BC (similar to **Nos. 83, 91, 114, 122**).

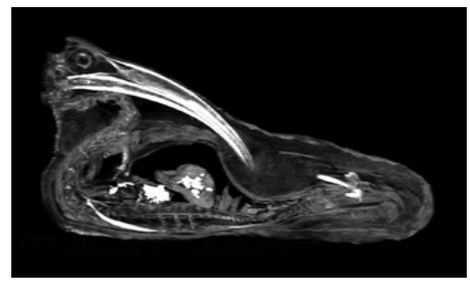
Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, p. 21.
Parallels: For gizzards, see Wade et al., *JAS* 39 (2012), pp. 1644–45. Several of the larger ibis mummies from Asyut in the Turin collection are similarly wrapped, albeit with more elegance (**Nos. 93–94, 100–103**), and this style of wrapping is also attested for ibises coming from Abydos (New Haven, YPM ANT 006924.001, ANT 006924.004).

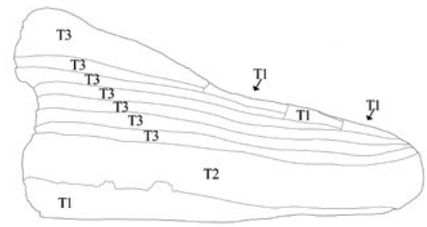
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	18 x 7	Undyed	Selvedge Starting border
T2	Linen	S	Warp-faced	34–36 x 15–16	Undyed	Self-bands

Textile notes: Two qualities of linen were used to wrap this mummy.

89







Inventory number: Suppl. 8188
Object: Ibis mummy
Dimensions: L: 34, W: 12.4, H: 14.2
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: Probably 5th to 1st century BC, based on parallels
Scientific analyses: CT, Pyrolysis-GC/MS, UVF, Optical Microscopy
Description: An ibis mummy wrapped to show the animal lying on its back with the beak resting on its ventral side and the legs drawn up to the body as if it were seated. The bandages have worn through at the head and there is an opening showing the skull. This in turn has a hole in it, revealing the cranial cavity, which is empty save for some debris, which might include small fragments of the brain. Different qualities of linen are used on the head and the body. The head was probably covered by a darker brown textile (T3), emulating the black-brown colour of the bird's head in nature. The body is decorated in a herringbone pattern with insets,[139] evoking the crossing of the wings and the feathers, going from the beak down, with six overlapping bandages from the same fabric (T3). Each row is covered at the edge with a transverse strip that serves to fix it; each row has an inset that looks triangular due to the way in which it is wrapped. The bandages are covered by a resin that does not allow to identify the original dyes. A large bandage runs along the edge (T2). The dorsal side once might have been covered by another piece of cloth, but now one can see the tidy bandages that made up the mummy wrappings beneath the elaborate herringbone bandage (T1). The ibis is not level; it tilts to the left proper. The beak is a bit broader than one might expect, no doubt the result of padded wrapping. A generous amount of a black resin-like substance has run from the back of the head down the neck and onto the body.

Scientific examination

CT investigation

The CT scans show a complete skeleton of an adult ibis positioned on its back, with the head folded over the sternum, wings folded against the sides of the body, the neck curved in a pronounced S, and the legs flexed in a seated position. The body contains (maybe reintroduced into the body after evisceration and preparation) the crop and gizzard, complete with small pieces of bone, maybe snail shells (possibly *Bellamya unicolor*), its preferred food, in place so that the ibis would be well fed in the afterlife, as is seen in other ibis mummies.[140]

[139] Ikram et al., *RiME*, (forthcoming).
[140] Wade et al., *JAS* 39 (2012), pp. 1642–47: https://doi.org/10.1016/j.jas.2012.01.003.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	18 x 8	Too impregnated to determine	
T2	Linen	S	Warp-faced	36 x 11	Too impregnated to determine	Self-bands
T3	Linen	S	Warp-faced	52 x 16–18	Dark brown	

Textile notes: Three qualities of linen were used to wrap the mummy.

Analysis of organic residue

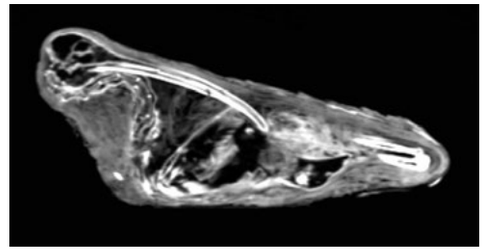
Pyrolysis-GC/MS analysis of the darkened textile in the neck area had markers of coniferous resin and saccharides of undetermined origin.

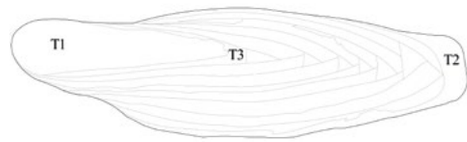
Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, p. 28 as "irreperibile" (untraceable); Xiaolin (ed.), *Egypt*, 2018, p. 110, fig. 120; Marini and Tjabbes (eds.), *Egito Antigo*, 2020, p. 125.

Parallels: Cairo, EMC CG 29696 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 15, 78); Leiden, RMO H.III. EEE 1, AH 3a (Raven and Taconis, *Egyptian Mummies,* 2005, pp. 283–86); Darmstadt, HLMD A-2463 (Keefer, in Von Recklinghausen [ed.], *Ägyptische Mumien*, 2007, p. 312); for parallels to gizzards being full and from Abydos, see Wade et al., *JAS* 39 (2012), pp. 1644–45; **Nos. 90–109**; New Haven, YPM ANT.006924.002, ANT.006924.004; Medelhavsmuseet NME 953.

90









Inventory number: Suppl. 8189
Object: Ibis mummy
Dimensions: L: 31, W: 7.8, H: 12.9
Acquisition: Italian Archaeological Mission (1909)
Provenance: Asyut
Date: Probably 5th to 1st century BC, based on parallels
Scientific analyses: CT, Optical Microscopy
Description: An ibis mummy wrapped to show the animal lying on its back with the beak resting on its ventral side and the legs drawn up to the body as if it were seated. The body is decorated in a herringbone pattern with insets, starting from the beak down, with seven overlapping strips alternating undyed (T2), light brown (T3) and dark brown (T4) bandages. Each row is kept in place by a transversal strip. Once the pattern is completed, each row has an inset that appears triangular due to the wrapping pattern. Beneath the herringbones is the usual system of several bandages (T1 on the head) kept in place by thread, and maybe a covering over the base, now missing, which was kept in place by a black resin-like substance. Vestiges of dark bandages (T4) covering the head and beak survive. Some of the bandages in the head area have worn away, exposing the feathers that are somewhat discoloured by natron salts and oils.

Scientific examination

CT investigation

The CT scans show a complete skeleton of an adult sacred ibis, positioned on its back, with the head folded over the sternum, wings folded against the sides of the body, neck curved in an S and limbs flexed and pushed against the body. Unlike Supp. 8188, this ibis does not contain a gizzard stuffed with food. Rather, it is packed with rolled up textiles.

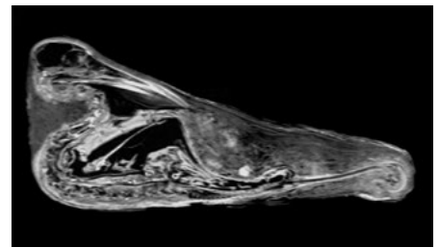
Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19, 28.
Parallels: Cairo, EMC CG 29696 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 15, 78); Leiden, RMO H.III.EEE 1, AH 3a (Raven and Taconis, *Egyptian Mummies,* 2005, pp. 283–86); Stockholm, Medelhavsmuseet NME 953; **Nos. 89, 91–109**; New Haven, YPM ANT.006924.002, ANT.006924.004.

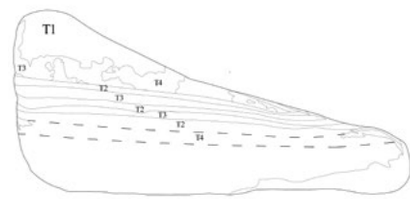
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	16 x 10	Undyed	
T2	Linen	S	Warp-faced	40 x 12	Undyed	
T3	Linen	S	Warp-faced	30 x 22	Light brown	
T4	Linen	S	Warp-faced	24 x 9	Dark brown	

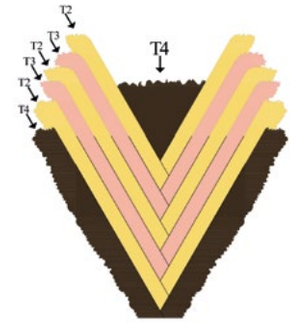
Textile notes: Four qualities of linen have been used to wrap the mummy.

91









Inventory number: Suppl. 11013
Object: Ibis mummy
Dimensions: L: 35, W: 12.2, H: 14.7
Acquisition: Italian Archaeological Mission (1909)
Provenance: Asyut
Date: 390–190 BC (^{14}C date)
Scientific analyses: CT, ^{14}C dating, Pyrolysis-GC/MS, UVF, Optical Microscopy
Description: An ibis mummy wrapped to show the animal lying on its back with the beak resting on its ventral side and the legs drawn up to the body as if it were seated. At least four qualities of linen were used to wrap this ibis. The head is currently covered by undyed bandages with a denser weaving (T1) and a sparser one (T3), held in place with linen threads (S-spun), sometimes doubled. Originally, another dark brown (T4) densely woven piece of textile covered this part, fragments of which are still visible. The colour simulated the colour of the beak of a living ibis. Six (only five are still visible on both sides, while the brown sixth is very fragmented) slightly overlapping layers of bandages encircle the ibis in a basic herringbone pattern at the tail, and form overlapping bands all the way around the neck. The herringbone pattern is created by using alternating textiles T2, T3, T4, in order to create a polychrome pattern. The same quality of textile (T3) is used, both undyed (bandages on the body) and dyed orange-pinkish (T5), in order to create the pattern. A larger bandage secures the edges of the herringbones (T1). The bandages and string on the bottom are still visible – perhaps they were originally covered by another piece of linen.

Scientific examination

CT investigation

The CT scans show a complete skeleton of an adult ibis, a young one, as the proximal epiphysis of the tibiotarsus has just closed. The animal is positioned on its back, with head folded over the sternum, wings folded against the sides of the body, neck curved in an S and limbs flexed and collected close to the body. It was eviscerated, but the peritoneal cavity contains the gizzard, filled with bone fragments and other material, perhaps of vegetable origin. Some cloth is present in the thorax.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 390–190 BC.[141]

Analysis of organic residue

Pyrolysis-GC/MS of the dark substance on the exterior wrapping showed it to be plant gum.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19, 33; Tamburini et al., *HeritSci* 9 (2021), pp. 5, 10, Table 2.

[141] In keeping with others from the Turin and Lyon (Richardin, *Radiocarbon* 59.2 [2017], pp. 595–607: https://doi.org/10.1017/RDC.2016.102) collections.

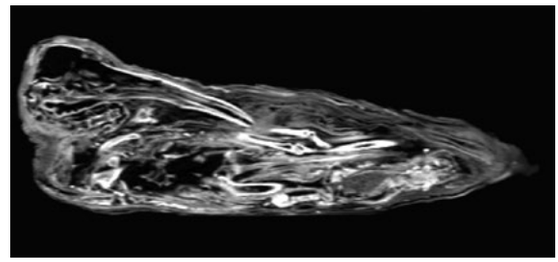
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	20 x 10	Undyed	
T2	Linen	S	Warp-faced	44 x 15	Undyed	
T3	Linen	S	Warp-faced	24 x 12	Undyed	
T4	Linen	S		Too badly preserved for thread count	Dark brown (possible tannins)	
T5	Linen	S	Warp-faced	24 x 12	Orange-pinkish	
Thread	Linen	S				

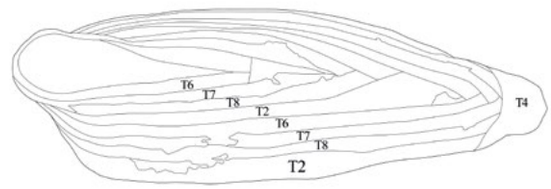
Textile notes: Five qualities of textiles have been used to wrap this mummy. T3 and T5 show the same thread count/density (24 x 12) and were probably made from the same fabric.

Parallels: Leiden, RMO H.III.EEE 1 (Raven and Taconis, *Egyptian Mummies,* 2005, p. 283); **Nos. 89–90, 92–109**; New Haven, YPM ANT.006924.002, ANT.006924.004.

92









Inventory number: Suppl. 11014
Object: Ibis mummy
Dimensions: L: 37, W: 11.3, H: 11.2
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: Probably 5th to 1st century BC, based on parallels
Scientific analyses: CT, Optical Microscopy
Description: An ibis mummy wrapped to show the animal lying on its back with the beak resting on its ventral side and the legs drawn up to the body as if it were seated. The overlapping bandages form a herringbone pattern from the tail up, with the tip covered by an undyed bandage. The bandages are of different qualities. From the beak down, radiating outward, the pattern is created by alternating a sequence of light brown (T6), undyed (T7) and dark brown (T8) bandages. A large bandage (T2) runs along the edge. Some of the textiles (T3, T7, T8) look very similar in terms of count/density and maybe come from the same piece of cloth. Textile T2, on the proper right, has a three-line thickness woven into it (self-bands). The head and beak would have been covered with a cloth, now almost gone (T8), revealing the bandages below, stained with embalming materials that are kept in place with thread. An outer bandage covered the base, but is now tattered, revealing the same situation of bandages and thread as is seen in the beak area. One of the pieces of linen wrapping (T5) presents a rolled hem, indicative of its reuse.

Scientific examination

CT investigation

The CT scans show a complete skeleton of a juvenile ibis (the tibiotarsus is unfused), positioned on its back, with the head folded over the sternum, wings folded against the sides of the body, neck curved in a pronounced S, and the legs flexed and pushed toward the body. The beak is not very pronounced (this might be due to the animal's age, as the beak increases in size and curves more with age, or could be indicative of it being a glossy rather than a sacred ibis). The left humerus has slipped a bit; this might be due to deterioration over time or might attest to poor embalming prior to wrapping. There is evidence for its last meal in its crop, although these elements are not as clear as they are in other ibises – possibly they had been more digested.

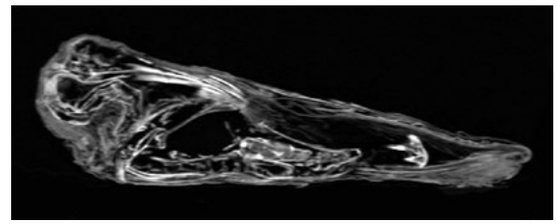
Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19, 33.
Parallels: Cairo, EMC CG 29696 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 15, 78); Leiden, RMO H.III. EEE 1 , AH 3a (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 283–86); from Abydos: Darmstadt, HLMD A-2463 (Keefer, in Von Recklinghausen [ed.], *Ägyptische Mumien*, 2007, p. 312); parallels to gizzards being full, see Wade et al., *JAS* 39 (2012), pp. 1644–45; **Nos. 89–91, 93–109**; Stockholm, Medelhavsmuseet NME 953; New Haven, YPM ANT.006924.002, ANT.006924.004.

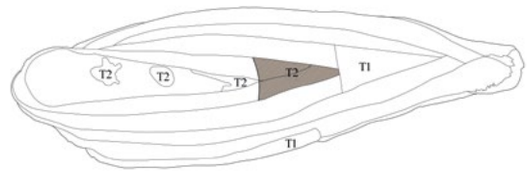
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	19 x 8	Undyed	
T2	Linen	S	Warp-faced	18 x 11	Undyed	Self-bands
T3	Linen	S	Warp-faced	36 x 12	Undyed	
T4	Linen	S	Warp-faced	50 x 16	Undyed	
T5	Linen	S	Warp-faced	32 x 14	Undyed	Rolled hem
T6	Linen	S	Warp-faced	24 x 8	Light brown	
T7	Linen	S	Warp-faced	34 x 12	Undyed	
T8	Linen	S	Warp-faced	34 x 12	Dark brown	

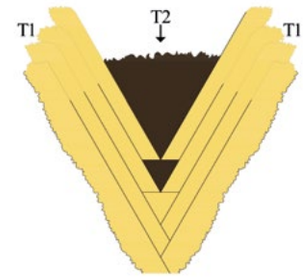
Textile notes: Different qualities of linen were used to wrap the mummy. Some of them (T3, T7, T8) have a similar density and may come from the same cloth.

93









Inventory number: Suppl. 11015
Object: Ibis mummy
Dimensions: L: 36, W: 10.7, H: 9.3
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: Probably 5th to 1st century BC, based on parallels
Scientific analyses: CT, Optical Microscopy
Description: An ibis mummy wrapped to show the animal lying on its back with the beak resting on its ventral side and the legs drawn up to the body as if it were seated. It is flatter than most of the others like it. The body is wrapped with bandages (T1) that were kept in place with thread. A series of four overlapping undyed bandages are wrapped horizontally around the bird, forming a herringbone pattern with insets. The first and second rows are kept in place by a transversal strip. The points of the herringbones are enhanced by an inset that appears triangular due to the manner in which it was wrapped. Vestiges of a dark brown bandage (T2) covering the head and beak survive. The base is discoloured with embalming materials and shows a tidy horizontal spiral bandage below (T1).

Scientific examination

CT investigation

The CT scans show a complete skeleton of an adult ibis, positioned on its back, with the head folded over the sternum, wings folded against the sides of the body, neck curved in an S, and limbs flexed and collected. The gizzard is intact and contains at least two shells, certainly one *Bellamya unicolor* and possibly a small bivalve, although it could be a vegetal element of some sort.[142]

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19, 33.
Parallels: From Abydos: Darmstadt, HLMD A-2463 (Keefer, in Von Recklinghausen [ed.], *Ägyptische Mumien*, 2007, p. 312); parallels for gizzards being full, see Wade et al., *JAS* 39 (2012), pp. 1644–45; **Nos. 89–92, 94–109**; New Haven, YPM ANT.006924.002, ANT.006924.004.

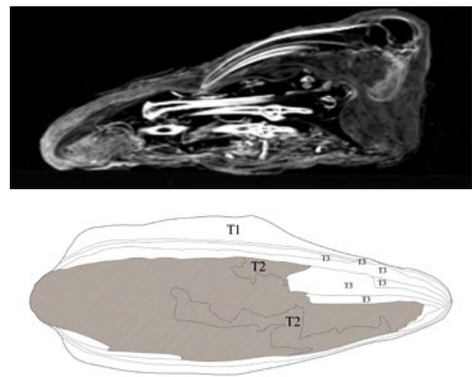
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	24–28 x 10	Undyed	
T2	Linen	S		Too badly preserved for thread count	Dark brown	

Textile notes: Two different qualities of linen were used to wrap the mummy and create the pattern.

[142] Wade et al., *JAS* 39 (2012), pp. 1642–47: https://doi.org/10.1016/j.jas.2012.01.003.

94





Inventory number: Suppl. 11016/1
Object: Ibis mummy
Dimensions: L: 32.3, W: 11.3, H: 13.2
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: 50 BC – AD 130 (^{14}C date)
Scientific analyses: CT, ^{14}C dating, UVF, Optical Microscopy
Description: An ibis mummy wrapped to show the animal lying on its back with the beak resting on its ventral side and the legs drawn up to the body as if it were seated. It is missing most of its outer wrappings. The head shows the inner textile (T1) that was covered by a darker brown cloth (T2), probably coloured with paint or resin to give the impression of the bird's black head, as is found in nature. The body would have been wrapped with bandages and swatches of cloth that were kept in place with threads, then wrapped in more bits of cloth over which a series of overlapping bandages would have been laid, in a herringbone pattern created by six overlapping strips (T3). A larger bandage (T1) secures the edges of the herringbones. The bottom side is exposed, revealing the spiral wrappings, swatches of cloth and thread that kept the wrappings in place. There are traces of what looks like gypsum plaster on the base.

Scientific examination

CT investigation

The CT scans show an adult ibis. The skeleton is complete but disorderly: the head is folded on the sternum, but the cervical spine is not joined to the skull; instead it is positioned between the wings. Most of the vertebrae are scattered, and the ribcage is fragmentary. The bird appears to have been eviscerated, with nothing placed within the body cavity, save a crumpled piece of linen. The tail is reinforced with extra fabric.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 50 BC – AD 130. This suggests that the Asyut necropolis continued to flourish from the Ptolemaic through the Roman era, as is further evidenced by the radiocarbon results of the other ibis mummies originating from it.

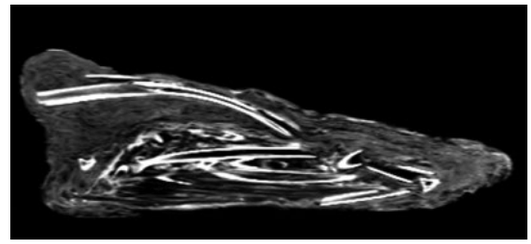
Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19, 33.
Parallels: Cairo, EMC CG 29696 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 15, 78); Leiden, RMO H.III.EEE 1, AH 3a (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 283–86); **Nos. 89–93, 95–109**; New Haven, YPM ANT.006924.002, ANT.006924.004.

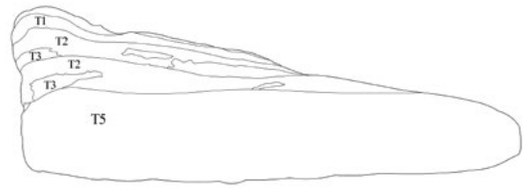
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	25 x 10	Undyed	
T2	Linen	S	Warp-faced	44 x 16	Dark brown	
T3	Linen	S	Warp-faced	44 x 13	Undyed	
Thread	Linen	S			Undyed	

Textile notes: Two qualities of linen were used to wrap the mummy and create the pattern. Textiles T2 and T3 could be the same (similar density).

95









Inventory number: Suppl. 11016/2
Object: Ibis mummy
Dimensions: L: 32, W: 10.2, H: 10.5
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: Probably 5th to 1st century BC, based on parallels
Scientific analyses: CT, UVF, Optical Microscopy
Description: An ibis mummy wrapped to show the animal lying on its back with the beak resting on its ventral side and the legs drawn up to the body as if it were seated. At least five qualities of linen were used to wrap this ibis. It is wrapped in a herringbone pattern using undyed (T1), pinkish, with self-bands (T2), and dark brown (T3) bandages, as are found in many other examples from this excavation and from other sites. Vestiges of a dark bandage covering the head and beak survive, probably coloured with paint or resin to give the impression of the bird's black head. A larger bandage (T5) secures the edges of the herringbones. The dorsal side of the package shows the way in which it was wrapped beneath the final complex herringbone shroud: the bird was covered with spiral bandages (T4) and pieces of textile laid lengthways, all of which were secured with thread.

Scientific examination

CT investigation

The CT scans show an incomplete skeleton of an adult ibis, originally positioned on its back, with the head folded over the sternum, wings folded against the sides of the body, neck curved in an S, and legs flexed and brought close into the body. The body is disarticulated and many of the bones are broken: indeed, not all the bones are present, for example, many of the foot bones are missing. One wing is articulated, complete with feathers, but the whole bird's plumage is not intact. There is a second beak on the right side of the animal, intermingled with the long bones, while the upper part of a third beak is present on the left side. The beak of the main bird has resinous substance applied to and appears to be supported by cloth, the head and neck are absent. It is possible that this bird was either improperly mummified and thus fell apart, and that the bits, together with those of other birds, were wrapped together. Alternatively, the mummy package might contain the remains of birds that had been found already decomposing, and thus the embalmers gathered together whatever was available, in a decayed state, and then wrapped these together.

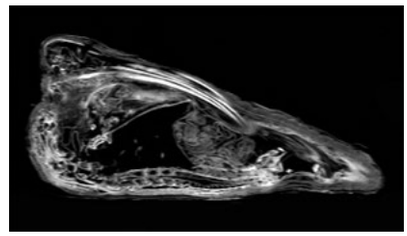
Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19, 33.
Parallels: New Haven, YPM ANT.006924.002, ANT.006924.004; **Nos. 89–94, 96–109**.

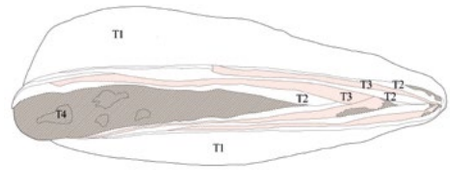
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	24 x 11	Undyed	
T2	Linen	S	Warp-faced	40 x 12	Orange-pinkish	Self-bands
T3	Linen	S	Warp-faced	36 x 10	Dark brown	
T4	Linen	S	Warp-faced	30 x 10	Undyed	
T5	Linen	S	Warp-faced	18 x 6	Undyed	
Thread	Linen	S			Undyed	

Textile notes: Five different qualities of linen were used to wrap the mummy and create the pattern.

96







Inventory number: Suppl. 11017
Object: Ibis mummy
Dimensions: L: 34, W: 13, H: 13.5
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: 360–40 BC (^{14}C date)
Scientific analyses: CT, ^{14}C dating, Optical Microscopy
Description: An ibis mummy wrapped to show the animal lying on its back with the beak resting on its ventral side and the legs drawn up to the body as if it were seated. The head and beak were covered in a dark brown bandage, of which only tatters remain (T4). The rest of the bird was covered with overlapping folded bandages to form a herringbone pattern created with five overlapping strips alternating polychrome bandages: undyed (T2), orange-pinkish (T3) and perhaps dark brown (T4), whose sequence is barely visible– this mummy is less finely made than others in the collection. A larger bandage secures the edges of the herringbones (T1). Beneath the fine herringbone pattern the body would have been wrapped with different pieces of textiles that were kept in place with linen thread. The base is well covered by different pieces of cloth that were made to adhere through the use of glue or a black resin-like substance and hide the untidy bandage and thread combination.

Scientific examination

CT investigation

The CT scans show a complete skeleton of an adult ibis, positioned on its back, with the head folded over the sternum, wings folded against the sides of the body, neck curved in an S, and limbs flexed as if it were seated. A sizable piece of cloth was rolled up and placed between sternum and neck, as well as in the eviscerated body cavity. Some bits of sand and gravel are trapped in the wrappings.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 360–40 BC.

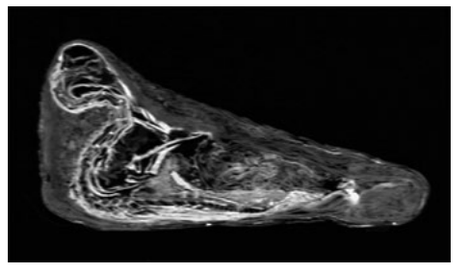
Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19, 33.
Parallels: New Haven, YPM ANT.006924.002, ANT.006924.004; **Nos. 89–95, 97–109**.

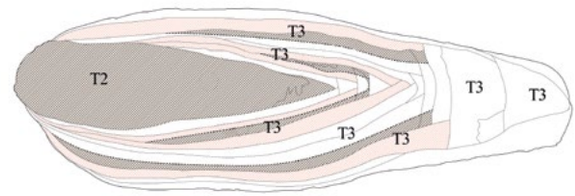
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	26–28 x 10	Undyed	
T2	Linen	S	Warp-faced	30 x 12	Undyed	
T3	Linen	S	Warp-faced	48 x 12	Orange-pinkish	
T4	Linen	S		Too badly preserved for thread count	Dark brown	
Thread	Linen	S			Undyed	

Textile notes: Four different qualities of linen were used to wrap the mummy and create the pattern.

97







Inventory number: Suppl. 11018
Object: Ibis mummy
Dimensions: L: 30, W: 10.3, H: 13.5
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: 40 BC – AD 210 (^{14}C date)
Scientific analyses: CT, ^{14}C dating, UVF, Optical Microscopy
Description: An ibis mummy wrapped to show the animal lying on its back with the beak resting on its ventral side and the legs drawn up to the body as if it were seated. It was wrapped with overlapping bandages (T3) creating a herringbone pattern with insets, going from the beak to the tail. This was made with eight overlapping polychrome strips (undyed, pinkish, dark brown, all of them from the same type of cloth T3). Horizontal inserts in the area of the V's create little triangles. The herringbone at the tip has been deliberately obscured by a series of five (extant) horizontal bands (T3); the wrappings evoke the plumage of the bird. The head and beak originally were probably covered with a brown cloth, most of which is broken off. Beneath this, the bandages that are of different densities of weave (T1, T2) are held in place by doubled up thread. The base is well covered by a piece of linen (T1) that overlaps with the last edge bandage. It was stuck down with a black resin-like substance, which is still visible.

Scientific examination

CT investigation

The CT scans show a complete skeleton of an adult ibis, positioned on its back, with the head folded over the sternum, wings folded against the sides of the body, neck curved in an S and limbs flexed and pushed to the body. The head and the beak are damaged, post-mortem and post wrapping. The neck is no longer properly articulated, and the area is reinforced by rolled up bandages. There is something in the peritoneal cavity, probably the gizzard, which includes some radio opaque objects that are hard to identify. These might be bits of grit, broken pieces of shell, some seeds, or even fragments of fish bone.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 40 BC – AD 210. This is very different from **No. 96**, also from Asyut, though not too dissimilar in its style of preparation. The result might suggest that the ibis necropolis functioned for a very long time, well into the Roman Period, or that some of the birds were wrapped in considerably older textiles.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19, 33; Tamburini et al., *HeritSci* 9 (2021), pp. 5, 11, Table 2.

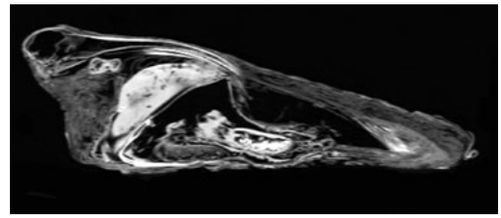
Parallels: Darmstadt, HLMD A-2463 (Keefer, in Von Recklinghausen [ed.], *Ägyptische Mumien*, 2007, p. 312); Wade et al., *JAS* 39 (2012), pp. 1644–45; **Nos. 89–96, 98–109**; New Haven, YPM ANT.006924.002, ANT.006924.004.

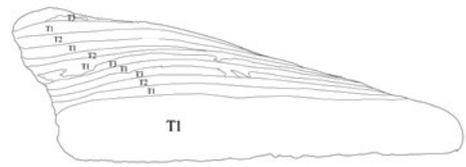
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	16 x 8	Undyed	
T2	Linen	S	Warp-faced	40 x 11	Undyed	
T3	Linen	S	Warp-faced	32–34 x 9	Undyed - Pinkish - Dark brown	
Thread	Linen	S			Undyed	

Textile notes: Three different qualities of linen were used to wrap the mummy and create the pattern.

98









Inventory number: Suppl. 11019/1
Object: Ibis mummy
Dimensions: L: 39, W: 13, H: 12.5
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: Probably 5th to 1st century BC, based on parallels
Scientific analyses: CT, UVF, Optical Microscopy
Description: An ibis mummy wrapped to show the animal lying on its back with the beak resting on its ventral side and the legs drawn up to the body as if it were seated. The head and beak were wrapped in a dark brown linen fabric (T3), most of which is lost, revealing the lower level of slightly messy spiral wrapped bandage (T4) held in place by linen thread. Beyond the beak, ten overlapping strips of light brown/yellow (?) (T1), undyed (T2) and dark brown (T3) bandages create a herringbone pattern. A large light brown/yellow (?) bandage (T1) runs along the edge and extends to the base, hiding all the straggling ends of the herringbones. The dorsal side does not have a single large piece of fabric covering it, but rather, consists of spiral bandages (T2). It has a few holes through which one can see some feathers and what might be a gastropod. Textiles T1 and T3 are very similar and maybe they come from the same fabric. The herringbone pattern is made by alternating textiles T1, T2 and T3, arranged in order to create a polychrome pattern.

Scientific examination

CT investigation

The CT scan shows a complete skeleton of a juvenile adult ibis as its proximal tibiotarsal epiphysis has just fused. The animal is positioned on its back, with the head pushed down over the sternum, wings folded against the sides of the body, the neck curved in an S, and the legs flexed as if it were seated. It contains the gizzard that is filled with a snail shell together with bits of gravel. It is conceivable that a fish vertebra is also located here. Clearly the ibis was lavishly supplied with food for eternity.

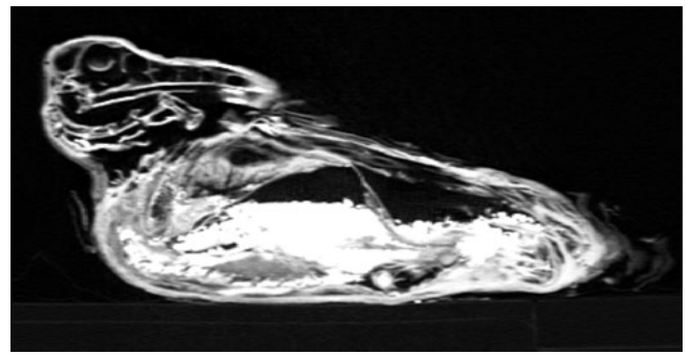
Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19, 33.
Parallels: Cairo, EMC CG 29696 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 15, 78); Leiden, RMO H.III. EEE 1 , AH 3a (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 283–86); Wade et al., *JAS* 39 (2012), pp. 1642–47; Stockholm, Medelhavsmuseet NME 953; **Nos. 89–97, 99–109**; New Haven, YPM ANT.006924.002, ANT.006924.004.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	44 x 10	Light brown/yellow	
T2	Linen	S	Warp-faced	34 x 11	Undyed	
T3	Linen	S	Warp-faced	40 x 11	Dark brown	
T4	Linen	S	Warp-faced	28 x 10	Undyed	
Thread	Linen	S			Undyed	

Textile notes: Four different qualities of linen were used to wrap the mummy and create the pattern; it is possible that T1 and T3 have been torn from the same cloth (similar thread count/density), and then dyed in different colours.

99





Inventory number: Suppl. 11019/2
Object: Ibis mummy
Dimensions: L: 38, W: 13, H: 13
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: 730–390 BC (^{14}C date)
Scientific analyses: CT, ^{14}C dating, UVF, Optical Microscopy
Description: An ibis mummy wrapped to show the animal lying on its back with the beak resting on its ventral side and the legs drawn up to the body as if it were seated. Most of the external wrappings are missing, revealing the beak and feathers. The mummy bundle is quite heavy, and this, together with the evidence from the beak, indicates the generous use of a black resin-like substance in the mummification process. At least three qualities of linen were used to wrap this ibis, with many pieces being used to "flesh" out the bird. The dorsal side shows that the ibis, at least in some of its final stages, was wrapped in overlapping spiral bandages (T1) and swatches of cloth (T3 [basket weave], T4, T5) secured with a black resin-like substance. A different bandage has been identified on the upper part of the body (T2).

Scientific examination

CT investigation

The CT scans show a complete skeleton of an adult ibis, positioned on its back, with the head folded over the sternum, wings folded against the sides of the body, neck curved into an S, and with the legs flexed as if it were seated. Considerable amounts of radio opaque material is scattered inside the wrappings, between the wings and the body, as well as in the eviscerated body cavity. It is possible that a shell or two are located within the body cavity, together with the other radio opaque materials, but these are not clearly identifiable. This too, no doubt, adds to the package's weight. Possibly the bird had been eviscerated, desiccated, oiled and part of the body cavity filled with sand and gravel, and then the still wet creature had been set down in the same sandy matrix, which adhered to the mummy. Subsequently, it was wrapped.

Radiocarbon dating (^{14}C)

Plant element, calibrated age (95% probability): 730–390 BC (similar to the textiles of **No. 87**).[143]

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19, 33.
Parallels: Cairo, EMC CG 29696 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 15, 78); Leiden, RMO H.III.EEE 1, AH 3a (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 283–86); Wade et al., *JAS* 39 (2012), pp. 1642–47; Stockholm, Medelhavsmuseet NME 953; **Nos. 89–99, 101–109**; New Haven, YPM ANT.006924.002, ANT.006924.004.

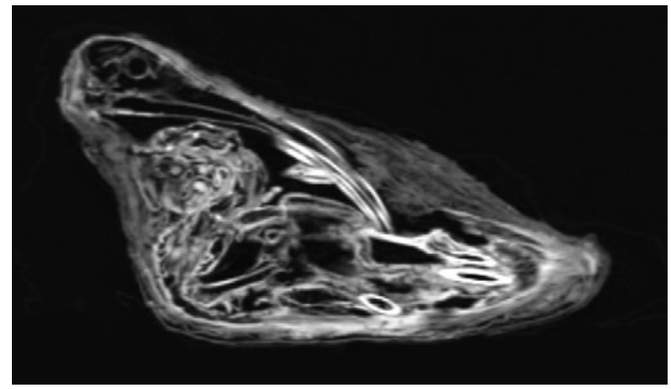
[143] Parallel to ibis mummy 90002482 in Lyon (Richardin et al., *Radiocarbon* 59.2 [2017], pp. 602: https://doi.org/10.1017/RDC.2016.102).

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	28 x 10	Undyed	
T2	Linen	S	Warp-faced	20 x 11	Undyed	Self-bands
T3	Linen	S	Basket	36 x 18	Undyed	
T4	Linen	S	Warp-faced	21 x 14	Undyed	Starting border
T5	Linen	S	Warp-faced	28 x 12	Undyed	Rolled hem

Textile notes: Different qualities of linen were used to wrap the mummy and create the pattern. It is possible that textiles T1 and T5 have been torn from the same cloth (similar thread count/density).

100





Inventory number: Suppl. 11020
Object: Ibis mummy
Dimensions: L: 39.8, W: about 12.3, H: 17
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: Probably 5th to 1st century BC, based on parallels
Scientific analyses: CT
Description: An ibis mummy wrapped to show the animal lying on its back with the beak resting on its ventral side and the legs drawn up to the body as if it were seated. Most probably it was originally wrapped like most of the others from this excavation. At least four qualities of linen were used to wrap this ibis in a herringbone with insets pattern. As part of the final wrappings, a dark brown bandage (T2) covered the head and beak, but this is largely gone, revealing the bandages below, that are made with different qualities of fabrics. These are kept in place by a doubled-up thread. The rest of the ibis is wrapped with overlapping folded bandages (T3, T4), alternating with the dark brown one (T2), that form the herringbone; the portion at the tail survives best. Small horizontal bandages, the largest closest to the tail, are inserted into the "V" of the herringbone, creating the insets. A single piece of fabric covers the base (T1). It is darkened with embalming agents.

Scientific examination

CT investigation

The CT scans show a complete skeleton of an adult ibis positioned on its back, with the head folded over the sternum, wings folded against the sides of the body, neck curved to S and legs pushed up toward the body. Its neck is supported by a rolled piece of cloth, and several layers of the same fabric are wound around it, both horizontally and vertically, augmented by swatches of linen. The bird was probably eviscerated, with the gizzard returned to the body; it contains some radio opaque materials, all of which are difficult to identify securely.

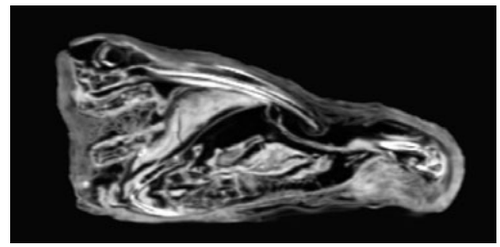
Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19, 33.
Parallels: Cairo, EMC CG 29696 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 15, 78); Leiden, RMO H.III. EEE 1, AH 3a (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 283–86); Darmstadt, HLMD A-2463 (Keefer, in Von Recklinghausen [ed.], *Ägyptische Mumien*, 2007, p. 312); Wade et al., *JAS* 39 (2012), pp. 1642–47; Stockholm, Medelhavsmuseet NME 953; **Nos. 89–99, 101–109**; New Haven, YPM ANT.006924.002, ANT.006924.004.

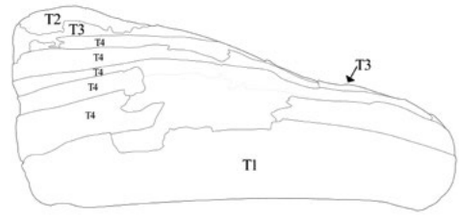
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Tabby-faced	16 x 10	Undyed	
T2	Linen	S	Warp-faced	28 x 8	Dark brown	
T3	Linen	S	Warp-faced	38–30 x 8	Undyed	Self-bands
T4	Linen	S	Warp-faced	36 x 13	Undyed	

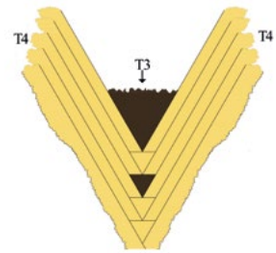
Textile notes: Four different qualities of linen were used to wrap the mummy and create the pattern.

101









Inventory number: Suppl. 11021
Object: Ibis mummy
Dimensions: L: 28, W: 12, H: 11
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: Probably 5th to 1st century BC, based on parallels
Scientific analyses: CT, UVF, Optical Microscopy
Description: An ibis mummy wrapped to show the animal lying on its back with the beak resting on its ventral side and the legs drawn up to the body as if it were seated. The bird was first wrapped in spiral bandages (T1, T2), originally completely hidden by elaborate outer wrappings in a herringbone pattern with insets (1–5) made with the same type of textile (T3, T4). The head and beak are covered with a bandage that is darker brown (T3) than the others, perhaps to simulate the black head of the bird; the same bandage is used close to the tail end, at the point where the herringbones make a "V". The base is surprisingly tidy, with an effort made to stick a few longitudinal bandages over the less tidy area, making for a very neat effect.

Scientific examination

CT investigation

The CT scans show a complete skeleton of an ibis that is relatively young as its proximal tibial epiphysis has just fused. The animal is positioned on its back, with the head folded over the sternum, wings folded against the sides of the body, neck curved into an S and the limbs flexed and pushed toward the body. Large amounts of textile were placed behind the neck to protect and pad it, as well as some beneath the wings and possibly within the body cavity. The gizzard is recognizable, with finely homogeneous materials filling and some more radiopaque fragments.

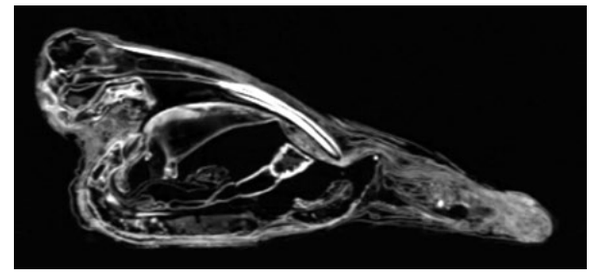
Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19, 33.
Parallels: Cairo, EMC CG 29696 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 15, 78); Leiden, RMO H.III. EEE 1, AH 3a (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 283–86); Darmstadt, HLMD A-2463 (Keefer, in Von Recklinghausen [ed.], *Ägyptische Mumien*, 2007, p. 312); Wade et al., *JAS* 39 (2012), pp. 1642–47; **Nos. 89–100, 102–109**; New Haven, YPM ANT.006924.002, ANT.006924.004.

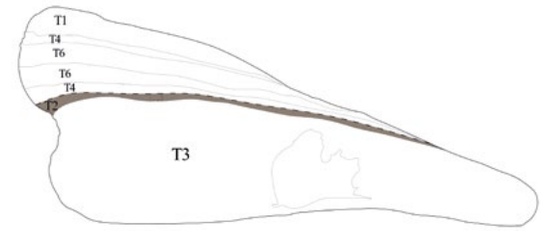
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	36 x 9	Undyed	
T2	Linen	S	Warp-faced	26 x 10	Undyed	
T3	Linen	S	Warp-faced	52 x 16–18	Dark brown	
T4	Linen	S	Warp-faced	52 x 16–18	Undyed	

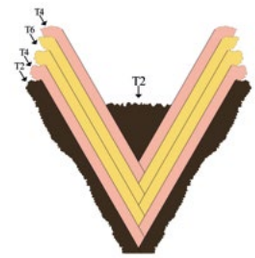
Textile notes: Three different qualities of linen were used to wrap the mummy. Textiles T3 and T4 are probably torn from the same fabric (same count/density).

102









Inventory number: Suppl. 11022
Object: Ibis mummy
Dimensions: L: 40, W: 11.6, H: 14.6
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: Probably 5th to 1st century BC, based on parallels
Scientific analyses: CT, Optical Microscopy
Description: An ibis mummy wrapped to show the animal lying on its back with the beak resting on its ventral side and the legs drawn up to the body as if it were seated. The area of the head and beak is covered with textile (T1), black embalming agents, and thread. Originally, the final wrapped mummy would have had a piece of linen coloured dark brown covering this area (T2). The body of the ibis itself is covered by five overlapping layers of broad bandages that are slightly discoloured and disordered, forming a herringbone pattern made by bands of textiles dyed with various colours and edged by a side band (T3) under which an inner bandage (T5) is partially visible. The herringbone bandages are undyed (T6), dark brown (T2), and slightly pink (orange-pinkish) (T4), possibly faded from a more intense shade of that colour. The base of the mummy might have been originally covered by a swatch of cloth that hid the slightly untidy, thread-covered bandages (T1) that are wrapped around the bird.

Scientific examination

CT investigation

The CT scans show a complete skeleton of an adult ibis positioned on its back with the head folded over the sternum, wings folded against the sides of the body, neck curved into an S and legs flexed as if it were seated. There are some radio opaque elements at the base (back), neck and tail area of the bird, all of which are difficult to identify securely. Evisceration is incomplete: the trachea and esophago-ventricle are in place, as are some intestinal loops. It has some cloth introduced into the body cavity.

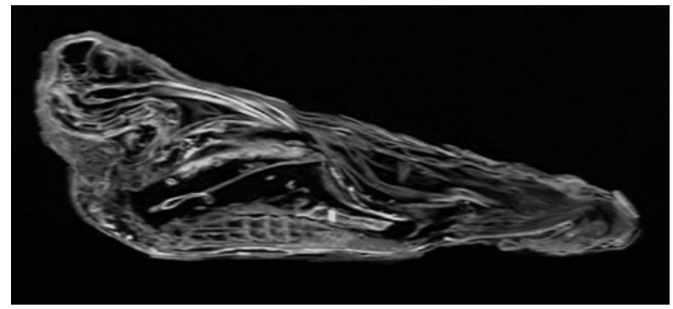
Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19, 33.
Parallels: Cairo, EMC CG 29696 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 15, 78); Leiden, RMO H.III. EEE 1, AH 3a (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 283–86); Darmstadt, HLMD A-2463 (Keefer, in Von Recklinghausen [ed.], *Ägyptische Mumien*, 2007, p. 312); Wade et al., *JAS* 39 (2012), pp. 1642–47; **Nos. 89–101, 103–109**; New Haven, YPM ANT.006924.002, ANT.006924.004.

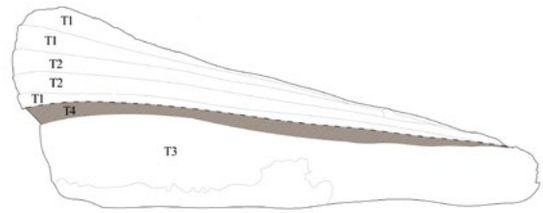
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	26–28 x 9–10	Undyed	
T2	Linen	S	Warp-faced	26–28 x 9–10	Dark brown	
T3	Linen	S	Warp-faced	34–36 x 10–11	Undyed	
T4	Linen	S	Warp-faced	44 x 12	Orange-pinkish	Self-bands
T5	Linen	S	Warp-faced	20 x 10	Undyed	
T6	Linen	S	Warp-faced	34–40 x 14–15	Undyed	Self-bands

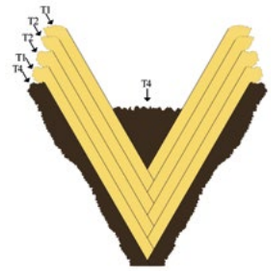
Textile notes: Six different qualities of linen were used to wrap the mummy. Textiles T3 and T4 are probably torn from the same fabric (same count/density).

103









Inventory number: Suppl. 11023
Object: Ibis mummy
Dimensions: L: 32.5, W: 10, H: 10.7
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: Probably 5th to 1st century BC, based on parallels
Scientific analyses: CT, Optical Microscopy
Description: An ibis mummy wrapped to show the animal lying on its back with the beak resting on its ventral side and the legs drawn up to the body as if it were seated. The bird's outermost wrappings are a herringbone with insets. The bird itself was first bandaged spirally (T1), with additional, larger bandages placed vertically (T1), with another set of spiral bandages (T3) wound around the bird. All of these were held in place by linen thread, particularly at the tail end. A series of undyed (T1, T2) and dark brown (T4) folded strips of linen were used to form a herringbone pattern, with the head and beak covered by a piece of dark cloth (T4), indicative of their colour in nature; this is now largely missing. A larger bandage (T3) secures the edges of the herringbones. There is one (or at least one survives) bit of linen that is inserted after the second herringbone down from the beak, creating a triangular inset. Possibly the rest of the herringbones were similarly enhanced, evoking the bird's tail feathers. Black resinous material is very much in evidence, both in the fabrication of the mummy, as well as in the anointing of the wrapped package. The mummy leans to the left proper.

Scientific examination

CT investigation

The CT scans show a complete skeleton of an adult ibis positioned on its back, with the head folded over the sternum, wings folded against the sides of the body, neck curved in an S, and the legs in a seated position. Grit and dirt were trapped within the wrappings and on the ibis itself, possibly adhering to the bird when it was still moist with the black resin-like substance used in its fabrication. The gizzard seems to have been reintroduced into the body and appears to contain inorganic elements, maybe one shell and other digested materials, as is seen in other examples from Asyut as well as elsewhere.[144]

[144] Wade et al., *JAS* 39 (2012), pp. 1642–47: https://doi.org/10.1016/j.jas.2012.01.003.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	32 x 9	Undyed	Selvedge
T2	Linen	S	Warp-faced	20 x 10	Undyed	Self-bands
T3	Linen	S	Warp-faced	20 x 10	Undyed	
T4	Linen	S		Too badly preserved for thread count	Dark brown	
Thread	Linen	S			Undyed	

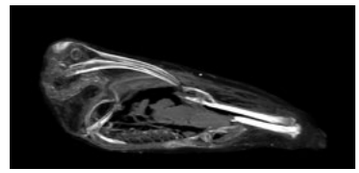
Textile notes: Four different qualities of linen were used to wrap the mummy and create the pattern.

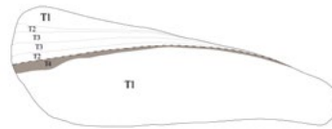
Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19, 33.

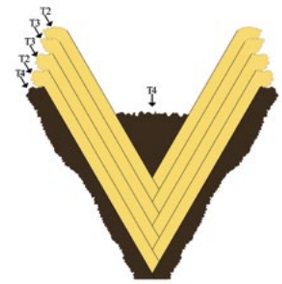
Parallels: Cairo, EMC CG 29696 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 15, 78); Leiden, RMO H.III. EEE 1, AH 3a (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 283–86); parallels to gizzards being full, see Wade et al., *JAS* 39 (2012), pp. 1644–45; Darmstadt, HLMD A-2463 from Abydos, an ibis that was imaged with similar results (Keefer, in Von Recklinghausen [ed.], *Ägyptische Mumien*, 2007, p. 312); **Nos. 89–102, 104–109**; New Haven, YPM ANT.006924.002 and ANT.006924.004.

104









Inventory number: Suppl. 11024
Object: Ibis mummy
Dimensions: L: 31.2, W: 11.1, H: 10.7
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: Probably 5th to 1st century BC, based on parallels
Scientific analyses: CT, Optical Microscopy
Description: An ibis mummy wrapped to show the animal lying on its back with the beak resting on its ventral side and the legs drawn up to the body as if it were seated. Bandages, both vertical and horizontal/spiral, cover the inner and the side of the bird (T1) held in place by linen thread. The final wrappings on the breast side of the bird create a herringbone pattern with insets, reminiscent of folded wings. It is made by alternating undyed (T2, T3) and dark brown (T4) strips of textile, secured by dabs of black resin-like substance, that create a polychrome pattern. Fragments of the same dark textile (T4) cover the beak. A piece of linen (T1) covers the flat base, and was secured by adhesives, most probably some sort of tree resin.

Scientific examination

CT investigation

The CT scans show a complete skeleton of a juvenile ibis positioned on its back, with the head folded over the sternum, wings folded against the sides of the body, neck curved in an S and its legs flexed and pushed in toward the body. The bird is well preserved, with some sand and gravel adhering to it in parts, as well as some being interspersed in the wrappings. The gizzard seems to have been re-introduced into the body, and has a radio opaque object in it that might be a pebble or a shell as is found in other mummies from Asyut as well as elsewhere.[145]

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19, 33.
Parallels: Donadoni Roveri, *Art of Weaving*, 2001, pp. 83–84; Leiden, RMO H.III.EEE 1, AH 3a (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 283–86); Darmstadt, HLMD A-2463 (Keefer, in Von Recklinghausen [ed.], *Ägyptische Mumien*, 2007, p. 312); parallels to gizzards being full, see Wade et al., *JAS* 39 (2012), pp. 1644–45; **Nos. 89–103, 105–109**; New Haven, YPM ANT.006924.002, ANT.006924.004.

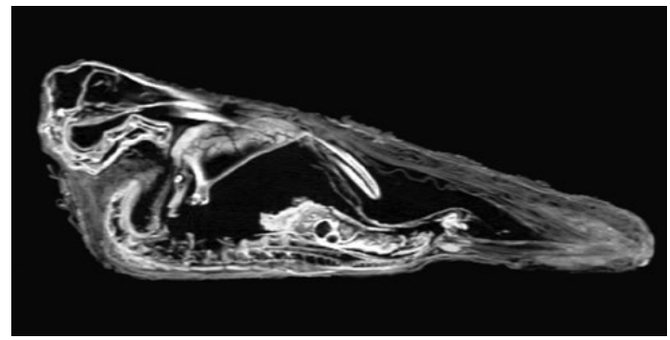
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	16–18 x 7–8	Undyed	Self-bands
T2	Linen	S	Warp-faced	44 x 11	Undyed	Self-bands
T3	Linen	S	Warp-faced	48 x 15	Undyed	Self-bands
T4	Linen			Too badly preserved for thread count	Dark brown	
Thread	Linen	S			Undyed	

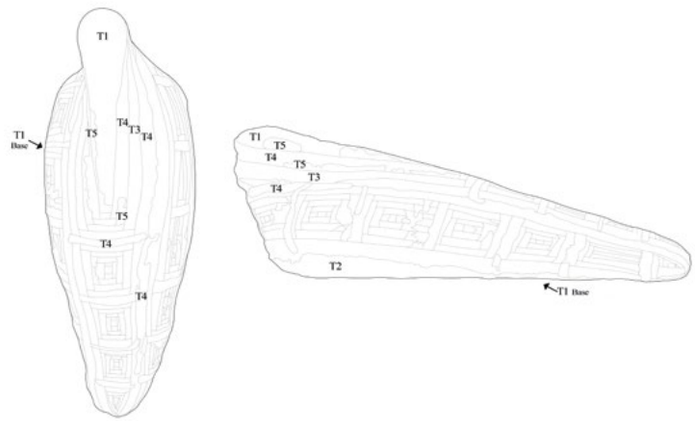
Textile notes: Four different qualities of linen were used to wrap the mummy and create the pattern.

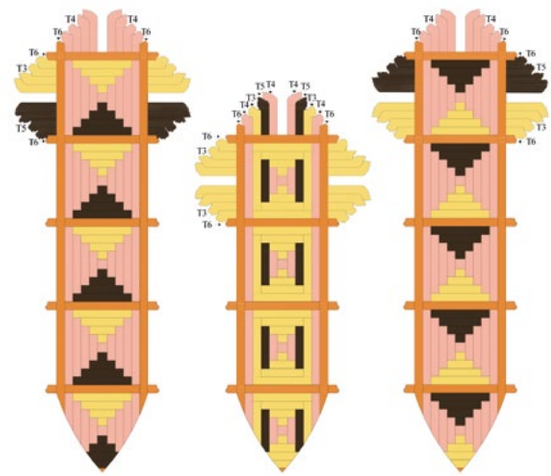
[145] Wade et al., *JAS* 39 (2012), pp. 1642–47: https://doi.org/10.1016/j.jas.2012.01.003.

105









Inventory number: Suppl. 11028
Object: Ibis mummy
Dimensions: L: 41.1, W: 13.8, H: 13.5
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: Probably 5th to 1st century BC, based on parallels
Scientific analyses: CT, UVF, Optical Microscopy
Description: An ibis mummy wrapped to show the animal lying on its back with the beak resting on its ventral side and the legs drawn up to the body as if it were seated. This mummy has the most elaborate polychrome coffered pattern among the ibises from Asyut at the Museo Egizio. The bird is wrapped in three columns of coffered bandages, each coffer being made of four colours: undyed (T3), pinkish (T4), light brown (T6), dark brown (T5). The beak is outlined by an elongated coffer. The central column of coffering consists of four coffers going down from the beak. The column of the side coffering has a different, polychrome mirrored coffer pattern. Its seven coffers are elongated and decrease in size from the head to the tail. Some of the bandages look as if they might have been dyed pink, but this is difficult to determine. The head and most of the beak area have lost their outermost bandages, revealing the rather haphazard bandaging beneath, held in place by linen threads. Originally, these two elements would have been covered by a dark brown linen cloth. There are smears of black resin-like substance on the mummy. The dorsal side has no final covering; possibly one existed but is now lost. Here the linen bandages spiralling around the ibis are visible, with the threads holding them in place and reinforcing the strength of the wrapping.

Scientific examination

CT investigation

The CT scans show a complete skeleton of a juvenile ibis, since the line of the proximal epiphysis of the tibiotarsus is still visible. The bird is positioned on its back, with the head folded over the sternum, the wings folded against the sides of the body, the neck curved in an S, and the legs

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1 (base-head)	Linen	S	Warp-faced	25 x 8–11	Undyed	
T2 (base)	Linen	S	Warp-faced	28–36 x 7–9	Undyed	
T3 (bandage)	Linen	S	Warp-faced	22 x 12	Undyed	
T4 (bandage)	Linen	S	Warp-faced	38–40 x 10–11	Pinkish	
T5 (bandage)	Linen	S		Too badly preserved for thread count	Dark brown	
T6 (bandage)	Linen	S	Warp-faced	46–48 x 11–12	Light brown	
Thread	Linen	S			Undyed	

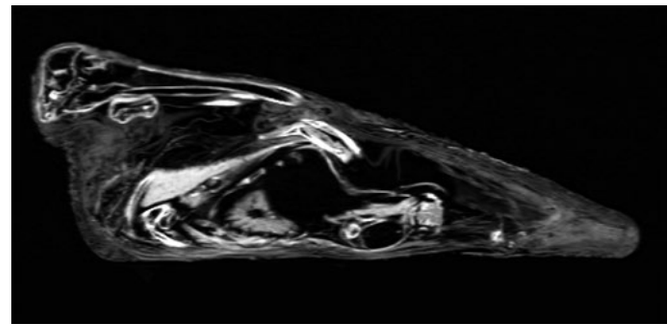
Textile notes: Six different qualities of linen were used to wrap the mummy and create the pattern.

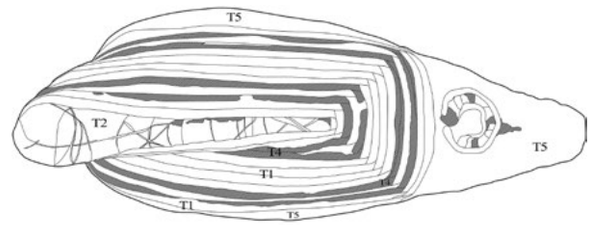
flexed toward the body. The gizzard is visible in the body cavity and contains, amongst other moderately radiodense material, a shell, most probably a *Lanistes carinatus*, based on its shape and size. It could have been reintroduced into the body after evisceration. Further tissue residue and a portion of trachea are visible in the peritoneal region, indicative of incomplete/careless evisceration.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19, 33; *Aegyptica Animalia*, 2000, pp. 67, 83, no. 27.
Parallels: Leiden, RMO H.III.EEE 1, AH 3a (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 283–86); Wade et al., *JAS* 39 (2012), pp. 1642–47; New Haven, YPM ANT.006924.002, ANT.006924.004; **Nos. 89–104, 106–109**.

106







Inventory number: Suppl. 11029
Object: Ibis mummy
Dimensions: L: 37.6, W: 12.2, H: 14.5
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: Probably 5th to 1st century BC, based on parallels
Scientific analyses: CT, Optical Microscopy
Description: An ibis mummy wrapped to show the animal lying on its back with the beak resting on its ventral side and the legs drawn up to the body as if it were seated. It is very elaborately wrapped, with the head covered with a piece of linen (T2) which was blackened by embalming agents and then covered with linen thread. Quite probably it was covered once by a more elegant dark brown bandage (T4), evoking the natural colour of the ibis' head. The body is covered by an elongated D-shaped bi/polychrome motif, in essence forming a large coffer, with the head and beak as the central foci. The coffers consist of two rows of undyed bandages (T1) followed by a dark brown one (T4), then a single undyed one, another brown one, then four undyed layers, a brown bandage, another undyed bandage, another single brown one, one undyed bandage, and the final large undyed covering (T5). The tail end is covered with a plain piece of fabric (T5), which is adorned by a roundel. This consists of two concentric circles filled in with dark brown, brown, undyed, or cream/white fabrics. The centre might have had brown in it originally. There is an equivalent of a stalk going toward the tip of the tail. The base of the mummy is less refined, with the edge bandages from the front overlapping slightly in the back, but not obscuring the spiral wrapping (T3) held in place with threads. Possibly this was once covered by another cloth, giving a tidy finish to the piece.

Scientific examination

CT investigation

The CT scans show a complete skeleton of an ibis positioned on its back, with the head folded over the sternum, the wings folded against the sides of the body, the neck curved in an S, and the legs flexed and pushed toward the body. The gizzard is within the body and contains some gravel, fragments of what might be broken shells, and at least one shell, a *Bellamya unicolor*. It might also contain a fish scale or two, but these cannot be confidently identified.

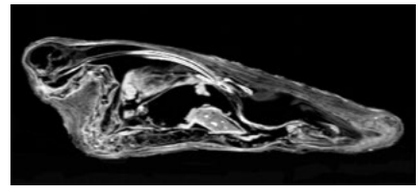
Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19, 33; *Aegyptica Animalia*, 2000, p. 83, no. 27.
Parallels: Wade et al., *JAS* 39 (2012), pp. 1642–47; **Nos. 89–105, 107–109**.

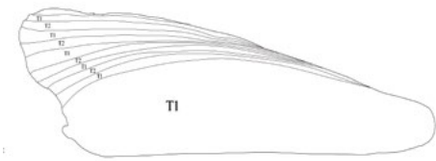
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1 (bandages, upper part)	Linen	S	Warp-faced	34 x 8–11	Undyed	
T2 (inner)	Linen	S	Warp-faced	18 x 8	Undyed	
T3 (back)	Linen	S	Warp-faced	22 x 11	Undyed	
T4 (strips)	Linen	S		Too badly preserved for thread count	Dark brown	
T5	Linen	S	Warp-faced	48 x 12	Undyed	
Thread	Linen	S			Undyed	

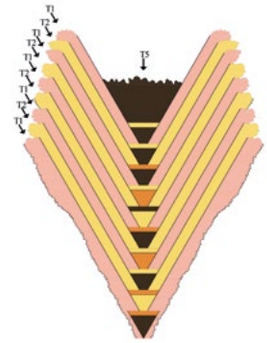
Textile notes: Five different qualities of linen were used to wrap the mummy and create the pattern.

107









Inventory number: Suppl. 11032
Object: Ibis mummy
Dimensions: L: 40.4, W: 13.6, H: 11.3
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: Probably 5th to 1st century BC, based on parallels
Scientific analyses: CT, UVF, Optical Microscopy
Description: An ibis mummy wrapped to show the animal lying on its back with the beak resting on its ventral side and the legs drawn up to the body as if it were seated. The head and beak are covered by a dark brown cloth (T5) and then a sequence of orange-pinkish (T1) and undyed (T2) strips were folded and wrapped around the package in a herringbone inset pattern: the "V" of each herringbone has an inset of transversal polychrome strips – undyed (T2), light brown (T4), or dark brown (T5) – forming a central line of triangles leading to the tip of the tail, reminiscent of the black part of the sacred ibis's tail feathers. A larger bandage (T3) secures the edges of the herringbones. The present colour of the bandages is caused by embalming oils.

Scientific examination

CT investigation

The CT scans show a complete skeleton of an adult ibis, positioned on its back, with the head folded over the sternum, wings folded against the sides of the body, neck curved in an S, and legs flexed and pushed toward the body. The ibis's gizzard contains seed-like objects, some heterogeneous material, some broken snail shells, gravel, and possibly some fishbone fragments.

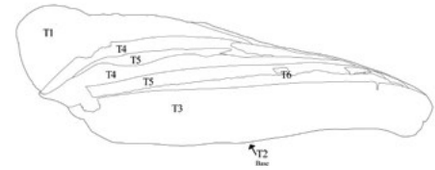
Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19.
Parallels: Cairo, EMC CG 29696 (Ikram and Iskander, *Non-Human Mummies,* 2002, pp. 15, 78); Leiden, RMO H.III. EEE 1, AH 3a (Raven and Taconis, *Egyptian Mummies,* 2005, pp. 283–86); Darmstadt, HLMD A-2463 from Abydos (Keefer, in Von Recklinghausen [ed.], *Ägyptische Mumien* 2007, p. 312); for parallels to gizzards being full, see Wade et al., *JAS* 39 (2012), pp. 1644–45; Stockholm, Medelhavsmuseet NME 953; **Nos. 89–106, 108–109**; New Haven, YPM ANT.006924.002, ANT.006924.004.

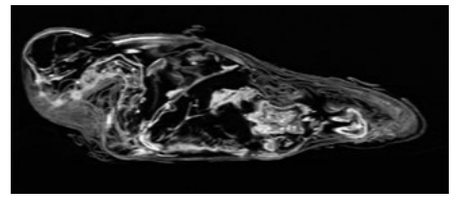
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	42–44 x 10–11	Orange-pinkish	
T2	Linen	S	Warp-faced	20 x 11	Undyed	
T3	Linen	S	Warp-faced	30 x 8	Undyed	
T4	Linen	S	Warp-faced	38 x 10	Light brown	
T5	Linen	S		Too badly preserved for thread count	Dark brown	

Textile notes: Five different qualities of linen were used to wrap the mummy and create the pattern.

108









Inventory number: Suppl. 11033
Object: Ibis mummy
Dimensions: L: 36.5, W: 12.5, H: 12
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: Probably 5th to 1st century BC, based on parallels
Scientific analyses: CT, UVF, Optical Microscopy
Description: An ibis mummy wrapped to show the animal lying on its back with the beak resting on its ventral side and the legs drawn up to the body as if it were seated. It was once elaborately bandaged in a herringbone pattern radiating from the beak down, although the bandages are now very damaged. The beak was covered with a textile (T1) soaked with a black resin-like substance. Originally the herringbone had alternating dark brown (T6), undyed (T4) and orange-pinkish (?) (T5) bandages. A larger undyed bandage (T3) secures the edges of the herringbone pattern. On the dorsal side, one can see that the ibis was covered vertically and horizontally by bandages (T2), held in place with some strands of linen thread.

Scientific examination

CT investigation

The CT scans show a complete skeleton of an adult ibis positioned on its back, with head folded over the sternum, wings folded against the sides of the body, neck curved in an S, and legs flexed up toward the body. A large package of sandy material was introduced into the body cavity, which contains a big shell, c. 15 mm high, possibly of *Lanistes carinatus*. Some fish vertebrae, plant stems, mineral fragments, and possibly packets of bandages might also be present. The tail end also has some sand in the wrappings.

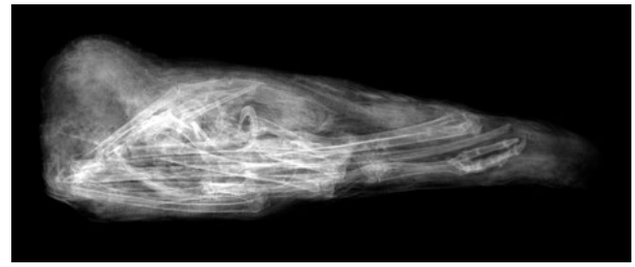
Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19, 33; Tamburini et al., *HeritSci* 9 (2021), pp. 5, 11, Table 2.
Parallels: Cairo, EMC CG 29696 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 15, 78); Leiden, RMO H.III. EEE 1, AH 3a (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 283–86); Darmstadt, HLMD A-2463 (Keefer in Von Recklinghausen [ed.], *Ägyptische Mumien,* 2007, p. 312); for parallels for gizzards being full, see Wade et al., *JAS* 39 (2012), pp. 1642–47; **Nos. 89–107, 109**.

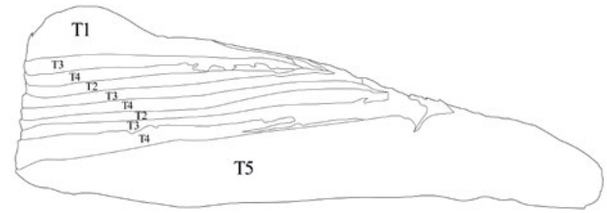
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	28 x 10	Undyed	
T2	Linen	S	Warp-faced	13 x 8	Undyed	
T3	Linen	S	Warp-faced	36 x 10	Undyed	
T4	Linen	S	Warp-faced	34 x 10	Undyed	
T5	Linen	S	Warp-faced	52 x 14	Orange-pinkish	
T6	Linen			Too badly preserved for thread count	Dark brown	
Thread	Linen	S			Undyed	

Textile notes: Six different qualities of linen were used to wrap the mummy and create the pattern.

109









Inventory number: Suppl. 11034
Object: Ibis mummy
Dimensions: L: 27, W: 8.3, H: 8.3
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: Probably 5th to 1st century BC, based on parallels
Scientific analyses: X-ray, CT, Optical Microscopy
Description: An ibis mummy wrapped to show the animal lying on its back with the beak resting on its ventral side and the legs drawn up to the body as if it were seated. The head and beak are covered by a slightly coarse bandage (T1) painted over with a black resin-like substance. The wrappings from the beak down take the form of a herringbone pattern with insets. The herringbone pattern is augmented, in the "V" areas, by a series of small overlapping horizontal bandages that create a triangular pattern. The bandage colours are varied, from the beak down: orange-pinkish (T3), dark brown (T4), undyed (T2), and undyed for the final perimeter bandage (T5), which extends over the edge of the mummy to its dorsal side. This bandage is large and covers the bottom very tidily.

Scientific examination

CT investigation

The CT scans show an incomplete skeleton of an adult ibis. The body position does not conform to the position implied by the wrappings, as the body is positioned sideways inside the bandages. The bird is damaged, and parts of the head, beak, and feet are missing. Fragments of the beak are distinguishable between the lower limbs. This suggests that it was either poorly embalmed, or it is a bird that had already started to decay before arriving at the embalming workshop – perhaps it was found outside the temple and brought to the embalmers/priests. It also might be an amalgam of parts of more than one ibis that had become detached from the bird(s) during the course of mummification and were gathered together to form an ibis package (see Chapter 1 for a discussion of false or amalgam mummies).

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 19, 33.
Parallels: Cairo, EMC CG 29696 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 15, 78); Leiden, RMO H.III.EEE 1, AH 3a (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 283–86); Darmstadt, HLMD A-2463 (Keefer, in Von Recklinghausen [ed.], *Ägyptische Mumien*, 2007, p. 312); for parallels for gizzards being full, see Wade et al., *JAS* 39 (2012), pp. 1642–47; **Nos. 89–108**; New Haven, YPM ANT.006924.002, ANT.006924.004.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	18 x 10	Undyed	
T2	Linen	S	Warp-faced	22 x 12	Undyed	
T3	Linen	S	Warp-faced	34 x 10	Orange-pinkish	
T4	Linen	S		Too badly preserved for thread count	Dark brown	
T5	Linen	S	Warp-faced	31 x 8	Undyed	

Textile notes: Five different qualities of linen were used to wrap the mummy and create the pattern.

110





Inventory number: Provv. 1515/3
Object: Ibis mummy
Dimensions: L: 13, W: 7.8
Acquisition: Unknown
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT, Optical Microscopy
Description: A roughly wrapped bundle summarily wrapped in three different qualities of textiles.

Scientific examination

CT investigation

The results of the CT scan show that the mummy bundle is messy within, containing four bird limbs – two upper and two lower ones, flexed – between which there is some textile treated with a black resin-like substance, and mixed material including three snail shells (probably *Bellamya unicolor*). A fragment of crocodile skin is also preserved. Whether the crocodile is related to the birds, has a specific religious reason for its inclusion, or was placed within with other (sacred?) detritus is unknown.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, p. 21.
Parallels: No parallels.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	20 x 10	Undyed	
T2	Linen	S	Warp-faced	30 x 9	Undyed	Self-bands
T3	Linen	S	Balanced	16 x 11	Dark brown	

Textile notes: Three different qualities of linen were used to wrap the mummy.

111







Inventory number: Cat. 3506/1 (other number: 201, on a label on the jar: 133)
Object: Jar for an ibis
Dimensions: H: 35.7, D mouth: 40.4
Acquisition: Acquired before 1882
Provenance: Probably from Saqqara, based on the jar type
Date: Probably Ptolemy II – Roman Period (284 BC – AD 395), based on jar shape and stopper type
Scientific analyses: CT
Description: The jar has a conical body, a rounded bottom and a straight flat rim. The fabric is a very coarse Nile C with many inclusions of sand, limestone, and a high amount of straw temper. The stopper, an inverted cup, is sealed with plaster. Because it is closed with this type of stopper (SD+) – a cheaper alternative to stoppers of gypsum and linen – and because of its beaker shape (MB1b2) the jar can be assigned to von den Driesch's type Mb1b2/SD2a.[146]

Scientific examination

CT Investigation

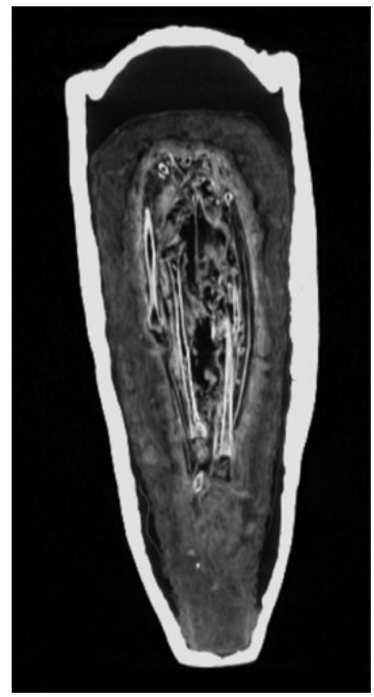
The CT scans reveal that the vessel contains the fragmentary remains of at least one bird, an ibis or possibly a raptor. The scarcity of the bone fragments makes a certain identification impossible.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 469, no. 3506 [133–35]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 37–38, fig. 1.
Parallels: Lortet and Gaillard, *La faune momifiée*, 1903, p. 118; Dublin, NMI 1888.22 (Murray, *Tomb of Two Brothers*, 1910, p. 18); Emery, *JEA* 51 (1965), pp. 3–8; Donadoni Roveri, *Art of Weaving*, 2001, p. 84; Leiden, RMO AMKZ 1, H.III.EEE 2 (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 288–89); Paris, Louvre E 2808–09; **Nos. 112–113**.

[146] von den Driesch et al., *ÄgLev* 15 (2005), pp. 208–10.

112







Inventory number: Cat. 3506/2 (other numbers, on three labels on the jar: 134, 60 and 725)
Object: Jar for an ibis
Dimensions: H: 49.4, D mouth: 57
Acquisition: Acquired before 1882
Provenance: Probably from Saqqara, based on the jar style
Date: Probably Ptolemy II – Roman Period (284 BC – AD 395), based on jar shape and stopper type
Scientific analyses: CT
Description: The jar has a conical body, a rounded bottom and a straight flat rim. The fabric is a very coarse Nile C with many inclusions of sand, limestone, and a high amount of straw temper. The lid, an inverted cup, is sealed with plaster. Because it is closed with this type of stopper (SD+) – a cheaper alternative to stoppers of gypsum and linen – and because of its beaker shape (MB1b2) the jar can be assigned to von den Driesch's type MB1b2/SD2b.[147]

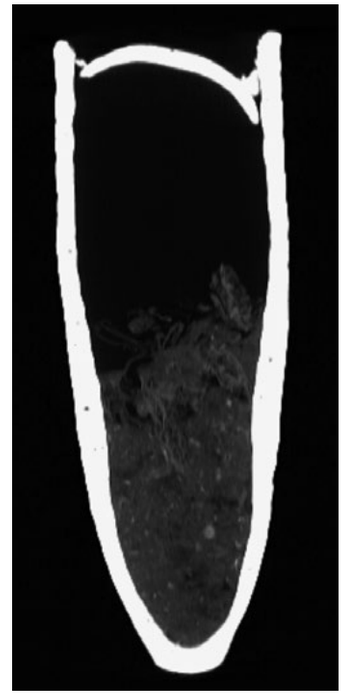
Scientific examination
CT Investigation
The CT scans show a complete skeleton of an adult ibis, based on epiphyseal fusion, arranged with the limbs flexed and the beak resting between them, along the sternum.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 469, no. 3506 [133–35]; Grilletto, *Materiali antropologici e zoologici*, 1991, p. 12, 19; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 37–38, fig. 1.
Parallels: Dublin, NMI 1888.22 (Murray, *Tomb of Two Brothers*, 1910, p. 18); Donadoni Roveri, *Art of Weaving*, 2001, p. 84; Leiden, RMO AMKZ 1, H.III.EEE 2 (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 288–89); Emery, *JEA* 51 (1965), pp. 3–8; **Nos. 111, 113**.

[147] von den Driesch et al., *ÄgLev* 15 (2005), pp. 208–10.

113







Inventory number: Cat. 3506/3 (other number: 223, on a label on the jar: 4879)
Object: Jar for an ibis
Dimensions: H: 34.5, D mouth: 41.6
Acquisition: Acquired before 1882
Provenance: Probably from Saqqara, based on jar style
Date: Probably Ptolemy II – Roman Period (284 BC – AD 395), based on jar shape and stopper type
Scientific analyses: CT
Description: The jar has a conical body, rounded bottom and straight flat rim. The fabric is a very coarse Nile C with many inclusions of sand, limestone, and a high amount of straw temper. The lid, an inverted cup, is sealed with plaster. Because it is closed with this type of stopper (SD+) – a cheaper alternative to stoppers of gypsum and linen – and because of its beaker shape (MB1b2) the jar can be assigned to von den Driesch's type MB1b2/SD2a.[148]

Scientific examination

CT Investigation

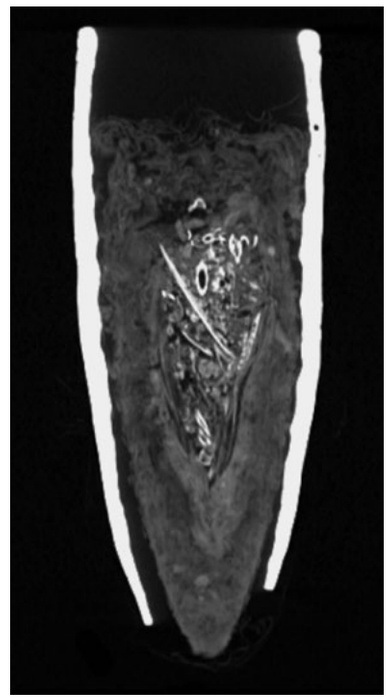
The CT scans show a complete skeleton of an unidentifiable bird, probably a chick due to its small size and poor bone mineralization. The upper and lower limbs appear gathered on the chest.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 469, no. 3506 [133–35]; Grilletto, *Materiali antropologici e zoologici*, 1991, p. 12, 19; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 37–38, fig. 1.
Parallels: Dublin, NMI 1888.22 (Murray, *Tomb of Two Brothers*, 1910, p. 18); Donadoni Roveri, *Art of Weaving*, 2001, p. 84; Leiden, RMO AMKZ 1, H.III.EEE 2 (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 288–89); Emery, *JEA* 51 (1965), pp. 3–8; Paris, Louvre E 2808–09; **Nos. 111–112**.

[148] von den Driesch et al., *ÄgLev* 15 (2005), pp. 208–10.

114







Inventory number: Cat. 3507 (other number, on a label on the jar: 4877)
Object: Jar for an ibis
Dimensions: H: 45.5, D mouth: 17.4
Acquisition: Acquired before 1882
Provenance: Unknown
Date: 370–200 BC (^{14}C date)
Scientific analyses: CT, ^{14}C dating
Description: The jar has a straight, flat rim, a conical body, and the bottom is broken. The fabric is a very coarse Nile C with many inclusions of sand, limestone, and a high amount of straw temper. It is slightly brownish on one side, and more red on the other, probably due to firing. It is an "MB with LP" type in von den Driesch's typology because it is beaker-shaped (MB) and linen is used as a stopper (LP).[169]

Scientific examination

CT Investigation

The CT scans show a probably complete, but fragmented, skeleton of an adult ibis positioned on its back with the head on the chest. The animal appears to be wrapped in many layers of textile bandages with padding, and some areas, particularly in the skull area, were covered with what might have been an oily-resinous material.

Radiocarbon dating (^{14}C)

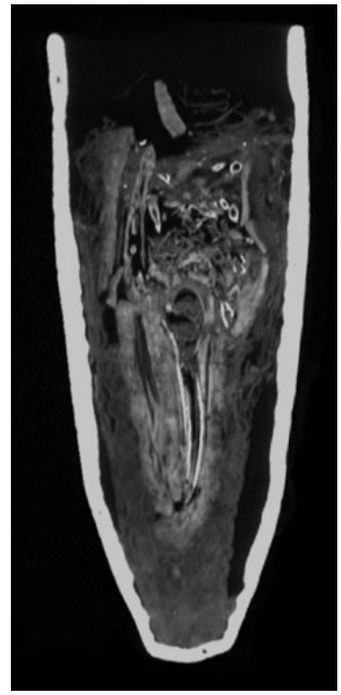
Textile, calibrated age (95% probability): 370–200 BC. It is noteworthy that it is earlier in date than those from Saqqara in the Museo Egizio collection.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 469, no. 3507 [136]; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, p. 37.
Parallels: Dublin, NMI 1888.22 (Murray, *Tomb of Two Brothers*, 1910, p. 18); Donadoni Roveri, *Art of Weaving*, 2001, p. 84; Leiden, RMO AMKZ 1, H.III.EEE 2 (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 288–89); Emery, *JEA* 51 (1965), pp. 3–8; **No. 115**.

[169] von den Driesch et al., *ÄgLev* 15 (2005), pp. 208–10.

115







Inventory number: Cat. 3508
Object: Jar for an ibis
Dimensions: L: 45.4, D mouth: 16.6
Acquisition: Acquired before 1882
Provenance: Probably from Saqqara, based on the jar style
Date: Probably 30th Dynasty – Early Ptolemaic Period (380–332 BC), based on the shape of jar and type of stopper
Scientific analyses: CT
Description: The jar has a conical body, rounded bottom and straight flat rim. The fabric is a very coarse Nile C with many inclusions of sand, limestone, and a high amount of straw temper. It is a "MB with LP" type in von den Driesch's typology because it is beaker-shaped (MB) and linen is used as a stopper (LP).[150]

Scientific examination

CT Investigation

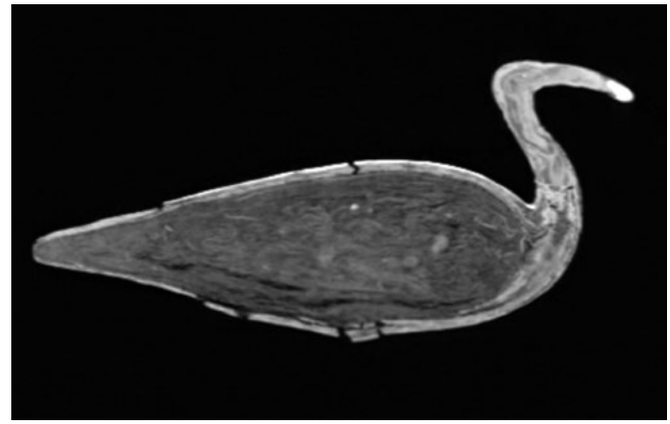
The CT scans show a complete, but fragmented, body of an adult ibis. The head was possibly placed under the wing, at an angle. Initially the bird was tightly wrapped in bandages, and then covered with what appears to be a "crust" that might have been made of clay or oils that impregnated the textiles, perhaps applied as part of a ritual or to serve as additional protection of the contents. Finally, several layers of more loosely wound textiles cover the package.

Bibliography: Fabretti et al., *Regio Museo,* 1882, p. 469, no. 3508 [137]; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, p. 37.
Parallels: Dublin, NMI 1888.22 (Murray, *Tomb of Two Brothers*, 1910, p. 18); Donadoni Roveri, *Art of Weaving*, 2001, p. 84; Leiden, RMO AMKZ 1, H.III.EEE 2 (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 288–89); Emery, *JEA* 51 (1965), pp. 3–8; **No. 114**.

[150] von den Driesch et al., *ÄgLev* 15 (2005), pp. 208–10

116





Inventory number: Cat. 2383 (= Provv. 3594)
Object: Coffin for an ibis
Dimensions: L: 43, W: 8.5, H: 22.4
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: CT
Description: A cartonnage coffin (?) in the form of an ibis. The head, beak, and neck are made of textile deeply impregnated with black resin-like substance or some radiopaque material. The head and beak are black and the neck is painted white. The dorsal side, comprising the wings and the back, is made of one carefully modelled piece of cartonnage made of linen and plaster and then painted. The layer of outer plaster is thick. The tail, which is squared off, was modelled so that lines indicative of feathers are visible. The ventral side is covered by a separate section consisting of at least eight layers of linen, pulled tight over the contents. Some sort of glue or gum Arabic helps to strengthen the layers of textile. The whole is painted with some sort of oil, resin, bitumen, or viscous paint. The surviving portions of the legs are made of textile that might have been painted with plaster. The modelling of the bird and its beak suggests that it is an image of a sacred ibis (*Threskiornis aethiopicus*), though the overpainting fits better with a Glossy ibis (*Plegadis falcinellus*). It was possibly a votive offering in statue form to the god Thoth.

Scientific examination

CT Investigation

The CT images show only textiles packing and no ibis bones, suggesting that this is a textile statue or false mummy.

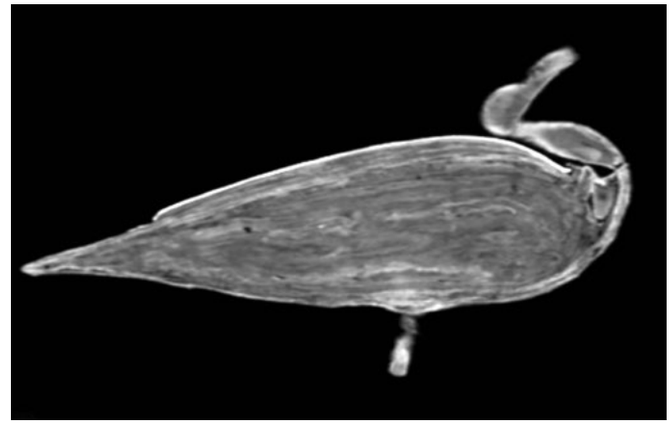
Textile notes

It is not possible to identify the textiles as they are impregnated with different materials.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 337, no. 2383 [60]; *Aegyptica Animalia*, 2000, p. 84, no. 29.
Parallels: Leiden, RMO F 1954/11.2 (Raven and Taconis, *Egyptian Mummies*, 2005, p. 287); Cairo, EMC CG 29874 (ibis), CG 29816 *bis* (crocodile): complete cartonnage coverings of animals; **No. 117**.

117





Inventory number: Cat. 2384 (= Provv. 3595) (other numbers: S. 920, on label; 2384 and P3, in black ink on the left wing)
Object: Coffin for an ibis
Dimensions: L: 36.8, W: 8.7, H: 16.3
Acquisition: Acquired before 1882
Provenance: Unknown, probably Tuna el-Gebel[151]
Date: Undetermined
Scientific analyses: X-ray, CT
Description: A coffin in the form of a sacred ibis. It was made of cartonnage (reinforced textile with plaster), constructed in sections, with the wings modelled and attached to the body. The neck and head are modelled in linen and painted black-brown, and attached to the main package; the neck arches back so the head touches the body of the bird (a similar pose is seen in a wooden ibis coffin).[152] The beak is reinforced with thread. White plaster covers the body and wings. The tail is blackened, but it is also possible that another piece of black cartonnage was placed here, indicative of the black tail feathers of a sacred ibis. A small part of the plumage might have been painted on the body near the neck, though it is also possible that this is an impression from a net-like material. The legs – thin pieces of wood wrapped in bandages – were probably set into a base. The wings were re-glued to the body in recent times. Two kinds of linen (T1–T2) can be distinguished, one around the neck and one from the base. A density count for the textiles is impossible due to their diminutive size.

Scientific examination

CT investigation

The CT scan shows that this coffin is empty of bones and consists only of textile and plaster. It is possible that there was no intention of ever filling it with a bird and that it was made as a sculpture from its inception.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 337, no. 2383 [61]; *Aegyptica Animalia*, 2000, p. 84, no. 29.
Parallels: Leiden, RMO F 1954/11.2 (Raven and Taconis, *Egyptian Mummies*, 2005, p. 287); Cairo, EMC CG 29874 (ibis), CG 29816 *bis* (crocodile): entire cartonnage coverings of animals; **No. 116**.

[151] Coffins echoing the shape of the ibis are found there (seen in the Mallawi Museum prior to the destruction post 2011).
[152] Raven and Taconis, *Egyptian Mummies*, 2005, p. 287, Inv. F. 1954/11.2.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S		Too badly preserved for thread count	Undyed	
T2	Linen	S		Too badly preserved for thread count	Undyed	

Textile notes: Two different qualities of linen have been identified but they cannot be described because they are too small and impregnated with stucco and other substances.

8.9 Raptors

Raptor mummies are a feature of several animal necropoleis and are primarily associated with the sun god Re, Horus (and thus the king) and, possibly, the creator god Atum,[153] due to their colouration and the fact that they are efficient hunters, fly high, and have excellent eyesight, making them masters of the air and of all that they survey. Other deities associated with falcons are Sokar and Sopdu, but these do not seem to have been an object of animal cults, though one example in **No. 126** might be associated with the former deity.

Major raptor burials sites are recorded at Saqqara,[154] Quesna,[155] and Asyut, the latter being excavated by Schiaparelli, with the mummies now being located in the Museo Egizio. Many of the mummified raptors are falcons of some sort, but other birds of prey are often also found amongst them,[156] as the gods were often über-exemplars of a general type of animal, rather than a specific species. Thus, Horus is an amalgam of several raptors, taking the best and strongest attribute from each,[157] as is also the case for Re, and indeed other deities. Sites where raptor mummies were found, such as the Theban Tomb 11 complex,[158] often yielded a considerable variety of species, including passerines and even water birds – it has been suggested that these animals died within a sacred complex and were therefore thought deserving of consecration to the god, and thus mummified and interred together with the animals that were the god's avatar.

Raptor mummies tend to be wrapped in similar ways to ibis mummies (see Chapter 9.8): teardrop-shaped, with variations in the wrappings. However, some take the form of anthropomorphic figures with raptor heads detailed in appliqué or in the form of cartonnage masks,[159] as is seen in this catalogue (**Nos. 120, 122–123**). At Saqqara,[160] these birds were also placed in pots, though this is not the norm for them, as often at other sites, such as Quesna and Thebes, these votive offerings were buried without containers. However, some wooden falcon (Horus) shaped wooden coffins are used for mummies (**Nos. 125–128**), as well as bronze containers, either in the shape of the bird, or as boxes with images of the bird surmounting them (**Nos. 129–131, 134–135**).

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[153] Lortet and Gaillard, *La faune momifiée*, 1905, pp. 114–77, 283–301; Wilkinson, *Complete Gods and Goddesses*, 2003, 200–11; Vernus and Yoyotte, *Bestiaire des pharaons*, 2005, pp. 369–77; Ikram, in Wallis (ed.), *Relating to Raptors*, forthcoming.

[154] Russell et al., *BullOrnith* 117 (1997), pp. 148–49; Davies and Smith, in Quirke (ed.), *Temple in Ancient Egypt*, 1997, pp. 112–31; Davies and Smith, *Falcon Complex*, 2005.

[155] Rowland et al., *JEA* 99 (2013), pp. 53–84.

[156] von den Driesch et al., *ÄgLev* 15 (2005), pp. 208–10; Rowland et al., *JEA* 99 (2013), pp. 53–84; Ikram and Spitzer, in Daujat et al. (eds.), *Archaeozoology of Southwest Asia*, pp. 245–55.

[157] Houlihan and Goodman, *The Birds of Ancient Egypt*, 1986, p. 48; Ikram, in Ikram (ed.), *Divine Creatures*, 2015, p. 9, especially note 9.

[158] Ikram and Spitzer, in Daujat et al. (eds.), *Archaeozoology of Southwest Asia*, pp. 245–55; possibly at Sharuna, though these remain to be studied in detail; Bosch-Puche and Ikram, in Di Cerbo and Jasnow (eds.), *On the Path to the Place of Rest*, 2022, pp. 17–36.

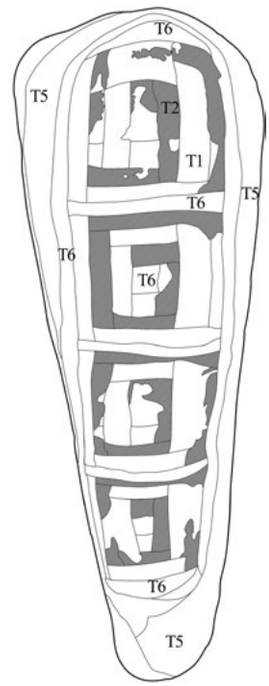
[159] Martin, *Sacred Animal Necropolis: Southern Dependencies*, 1981, pl. 33.1404 and 1183.

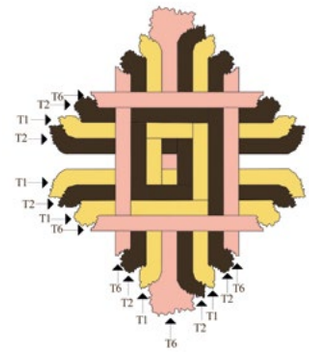
[160] Davies and Smith, in Quirke (ed.), *Temple in Ancient Egypt*, 1997, pp. 112–31; Davies and Smith, *Falcon Complex*, 2005.

118









Inventory number: Suppl. 11030
Object: Raptor mummy
Dimensions: L: 28.5, W: 10.3
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: Possibly 3rd century BC to 3rd century AD, based on parallels
Scientific analyses: CT
Description: Raptor mummy in a teardrop shape with four meander coffers running centrally. The coffers consist of undyed (T1), orange-pinkish (T6) and dark brown bandages (T2), set within a frame of pinkish bandages (T6). The meander pattern is not quite centred. The verso has no final tidying bandage, thus the many spiral bandages and threads used to create the mummy are visible. The inner layer is made of textile strips (T3 and T4), probably impregnated with embalming agents, which are covered with another piece of fabric (T3) secured by thread. The edges are bolstered by multiple layers of folded perimeter bandages (T5) gathered at the tip of the teardrop.

Scientific examination

CT investigation

The CT scans show that this package contains two birds, both missing their head. One bird is a bit bigger than the other, but both seem to be adult raptors, most probably Lanner falcons (*Falco biarmicus*), based on bone measurement (humerus is c. 6.3 cm long). As the left proper specimen is slightly smaller than the other, it is possible that it is a male, and the other a female.[161] Both animals are in a standard position, with the wings gathered along the body and the legs flexed at the knee. The package is larger than the birds, presumably to make it look more impressive and costly.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 13, 20, 33.
Parallels: This shape and the wrapping pattern are generally associated with ibis mummies: New York, BM x1179.5; Philadelphia, Penn Museum E12443.

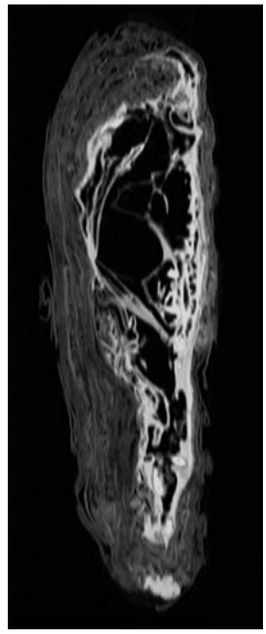
[161] We are grateful to M. Spitzer of the Smithsonian Institution's Natural History Museum for discussing and confirming this identification.

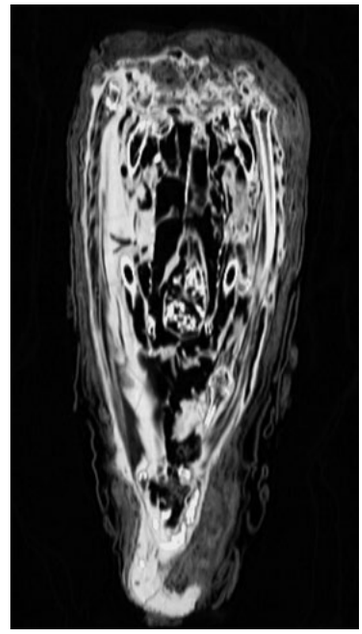
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	20 x 13	Undyed	
T2	Linen	S	Warp-faced	34 x 12	Dark brown	
T3	Linen	S	Balanced	10 x 7	Undyed	
T4	Linen	S	Basket	20 x 9	Undyed	
T5	Linen	S	Warp-faced	34 x 12	Undyed	
T6	Linen	S	Warp-faced	44 x 14	Orange-pinkish	
Thread	Linen	S			Undyed	

Textile notes: Six different qualities of textile were used to wrap the mummy and create the decorative pattern.

119







Inventory number: Provv. 6115
Object: Bird mummy
Dimensions: L: 30.4, W: 11.4
Acquisition: Unknown
Provenance: Unknown
Date: Undetermined
Scientific analyses: CT, Optical Microscopy
Description: A bird mummy in a roughly teardrop shape that is spiral bound with broad bandages. One side is domed and the other flat. It is very heavy and dense. At least three different qualities of linen were used to create the mummy. The most external bandage (T1) has self-bands and retains its starting border and a selvedge. The exterior spiral bandages (T1) are wide: 5.5 cm. The inner bandage (T2) is 4 cm wide. A third textile (T3) was found in the pointed tail-area.

Scientific examination

CT investigation

The CT scans show that the package contains the body of an adult bird without its skull – perhaps this was used to make up another mummy. The legs are flexed at knee height and otherwise extended. The mummy appears to be coated in a black resin-like substance, which is more abundant at the caudal end. The body was eviscerated. Based on the morphology of the bones, it is probably a small raptor.

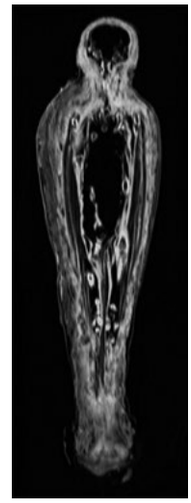
Bibliography: Unpublished.
Parallels: No precise parallels for this shape, but for a headless raptor see Cairo, EMC CG 29685.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	26–28 x 7	Undyed	Starting border Self-bands Selvedge
T2	Linen	S	Warp-faced	38 x 16	Undyed	
T3	Linen	S	Balanced	12 x 9	Undyed	

Textile notes: Three different qualities of textile were used to wrap the mummy.

120






Inventory number: Provv. 1450
Object: Raptor mummy
Dimensions: L: 28.6, W: 7
Acquisition: Unknown
Provenance: Unknown
Date: Undetermined
Scientific analyses: CT, UVF, Optical Microscopy
Description: Raptor mummy with stylised animal head and mummiform body. The mummy is lying on its dorsal side. Some details of the head are modelled in linen. There is some degree of anthropomorphizing, as the end is almost made to resemble human feet or, rather, the foot of a coffin, all of which are also evocative of the form of Osiris. The face and beak were covered with a piece of fabric (T1), to which round, dark, linen eyes were appliquéd. The mummy was wrapped in several pieces of cloth and bandages that were secured by threads (S-spun). Then the ventral side was covered with two textiles: one, in an irregular basket weave, extends from the neck to approximately the start of the legs (T2); overlapping this, but mainly on the legs, is the other textile in a plain weave (T3). The bird is neatly edged on the ventral side by two large folded pieces of fabric (T4). The dorsal side is less tidy, and was not meant to be seen, unless it is missing a final bandage.

Scientific examination

CT investigation

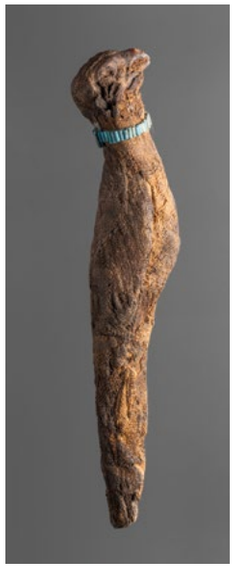
The CT scans show that the package contains a complete skeleton of an adult raptor, possibly one of the smaller *Falco* species. The animal is in a standard position with the wings gathered along the body and the legs crossed and flexed at the knee. The animal was probably eviscerated, although there is evidence of some soft tissues in the peritoneal area. The trachea is still present in the cervical region.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 14, 19, 21.
Parallels: Lortet and Gaillard, *La faune momifiée*, 1903, p. 14, fig. 59; Leiden, RMO F1982/121.2, 1982/11.2 (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 278, 281); Chicago, OIM E9162; Manchester, MM 19.81.576 (painted face).

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	36 x 13	Undyed	
T2	Linen	S	Irregular basket	24 x 20	Undyed	
T3	Linen	S	Warp-faced	42 x 14	Undyed	
T4	Linen	S	Warp-faced	36 x 9	Undyed	
Thread	Linen	S			Undyed	

Textile notes: Four different qualities of textiles were used to wrap the mummy and create the pattern.

121





Inventory number: Provv. 1483
Object: Raptor mummy
Dimensions: L: 28, W: 7
Acquisition: Unknown
Provenance: Unknown
Date: 360–190 BC (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating, UVF, Optical Microscopy
Description: Falcon mummy in the shape of the animal. The mummy has coarse bandages, at least four layers, probably from the same fabric, impregnated with a dark, resinous substance. Many are broken off, revealing portions of the bird beneath. The feathers are darkened with the same substance that discolours the linen bandages – no doubt the bird was coated with a layer of this resinous material as part of the embalming process. This mummy is very unusual in that a choker of forty-four cylindrical blue faience beads adorns its neck. The beads are not uniform in size or colour, as they range from royal blue to light turquoise. At least three beads have horizontal striations around them. It is possible that a dealer added the choker to the mummy in order to increase the artefact's value, as the beads are strung on blue thread, which is unusual for such jewellery. The blue yarn in which the beads are strung is S-spun, dyed after the thread had been twisted. Threads used for funerary nets are usually undyed and Z-plied. Furthermore, there are no known examples of the use of dyed yarn to string beads.

Scientific examination

CT investigation

The CT scan reveals that the mummy is an adult kestrel (*Falco tinnunculus*).

Visual examinations, together with radiographs, show that the bird's legs are stretched along the belly. Probably it was eviscerated, though there is evidence of soft tissues in the peritoneal area.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 360–190 BC.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19.
Parallels: None with a necklace, but plainly wrapped *Falco tinnunculus* are fairly common: Leiden, RMO F 1910/5.2 (Raven and Taconis, *Egyptian Mummies*, 2005, p. 282); Chicago, OIM E 42440 (Pelizzari et al., in Bailleul-LeSuer and Ressman [eds.], *Between Heaven and Earth*, 2012, p. 110, fig. 13.1); Manchester, MM 11295; Philadelphia, Penn Museum CG2015-4-1276, L-55-284.

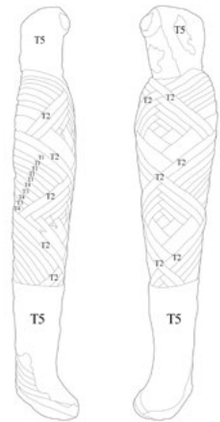
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	22 x 9–7	Undyed	

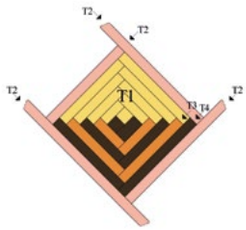
Textile notes

122









Inventory number: Provv. 1460
Object: Raptor mummy
Dimensions: L: 22.3, W: 3.7
Acquisition: Unknown
Provenance: Unknown
Date: 390–170 BC (^{14}C date)
Scientific analyses: CT, ^{14}C dating, UVF, Optical Microscopy
Description: Raptor mummy with stylised animal head and mummiform body. The head was wrapped separately (T5) and is a bit squashed and unevenly covered with a black resin-like substance (possibly it once had a mask?). The body is wrapped to create two diamond-shaped coffers in the front, created with four bandage colours: undyed (T1); pinkish (T2); light brown-orange (T3); dark brown (T4). Moreover, some light brown-orange strips (T3) are impregnated with a black resin-like substance to give an impression of shading and depth. On the back they form a very tidy row of horizontal bandages. The bottom third of the mummy is covered by a folded piece of the same undyed linen (T5) used for the head, which provides support and also gives form to the foot of the object. The foot was further reinforced with extra linen and thread, wound around spirally.

Scientific examination

CT investigation

The CT scan shows that the package does not contain a complete mummy; rather, it contains about ten feathers of different lengths originating from different parts of a bird. It is not possible to tell if the feathers are from a raptor or not. In the head area there is radiopaque material around the feathers. The beak is created in textile, with the black resin-like substance making it radiopaque in the head area.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 390–170 BC.

Bibliography: *Aegyptica Animalia*, 2000, p. 82, no. 14; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 14 (as "1460" without the prefix "Provv."), 19, 21.
Parallels: Cairo, EMC CG 29682, 29689 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 13–14, 76–77); Leiden, RMO F1982/12.8, 1982/12.11 (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 274, 277); Philadelphia, Penn Museum E476.[162]

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	44–38 x 11–10	Undyed	
T2	Linen	S	Warp-faced	28 x 11	Pinkish	
T3	Linen	S	Warp-faced	20 x 13	Light brown-orange	
T4	Linen	S	Warp-faced	40 x 13	Dark brown	
T5	Linen	S	Warp-faced	28 x 11	Undyed	

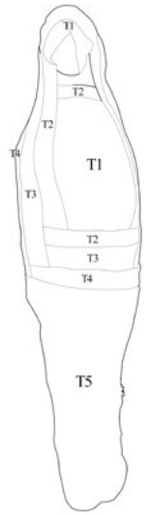
Textile notes: Five different qualities of textiles were used to wrap the mummy and create the pattern. Probably textile T2 and T5 are from the same fabric.

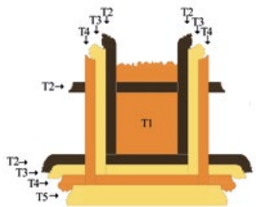
[162] From Thebes (contents uncertain).

123









Inventory number: Suppl. 11039
Object: Raptor mummy
Dimensions: L: 25.5, W: 5.5
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: Probably Ptolemaic Period (332–30 BC) based on parallel with **No. 124**
Scientific analyses: X-ray, CT, Optical Microscopy
Description: The mummy has a roughly anthropoid form, with a mummiform body and a head that might once have had some modelling. The ventral side is more elaborately decorated than the dorsal, although it is damaged and portions are missing, as attested by their shadowy remains. The textile that covers the breast and the face (T1) functioned as the background. A dark brown bandage (T2) creates a rectangular frame that also extends to encircle the head. On the body, this bandage was edged by a broader undyed folded bandage (T3). At the approximate start of the legs, there is a horizontal red-orange (T4) folded bandage. The tail end of the bird is covered by a beige-yellow loosely woven bandage (T5). The head was probably covered by an extra bandage on which indications of the bird's face were traced. The dorsal side of the mummy is very disordered, showing disintegrating bandages darkened by black resin-like substances, kept in place with thread.

Scientific examination

CT investigation

The CT scan shows a complete skeleton of an adult raptor, probably a *Falco* spp. The animal is in a standard position with the wings gathered along the body and the legs flexed rather dramatically. The skull is fairly damaged. It was probably eviscerated: the gizzard, containing inhomogeneous material (perhaps bandages), might have been reintroduced into the body. The cervical and peritoneal tracts of the trachea are also visible, but no other internal organs.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, p. 19.
Parallels: Lortet and Gaillard, *La faune momifiée*, 1903, p. 115, fig. 62; Leiden, RMO F 1998/11.2 (Raven and Taconis, *Egyptian Mummies*, 2005, p. 281); Philadelphia, Penn Museum E1035; **No. 124**.

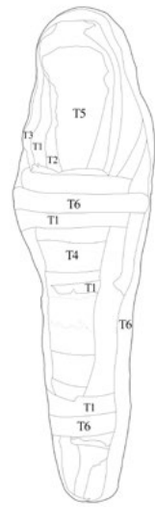
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	22–20 x 15–14	Undyed	
T2	Linen	S	Balanced	17 x 11	Dark brown	
T3	Linen	S	Warp-faced	19 x 9	Undyed	
T4	Linen	S	Balanced	16 x 11	Red-orange	
T5	Linen	S	Balanced	14 x 11	Undyed	

Textile notes: Five different qualities of textile were used to wrap the mummy and create the pattern. The count/density of T2, T4 and T5 is similar and it is possible that these bandages are made from the same fabric.

124







Inventory number: Suppl. 11040
Object: Raptor mummy
Dimensions: L: 24.8, W: 7.8
Acquisition: Italian Archaeological Mission (1910)
Provenance: Asyut
Date: 210–30 BC (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating, UVF, Optical Microscopy
Description: Raptor mummy with undefined head and mummiform body (without feet). The ventral side was decorated with an elaborate pattern of bandages that are now damaged. It originally had at least two coffers of undyed (T1), dark brown (T2) and orange (T3) bandages on a textile used as background (T4). The same undyed (T1) and dark brown (T2) and orange (T3) strips frame the head of the mummy on a different background textile (T5), giving the impression of someone wearing a shawl over the head. The dorsal side shows the inner fabric, which is soaked with embalming agents and covered with an undyed textile (T6) overlapping the sides of the package. Beneath the final wrappings, the bird was covered with a series of spiral bandages as well as swatches of cloth, held in place with linen thread and a black resin-like substance which impregnated all the material. The wrapping was completed with an undyed textile (T6) placed around the whole.

Scientific examination

CT investigation

The CT scans show a complete skeleton of an adult raptor, most probably a kestrel (*Falco tinnunculus*). It was positioned lying on its back with the head turned to the left – suggesting that the neck was possibly broken. The tibiotarsi are crossed, a common phenomenon in small raptor mummies, and the wings slightly pushed up, unlike other bird mummies, when they are pressed down, along their bodies, as they are in nature. A large part of the peritoneal cavity is occupied by the gizzard, inside which there is various material, including possibly bone fragments and plant elements from the bird's last meal.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 210–30 BC.

Bibliography: Tamburini et al., *HeritSci* 9 (2021), pp. 7, 14, Table 2.
Parallels: For the wrapping, Cairo, EMC CG 29879 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 42, 96).

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	20 x 10	Undyed	
T2	Linen	S	Balanced	18 x 15	Dark brown	
T3	Linen	S	Warp-faced	26 x 11	Orange	
T4	Linen	S	Warp-faced	20 x 11	Undyed	
T5	Linen	S	Warp-faced	28 x 11	Undyed	
T6	Linen	S	Warp-faced	40 x 13	Undyed	

Textile notes: Six different qualities of textiles were used to wrap the mummy and create the pattern. The count/density of T1 and T4 is similar, and it is possible that these bandages are made from the same fabric. Even T3 and T5 have a very similar count.

125





Inventory number: Cat. 2376
Object: Raptor mummy and its coffin
Dimensions: L: 17.7, W: 6.1, H: 8.5
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT

Description: A rectangular wooden coffin surmounted by a carved image of a recumbent mummiform falcon wearing the double crown. The coffin is made from a single piece of wood, with a 5 cm deep recess on the bottom to house the mummy. The body of the falcon is poorly defined and the face is not detailed. It is possible that the eyes had been added or enhanced in another material. The entire object was covered with a thin layer of plaster, and the top, at least, was gilded. Oils poured over it obscure the gilding.

Scientific examination

CT investigation

The CT scans show that inside the box there is a small textile bundle (about 11 cm long) containing a skeletal structure that is difficult to identify due to its size. It could be a young bird, perhaps a raptor, but the body position is unusual: supine with lower limbs extended and upper limbs semi-flexed at the elbow.

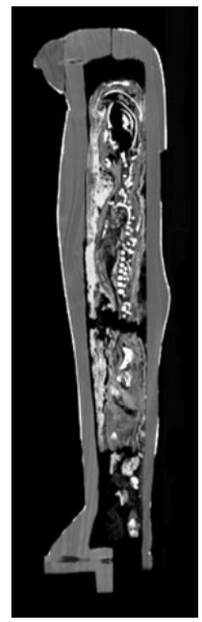
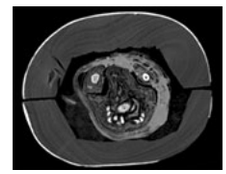
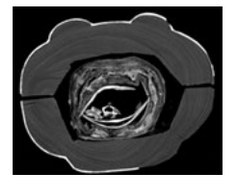
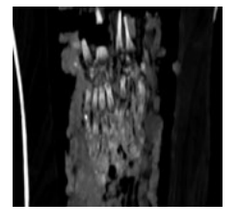
Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 335, no. 2376 [53].
Parallels: Donadoni Roveri, *Art of Weaving*, 2001, p. 82.

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Rectangular box surmounted by animal	Yes	No	No	One piece of wood	No	No	No

Coffin technical notes

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Inventory number: Cat. 2373
Object: Human mummy in a coffin for a raptor

MUMMY

Dimensions: L: 3, H: 52
Acquisition: Acquired before 1882
Provenance: Unknown
Date: See discussion
Scientific analyses: CT, ^{14}C dating
Description: An elongated mummy bundle. It is wrapped in a linen shroud (T1) that is quite dark due to oils and resins used in embalming. Similar dark bandages, soaked with embalming agents, are positioned at the foot end, serving as a cushion. Beneath this outer shroud, lighter undyed bandages (T2) are visible on the mummy. Some more undyed pieces of textiles (T3) are positioned under the mummy bundle, with more filling the empty space at the foot end and tied around the mummy at the narrow end. It is possible that this filling is not original to the mummy. At the narrow foot end there are breaks, and a fragment of a bone is visible.

Scientific examination

CT investigation

The CT scan shows the complete skeleton of what appears to be either a foetus or possibly a new-born human no more than 8 weeks old, probably dead at birth due to head trauma, although the broken state of the skull might be due to brutal handling during mummification. The body is supine with the arms extended along its sides and the hands placed in front of the pelvis. The skeleton is broken into several parts that have slightly separated, particularly notable in the area of the tibiae. This is post-mortem: pushing the body into the narrow coffin might be partially responsible for the breakages. It is wrapped in several layers of cloth, with the arms and legs wrapped separately and then wrapped together with the body. A resinous coating covers the exterior and has penetrated several layers of bandages, particularly on the left proper side.

Radiocarbon dating (^{14}C) and discussion

Textile (T3), calibrated age (95% probability): 1210–930 BC. The textile sampled is significantly older than any other votive mummy from Turin, however not only is the coffin stylistically Ptolemaic, but its wood dates to that period (see below). It is possible that the textile was reused for a burial of the Ptolemaic Period, or the mummy was reburied in a Ptolemaic coffin. Also, it is possible that this piece of textile was not originally in the coffin, but was placed here later in order to cushion the mummy.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	20 x 9	Undyed	Selvedge
T2	Linen	S	Warp-faced	21 x 11–9	Undyed	
T3	Linen	S	Warp-faced	33 x 14	Undyed	

Textile notes: Three different qualities of textiles were used to wrap the mummy. Textiles T1 and T2 are probably from the same fabric as they have a similar thread count/density.

COFFIN

Dimensions: L: 14.2, W: 13, H: 64; Lid W: 7.5, Box W: 5.5
Acquisition: Acquired before 1882
Provenance: Unknown
Date: 400–200 BC (^{14}C date)
Scientific analyses: CT, ^{14}C dating
Description: Falcon-headed mummiform wooden coffin with human ears, probably a manifestation of the god Sokar. It originally consisted of parts: the base, which is lost, and the two halves of the coffin that contain the mummy, with a tenon to secure them to the base. The body is plastered and painted white, the wig is blue and yellow, the eyes are inlaid in black glass, and blue (Egyptian blue?) is used for the details of the facial markings. Originally the face and neck were gilded; only some residue of this remains.

Scientific examination

Radiocarbon dating (^{14}C)

Wood, calibrated age (95% probability): 400–200 BC (see discussion above).

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 335, no. 2373 [81]; *Aegyptica Animalia*, 2000, p. 82, no. 16.
Parallels: London, BM EA41552: similar coffin, but the mummy has a wax face of Osiris.

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Mummiform coffin with animal head	Yes	Yes	White Blue Yellow	Two halves from the same piece of wood A lost base	Three between the halves	One between body and base	Eyes inlaid in black glass

Coffin technical notes

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Inventory number: Cat. 2374
Object: Raptor mummy in a coffin

MUMMY

Dimensions: L: 10, H: 31.5
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: CT, Optical Microscopy
Description: Mummy package in a roughly anthropoid form, considerably smaller than the coffin. The mummy is wrapped in bandages that are splitting. The uppermost bandage on the top was coated with a black resin-like substance and the ones below are plain. At least six layers of spirally wrapped bandaging can be counted, with the final ones creating an "X". The outermost bandage is wrapped horizontally. The black material from the outer bandage has dribbled a bit on the right proper side of the coffin's trough. The bandages crossed over the head are 2.5–2.7 cm in width.

Scientific examination

CT investigation

The mummy contains some skeletal elements, which are hard to identify. In some areas, close to the centre of the package, fragments of bones can be seen, covered with a black resin-like substance that renders them radiopaque. Some metapodia seem to be present, but the species cannot be identified. The bandage is discontinuous, especially ventrally; inside there is black resin-like substance encompassing bone fragments in some places.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	32 x 13	Undyed	

Textile notes

COFFIN

Dimensions: L: 15.6, W: 15, H: 49; Lid W: 8.1; Box W: 4.5
Acquisition: Acquired before 1882
Provenance: Unknown
Date: 470–200 BC (^{14}C date)
Scientific analyses: CT, ^{14}C dating
Description: Falcon-headed mummiform wooden coffin with the falcon wearing a tripartite wig and a broad collar. The coffin is made of two horizontal halves cut from the same piece of wood, with the beak inserted into the face. It has a back-pillar. The face is gilded, the eyes are inlaid in a black material, and the beak, facial markings, wig, and broad collar are painted. The front of the coffin is inscribed with a column of hieroglyphs painted in black.

Inscription

The inscription, which is framed by a single line on the top and sides, reads:



ḏd-mdw j(n) **[***Skr?***]** *Wsir Wn-nfr ḫnt.j* <*jmn.tyw?*>
"Words spoken by [...] Osiris Wennefer, Foremost of the Westerners (?)"

Comment
One would expect ***Skr***, "Sokar", after "Words spoken", but what's left of the signs in that group does not seem to match this reading. The two horizontal signs appear to be the crossbars of a *nfr* sign rather than two N's following *wnn*. Again, one would expect *jmn.tyw* after *ḫnt.j*, but that is not what is written. The last sign looks like the seated man (*GEG* A1), in which case it could be the determinative of the personal name of the dedicator, unreadable to us.

Scientific examination

Radiocarbon dating (^{14}C)
Wood, calibrated age (95% probability): 470–200 BC, in keeping with the style of the coffin.

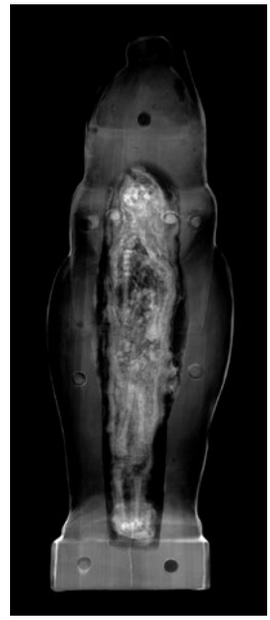
Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 335, no. 2374 [51]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19; *Aegyptica Animalia*, 2000, p. 82, no. 15; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 39–40, fig. 2C.
Parallels: London, BM EA41552: similar coffin, but mummy has a wax face of Osiris; Manchester, MM 9429, same wrapping but without coffin.

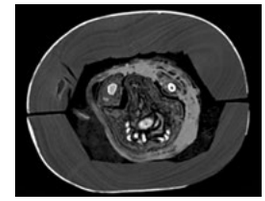
Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Mummiform coffin with animal head	No	Yes	Gilded Blue Red	Two pieces from the same piece of wood A separate piece of wood for the beak		Six	Eyes inlaid in black material

Coffin technical notes

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Inventory number: Cat. 2375
Object: Human mummy in a coffin for a raptor

MUMMY

Dimensions: L: 4.2, H: 19
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT, Pyrolysis-GC/MS
Description: The coffin contains a package spirally wrapped in linen that is covered with a black resin-like substance.

Scientific examination

CT investigation

The CT scans show that inside the box there is a textile-wrapped package containing a skeletal structure that is difficult to discern. It appears to be a human foetus, 16 to 18 weeks of age based on its size, lying on its right side and forced into the small coffin. The arms seem to be crossed over the chest. The head is missing, as are the hands, save for a few metacarpi. The feet appear to be present, but are separated from the distal tibia.

Pyrolysis-GC/MS

The mummy was subjected to Pyrolysis-GC/MS. The results showed traces of lipids and saccharides of undetermined origins.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S		Too badly preserved for thread count	Undyed	

Textile notes

COFFIN

Dimensions: L: 8.5, W: 8.5, H: 27.5; Lid W: 6.2; Box W: 2.4
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT
Description: Mummiform wooden coffin with the head of a falcon wearing the double crown. The coffin's two halves are carved from a single piece of wood, which were dowelled together. The body is covered with a brown paint layer without a preparatory layer of plaster, with the head and lappets gilded in front. The eyes are rendered with balls of hard black material.

Bibliography: Fabretti et al., *Regio Museo,* 1882, p. 335, no. 2375 [52]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19; *Aegyptica Animalia*, 2000, p. 82, no. 15; Xiaolin (ed.), *Egypt*, 2018, p. 111, fig. 62; Marini and Tjabbes (eds.), *Egito Antigo*, 2020, p. 123; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, p. 41.
Parallels: No parallels.

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Mummiform coffin with animal head	No	Yes	Gilded Brown	Two halves from the same piece of wood	Seven	No	Eyes inlaid in black material

Coffin technical notes

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Inventory number: Cat. 2380
Object: Coffin for a raptor
Dimensions: L: 17.3, W: 5.15, H: 10.5; Box H: 5.3; Falcon sculpture H: 5.2
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Probably Late Period (722–332 BC), based on parallels and general typology.
Scientific analyses: None
Description: Rectangular hollow-cast copper alloy box that contained a probably avian mummy, surmounted by an image of a falcon.

The aperture at the rear of the box whence the mummy would have been introduced into the coffin is now open. The falcon image is situated a little bit off-centre of the lid's axis, c. 5.5 cm away from the front, leaning to the right. The feet and legs are large in comparison to the rest of the body. The front toes ending in small talons are spread out, and small angular extensions at the back of the legs represent the crural feathers; plumage details are incised. Falcons without a crown are rather rare, as are plain boxes. Potential Lower Egyptian places of origin for such artefacts are particularly Buto and Saqqara.[163]

Technical notes

The box and the falcon were cast together based on two separately modelled wax pieces. The feet and tail are fused with the box's lid. The presence of several core supports can be determined: there is one 2.5 cm away from the front edge and another one under the tail of the falcon along the central axis of the box's top. Corresponding chaplets are present along the centre lines of the outer sides. The chaplets of the bottom are at 4.8 and 13 cm from the front. The corroded appearance of the box renders it quite difficult to identify the chaplets on the outside. The box's walls are between 0.25 and 0.3 cm thick.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 336, no. 2380 [57].
Parallels: Type T 22 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 286, 746, nos. 835–838, pls. 45b–c); for more parallels, see Engelbach, *ASAE 24* (1924), p. 175, no. 13; Berlin, ÄM 22717, 7519 (Roeder, *Bronzefiguren*, 1956, p. 399, §534d, p. 397, §532k, fig. 586, pl. 56b); Vatican City, MGE 18506 (Grenier, *Bronzes*, 2002, p. 153, no. 317, pl. XL); Saqqara North Falcon Complex FCO-152 H5-2214 [4316] (Davies and Smith, *Falcon Complex*, 2005, p. 89, pl. XXXIXc; Weiß, *Tier- und Götterbronzen*, 2012, p. 746, no. 836, pl. 45b), FCO-150 H5-2212 [4314] (Davies and Smith, *Falcon Complex*, 2005, p. 89, pl. XXXVIIIb [Birmingham, BM&AG B.51'71]); see also FCO-321 H5-2447 [4653] (no figure, falcon with double crown on plain box); Brussels, MRAH E.07584; London, BM EA36154, EA11622, EA36146, EA68291 (Thum, "Creatures Compartimentalised", 2012, p. 83, fig. 36, p. 117, no. C-16); Antwerp, AV 79.1.106 (Weiß, *Tier- und Götterbronzen*, 2012, p. 746, no. 835, pl. 45c); London, Petrie UC8189, UC8185.

[163] Weiß, *Tier- und Götterbronzen*, 2012, pp. 286–87.

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Inventory number: Cat. 2381
Object: Coffin for a raptor
Dimensions: L: 7.75, W: 2.5, H: 7.9; Box H: 2.85; Falcon figure H: 5
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Probably Late Period (722–332 BC), based on parallels and general typology
Scientific analyses: None
Description: Rectangular hollow-cast copper alloy box in the shape of a slightly trapezoidal naos surmounted by an image of a falcon wearing the double crown complete with lituus.

The tip of the bird's tail rests on the box. The naos has a torus moulding and a cavetto cornice that do not extend to the now-unsealed back. A textile package is visible inside the box, but the mummified animal has not been identified with any confidence.[164] The falcon perches in the centre of the box's top. The face of the falcon has a curved beak. The eyes appear in relief as circular protrusions under pronounced orbital ridges. The curl of the lituus might have served as a suspension loop. A flat stubby uraeus appears above the forehead. Both the white crown and the lituus are, in contrast to the nicely detailed falcon, not particularly well-finished. The large feet of the falcon are nicely modelled. Thin faint lines indicate the scaled skin of the feet. The crural feathers are represented by a gentle bulge at the back of the legs. The breast seems to bear lines of a broad collar. The plumage is marked. The artefact is probably from Lower Egypt, either Buto or Saqqara,[165] although it is possible that it comes from other Delta sites, such as Quesna, where fragments of such boxes have been recovered recently.[166]

Technical notes

The box was cast together with the falcon. The falcon is solid, while the box is hollow cast. Two larger bulges identifiable as core support remains appear on the outside of the bottom along the central axis. Two such chaplet areas are visible at the left side; they are, however, smaller and were properly worked to give a finished appearance of the box. In the front, there might be a chaplet a little bit off-centre. The right side only shows one potential and poorly visible chaplet candidate in its front area. The details of the plumage and feet were incised in the original wax model. The thickness of the bronze walls of the box is c. 0.15 cm.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 336, no. 2381 [58].
Parallels: Type T 23 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 287, 747–54, nos. 839–71, pls. 45d–i, pp. 750–54, nos. 854–71); Buto cachette of bronzes (Engelbach, in *ASAE* 24 [1924], pp. 174–76, Weiß, *Tier- und Götterbronzen,* 2012, pp. 750–54, nos. 854–71); Vatican City, MGE 18513 (Grenier, *Bronzes*, 2002, p. 152, pl. XL); North Saqqara Falcon Complex FCO-146 H5-2208 [4278] (Davies and Smith, *Falcon Complex*, 2005, pp. 87–89, pls. XXXVIIa–c [Cairo JdE 91456]); FCO-147 H5-2209 [4311] (Davies and Smith, *Falcon Complex*, 2005, pl. XXXVIId [Cairo, JdE 91457]); FCO-149 H5-221 [4313] (Davies and Smith, *Falcon Complex*, 2005, pl. XXXIXa [London, BM

[164] Fabretti et al., *Regio Museo*, 1882, p. 336, mentions "qualche resto del corpo di uno sparviero imbalsamato ed avvolto nella tela" (some remains of the body of a stuffed sparrowhawk wrapped in cloth) inside the box.
[165] Weiß, *Tier- und Götterbronzen*, 2012, pp. 286–87. See also Kessler, *Die heiligen Tiere*, 1989, pp. 17–43, for a list of other potential animal necropoleis where birds including raptors (letter code "B" in the tables) were buried.
[166] S. Ikram, personal observation.

EA67196]; FCO-151 H5-2213 [4315] (Davies and Smith, *Falcon Complex*, 2005, pl. XXXIXb); FCO-153 H5-2215 [4317] (Davies and Smith, *Falcon Complex*, 2005, pl. XLIa [Bolton, BM A.32.1971, falcon missing]); FCO-309 H5-2435 [4640] (Davies and Smith, *Falcon Complex*, 2005, p. 107, pl. LVb [Oxford, Ash. 1971.136, wears red crown only]); FCO-426 H5-2687 [4967] (Davies and Smith, *Falcon Complex*, 2005, p. 117, pls. LVIIC and LIXa [Bolton, BM 419.1975]); FCO-478 H5-2755 [5094] (Davies and Smith, *Falcon Complex*, 2005, pl. LXVIa [Bristol, BMAG 7134, missing the crown once attached to the head with a peg]); Boston, MFA 86.275 (from Naukratis), Karlsruhe H 7 (Albersmeier, *Ägyptische Kunst*, 2007, pp. 88–89, no. 2.29) and New York, MMA 26.7.856 are the same size as Cat. 2381, while Norwich 1925.93.25 (Kalloniatis, *Egyptian Collection*, 2019, p. 107, pl. 9, no. 51) is smaller; London, BM EA68869; Brussels RMAH E.07581, RMAH E.06930; Chicago OIM E10676; Geneva Musée d'Art et d'Histoire A 2004.0084; New York, MMA 15.6.2, MMA 41.160.107; Vienna KHM ÄS 6601; see also Roeder, *Bronzewerke*, 1956, p. 398, §534c; Aubert and Aubert, *Bronzes*, 2001, p. 235–36, with pl. 34 on the subject.

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Inventory number: Cat. 2405
Object: Coffin for a raptor
Dimensions: L: 16, W: 5.15, H: 13.5; Box H: 5.2; Falcon figure H: 8.3
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Probably Late Period (722–332 BC), based on parallels and general typology
Scientific analyses: None
Description: Rectangular hollow-cast copper alloy box in the shape of a naos with a cavetto cornice and torus moulding, surmounted by a falcon wearing the double crown.

The box is open at the back and empty. The rear edges and the rounding of the cavetto cornice form a recessed frame into which a sealing would have been fitted from below. Possible remains of the dark sandy casting core are present in the interior, particularly in the lower corners and under the top.

The falcon perches in the centre of the box's top. The eyes appear as circular protrusions under contoured orbital ridges. The head is bent forward, so that the double crown rests on an inclined top. The double crown lacks its lituus. Thin incisions indicate the skin pattern of the feet and legs. The crural feathers are shown as small triangular elements. The mantle plumage is indicated by few loop-patterned lines and the secondary coverts by curved lines running diagonally towards the crossing of the primaries. The tail feathers are divided by vertical lines. Based on the well-attested provenance of such objects from Buto and Saqqara,[167] it is possible that this comes from one of these sites, or even Quesna, where fragments of similar receptacles have been found recently.[168]

Technical notes

The hollow box and the solid falcon were cast together. Chaplet remains appear as either small flat greyish spots or larger holes: two along the central axis in front and behind the falcon on the lid; two at the bottom. There is one potential chaplet in the upper centre of the front side, but it is covered with bronze. On the right side, two small flat greyish chaplets appear a little bit above the central axis; the one in the front has a pendant on the other side. The box's walls are between 0.1 and 0.4 cm thick; the presence of casting core remains in the inner corners, however, impede more precise measurements.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 339, no. 2405 [82]; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 47–48, fig. 7E.
Parallels: Type T 23 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 286–87); Buto cachette of bronzes (Engelbach, *ASAE 24* [1924], pp. 169–77, Weiß, *Tier- und Götterbronzen,* 2012, pp. 750–54, nos. 854–87); North Saqqara Falcon Complex FCO-146 H5-2208 [4278] (Davies and Smith, *Falcon Complex*, 2005, pp. 87–89, pls. XXXVIIa–c [Cairo, EMC CG 91456]); FCO-148 H5-2210 [4312] (Davies and Smith, *Falcon Complex*, 2005, pl. XXXVIIIa [Cambridge, FM 10a/b.1971]); FCO-147 H5-2209 [4311] (Davies and Smith, Falcon Complex, 2005, pl. XXXVIId [Cairo, EMC CG 91457]); FCO-149 H5-221 [4313] (Davies and Smith, *Falcon Complex*, 2005, pl. XXXIXa [London, BM 67196]); FCO-151 H5-2213 [4315] (Davies and Smith, *Falcon Complex*, 2005, pl. XXXIXb); FCO-153 H5-2215 [4317] (Davies and Smith, *Falcon Complex*, 2005, pl. XLIa [Bolton, BM 32.1971, falcon missing]); FCO-309 H5-2435 [4640], (Davies and Smith, *Falcon Complex*, 2005, p. 107, pl. LVb [Oxford, Ash. 1971.136, wears red crown only]); FCO-426 H5-2687 [4967] (Davies and Smith, *Falcon Complex*, 2005, p. 117, pls. LVIIC and LIXa [Bolton, BM 419.1975]); FCO-478 H5-2755 [5094] (Davies and Smith, *Falcon Complex*, 2005, pl. LXVIa [Bristol, BMAG 7134, missing the crown once attached to the head with a peg]), FCO-310 H5-2436 [4641] (Davies and Smith, *Falcon Complex*, 2005, p. 108, pl. LVIc [Cairo, EMC CG 91458]); New York, BM 37.416Ea-b (Bleiberg et al., *Soulful Creatures*, 2013, p. 51, fig. 42 [as possibly from Saqqara]); Norwich, NC 1925.93.25 (Kalloniatis, *Egyptian Collection*, 2019, p. 107, pl. 9, cat. 51); Boston, MFA 1987.285, 86.275; Florence, MAF 8404; London, RCT RCIN 84125 (from Saqqara); New York, MMA 26.7.856; Vienna, KHM 4239.

[167] Weiß, *Tier- und Götterbronzen*, 2012, pp. 286–87.
[168] S. Ikram, personal observation.

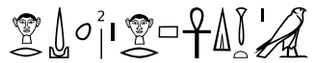
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Inventory number: Cat. 2385
Object: Coffin for a raptor
Dimensions: L: 15.5, W: 3.9–4.2, H: 6.2
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Probably Late Period (722–332 BC), based on parallels and general typology
Scientific analyses: None
Description: Rectangular copper alloy box with a smaller pedestal on the top, on which two feet of a raptor remain. Fabretti et al. identified this as an ibis.[169] The position as well as the anatomy of the feet, however, indicate that they belonged to a falcon.[170]

The box, which bears a hieroglyphic inscription on the upper front part, is still sealed, with the cover at the back sitting tightly in its frame. The main box is a parallelogram in section and the plainness of the box is rare. The straight cover of the back sits tightly in its frame, and is flush with the rear sides of the main box. The smaller pedestal is slightly askew and does not have the same orientation as the box. The animal's toes are cursorily modelled; the right claw is flatter than the left. The object might have come from Buto (mentioned in the text, see below), or Saqqara.

Inscription



(1) *Ḥr Wꜣḏ.t dj ꜥnḫ P(ꜣ)-ḥr* (2) *sꜣ(?) (W)ḏꜣ-ḥr*
"Horus and Wadjet, who give life to Paher, son (?) of Wedjaher."

Comment
A short hieroglyphic inscription, which was shallowly incised in two lines oriented from right to left already in the original wax model, is present in front of the pedestal. The term *Wꜣḏ.t* after the name of Horus lacks a female deity classifier; such a writing is, however, widely attested and not exceptional for such laconic texts. It could possibly also be the nisba *wꜣḏ.t(i)* "the one belonging to Wadjet" and refer to Buto, which is known as *pr-Wꜣḏ.t* "the house of Wadjet". The *t* under the *wꜣḏ* indicates that *Ḥr wꜣḏ* "Horus, the youngling"[171] is not to be read. The little rectangular sign to the right of *ḥr*, which is accompanied by the small stroke-determinative at its left, can only be understood as *p(ꜣ)*. It thus forms the beginning of the name *P(ꜣ)-ḥr(i)*.[172] In view of the usual content of such texts, the other little sign at the beginning of the second line can most probably be read as *sꜣ* (Gardiner sign-list H8), thus as filiation. The name of P(a)-herj's father Wedjaher is attested in the Late Period onomasticon as well.[173]

Technical notes
Except for the rear seal, all the elements were made separately in wax, then joined together and cast as one piece. Remains of core supports can be found in the centre of the front of the box, along the centre line of the left side at 1.8 cm from the front and at 1.55 cm from the back end, at the right outer side in corresponding locations at 2.3 cm from the front and at 3.6 cm from the back end, and along the centre axis of the bottom at 3.6 cm from the front and at 2.9 cm from the back end. Several of the irregularities of the bottom seem to originate from the wax model of the box. The animal's claws are tightly merged with the upper surface of the base. Markings of the smearing of the wax to connect the feet to the pedestal in the wax model stage of the artefact are nicely discernible. In the centre of the rear top surface, there is a further small rusty elevation indicative of a chaplet. Along the fringes of the white interior fill, which might be white paste or lead, there is some coarse dark material that could possibly be the remains of the casting core.

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[169] Fabretti et al., *Regio Museo*, 1882, p. 337.
[170] For the typical feet position of walking ibises see, e.g., Turin Cat. 1010–11, or Louvre E 2411 (Guichard [ed.], *Des animaux*, 2014, pp. 52–53, cat. 39a).
[171] Leitz (ed.), *Lexikon der ägyptischen Götter*, V, 2002, p. 248.
[172] *PN*, I, 1935, p. 115, §24.
[173] *PN*, I, 1935, p. 88, §26.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 337, no. 2385 [62].

Parallels: Types T 22 (without crown) and T 23 (with crown) by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 286–87 , 746–74, nos. 835–871, pls. 45b–i); Brussels, MRAH E.07581, E.06930; Chicago, OIM E10676; Geneva, MAH A 2004.0084, New York, MMA 15.6.2, 41.160.107; Vienna, KHM ÄS 6601. The best evidenced places of origin for such artefacts in Lower Egypt are Buto (to which the deities mentioned in the inscription correspond) and Saqqara (Weiß, *Tier- und Götterbronzen*, 2012, pp. 286–87).

133



Inventory number: Cat. 2382
Object: Coffin for a raptor
Dimensions: L: 6.3, W: 4.95, H: 6.35; Box H: 2.5; Falcon H: 3.85
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Probably Late Period (722–332 BC), based on parallels and general typology
Scientific analyses: None
Description: Rectangular hollow-cast copper alloy box surmounted by three falcons sitting abreast.

The left side of the box, through which the animal remains would have been inserted, is open. The falcons, which stand abreast to each other on the top, are virtually identical in appearance; only some smaller details hint at individual finishing of the original wax models. The claws of the large flat feet of the falcons are indicated by fanning lines. The heels and crural feathers are indicated. Only the central falcon has proper hind, i.e., hallux, toes. The tails rest on the ground, tightly fused with the box's top.

Technical notes
The box and the falcon figures were individually modelled in wax, then joined and cast as one piece. No definite traces of core supports can be recognised from the outside, except for a small protrusion on the left half of the rear wall and another one a little bit off-centre on the bottom. Due to the adherence of silt and inorganic material to the interior walls of the box (which could be the remains of the casting core), no further chaplets can be distinguished. There are no conclusive indications as to where the gating system was positioned. The walls of the box are quite thick, particularly the rear wall (approx. 0.5 cm).

Bibliography: Orcurti, *Catalogo Illustrato*, 1855, p. 138, no. 87; Ministero della pubblica istruzione (ed.), *Documenti inediti*, III, 1880, p. 211, no. 327; Fabretti et al., *Regio Museo*, 1882, p. 336, no. 2382 [59]; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 47–48, fig. 7D.
Parallels: Closest to Type T 22 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 286, 746, nos. 835–38, pls. 45b–c), but such bronze groups of falcons are not defined as an individual type; Baltimore, WAM 54.2114 (Steindorff, *Egyptian Sculpture*, 1946, p. 151, pl. C, no. 678); the closest parallels, falcons wearing the double crown perching abreast on a naomorphous box, are London, BM EA37916, EA59873 (Thum, "Creatures Compartmentalised", 2012, p. 123, no. X-09, p. 122, no. X-05), and Marseille, MAM 676 (Charron, in Zivie-Coche and Guermer [eds.], *Parcourir l'éternité*, 2012, pp. 289, 304, pl. 2a).

134



Inventory number: Cat. 980
Object: Coffin for a raptor
Dimensions: L: 7.1, W: 8.87, H: 20.9
Acquisition: Acquired before 1882 (probably donation by Vittorio Emanuele II in 1869)
Provenance: Unknown
Date: Probably Late Period (722–332 BC), based on parallels and general typology
Scientific analyses: None
Description: Hollow-cast copper alloy figure of a falcon, with two separate feet, finely incised plumage, and a breast collar consisting of three main bands with small vertical streaks in-between.

There is a framed rectangular opening on the abdomen into which the mummy would have been introduced. It was probably originally sealed with a metal or wood cover. The head is well crafted, with deep lores in front of the eyes; the beak is missing its upper portion. The plumage is marked with incised lines. The legs and feet have criss-cross lines indicating the skin, and the crural feathers take the form of "shorts".

Technical notes

The falcon figure was hollow cast and – originally or secondarily? – fitted with separate feet. The upper legs appear to be solid; there is no opening from the falcon's belly connecting to them. Some spots remindful of chaplet remains on both the inner and outer thighs suggest that the trousers were modelled in wax around a core that is still present inside. They were then fixed as separately-made pieces to the wax model. Both feet were attached to the body with pins connecting them and the legs. Since both legs have the same size but are different in surface details, one or both might originate from another falcon. The tenons under both feet attest to their fixation to a base. The casting core remains in the head and tail reveal that the interior was not completely emptied. The opening of the abdomen was necessary to remove the casting core. Chaplets can be identified at three places at least. The best visible one sits on the upper part of the breast, in the centre of the collar: the thin rusty spot (0.4 x 0.1 cm) also appears as rusty projection within a green corrosion cluster on the inside. Two further chaplets, corresponding, can be found in the middle of the folded wings. They appear as small projections on the inside. There are no signs as to where the elements of the gating system were located. Several falcon figures show a sprue at the lower end of the tail (e.g., Berlin ÄM 22605, Philadelphia Penn Museum E14287, Harvard Art Museums 1957.165), while the other main gating system remains are represented by tangs under the feet or bases, in cases where they are not separate but an integral part of the original wax model and subsequently of the bronze figure.

Bibliography: Ministero della pubblica istruzione (ed.), *Documenti inediti*, III, 1880, p. 211, no. 27; Fabretti et al., *Regio Museo*, 1882, p. 67, no. 980 [335]; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 47–48, fig. 7H.
Parallels: The subject is classified as Type T 18 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 281–82, 738–40, nos. 803–09, pls. 43c–e); Baltimore, WAM 54.547 (Steindorff, *Catalogue*, 1946, p. 149, no. 656, pl. XCIX); Antwerp, AV 79.1.4 from Memphis (*Van Nijl tot Schelde*, 1995, pp. 136–37); New York, MMA 25.2.11 (with animal bones inside, presumably of a falcon; still sealed); Philadelphia, Penn E14287; Cambridge, HAM 1957.165; Vienna, KHM 304.

135



Inventory number: Provv. 5220
Object: Coffin for a raptor
Dimensions: L: 5.84, W: 4.9, H: 12
Acquisition: Unknown
Provenance: Unknown
Date: Probably Late Period (722–332 BC), based on parallels and general typology
Scientific analyses: None
Description: Hollow-cast copper alloy image of a falcon with a rectangular opening on the abdomen into which the mummy would probably have been introduced, though it might also have been a votive statue of a falcon.

The falcon figure is missing its tail and feet, and its head is filled with lead. The face shows the typical facial markings; the right pupil is filled with darker material (bronze?), the left one is empty. Behind the right eye, the ear coverts are stylised as a rough lanceolate drop-shaped recess with a downward pointing tip, which would once have been inlaid, as suggested by the rough inner surface. The wings are tightly folded to the body. The legs have "shorts" indicative of the crural feathers, and both missing feet would have been slotted in into holes here.

Technical notes
The falcon was hollow cast. Its canonical facial emblems were inlaid. The trousers were attached to the wax model and dressed. The lower legs were cast separately and then inserted into the holes provided. The most noteworthy feature of this figure is the lead filling its shoulders and head. The surface of this filling, when level, indicates how the figure was positioned (turned upside down) when the lead was poured in. The lead filling might have been added because the bronze wall was cracked at the neck as indicated by the tiny fissures at the nape. The lead was thus most likely cast in to support the bronze from the inside to avoid more cracking and to allow for further consolidation or repair work. Conversely, however, it might have been the slowly corroding lead filling that generated pressure and thus led to the cracking of the metal over time. The presence of vegetal fibres in the gaps between the outer wall and the lead filling indicates that the latter was made secondarily after an initial use of the figure.[174] The bronze thickness ranges from 0.11 (upper left) to 0.39 cm (inner rim of opening). The fact that the bronze walls are not consistent in thickness due to having been modelled with tools by hand is also evidenced at the break at the tail.

Bibliography: Unpublished.
Parallels: Type T 18 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 281–82, 738–40, nos. 803–09, pls. 43c–e); Roeder, *Bronzefiguren*, 1956, pp. 395–96, §531; Athribis 383 (Gomaà and Hegazy, *Neuentdeckte Nekropole*, 2001, p. 21, pl. Xd; Weiß, *Tier- und Götterbronzen*, 2002, p. 739, no. 804, pl. 43); North Saqqara Falcon Complex FCO-145 H5-2207 [4277] (Davies and Smith, *Falcon Catacomb*, 2005, p. 87, pl. XXXVIc [London, Petrie UC30495]); Vatican City, MGE 18512 (Grenier, *Bronzes*, 2002, pp. 151–52, no. 314, pl. XXXVIII); Baltimore, WAM 54.2120 (Steindorff, *Catalogue*, 1946, p. 150, pl. CI, no. 663); Christie's New York, 10 May 2018, Lot 902 (Ellsworth et al., *Rockefeller Collection*, III, 1993, 370, no. 275).

[174] Whether the fibres also served a technological purpose is a matter that needs further investigation.

8.10 Lizards/Skinks

While lizards and skinks are very common in Egypt (there are currently sixty-one species of these creatures recorded in Egypt),[175] they played a limited role in Egyptian mythology. They are apotropaic and associated with the sun god (particularly Re-Atum, but Horus, too)[176], with an emphasis on regeneration and rebirth – some of these animals can regrow their tails if they are lost or damaged. They are mummified quite simply (generally desiccated without evisceration, and only sometimes natroned[177]), wrapped, and placed in groups in pottery vessels, as noted at sites such as Lisht or South Saqqara, or singly in cupreous containers, as those now in the Museo Egizio's collection. Many provenanced examples of this last group come from Naukratis and the Sacred Animal Necropolis at Saqqara, though they are found elsewhere as well.[178] It is quite possible that wrapped lizards and skinks were even placed directly into the ground. These reptiles had both positive and negative connotations; lizards were used medically, but geckos and chameleons were often considered poisonous, an idea that persists to this day in relation to geckos.[179]

[175] Baha El Din, *A Guide to the Reptiles and Amphibians*, 2006, pp. 48–209; For a study of Egyptian categorisations of these animals, see Andreozzi, *Anthropozoologica* 55.9 (2020), pp. 129–44.
[176] Bonnet, *Reallexikon der ägyptischen Religionsgeschichte*, 1953, im passim; Vernus and Yoyotte, *Bestiaire des pharaons*, 2005, pp. 334–36, 338.
[177] As observed by Ikram at the complex of Djedkare Isesi, where they were found in pottery vessels.
[178] Masson-Berghoff, *BMSAES* 24 (2019), pp. 127–58; Masson-Berghoff and O'Flynn, *BMSAES* 24 (2019), pp. 159–175; Thum, "Creatures Compartimentalised", 2012.
[179] Aufrère, in Porcier et al. (eds.), *Creatures of Earth, Water, and Sky*, 2019, pp. 47–65; Hansen, in Hawass and Pinch Brock (eds.), *Egyptology at the Dawn of the Twenty-First Century*, II, 2003, pp. 290–97; Sauneron, *RdE* 24 (1972), pp. 160–64; Sauneron, *Un traité égyptien d'ophiologie*, 1989.

136



Inventory number: Cat. 2397 (two labels on the base: 379 and 555)
Object: Coffin for a lizard or skink
Dimensions: L: 9.35, W: 2.4–2.7, H: 2.2; Box H: 1.6; lizard/skink figure L: 8.2
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Probably Late Period (722–332 BC), based on parallels and general typology
Scientific analyses: None
Description: Small rectangular copper alloy box lacking its base. The top is surmounted by an image of a lizard or skink.

The reptile rests flat on the top of the box with its head slightly raised. The muzzle is round, the mouth is indicated by a shallow groove, and two small round protrusions on top of the head indicate the cavities for the forward-looking eyes. The toes, particularly on the left side, are indicated with lines. The tail and body are enhanced by small, irregularly positioned incised dots indicating a scaly or rough skin.

Technical notes
The box and the animal figure were cast together. While the box was hollow cast (with its original base in place?), the lizard is solid. Its wax model was thus directly joined with the model of the box and then put together into a casting mould. Although core support remains seem to be discernible, they were technologically not fully necessary as no hollow element had to be produced. The thickness of the bronze ranges between 0.1 and 0.23 cm. Whether a now missing and fitting panel was inserted to seal off the animal remains cannot be verified, but seems likely.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 338, no. 2397 [74]; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 47–48, fig. 7F.
Parallels: The subject is classified as Type T 15 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 278–79, 731–38, nos. 770–800, pls. 42g-i); New York, MMA 04.2.510; Aix-les-Bains, MF 0515 (Ratié, *Collection égyptiennes*, 1984, p. 131, cat. 280); Saqqara North Falcon Complex FCO-156 H5-2218 [4320], FCO-158 H5-2220 [4322] (Davies and Smith, *Falcon Complex*, 2005, p. 89, both pl. XXXIXd); FCO-234 H5-2327 [4518] (Davies and Smith, *Falcon Complex*, 2005, p. 98 [no figure]); FCO-322 H5-2448 [4654] (Davies and Smith, *Falcon Complex*, 2005, p. 109 [no figure]); Antwerp, AV 79.1.65; Berlin, ÄM 30942; Brussels, MRAH E.06934; Cairo, EMC JdE 27683; Chicago, OIM E25605; Frankfurt, LS 1822; Geneva, MAH D 0428; Hannover, KM 1926; London, BM EA36167, EA36164; London, Petrie UC8206, UC8208; New York, MMA 04.2.513; Vienna, KHM ÄS 644.

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Inventory number: Cat. 2398
Object: Coffin for a lizard or skink
Dimensions: L: 5.2, W: 1.7, H: 1.5; lizard/skink figure L: 4.8
Acquisition: Donation Zucchi (1858)
Provenance: Unknown
Date: Probably Late Period (722–332 BC), based on parallels and general typology
Scientific analyses: None
Description: Rectangular copper alloy votive coffin surmounted by an image of a lizard or skink with two loops on diagonally opposite corners, either for suspension in a sacred space or symbolically indicating the potential of suspension.

The front of the green corroded box is slightly curved and the long sides are straight. The sides of the back opening have inward-looking rims whose edges are clear cut. The lizard takes up almost all of the space and lies partly off centre on the box and is very flat. While the right hind leg reaches the edge of the box, the opposite does not. The lizard raises its round tubular head, and tiny dents indicate the eyes. Incised lines at the nape indicate either the scales or the buckling of the skin, and the torso of the lizard is dotted with small spots, some of which are present also on the tail. The back of the box is open, and a linen package is stuffed into it. This package might contain a lizard, parts thereof, or even a snake.

Technical notes
The box including the loops and the lizard was cast in one event after the single parts were individually modelled in wax and then joined to create a single model.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 338, no. 2398 [75].
Parallels: Type T 15 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 278–79, 731–38, nos. 770–800, pls. 42g-i); subgroups with loops: Leiden, RMO B 496 (Roeder, *Bronzefiguren*, 1956, p. 408, §554b, fig. 610); London, Petrie UC210–13, UC215, UC802; North Saqqara Falcon Complex FCO-184 H5-2277 [4468] (Davies and Smith, *Falcon Complex*, 2005, p. 94 [no figure, Durham, OM 1971.104]); FCO-234 H5-2327 [4518] (Davies and Smith, *Falcon Complex*, 2005, p. 98 [no figure]); Lyon, MdC 90000531 (Emmons et al., *Musée des Confluences*, 2010, pp. 92, 110, no. 91 [includes a mummy]); London, BM EA49146, EA49147–51, EA27583 from Naukratis (Thum, "Creatures Compartimentalised", 2012, pp. 96–99, nos. A-04, A-05 to A-12; Masson-Berghoff and O'Flynn, *BMSAES* 24 [2019], pp. 162–63, fig. 1, no. 3; O'Flynn et al., *SciRep* 13 [2023], p. 3, Table 1, pp. 4–5, fig. 3); London, BM EA36163, EA36166 from Lahun (Thum, "Creatures Compartimentalised", 2012, pp. 96–97, nos. A-04 and A-05); London, BM EA35643, EA36159, EA71431, EA71433, EA71435–37, EA71441, (Thum, "Creatures Compartimentalised", 2012, pp. 100–102, nos. A-13 to A-19, 105, no. A-26); New York, BM 08.480.60 (Bleiberg et al. [eds.], *Soulful Creatures*, 2013, 56); Boston, MFA 86.271, 86.274; Bristol, BMAG H 1074, 1089.2, 1098.1 ; Brussels, MRAH E.07601a; Geneva, MAH A 2004-0135; Liverpool, NML M11851.

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Inventory number: Suppl. 18071
Object: Coffin for a lizard
Dimensions: L: 8.2, W: 2.2, H: 2.05; Box H: 1.7; Lizard figure L: 7.25
Acquisition: Donation around 1970
Provenance: Unknown
Date: Probably Late Period (722–332 BC), based on parallels and general typology
Scientific Analysis: None
Description: Rectangular hollow-cast copper alloy box with two loops at diagonally opposite sides and an open back. The top is surmounted by an image of a lizard.

The loop at the left front is flush with the side. The other one is positioned slightly inward from the side. The sides of the box are quite straight, while the front is more rounded. Irregular striation marks are discernible under the corrosion. The bottom is more irregular. The edges show inverted rims. The rim of the lower edge is smaller and thinner than the others.

The lizard rests flat on the ground. Its round head is raised. The eyes are clearly indicated. The neck shows incised lines. The back of the wide flattened body and of the tail bear tiny dots. The legs are widely spread out, the front legs are oriented forwards, the hind legs backwards, the toes are indicated by lines. The tapering tail ends just before a cut in the edge made by a small sharp implement, also causing a small part of the corner to break off. The back of the box is open; it is now empty.

Technical notes
The box, the loops and the lizard were cast together using prefabricated individual wax models that were joined with wax. Core support remains for casting the piece are visible in the middle of the front and in the rear of the right side. The latter chaplet is visible both from the in- and outside as a small rusty diagonal impurity in the green surface. Other pins on the other sides cannot be clearly determined. The thickness of the bronze wall of the box ranges from 0.15 to 0.2 cm. There are no clear indications as to where the gating system was positioned.

Bibliography: Unpublished.
Parallels: See under **No. 137**.

8.11 Snakes/Eels

Like many other animals, serpents in ancient Egypt have dual natures: they can represent both benevolent and malevolent deities of either sex. The sun and creator gods Re and Atum; the multi-faceted goddesses associated with the uraeus in different ways: Hathor, Wadjet, Weret-Hekau, Wepset; the fertility/harvest goddess Renenutet; and the protector god Mehen are all benign serpent deities, while Apophis, the sworn foe of Re, is also shown as a snake.[180] While it is possible that several of these deities were associated with the offerings of serpent mummies, it is most likely that the more powerful Re or Atum were honoured.
While no necropolis devoted solely to serpents has been discovered, they are generally found in contexts dedicated to Re or to Horus in his solar manifestation, together with other solar animals, such as raptors (see Chapter 8.9) or shrews (see Chapter 8.7). They can also be associated with Atum. Serpent mummies have been found at Saqqara, Thebes, and Kom Ombo,[181] though they were probably buried in other animal cemeteries as well.

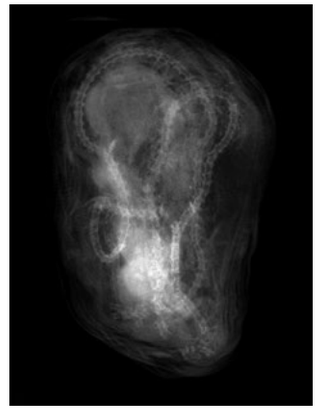
Most snake mummies are wrapped in circular or rectangular packages, in plain linen or linen dyed red/pink or yellow that evokes the sun (such as, possibly, **No. 139**, and specimens excavated in the area of the Theban Tomb 11[182]), or are decorated with more complex bandaging patterns (e.g., **No. 140**). These shapes allow the snake to be arranged in a figure eight within, or coiled around itself. Wooden and metal containers, often surmounted by an image of the animal, are also used for serpent mummies. Some confusion and variations occur with these containers. Some of the figures are clearly serpents, with cobras with their distinctive hoods being depicted. Others, which have lost their heads, have straight or slightly undulating bodies that are less clear, and have been described both as snakes and as eels. A curious group of these occur in metal. These hybrid creatures have undulating bodies, often with incisions in keeping with eel-fins (e.g., **Nos. 147–148**), with the heads in the form of a uraeus with a human head wearing an *atef* crown. These have been iconographically associated with Atum,[183] as a manifestation of creation emerging from the waters. Their provenance seems to be, thus far, in Lower Egypt.

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[180] Wilkinson, *Complete Gods and Goddesses*, 2003, pp. 220–28; Vernus and Yoyotte, *Bestiaire des pharaons*, 2005, pp. 293–334, 336–38.
[181] Kessler, in Helck and Otto (eds.), *LÄ*, VI, 1986, col. 571–87; Störk, in Helck and Otto (eds.), *LÄ*, V, 1984, col. 644–52, esp. 649.
[182] Personal observation, S. Ikram.
[183] Gamer-Wallert, *Fische und Fischkulte*, 1970, pp. 115–30; Vernus and Yoyotte, *Bestiaire des pharaons*, 2005, pp. 203–04; Kakosy, in Helck and Otto (eds.), *LÄ*, I, 1975, col. 550–52; Myśliwiec, *Studien zum Gott Atum* 1, 1978, pp. 191–92, 279, pls. XXXVIIa and XLIIb, no. 36 (with double crown with attached feathers).

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Inventory number: Provv. 1515/2
Object: Snake mummy
Dimensions: L: 11.3, W: 7.5, H: 4
Acquisition: Unknown
Provenance: Unknown
Date: 360–200 BC (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating, Optical Microscopy
Description: Snake mummy in a roughly egg-shaped package. One side of the package is entirely covered by a single piece of linen (T1), which was secured by a perimeter bandage that was folded over, providing a clean edge (T2). The other side shows a set of spiral bandages, 2.5 cm wide on average (T1). Bits of black substances, probably embalming material, are visible. Similarly wrapped smaller packages have been found in the area of TT 11 at Dra Abu el-Naga in Thebes, which also contained snakes.[184]

Scientific examination

CT investigations

The CT scans show that this package contains a snake or parts thereof (mainly vertebrae), which was coated with what seems to be a black resin-like substance. The head is not present, as is common with many snake mummies (as observed by Ikram in the Theban Tomb 11 group). Possibly, the ancient Egyptians, like their modern counterparts, dispatched snakes by hitting or cutting off the head, which might explain the paucity of heads in mummified remains. The average dimensions of the vertebrae are 0.3 by 0.3 cm. The mummy bundle was strengthened internally with linen.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 360–200 BC.[185]

Bibliography: Unpublished.
Parallels: Bosch-Pusche and Ikram, in Di Cerbo and Jasnow (eds.), *On the Path to the Place of Rest*, 2022, pp. 17–36, figs. 7–8, 12.

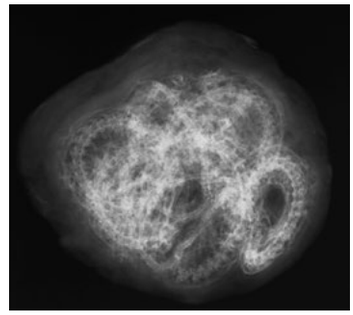
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	36 x 12	Undyed	Selvedge Starting border
T2	Linen	S	Warp-faced	40 x 10	Undyed	

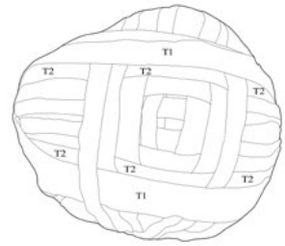
Textile notes: Two different qualities of textile were used to wrap the mummy.

[184] Bosch-Pusche and Ikram, in Di Cerbo and Jasnow (eds.), *On the Path to the Place of Rest*, 2022, pp. 17-36.
[185] Similar to another snake **No. 141**.

140







Inventory number: Provv. 6110 (other numbers, label on the mummy: 921)[186]
Object: Snake mummy
Dimensions: L: 16, W: 13, H: 7.8
Acquisition: Unknown
Provenance: Unknown
Date: 750–390 BC (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating
Description: Roughly egg-shaped snake mummy package wrapped in a concentric square coffer pattern, with undyed (T1) and orange-pinkish stripes (T2) (3 cm folded). The snake(s?) within were untidily wrapped with bandages and linen thread to secure them, which are visible on the bottom of the package where the coffering does not extend. There was probably a perimeter bandage that is now missing, as is suggested by the disorderly edge of one of the coffers. Black stains of embalming agents are visible on the sides and on the back. Parallels are known from Thebes and Kom Ombo (see parallels, below); thus it is possible that it has a southern origin.

Scientific examination

CT investigations

The CT scan shows at least one snake that is wrapped over itself in a repeated figure eight several times over; it is also possible that more than one individual is present. A head is present, but broken and difficult to identify. It is probably a colubrid snake of some sort.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 750–390 BC. This is a wide range and indicates an early date for the production of snake mummies.

Bibliography: Unpublished.
Parallels: Cairo, EMC CG 29725–26.

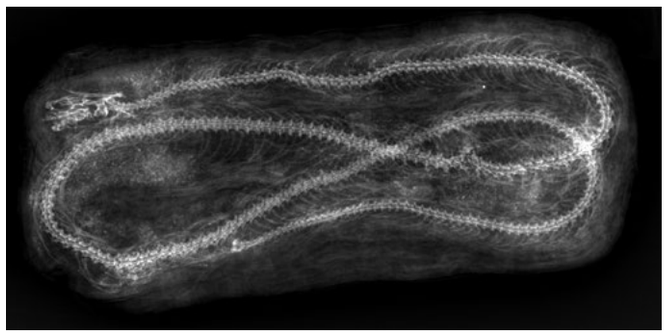
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	38–36 x 12	Undyed	
T2	Linen	S	Warp-faced	28 x 10–12	Orange-pinkish	

Textile notes: Two different qualities of textile were used to wrap the mummy and create the pattern.

[186] The label was removed during conservation works in 2015.

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Inventory number: Provv. 6111 (other number Provv. 1459)
Object: Snake mummy
Dimensions: L: 35, W: 17, H: 6.8
Acquisition: Unknown
Provenance: Unknown
Date: 370–200 BC (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating, Optical Microscopy
Description: Snake mummy in a rectangular package with rounded ends (almost an elongated oval). The mummy was wrapped in several textiles (T2–T4), of different qualities (only some of which are visible and detectable), kept in place by a loose weave bandage (T3) wrapped around the perimeter of the package. The upper part is covered by a tightly woven cloth (T1) and on the top is a small, thin fragment of cartonnage. This is now green and yellow, and might have also been inscribed. A neatly folded perimeter bandage runs around the edge, securing the shroud (T1). At least sixteen layers of cloth could be counted covering the contents. A fragment of a bandage (T5), not attached to the mummy, was found in the modern packing of this mummy, but might have no original association with it.

Scientific examination

CT investigations

The CT scan reveals that the package contains a snake that is curved around itself in almost a double figure eight. The neck is broken. The head is damaged – the lower portion of the skull and the mandible are missing. The smashing of the head makes it difficult to identify the species, but its length was approximately 128 cm, so it is unlikely that it was a horned or sand viper; it could belong to a number of different species of snakes, probably of the Colubridae family. The skin is still present on almost all of the animal.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 370–200 BC.

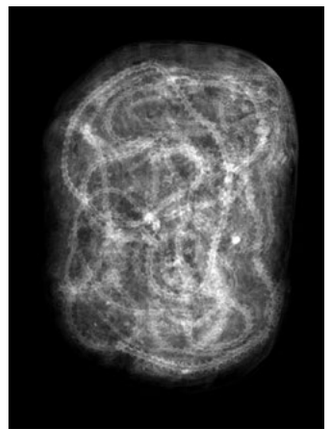
Bibliography: *Aegyptica Animalia*, 2000, p. 86, no. 42 (Provv. 1459 corresponds to Provv. 6111).
Parallels: Leiden, RMO AMM 16n-r (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 308–12); Johnston et al., *SciRep* 10 (2020), fig. 6.

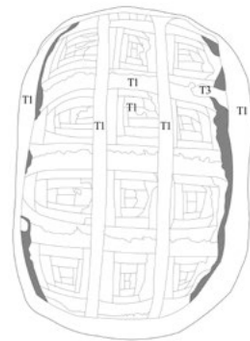
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	44–46 x 12–14	Undyed	Selvedge Self-bands
T2	Linen	S	Warp-faced	48 x 18	Undyed	
T3	Linen	S	Warp-faced	22 x 7	Undyed	
T4	Linen	S	Warp-faced	40 x 14	Undyed	Selvedge Self-bands
T5	Linen	S	Warp-faced	32 x 12	Undyed	

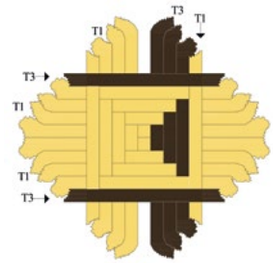
Textile notes: Five different qualities of textile were used to wrap the mummy.

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Inventory number: Provv. 1441
Object: Snake mummy
Dimensions: L: 15, W: 10.5, H: 6
Acquisition: Unknown
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT, UVF, Optical Microscopy
Description: Rectangular snake mummy package with rounded ends. The top is decorated with three columns of four rows of square-shaped coffers (one quarter coloured coffer). The coffers are elaborate, with undyed (T1) and dark brown strips (T3) interwoven into patterns of concentric squares. The coffers are secured around the packet's perimeter by a wide folded perimeter bandage (T1). The interior bandages consist of swatches of cloth as well as bandages that were wrapped around the contents rather haphazardly. A plain piece of cloth is affixed to the bottom and overlaps with the lower edge of the perimeter bandage (T2). Areas of dark staining and drips indicate the use of oils and resins in the mummification process.

Scientific examination

CT investigations

The CT scans show several snakes (considering the high number of fragments) coiled around themselves. What are probably two heads can be distinguished.
Numerous fragments of vertebrae can be detected; the average dimensions of the vertebrae are 0.34 x 0.4 cm.

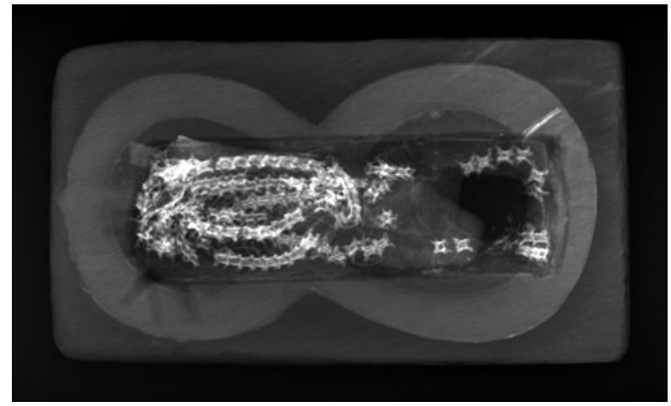
Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 14 (as "tartaruga", turtle), 21; *Aegyptica animalia*, 2000, p. 58, fig. 41, p. 85, no. 42 (wrongly numbered P. 1459); Gordan-Rastelli, *KMT* 18.2 (2007), p. 93 (wrongly numbered P. 1459).
Parallels: Artemis Gallery Auction (private J.H. Collection, Beaverton, Oregon, USA).

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	linen	S	Warp-faced	38–40 x 9–10	Undyed	
T2	linen	S	Warp-faced	30 x 12	Undyed	
T3	linen	S		Too badly preserved for thread count	Dark brown	

Textile notes: Three different qualities of textiles were used to wrap the mummy.

143





Inventory number: Cat. 2402 (other numbers written in black ink on the base: 262)
Object: Snake mummy and its coffin
Dimensions: L: 15.1, W: 8.7, H: 8.5
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT
Description: A rectangular wooden coffin made of two pieces. The top one carries a relief representation of a serpent coiled in a figure eight with the tail going through the second loop. A rectangular depression accommodates the rearing head of a cobra that is fixed by a tenon. The snake was once painted, with vestiges of colours surviving on the throat. The base's bottom has a rectangular opening to accommodate a mummy.

Scientific examination

CT investigations

The CT scans show that the coffin contains the jumbled and disarticulated remains of a long snake. The head and body position are not easily identifiable. The animal was probably arranged in a figure eight. It is wrapped in several layers of fabric.

Bibliography: Fabretti et al., *Regio Museo,* 1882, p. 338, no. 2402 [79]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 21; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 39–40, fig. 3E.
Parallels: Cairo, EMC CG 29818 (Gaillard and Daressy, *La faune momifiée*, 1905, p. 153); **No. 144**.

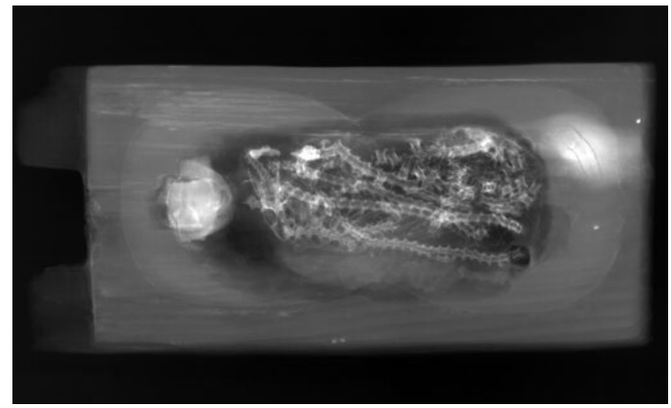
Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Rectangular box surmounted by animal	No	No	No	A single piece of wood for the box and another piece for the head of snake	No	Between the snake and the box	No

Coffin technical notes

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Inventory number: Cat. 2403 (other numbers written in black ink on the base: 266)
Object: Snake mummy in a coffin

MUMMY

Dimensions: L: 7, W: 2.5
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT
Description: A wrapped linen package with twine holding the bandages in place. A single type of textile was used to wrap this mummy. The fabric is so impregnated with black resin-like substance that a density count was not possible.

Scientific examination

CT investigations

The CT scans show that the coffin contains the jumbled and disarticulated remains of a long snake. The head and body position are hard to distinguish. The animal might have been arranged in a figure eight and is wrapped in several layers of fabric.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S		Too badly preserved for thread count	Undyed	
Thread	Linen	S				

Textile notes

COFFIN

Dimensions: L: 17, W: 7, H: 7
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT
Description: A rectangular wooden coffin on a sledge (?) with a relief representation of a coiled snake in high relief. The object is carved from a single piece of wood; the head and neck, now broken off, were originally carved and attached separately. The serpent's body is coiled in a figure eight with the tail going through the last loop. The bottom of the base contains a rectangular opening sealed by a wooden panel. The aperture would have contained the snake mummy.
The piece might have been painted or gilded, but no trace is visible. There is a pair of holes on either side of the tail in the back coil. One is still filled with some as-of-yet unidentified material, and the other one is empty.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 338, no. 2403 [80]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 21.
Parallels: **No. 143**.

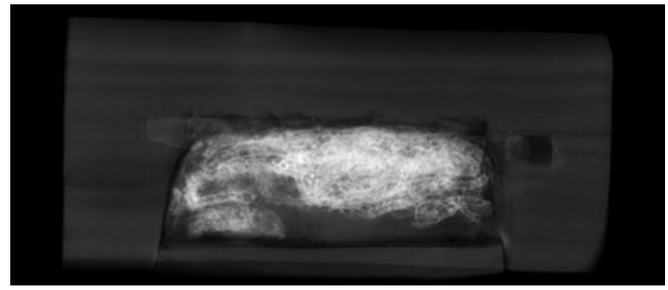
Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Rectangular box surmounted by animal	No	No	No	A single piece of wood for the box and another piece for the head of snake (missing)	No	No	No

Coffin technical notes

145







Inventory number: Cat. 2406 (other number, label written in reddish purple ink: 933; two numbers written in black ink on the base: Cat. 2406 and 265)
Object: Snake mummy in a coffin

MUMMY

Dimensions: L: 7.5, W: 3
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT

Description: One type of textile was used to wrap this mummy. On the corner of the mummy bundle, a rolled hem secured by whip-stitch is visible, indicating that the textile is reused.

Scientific examination

CT investigations

The CT scan shows the remains of what has tentatively been identified as a long snake. The head is not visible, and the body position is hard to distinguish. The animal is wrapped in several layers of fabric. Based on its length and the appearance of its vertebrae, it is probably a member of the Colubridae family rather than a cobra (Elapidae).

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S		Too badly preserved for thread count	Undyed	Rolled hem

Textile notes

COFFIN

Dimensions: L: 12.6, W: 5.5, H: 4
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT
Description: A rectangular wooden coffin made of a single piece of wood with a recess opening (8 x 3 cm) on the right proper side, closed by a panel. A relief representation of a snake-like creature is stretched straight along the top of the coffin. The straightness of the animal is suggestive of an eel, but this cannot be said for sure. In front of the body is a hole for the insertion of the separately carved head. The head could have been of a snake or of a man with the *atef* crown. There are vestiges of red paint on the right side, where the panel is. When opened, this panel reveals a mummy that is firmly jammed into place.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 339, no. 2406 [83].
Parallels: Florence, MAF 6474; Paris, Louvre N2908A; **No. 146**.

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Rectangular box surmounted by an animal	No	Yes	Red	Made from a single piece of wood	No	No	No

Coffin technical notes

146



Inventory number: Cat. 7380
Object: Coffin for a snake
Dimensions: L: 10.8, W: 5.1, H: 4.5
Acquisition: Acquired before 1888
Provenance: Unknown
Date: Undetermined
Scientific analyses: None
Description: A rectangular coffin made from a single piece of wood with a separately made sliding lid. A rectangular and now empty cavity is carved into the coffin trough to create space for a mummy. Along the inner rim, there is a recess allowing the lid to slide into place. The lid is surmounted by a shallow carved image in relief of a snake or perhaps an eel, the originally erect head of which, now missing, was made from a separate piece of wood.

Bibliography: Fabretti et al., *Regio Museo*, 1888, p. 337, no. 7380 [32].

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Rectangular box surmounted by animal	No	No	No	A single piece of wood for the box and a separate piece for the head of the snake	No	No	No

Coffin technical notes

147



Inventory number: Cat. 2400
Object: Coffin for an eel
Dimensions: L: 17.9, W: 2.4, H: 8
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Probably Late Period to Ptolemaic Period (772–332 BC), based on parallels and general typology
Scientific analyses: None
Description: A long rectangular hollow-cast copper alloy box surmounted by an image of a hybrid creature with the undulating body of an eel (*Anguilla vulgaris*) with etched parallel lines along the back representing the dorsal fin.

The hybrid creature has a rearing uraeus with a human head, surmounted by a double crown over a tripartite wig. In the back, the uraeus component is supported by a diagonal Maat-feather. Etched lines on the uraeus give it details and the face is clearly modelled, as are the false beard and double crown. The object shows traces of an ancient repair whereby the front part was re-attached to the box by means of a cast-on bronze layer.

The back of the box had a ledge on three sides to support the now-missing seal that secured the mummy within; it is now empty. It might come from Sais and the Memphite region, particularly Saqqara,[187] based on provenanced parallels.

Technical notes

The original wax model consisted of both the hollow box and the solid hybrid creature. Several core supports were put into place along its centre line to cast the piece. Vestiges of the first chaplet, possibly of iron and now fully corroded, survive as a small hole in the front. Other chaplet remains survive in the front and back and are also visible on the inside wall as thin and partly rusty protrusions. The technologically most interesting part of this piece is the front part, which shows a successful repair. It seems that the whole front element, including the uraeus and the Maat-feather, broke off at some point. The craftspeople then decided to cast a reconstruction layer around this element to re-attach it to the box and the eel body.[188] The irregular agglomeration of bronze around it and its distribution allow for insights into the technological knowledge of the ancient craftsmen.

The bronze was put in place in the form of wax smeared around the broken-off front part. In adding this wax and ensuring a tight connection, the front part was slightly elevated in comparison to the rest of the eel body. Based on the appearance of the cast-on bronze that represents the wax holding the broken part in place and reattaching it to the box, it seems that the wax was applied as a coil starting on the front left, and was then wrapped around behind the backside of the Maat-feather and the right and front side of the box to end in the form of a tapering lip on top of the section where the wax coil started. In addition, the wax was applied to the front and back of the uraeus around the area where it connects with the Maat-feather, in the area where the feather connects with the eel body and along the right corner and right side of the box. The cast-on bronze layer was obviously very thin in several parts, particularly at the front of the uraeus and on the right side of the box, and thus peeled off easily, so that it is not present anymore. To make a successful repair cast, the whole object, including the wax additions, was put into a new casting mould, and a new gating system, potentially directly targeted at the areas to be cast-on, was created. The mould was then

[187] Weiß, *Tier- und Götterbronzen*, 2012, p. 180.
[188] See Ogden, in Nicholson and Shaw (eds.), *Ancient Egyptian Materials and Technologies*, 2000, p. 159 and Fitzenreiter et al., *Materialien einer Gusswerkstatt*, 2016, pp. 136–40 for more evidence of this technique.

heated to make the wax run out. Then, copper alloy was cast into the cavities left by the molten wax. Since such new bronze layers do not fuse with the original object, there are several thin gaps. The considerate distribution of the new bronze layer, however, ensured that the broken-off element was safely reattached.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 338, no. 2400 [77]; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 47–48, fig. 7I.

Parallels: The subject "eel with reared uraeus, human head and double crown on votive coffin" is classified as Type T 87 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, pp. 178–80, 656–57, nos. 509–14, pls. 26a–c); Copenhagen, CG AEIN 278 (Mogensen, *Collection égyptienne*, 1930, p. 60, pl. LVIII, A438); Hildesheim, RPMH 358, 363 (Roeder, *Bronzewerke*, 1937, pp. 60–61, §§260–61, figs. 149–51, pls. 35g-i and l); Berlin, ÄM 8897 (Roeder, *Bronzefiguren*, 1956, pp. 394–95, §530c, fig. 581, pls. 56a, d and l; Myśliwiec, *Studien zum Gott Atum 1*, 1978, pp. 191–92, 279, pls. XXXVIIa and XLIIb); Vienna, KHM 625 (Roeder, *Bronzefiguren*, 1956, p. 394, §530a, fig. 580); Lucerne, CKT 153 (Schlögl, *Geschenk des Nils,* 1978, p. 91); Cairo, EMC CG 41745, CG 48898 (Myśliwiec, *Studien zum Gott Atum 1*, 1978, pp. 192–96, pls. XXXVIII, XXXIX, XLIIa and c); Cambridge, FM E.354.1932 (Myśliwiec, *Studien zum Gott Atum 1*, 1978, pp. 192, 279, XXXVIIb); London, BM EA49233 (Myśliwiec, *MDAIK 37* [1981], p. 378, pl. 56b); Copenhagen, NM 6621 (Myśliwiec, in Junge [ed.], *Studien zu Sprache und Religion*, 1984, pp. 811–14, fig. 2, pls. 2a–b, 3a–b, 5a); Vatican City, MGE 37428, 37217 (Grenier, *Bronzes*, 2002, pp. 181–82, pl. IL); Saqqara North Falcon Complex FCO-43 H5-1941 [3904] (Davies and Smith, *Falcon Complex*, 2005, p. 76, pl. XXVIId [London, Petrie UC30501]); Antwerp, Vleeshuis 79.1.64 from Memphis (Weiß, *Tier- und Götterbronzen*, 2012, p. 656, no. 509); Cairo, EMC CG 38702–03 from Sais (Weiß, *Tier- und Götterbronzen*, 2012, pp. 656–57, nos. 510–11) and Paris, Louvre N 5200 from the Saqqara Serapeum dromos (Weiß, *Tier- und Götterbronzen*, 2012, pp. 656–57, no. 513; see also Ziegler, *BSFE 90* [1981], pp. 38–39, fig. 3); London, BM EA6879 (Thum, "Creatures Compartimentalised", 2012, p. 121, no. X-01); London, BM EA36151 (Masson-Berghoff and O'Flynn, *BMSAES 24* [2019], pp. 164–65, fig. 5, p. 170, fig. 12; O'Flynn et al., *Scientific Reports 13* [2023], p. 3, Table 1, pp. 7–9, fig. 7); London, BM EA71428 (Thum, "Creatures Compartimentalised", 2012, p. 121, nos. X-02; Masson-Berghoff and O'Flynn, *BMSAES 24* [2019], p. 164, fig. 4, p. 170, fig. 11; O'Flynn et al., *Scientific Reports* 13 [2023], pp. 2–3, Table 1, pp. 6–8, figs. 5–6); New York, BM 36.624 (Bleiberg et al., *Soulful Creatures*, 2013, pp. 54–55, fig. 45); Geneva, FGA EG-94 (Bianchi, *Ancient Egyptian Works of Art*, 2014, pp. 232–233); Boston, MFA 1986.239; Brussels, MRAH E.02169; London, Petrie UC8227; Stockholm, Medelhavsmuseet MM 1969.194.

148



Inventory number: Cat. 2401
Object: Coffin for an eel
Dimensions: L: 17.4, W: 1.7–1.9, H: 6.67
Acquisition: Donation Zucchi (1858)
Provenance: Unknown
Date: Probably Late Period to Ptolemaic Period (772–332 BC), based on parallels and general typology
Scientific analyses: None
Description: A long rectangular copper alloy votive coffin surmounted by an image of a hybrid creature with the body of an eel, the front of which takes the form of an erect uraeus with a human head wearing an *atef* crown, that is supported by a diagonal Maat-feather at the back.

The uraeus has a flat back. The human head rests on the uraeus hood flare. The beard is cut off diagonally at its lower end. The chin and mouth are cursorily indicated. The face is offset and its left side is higher than the right. The nose is slightly twisted towards the left and superficially modelled. A tripartite wig surmounted by the *atef* crown completes the head. It is, like the face, asymmetrical. The Maat-feather supporting the uraeus and connecting it to the eel's body is fixed to the latter's back by a small agglomeration of bronze, representing the original wax joint. The box is narrower at the front and flares out at the back, which is where the opening for the mummy is located. A wrapped package is visible inside, but could not be examined. The eel's body starts behind the uraeus and undulates seven times, becoming increasingly straight toward the tip. At the rear, 0.95 cm away from the back end, after a tiny recess, is the caudal fin typical of eels. Based on the provenanced eel boxes from Sais and the Memphite region, particularly Saqqara, one could speculate that this coffin also comes from one of these sites.

Technical notes

The eel and the uraeus head were cast together with the hollow box. All elements were seemingly made separately in wax and then joined together for casting. The feather acted as a support channel for the hot bronze to properly reach the upper parts of the uraeus. The core supports can be identified in the centre of the front of the box, three along the centre line of the bottom, and more on the front and left side. The thin striations on the outer sides could possibly represent the smoothing of the original wax model; they might, however, also be an artefact of a restoration process.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 338, no. 2401 [78].
Parallels: Type 87 by Weiß (Weiß, *Tier- und Götterbronzen*, 2012, p. 180; for examples, see pp. 178–80, 656–57, nos. 509–14, pls. 26a-c); Berlin, ÄM 8897 (Myśliwiec, *Studien zum Gott Atum 1*, 1978, pp. 191–92, 279, pls. XXXVIIa, XLIIb); Leiden, RMO 199 (Myśliwiec, in Junge [ed.], *Studien zu Sprache und Religion*, 1984, pp. 814–16, fig. 3, pls. 2c, 4a–b, 5b); Leiden, RMO AB 67 (Giovetti and Picchi [eds.], *Egitto. Splendore millenario*, 2015, pp. 488, 571); Copenhagen, NM 6621 (Myśliwiec, in Junge [ed.], *Studien zu Sprache und Religion*, 1984, pp. 811–14, fig. 2, pls. 2a–b, 3a–b, 5a); Bothmer, in Hall (ed.), *Antiquities Collection Christos G. Bastis*, 1987, pp. 47–48; Amiens, MP 3057.315 (Perdu and Rickal, *Collection égytienne*, 1994, p. 130); North Saqqara Falcon Complex FCO-176 H5-2238 [4355] (Davies and Smith, *Falcon Complex,* 2005, p. 93, pl. XLIIIa); Cairo, EMC CG 38704.

8.12 Crocodiles

Crocodiles have been emblematic of Egypt to the Greeks, Romans, and even Europeans, figuring in mosaics, paintings, and coins. These images evoked exoticism, danger, and the mysterious Nile. These animals, as well as their mummies, made their way into European collections quite early on in history – possibly some of the crocodiles suspended in apothecary shops and displayed in early *cabinets des curiosités*[189] were mummified ones that had been unwrapped and exhibited. Crocodiles were associated most commonly with the god Sobek. Sobek is attested from the Old Kingdom onwards, and had cult centres in several places in Egypt, with a concentration in the Fayum, and in Upper Egypt at Sumenu (al-Mahamid Qibly), Gebel el-Silsila, and Kom Ombo.[190] Sobek was essentially a deity associated with fertility in the form of the Nile flood, sexuality, and solarity in his syncretised form of Sobek-Re.[191] In some contexts crocodiles have also been associated with Seth, the god reigning over chaos.[192]

Crocodile mummies have been amongst the earliest subjects for studies on the zoological diversity of Egypt. Étienne Geoffroy Saint-Hilaire, a naturalist who was one of the savants in Napoleon Bonaparte's expedition to Egypt (1798–1801), studied animal mummies to determine what the fauna of the country was in antiquity and what animals might have become extinct by his time. Saint-Hilaire's observations of the morphology (particularly cranial) of crocodile mummies led him to believe that the ancient Egyptians mummified two types of crocodiles: *Crocodilus niloticus* and *Crocodilus suchus*, and that the latter had become extinct, as it was no longer found in the Nile.[193] While the fierce Nile crocodile was well-attested in the Nile, the more docile Suchus inhabited western Africa. However, Saint-Hilaire's assertion was disputed until 2011, when DNA extracted from crocodile mummies vindicated his results,[194] establishing that both species were exploited by the ancient Egyptians.[195] Whether both species inhabited the Nile and Suchus became extinct, remains undetected, or interbred with Niloticus to a degree that it cannot be identified easily is unknown as yet. It is also possible that young Suchus were imported from elsewhere, as were baboons and other monkeys, though transporting any but very young crocodiles would have been challenging due to the practicalities involved.

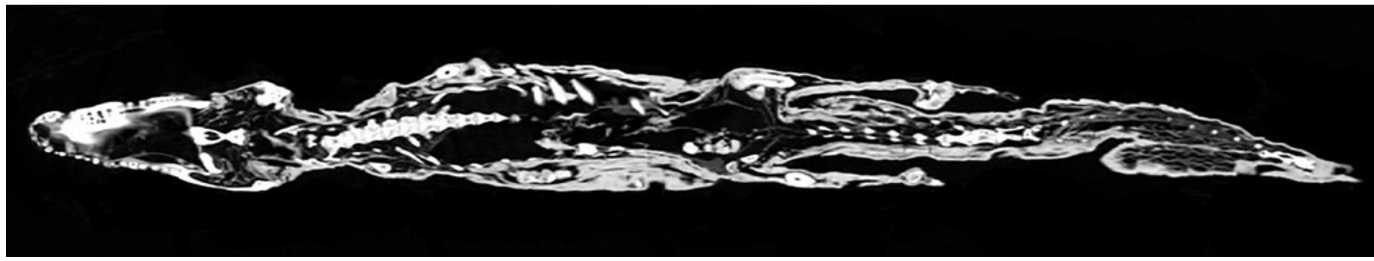
Crocodile cults in West Africa (for example in Mali and Mauritania)[196] are common, and one can even swim safely with these animals – something that is not generally possible with Nile crocodiles. The descriptions of classical authors such as Herodotus (II, 69) and Strabo (XVII, 38) of the ancient Egyptians' interactions with these animals involve bejewelling them as well as feeding them from close quarters – the former in particular would have been easier and safer to achieve with Suchus than Niloticus. Presumably the ancient Egyptians were aware of this and thus sought out Suchus both as receptacles for the god's spirit and as offerings to him. It is worth noting that until recently it was thought that there were no or very few Suchus in eastern Africa, but recent work has established that they exist and are more numerous than believed hitherto;[197] possibly further research in Egypt might also show evidence for Suchus here.

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[189] Seba, *Cabinet of Natural Curiosities*, 1999; Listri, Paolucci, Carciotto, *Cabinet of Curiosities*, 2020.
[190] Vernus and Yoyotte, *Bestiaire des pharaons*, 2005, pp. 209–40; Wilkinson, *Complete Gods and Goddesses*, 2003, pp. 218–20.
[191] For details of why the Egyptians might have associated crocodiles/Sobek with this variety of traits, see Ikram, in Ikram and Hawass (eds.), *Thebes and Beyond*, 2011, pp. 85–98.
[192] Vernus and Yoyotte, *Bestiaire des pharaons*, 2005, pp. 215–18.
[193] Geoffroy Saint-Hilaire, *AMHN* 10 (1807), pp. 67–86.
[194] Hekkala et al., *MolEco* 20 (2011), pp. 4199–215: https://doi.org/10.1111/j.1365-294X.2011.05245.x.
[195] Hekkala et al., *JAS-Rep* 33 (2020), 102483: https://doi.org/10.1016/j.jasrep.2020.102483; Hekkala et al., *BullPeabodyNH* 63.1 (2022), pp. 3–14: https://doi.org/10.3374/014.063.0101. Attempts are also being made to differentiate morphologically (to some extent following Saint-Hilaire's methods) between the two species; of note: De Cupere et al., *PLOS ONE* 18.1 (2023), e0279137: https://doi.org/10.1371/journal.pone.0279137.
[196] For Mali, Ikram, personal observation; for Mauritania, see Cunningham, *Spatial and Genetic Analyses*, 2015; Mayell, *National Geographic* (18 June 2002).
[197] Bogezi, *Distribution and Status of Crocodylus suchus*, 2015.

149





Inventory number: Cat. 2351/1
Object: Crocodile mummy
Dimensions: L: 175, W: 16
Acquisition: Acquired before 1882
Provenance: Unknown
Date: 50 BC – AD 70 (^{14}C date)
Scientific analyses: CT, ^{14}C dating, UVF, Pyrolysis-GC/MS
Description: Long and skinny crocodile mummy with only a few bits of coarse bandaging surviving. Only small fragments of weave adhere to the tail of the crocodile and to its proper right side. Imprints of the fabric are still visible on the skin. Evidence of resins and oils are clearly visible, and tiny bits of vegetal material are stuck to these. The tongue is inside the mouth and pushed against the teeth on the left side.

Scientific examination

CT investigations

The CT scans show a complete mummy of a crocodile, probably about 1 or 2 years old judging from the length of the animal. The gender of the creature is uncertain. The body is in a good state of preservation, except for post-mortem dislocation of the pubis. No evisceration cut is visible; indeed, it seems as if the animal was not eviscerated at all, and that some almost digested bits of mammalian bone still remain in the stomach.

Radiocarbon dating (^{14}C)

Biological tissue, calibrated age (95% probability): 50 BC – AD 70 (like **No. 153**).

Pyrolysis-GC/MS

Pyrolysis-GC/MS analysis showed the presence of coniferous resin, as is seen in other crocodile mummies.

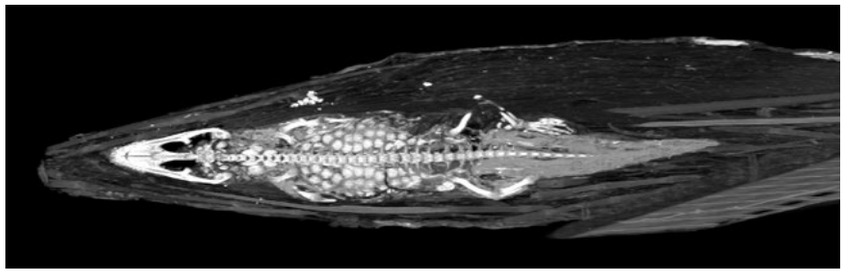
Bibliography: Fabretti et al. *Regio Museo*, 1882, p. 332, no. 2351 [25–26]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19.
Parallels: No parallels.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	18 x 3	Undyed	

Textile notes

150





Inventory number: Cat. 2351/2
Object: Crocodile mummy
Dimensions: L: 181.5, W: 23
Acquisition: Acquired before 1882
Provenance: Unknown
Date: 40 BC – AD 210 (^{14}C date)
Scientific analyses: CT, ^{14}C dating
Description: An elaborately prepared crocodile mummy in the shape of the reptile. A mat of reeds is wrapped around the animal. It is tied at the muzzle with a rope (probably made of halfa grass), while the tip of the muzzle is reinforced with linen. The head is covered by a dark brown piece of linen (T1) that is also coated with black resin-like substance, beneath which linen bandages provide the form of the postorbital lumps on a crocodile's head. The appliquéd eyes are formed by a series of concentric bandages, undyed and brown. The body is covered by the mat as well, which is secured in place by rope, and then by a plain linen shroud (T3). This is surmounted by a series of overlapping horizontal bandages of differing widths (T5). Originally, these were interspersed with vertical dark brown bandages, creating a coffered pattern (emulating the crocodile's scutes). At the base of the tail, the reed matting is augmented by some grass. The tail is spirally bound in rope and then wrapped in light brown/orange (T4) and undyed bandages (T2). The sides are covered with undyed linen that preserves the starting border and fringes (T5).

Scientific examination

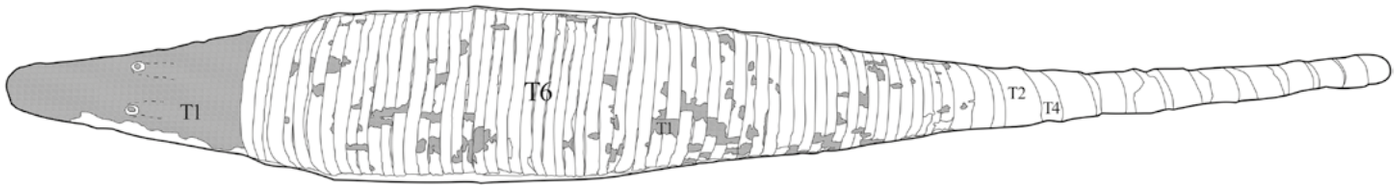
CT investigations

The CT scans show a complete skeleton of a crocodile, probably about 1 year old judging from its length. The animal was eviscerated. The crocodile is smaller than the wrappings would suggest, occupying two thirds of the space of the mummy bundle. The body of the animal is wrapped in two layers of plant fibres. Two long sticks, about 1 cm wide, are placed on either side of the animal; quite possibly these are bits of palm rib providing support to the fragile skeleton, and have been noted on both unwrapped and wrapped crocodile mummies.

Radiocarbon dating (^{14}C)

Plant elements, calibrated age (95% probability): 40 BC – AD 210. This is later than any of the other crocodile mummies in the Museo Egizio that have been radiocarbon-dated.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 332, no. 2351 [25–26]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 19; Ciccopiedi (ed.), *Archeologia invisibile*, 2019, pp. 64–65, fig. 18; Tamburini et al., *HeritSci* 9 (2021), pp. 6, 12, tab. 2.
Parallels: Liverpool, NML 14289.

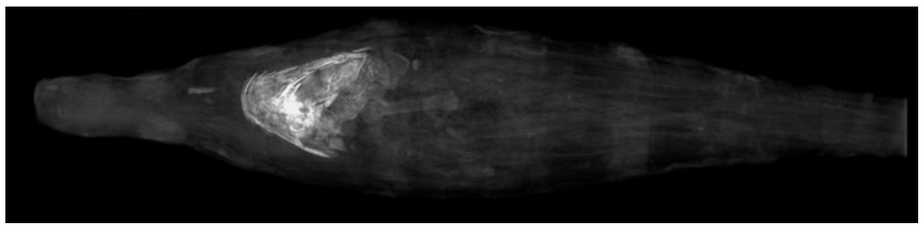


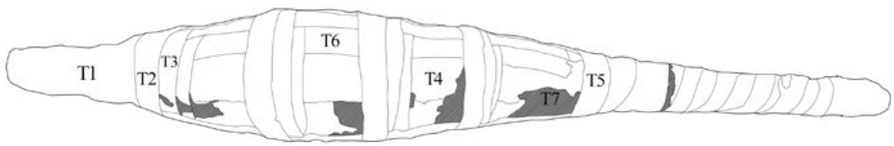
	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S		Too badly preserved for thread count	Dark brown	
T2	Linen	S	Warp-faced	30 x 10	Undyed	One selvedge
T3	Linen	S	Warp-faced	22 x 10–11	Undyed	
T4	Linen	S	Warp-faced	28 x 10	Light brown/ orange (?)	
T5	Linen	S	Warp-faced	30 x 12	Undyed	Starting border Self-bands Fringes

Textile notes: Five different qualities of textiles were used to wrap the mummy and create the pattern.

151







Inventory number: Provv. 1443
Object: Crocodile mummy
Dimensions: L: 53, W: 9.2
Acquisition: Unknown
Provenance: Unknown
Date: 370–200 BC (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating, UVF, Pyrolysis-GC/MS, Optical Microscopy
Description: An elaborate mummy, completely wrapped, in the form of a crocodile. The head is small and plain, wrapped in a small piece of dark brown textile folded on its sides (T1), with the eye area marked by a protuberance of textile; any paint or appliqué that would have marked the eyes is now missing. The central dorsal part is covered using three different textiles (T2, T3, T6), partly coated with black resin-like substance. The pattern is not discernible anymore. It probably consisted of polychrome coffers whose colour pattern cannot be precisely determined.
The tail is spirally wrapped in black (T7) and undyed bandages (T5). The ventral side shows that it was spirally wrapped with the bandages secured with dots of resin (acacia gum?) (T4), before the outer shroud was put on. The edges of the fine shroud extend partially over the belly. Beneath the bandages lie reed and papyrus strips, possibly woven into a loose mat. These are kept in place with a rope and linen strips that extend all the way down the tail.

Scientific examination

CT investigations
The CT scans show that the package does not contain a whole crocodile, only fragments of flat bones, which might be crocodilian. There is a large radiopaque object present as well; it is not clear if it is mud or part of a crocodile skull thickly covered with resin. Some tubular structures with a lower radiopacity, probably reeds used to give shape and support to the mummy, are also visible.
Radiocarbon dating (^{14}C)
Plant elements, calibrated age (95% probability): 370–200 BC.[198]

[198] This is a similar date to **No. 162**.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	24 x 15	Dark brown	
T2	Linen	S	Warp-faced	37 x 16	Light brown	
T3	Linen	S	Warp-faced	36 x 12	Undyed	
T4	Linen	S	Warp-faced	14 x 9	Undyed	
T5	Linen	S	Warp-faced	40 x 17	Undyed	
T6	Linen	S	Warp-faced	36 x 15–16	Undyed	
T7	Linen	S		Too badly preserved for thread count	Black	

Textile notes: Seven different qualities of textiles were used to wrap the mummy and create the pattern.

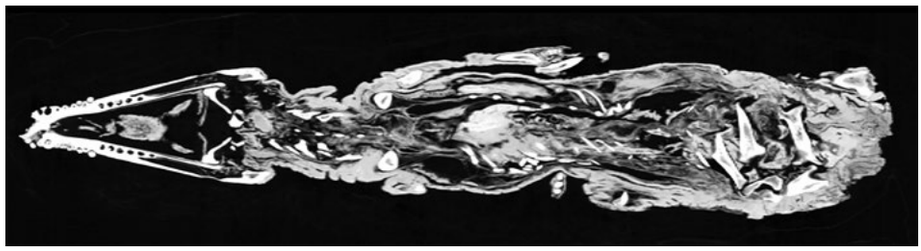
Pyrolysis-GC/MS

Results of pyrolysis-GC/MS testing of some of the dark resinous material yielded (low) traces of plant gum, possibly from acacia trees, which are common in Egypt, although imported plant gum/resin is also a possibility.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 14, 19, 21; Tamburini et al., *HeritSci* 9 (2021), pp. 6, 12, tab. 2; Xiaolin (ed.), *Egypt*, 2018, p. 110, fig. 61; Marini and Tjabbes (eds.), *Egito Antigo*, 2020, p. 123.
Parallels: Kessler, *Die heiligen Tiere*, 1989, pp. 170–71; Nicolotti, *Les crocodiles momifiés*, 1992; Brussels, MRAH E 1229 (Francot et al. [eds.], *Les momies égyptiennes*, 1999, pp. 28–29, 56, fig. 41); Leiden, RMO AMM 16i, AMM 16k (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 304–05).

152





Number: Provv. 1444 (other numbers: 918)
Object: Crocodile mummy
Dimensions: L: 175, W: 13
Acquisition: Unknown
Provenance: Unknown
Date: Undetermined
Scientific analyses: CT, Pyrolysis-GC/MS
Description: A crocodile mummy that has lost almost all its bandages, though it is still coated with a resinous substance. Fragments of folded fabric fill the gaps between the body and the legs of the crocodile. The right side of its snout is damaged, and the tail is broken off.

Scientific examination

CT investigations

The CT scans show a crocodile skeleton, probably between 5 and 8 years old judging from the length of the animal (approximately 240 cm). The animal is incomplete, missing part of the hind limbs and most of the tail. The pubis was dislocated post-mortem. This crocodile was not eviscerated, as remains of bones (thus far unidentifiable) from its last meal are still in the body.

Pyrolysis-GC/MS

Pyrolysis-GC/MS of the resinous substance shows that it is a coniferous resin.

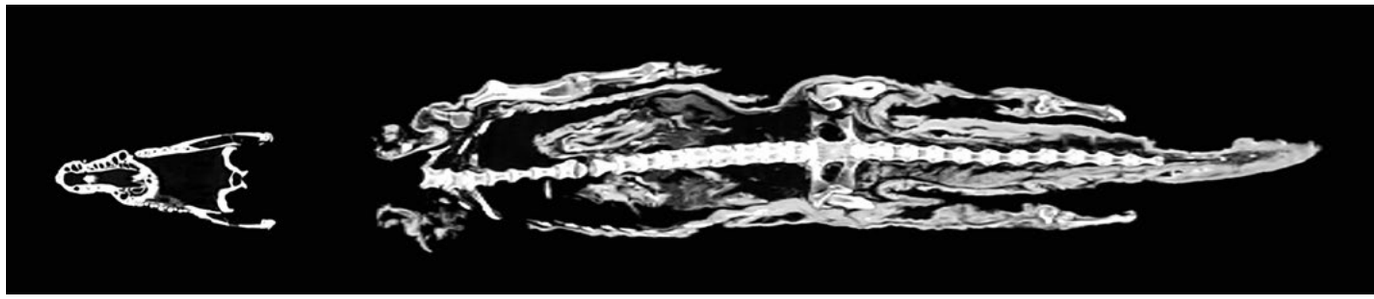
Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 333; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 14, 19, 21.
Parallels: Cairo, EMC CG 29630 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 7, 77).

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S		Too badly preserved for thread count	Undyed	

Textile notes

153





Inventory number: Provv. 1447
Object: Crocodile mummy
Dimensions: Head L: 34.8, W: 15; Body L: 139.5, W: 19.5
Acquisition: Unknown
Provenance: Unknown
Date: 50 BC – AD 70 (^{14}C date)
Scientific analyses: CT, ^{14}C dating, Pyrolysis-GC/MS
Description: A crocodile mummy with its head separated from its body. It has lost most of its bandages; only tiny fragments of cloth remain between the feet. The body is liberally covered with a resin that gives it a black patina.

Scientific examination

CT investigations

The CT scans show a crocodile skeleton, probably about 1 year old judging from the reconstructible length of the animal. The animal is incomplete, missing the right forelimb and the last coccygeal vertebrae. The ischium and the pubis were dislocated post-mortem. There might be remnants of a meal in the body, but it is also possible that these are merely the crocodile's own organs, as it was not eviscerated.

Radiocarbon dating (^{14}C)

Biological tissue, calibrated age (95% probability): 50 BC – AD 70, straddling the Ptolemaic and early Roman periods.

Pyrolysis-GC/MS

Pyrolysis-GC/MS identified a coniferous resin of an undetermined tree species.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 14, 19, 21; Donadoni Roveri, *Art of Weaving*, 2001, p. 88.
Parallels: Berkeley, HM 5-514; Maidstone, MaM EA19/1 (1868-100); Stockholm, Medelhavsmuseet NME 1961: 256–62; Vienna, KHM 264–65, 275–89; Washington, NMNH AT 5604-0.

154



Inventory number: Provv. 1458/1 (other number: 8)
Object: Crocodile mummy
Dimensions: L: 11.4, W: 2.7; Head L: 5.5
Acquisition: Unknown
Provenance: Unknown
Date: Undetermined
Scientific analyses: None
Description: The head and foreparts of a very juvenile crocodile, probably a few weeks old judging from the length of the animal. It is blackened with embalming materials. No textile is preserved on this mummy.

Bibliography: Grilletto, *Materiali antropologici e zoologici,* 1991, pp. 14, 19, 21.
Parallels: Berkeley, HM 5-514; Maidstone, MaM EA19/1 (1868-100); Stockholm, Medelhavsmuseet NME 1961: 256–62; Vienna, KHM 264–65, 275–89; Washington, NMNH AT 5604-0.

155

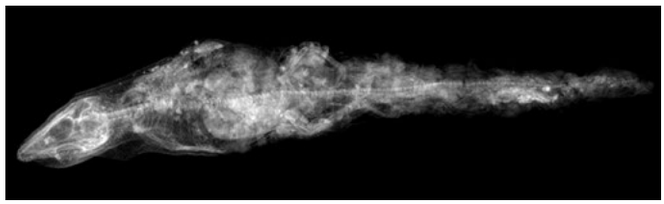


Inventory number: Provv. 1458/2 (other number: 9)
Object: Crocodile mummy
Dimensions: L: 28; Head L: 6.2, W: 3
Acquisition: Unknown
Provenance: Unknown
Date: Undetermined
Scientific analyses: None
Description: A broken but complete and darkened juvenile crocodile, probably a few weeks old judging from the length of the animal. Any original wrappings are now lost. No textile is preserved on this mummy.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 14, 19, 21.
Parallels: Berkeley, HM 5-514; Maidstone, MaM EA19/1 (1868-100); Stockholm, Medelhavsmuseet NME 1961:256–62; Vienna, KHM 264–65, 275–89; Washington, DC NMNH AT 5604-0.

156





Inventory number: Provv. 1458/3 (other number: 12)
Object: Crocodile mummy
Dimensions: L: 27.2, W: 5
Acquisition: Unknown
Provenance: Unknown
Date: 210–40 BC (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating, Optical Microscopy
Description: A crocodile mummy wrapped in small fragments of different fabric held in place by multiple strands of linen threads (S-spun). A density count of these bandages is impossible, due to their size and their partial impregnation by embalming substances. The only exception is one larger bandage fragment (T1, 4.5 cm wide), which wraps the head.

Parts of this bandage (T1), just below or on the back paws, is secured by linen thread. Over the final bandaging, the crocodile was brushed with a black substance – possibly resin of some sort. The bottom of the crocodile shows bandages that are far less discoloured and show their original tone. At the end of the tail, the textile extends a bit beyond the body and is folded in. The tip of the snout and tiny teeth are visible.

Scientific examination

CT investigations

The CT scans show that the animal was very young, a hatchling or an animal that was only a few weeks old, judging from the length of the body. It was not eviscerated, as soft tissue residues are present in the abdomen. Presumably it was desiccated in some fashion.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 210–40 BC.

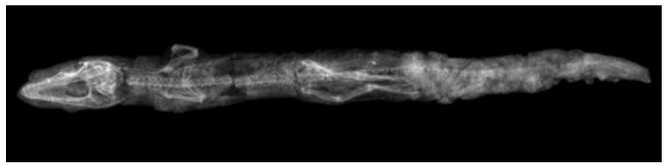
Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 14, 19, 21.
Parallels: Chicago, OIM E714; Milan, CMA 0.9.41359; Manchester, MM 12008 (22941), 12010 (22943); Philadelphia, Penn 97-121-3; Vienna, KHM 292.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Balanced	12 x 7	Undyed	Self-bands?
Thread	Linen	S				

Textile notes

157





Inventory number: Provv. 1461/1 (other number: 15)
Object: Crocodile mummy
Dimensions: L: 30.5, W: 3.7
Acquisition: Unknown
Provenance: Unknown
Date: 50 BC – AD 120 (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating, UVF, Optical Microscopy
Description: A crocodile mummy that is spirally wrapped with coarse linen bandages. Different pieces of textiles (possibly from the same fabric T1) are held in place by multiple strands of linen threads (S-spun). At the junction of the tail and the body the bandages are also reinforced by thread.

Scientific examination

CT investigations

The CT scans show that the animal was very young, probably a few weeks old, judging from its bones. The skeleton is complete, but shows post-mortem vertebral dislocation. Cerebral remnants are possibly present, but they are difficult to detect due to the small size of the animal.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 50 BC – AD 120, straddling the Ptolemaic and Roman periods.

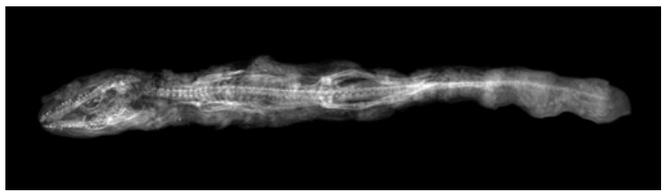
Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 14, 20 (as snake), 21.
Parallels: Gotha, SSFG Ae 1153; Maidstone, MaM EA496; **Nos. 158–159**.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Balanced	8 x 5	Undyed	
Thread	Linen	S				

Textile notes

158





Inventory number: Provv. 1461/2 (other number: 16)
Object: Crocodile mummy
Dimensions: L: 31.1, W: 3.3
Acquisition: Unknown
Provenance: Unknown
Date: Probably Ptolemaic Period or Roman Period (332 BC – AD 395), based on **No. 157**
Scientific analyses: X-ray, CT, UVF, Optical Microscopy
Description: A crocodile mummy spirally wrapped with coarse quality linen bandages.
Different kinds of fabric are present (T1-T6). One of these (T2) is very coarse. A thread (S-spun) is wrapped around the lower part to secure the bandages.

Scientific examination

CT investigations

The CT scans show that the package contains a juvenile crocodile, probably a few weeks old judging from the length of the animal. The body is broken at the base of the head, halfway down the body, probably post-mortem, and there are cracks in the tail. The dorsal osteoderms are visible, but small.

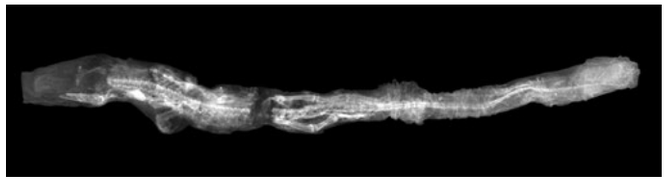
Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 14, 20 (as snake), 21.
Parallels: Chicago, OIM E714; Gotha, SSFG Ae 1153; Maidstone, MaM EA496; Milan, CMA E 0.9.41359; Manchester, MM 12008 (22941), 12010 (22943); Philadelphia, Penn 97-121-3; **Nos. 157, 159**; Vienna, KHM 292.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Balanced	12 x 10	Undyed	
T2	Linen	S	Warp-faced	18 x 5–6	Undyed	
T3	Linen	S	Warp-faced	20 x 12	Undyed	Hem
T4	Linen	S	Balanced	12 x 16	Undyed	
T5	Linen	S	Warp-faced	14 x 7	Undyed	
T6	Linen	S	Warp-faced	20 x 12	Undyed	
Thread	Linen	S				

Textile notes: Six different qualities of textiles were used to wrap the mummy. It is possible that T3 and T6 come from the same piece of fabric.

159





Inventory number: Provv. 1461/3 (other number: 17)
Object: Crocodile mummy
Dimensions: L: 31, W: 2
Acquisition: Unknown
Provenance: Unknown
Date: Probably Ptolemaic Period or Roman Period (332 BC – AD 395), based on parallel with **No. 157**
Scientific analyses: X-ray, CT, UVF, Pyrolysis-GC/MS, Optical Microscopy
Description: A crocodile mummy spirally wrapped with coarse linen bandages, c. 2.5 wide, reinforced by a thin spiral bound cord (Z-spun) all over, and particularly at the junction of the tail. Two different types of linen are present; one has a thicker linear motif (self-bands) that could be decorative or indicative of an edge.

Scientific examination

CT investigations

The CT scans reveal a juvenile crocodile, probably a few weeks old judging from the length of the animal. The body was broken in a few places, particularly above the hind legs. Smears of resin might have been used to help mend the breaks.

Pyrolysis-GC/MS

Pyrolysis-GC/MS of the resinous substance shows that it is a coniferous resin.

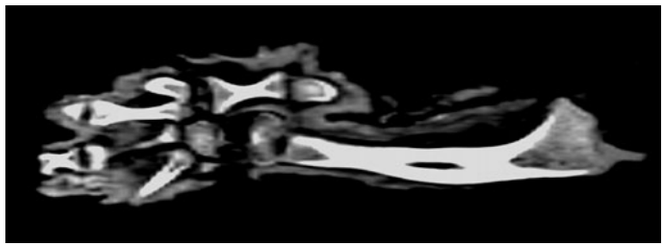
Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 14, 20 (as snake), 21.
Parallels: Chicago, OIM E714; Gotha, SSFG Ae 1153; Maidstone, MaM EA496; Manchester, MM 12008 (22941), 12010 (22943); Milan, CMA E 0.9.41359; Philadelphia, Penn 97-121-3; Vienna, KHM 292; **Nos. 157–158**.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Balanced	18 x 16	Undyed	
T2	Linen	S	Balanced	18 x 14	Undyed	Self-bands
Cord	Linen	Z				

Textile notes: Two different qualities of textiles were used to wrap the mummy.

160





Inventory number: Provv. 1462 (other number: 5)
Object: Crocodile mummy
Dimensions: L: 19.4
Acquisition: Unknown
Provenance: Unknown
Date: 190–50 BC (^{14}C date)
Scientific analyses: CT, ^{14}C dating, Pyrolysis-GC/MS
Description: Foreleg of a crocodile covered with a dark resinous substance. No textile is preserved on this mummy part. It is possible that the purchasers acquired only a part of a crocodile mummy as a curiosity/souvenir, as the entire animal would have been difficult to transport, or that this is a remnant of a complete animal that was too damaged to salvage.

Scientific examination

CT investigations

The CT scans show the forearm and foot of the left front limb of an adult crocodile, its age based on the deduced size of the complete animal. The distal phalanges of the first and third fingers are absent.

Radiocarbon dating (^{14}C)

Biological tissue, calibrated age (95% probability): 190–50 BC.

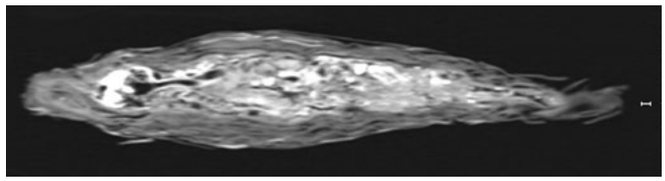
Pyrolysis-GC/MS

Pyrolysis-GC/MS analysis showed that a coniferous resin is present. Traces of an oil or fat are also noted, though it is not possible to determine if it was of plant or animal origin.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 14 (as “zampa di scimmia”), 19 (as “babbuino o cinocefalo”), 21.
Parallels: Maidstone, MaM EA 503 and 504.

161





Inventory number: Cat. 2353/1 (other number: 10)
Object: Crocodile mummy
Dimensions: L: 26.3, W: 4.1
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: CT, UVF, Optical Microscopy
Description: Crocodile mummy in the shape of the reptile. It is tightly wrapped. Two overlapping pieces of the same fabric (T1), held in place by some black resin-like substance, cover the upper and the lower side of the mummy. This textile was probably dyed orange-pinkish, but the original colour is no longer distinguishable due to degradation. A small strip (2 cm wide) (T2), probably light brown, was used to wrap the tail and the head.

In the outermost wrapping, the head is covered with one piece of cloth, beneath which are fabric fragments modelled to indicate the snout, eyes, and frontal bone. They are secured by a black resin-like substance and a bandage that covers the animal's neck and the transition to the second external shroud, which covers the rest of the body to just beyond the base of the tail. The tail is wrapped in a spiral bandage. Another bandage of the same cloth covers the ventral side of the crocodile. The top of the crocodile is darker than the bottom, not only due to the application of oils, but also to the fact that it was exposed to the elements and dirt, while the bottom was protected.

Scientific examination

CT investigations

The CT scans show that the package contains a small juvenile crocodile, probably a hatchling, judging from the length of the animal. The small size of the bones makes their identification difficult. The animal body was first wrapped in reeds (possibly papyrus). In the lower part of the bandage, a lath of 0.4 cm extends along the entire length, perhaps used to stabilise or support the mummy.

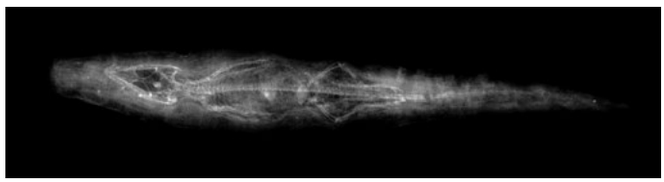
Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 333, no. 2353 [28–29]; Grilletto, *Materiali antropologici e zoologici*, 1991, p. 19.
Parallels: Leiden, RMO AMM 16g (Raven and Taconis, *Egyptian Mummies*, 2005, p. 302).

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Balanced	16 x 15	Orange-pinkish (?)	
T2	Linen	S	Warp-faced	56 x 16	Light brown (?)	

Textile notes: Two different qualities of textiles were used to wrap the mummy.

162





Inventory number: Cat. 2353/2 (other number: 11)
Object: Crocodile mummy
Dimensions: L: 34, W: 5
Acquisition: Acquired before 1882
Provenance: Unknown
Date: 370–200 BC (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating, UVF, Optical Microscopy
Description: A crocodile mummy bundle that tapers at both ends. One end looks as if it were the snout of a crocodile, with the eye bumps indicated. The body is bound using a variety of bandages of different qualities and colours (undyed, light brown, and dark brown) that are wrapped spirally around the animal and held in place by a black resin-like substance; one fabric (T3) is in a basket wave. Originally, a plain piece of cloth must have covered these, giving a more uniform appearance to the object. The tail is wrapped in two bandages, respectively light brown (T1) and dark brown (T2) that were tightly and elegantly folded and spiralled around it. The bandages covering the tail extend beyond it, and were folded over at the end. In terms of conservation, the dorsal side appears cleaner.

Scientific examination

CT investigations

The CT scans show that the package contains the body of a juvenile crocodile, probably a hatchling judging from the length of the animal.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 370–200 BC, like **No. 151**.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 333, no. 2353 [28–29]; Grilletto, *Materiali antropologici e zoologici*, 1991, p. 19; Donadoni Roveri, *Art of Weaving*, 2001, p. 88.
Parallels: Leiden, RMO AMM 16k (Raven and Taconis, *Egyptian Mummies*, 2005, p. 305).

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	44 x 14	Light brown	
T2	Linen	S	Warp-faced	20 x 8	Dark brown	
T3	Linen	S	Basket	14 x 12	Undyed	
T4	Linen	S	Warp-faced	36–38 x 14	Undyed	

Textile notes: Four different qualities of textiles were used to wrap the mummy.

163



Inventory number: Suppl. 9483/2
Object: Crocodile mummy
Dimensions: Unverifiable
Acquisition: Italian Archaeological Mission (1909)
Provenance: Asyut
Date: Undetermined
Scientific analyses: None
Description: A box with parts of a crocodile, some bones, and fragments of crocodile hide. The box also contains the root of a mammal tooth, probably of an ovicaprid. Also, a bit of black fur/hair. It is unclear if this is detritus from Schiaparelli's excavations or if this is derived from a single mummy bundle.

Textile notes

No textile is preserved on this mummy.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, p. 19.
Parallels: No parallels.

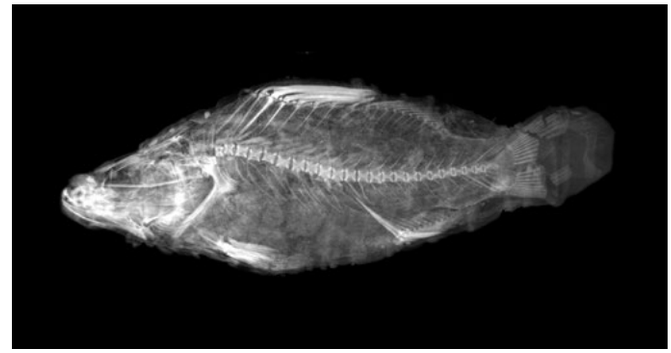
8.13 Fish

Given the diversity of fish in the Nile, it is surprising that so few fish are associated with deities. One minor goddess who was associated with fish is Hatmehyt, worshipped in the Delta city of Mendes. She was associated with a barbel (*Labeobarbus bynni*).[199] Her cult was overshadowed and subsumed by that of Banebdjedet, the ram god of the site, and fish mummies are not recorded from there. Although fish were associated with the goddess Neith, there is little evidence (at this point) of fish mummies originating from Sa el-Hagar (Sais), her main cult centre. However, one of her other cult centres at Esna is home to fish mummies (primarily Nile perch, *Lates niloticus*), while the goddess Mehyt, primarily seen as a lioness, was associated with the barbel (*Labeobarbus bynni*) at the site of Lepidontopolis, opposite Girga near Naga el Mesheikh. It has been hypothesised that the barbel might also have some associations with Taweret,[200] and classical authors list it as one of the fish that consumed Osiris's phallus after his body was cut into several pieces by Seth and his henchmen.[201] Fish mummies have been found at a few sites throughout Egypt, most commonly in the Fayum, notably at Oxyrhynchus,[202] but also elsewhere, such as Gurob (*Bagrus* sp. and *Lates niloticus*, mainly),[203] Thebes, and Esna (Latopolis).[204]

[199] Gamer-Wallert, *Fische und Fischkulte*, 1970, pp. 20, 98–101.
[200] Vernus and Yoyotte, *Bestiaire des pharaons*, 2005.
[201] Babbitt, *Moralia V. Isis and Osiris*, 1936, pp. 91–93.
[202] Van Neer and Gonzalez, in Peters et al. (eds.), *Animals*, 2019, pp. 311–42, which also includes an overview of sites with fish mummies.
[203] Loat, *Gurob*, 1905, pp. 3–6.
[204] Lortet and Gaillard, *La faune momifiée*, 1907, p. 305; Lortet and Gaillard, *La faune momifiée*, 1905, pp. 185–90; Raven and Taconis, *Egyptian Mummies*, 2005, pp. 317, 319–21; Gamer-Wallert, *Fische und Fischkulte*, 1970, pp. 20, 98–101.

164





Inventory number: Suppl. 19691/3
Object: Fish mummy
Dimensions: L: 27.3, W: 10.1
Acquisition: Paganini collection (post 1950)
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT, UVF
Description: A fairly flat fish mummy wrapped in a coarse undyed linen (T1), kept in place by strips of shredded papyrus (0.5 cm wide) that are knotted (square knots) in place, with several just at the base of the head. One side is flatter than the other, as it has slightly fewer wrappings, implying that some padding was used to protect the fish.

Scientific examination

CT investigations

The CT scans show a complete fish skeleton. The skull is shattered but still recognisable. It can be identified as a *Lates niloticus* due to the presence of two dorsal fins.

Bibliography: *Aegyptica Animalia*, 2000, pp. 69, 90, no. 75.[205]
Parallels: Lortet and Gaillard, *La faune momifiée*, 1903, pp. 185–86, figs. 79–80; Leek, *JEA* 62 (1976), pp. 131–33; New York, MMA 22.4.6.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	18 x 9	Undyed	

Textile notes

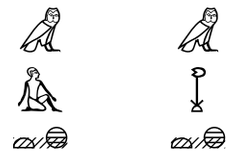
[205] This fish mummy was associated with human mummy S. 1969. However, as this association has not been proven, it has been disregarded.

165



Inventory number: Provv. 6119
Object: Fish mummy
Dimensions: Unverifiable
Acquisition: Unknown
Provenance: Unknown
Date: Undetermined
Scientific analyses: None
Description: Fragment of a fish, probably a *Distichodus engycephalus*, rarely found in the archaeological record, based on the fragmentary remains.[206] It does not seem to have been preserved with salt or natron; if it was, very little was used. This fish is unique in bearing an inscription in hieratic on the scales, a bit like a tattoo, and might suggest that this fish played a role in a medico-magical practice. The inscription runs along the length of the fish, but is oriented vertically from the head to the tail, rather than horizontally. Only a small portion survives.

Inscription
The fragmentary hieratic inscription does not yield a univocal sense, but possibilities are:



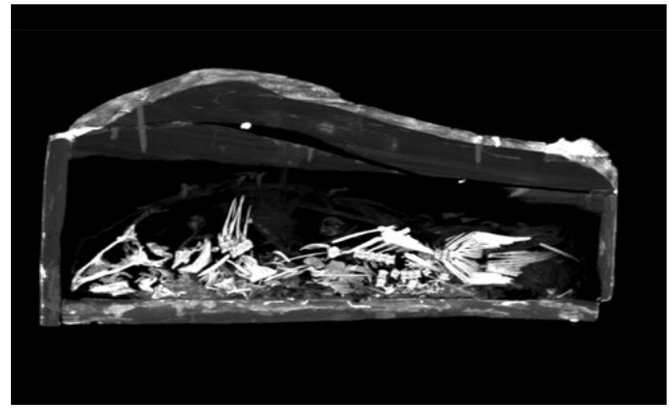
Comment
The *m* is of a type attested until the Eighteenth Dynasty.[207] The second sign looks like *ḫ3* (M12), but traces of an oblique stroke extending leftwards from the sign make it possibly more similar to *wrd* (A7). The subsequent *ḥ* and *t* are tentative readings. Traces of ink to the left of these two signs suggest there may have been another sign there, external to the column.

Bibliography: Unpublished.
Parallels: No parallels.

[206] Grateful thanks to Wim Van Neer for this identification; more on the limited attestation for this fish can be found in: von den Driesch, *Fische im Alten Ägypten*, 1986, p. 4. This fish is not commonly recorded in the archaeological record, particularly as a consumed fish, so, perhaps, it had a more religious function, though this might have been an opportunistic catch and use.
[207] Möller, *Hieratische Paläographie*, 1909–36, passim.

166





Inventory number: Cat. 2386
Object: Fish mummy and its coffin
Dimensions: L: 61.5, W: 12.5, H: 28
Acquisition: Acquired before 1882
Provenance: Unknown
Date: 970–800 BC (^{14}C date)
Scientific analyses: CT, ^{14}C dating
Description: A large coffin that takes the form of a slightly abstracted fish, surmounted by an image of a fish carved in very high relief. Both the fish and the coffin are tapered. The dorsal fin and the caudal fin are recognizable. The eyes are delineated by black circles with dots in the middle. The front (under the mouth of the fish) is stela shaped, but uninscribed. The construction of the coffin is unusual as the mummy was placed on a flat base with a recess, and the lid makes up the majority of the coffin.

Scientific examination

CT investigations

The CT scans show the fragmentary remains of a fish, a Nile barb (*Labeobarbus bynni*), to judge from the image on the lid and the remains,[208] and the distinguishable dorsal fin. It appears to have been eviscerated, and then possibly cured with salt or natron, and oiled, before being wrapped. No traces of black resin-like substance are discernible. The fish is somewhat broken up in the middle, but wrapped in bandages secured by a thin folded bandage, or possibly strands of papyrus wound around the textile.

Radiocarbon dating (^{14}C)

Wood, calibrated age (95% probability): 970–800 BC; an early date for an animal mummy. It is possible that the wood was reused due to a dearth of wood.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 337, no. 2386 [63].
Parallels: No parallels.

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Rectangular box surmounted by animal	No	Yes	Black	Seven pieces of wood	15	No	No

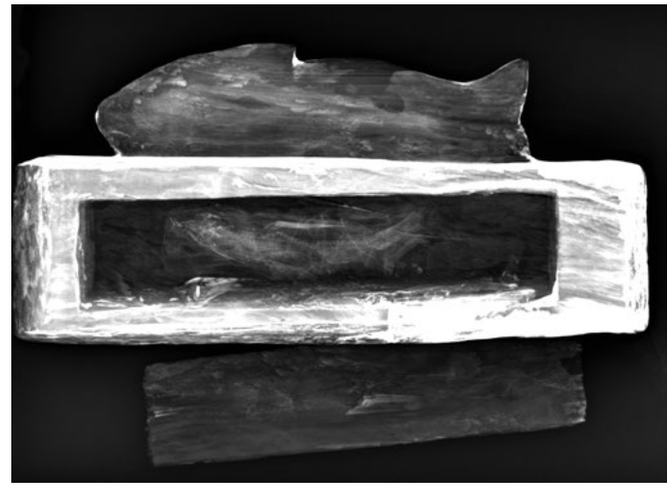
Coffin technical notes

[208] I am grateful to Wim Van Neer for sharing his expertise and helping with the identification of the fish mummies.

167







Inventory number: Cat. 2393
Object: Fish mummy in a coffin

MUMMY

Dimensions: L: 15.6, W: 4.6
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT

Description: Fish mummy wrapped in a piece of cloth (T2) augmented by spiral bandages (T1) (1.5 cm wide). Some drops of a black resin-like substance might have been used to secure the bandages.

Scientific examination

CT investigations

It is difficult to distinguish bones inside the bandages due to their small size. Portions of a collapsed skull, vertebrae, dorsal pinna, and tail engulfed in a heterogeneous material. A fish in a similar container in the Leiden Museum (see below), part of a larger group, could not be identified due to its size, but some scholars take the dedication to Mehyt as an indication that the fish should be a tilapia,[209] although an identification of *Lates* has also been put forward.[210] If it is indeed the latter, then the fish would have been caught close to the time that they spawned, as that is when they are in the shallows and easy prey.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn fatures
T1	Linen	S	Warp-face	70 x 22	Undyed	Selvedge
T2	Linen	S	Warp-faced	36 x 12	Undyed	

Textile notes

[209] Gaillard and Daressy, *La faune momifiée*, 1905, pp. 179–90; Gamer-Wallert, *Fische und Fischekulte*, 1970, pp. 39, 88–90.
[210] Kessler, *Die heiligen Tiere*, 1989, pp. 176–77, pls. 2–3.

COFFIN

Dimensions: L: 33.2, W: 10, H: 16.2; Box H: 9.5; Fish sculpture H: 6.7

Acquisition: Acquired before 1882

Provenance: Unknown

Date: 800–480 BC (^{14}C date)

Scientific analyses: X-ray, CT, ^{14}C dating

Description: Wooden rectangular coffin surmounted by the image of a fish with a dorsal fin, reminiscent of the Nile barbel (*Labeobarbus bynni*). The coffin is made from a single piece of wood and the box opens on the left proper side to accommodate the mummy. Both the box and the fish are plastered and painted. The "door" is painted in red and its frame in green. The other sides are painted with a central white band containing an inscription painted in red, flanked on the top and bottom with red bands. A fragment of bandage adheres to the upper red band on the right proper side. The fish was painted yellow, with facial details picked out in black and red. The top fin was painted green, and the tail was enhanced by red and black (or green) paint.

Inscription



Mḥ.yt [*dì*(*.t*) *ʿnḫ*] *wḏꜣ snb ʿḥʿ ḳꜣ jꜣw ʿꜣ nfr nḏm-jb* […] *rʿ nb n Ns-Mn.w sꜣ Ḫns.w-jr-dì-s*

"Mehyt, [who gives life (?),] prosperity, health, a long lifetime, a long and good old age, happiness […] every day to Nesmin, son of Khonsuirdis."

Comment

After *nḏm-jb* a group we cannot make sense of, starting with what seem to be two n-signs.

Nesmin and Khonsuirdis (*PN* I, 176.12 and 270.22, respectively) are common Late Period and Ptolemaic Period names.

Scientific examination

Radiocarbon dating (^{14}C)

Wood, calibrated age (95% probability): 800–480 BC. The wood is probably reused, as it is Ptolemaic, based on the orthography and palaeography of the texts, and parallels. Such reuse seems to be common with fish coffins in particular.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 337, no. 2393 [70]; Grilletto, *Materiali antropologici e zoologici*, 1991, p. 12; Kessler, *Die heiligen Tiere*, 1989, p. 176, pl. 2; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 39–40, fig. 3C.

Parallels: Brussels, MRAH 29588–95 (Gaillard and Daressy, *La faune momifiée*, 1905, pp. 185–88); Gamer-Wallert, *Fische und Fischkulte*, 1970, pp. 8–90, esp. p. 39; Paris, Louvre 2893 (Kessler, *Die heiligen Tiere*, 1989, pp. 176–77, pls. 2–3); Leiden, RMO AH 3b (Raven and Taconis, *Egyptian Mummies*, 2005, p. 322, cat. 132).

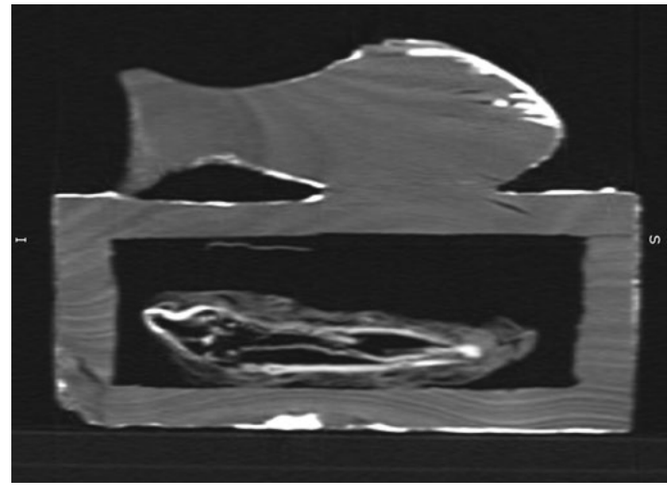
Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Rectangular box surmounted by animal	Yes	Yes	Red Green White	Made from a single piece of wood	No	No	No

Technical notes

168







Inventory number: Cat. 2394
Object: Fish mummy in a coffin

MUMMY

Dimensions: L: 11.6, W: 3.6
Acquisition: Acquired before 1882
Provenance: Unknown
Date: 460–250 BC (^{14}C date)
Scientific analyses: CT, ^{14}C dating

Description: The mummy is tightly wrapped with a small bandage (T1) (3.5–4 cm wide). This bandage is spirally bound in opposite (Z/S) directions (clockwise/anti-clockwise). A starting border and a selvedge are still visible on one side. The warp and weft look spaced out, as if some coloured (?) wefts were now missing.

Scientific examination

CT investigations

The CT scans seem to indicate that two tiny fish are wrapped together in at least four layers of wrappings. They are small and damaged, but based on what one can see and on the basis of the fish carved on top of the coffin, they should be barbels. Examples of doubled fish have been noted in **No. 169** (below), as well as in other collections, but in the case of **No. 169** they are two Nile perch.[211]

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 460–250 BC.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	38–40 x 16–17	Undyed	Selvedge Starting border

Textile notes

[211] Raven and Taconis, *Egyptian Mummies*, 2005, p. 319.

COFFIN

Dimensions: L: 17.2, W: 6.8, H: 12
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: CT
Description: A wooden rectangular coffin surmounted by a carved sculpture of a fish with a dorsal fin, reminiscent of the Nile barbel; the box is carved from a single piece of wood. The fish's eyes are painted in black; possibly more of the fish was painted in the past, but the colour is now lost. The top, sides and bottom of the box appear to have been painted white with a red or reddish-brown edge. The box opens from the side on a pivot and has a bevel onto which the panel rests.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 337, no. 2394 [71]; Grilletto, *Materiali antropologici e zoologici*, 1991, p. 12.
Parallels: Leiden, RMO AH 3b (Raven and Taconis, *Egyptian Mummies*, 2005, p. 322, cat. 132).

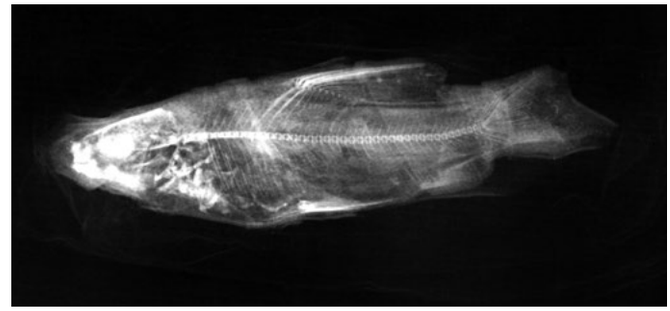
Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Rectangular box surmounted by animal	No	Yes	Black	From a single piece of wood	No	No	No

Coffin technical notes

169









Inventory number: Cat. 2395
Object: Fish mummies in a coffin

MUMMY

Dimensions: Mummy 1 L: 11, W: 3.1; Mummy 2 L: 11.4, W: 3.6
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT

Description: There are two small spirally wrapped fish mummies inside the wooden coffin. The first one is wrapped with two different textiles (T1 and T2). T1 consists of a strip 2 cm wide. T2, the inner one, is coarser. The second fish is spirally wrapped with the same T1, and the bandage is knotted in place.

Scientific examination

CT investigations

The CT scans show two complete fish skeletons, wrapped in several layers of cloth. They are both small and it is not possible to identify their species with certainty, though they look like Nile perch (*Lates niloticus*). Another example of two fish found in one coffin has also yielded *Lates*; then too the shape of the coffin did not mimic that of the fish.[212]

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	40 x 12	Undyed	
T2	Linen	S		Too badly preserved for thread count	Undyed	

Textile notes

The Museo Egizio collection also has another example of two fish in one coffin: **No. 168**.

COFFIN

Dimensions: L: 29, W: 8, H: 12; Box H: 6–5.5; Fish sculpture H: 5

Acquisition: Acquired before 1882

Provenance: Unknown

Date: 770–430 BC (^{14}C date)

Scientific analyses: X-ray, CT, ^{14}C dating

Description: Wooden rectangular coffin made from several pieces of wood dowelled together and plastered inside and outside. The lid is surmounted by a crudely carved image of a fish with a pronounced dorsal fin, reminiscent of the Nile barbel (*Labeobarbus bynni*), although it is also possible that a representation of a *Synodontis* was intended – examples of mummies of these fish have been found, albeit uncoffined,[213] as well as a coffin whose inscription mentions a *Synodontis*, though the fish within cannot be identified.[214] The four sides of the box are painted with a yellow band framed in green/blue, beyond which bands of white plaster are visible. The yellow band is inscribed with a hieroglyphic inscription, roughly painted in black. On the lid, the fish is outlined in red, red and blue/green bands mark the lid's edges, and the thickness of the lid is painted red. The fish itself was thinly plastered and then painted. The head and body are now a pale yellow. The face has details of the eyes and mouth painted in black and white. Bands encircling the fish's body near the dorsal fin are green, red, and black, and the dorsal fin is green, as is the tail, which has added details painted in black.

Inscription



(1) *ḏd mdw jn* (2) *Mḥ.yt di*(*.t*) *ꜥnḫ wḏꜣ snb ꜥḥꜥ.w kꜣ* {*nfr*} (3) *jꜣw ꜥꜣ* (4) <*n*>*fr* (*n*) *Jmn-ḥtp sꜣ Ḥr*-[…]-*Rꜥ mꜣꜥ-ḫrw* (*?*)

"Saying the words by Mehyt, who gives life, prosperity, health, a long lifetime, a great and good old age (to) Amenhotep son of Har(?)re, justified."

Comment

Two mistakes by the scribe stand out. One is a *lapsus calami* resulting in a superimposition of the words *snb* and *ꜥḥꜥ.w*: the scribe seems to have skipped the *n* and *b* and added them in after already having written the *ꜥḥꜥ* ideogram. The other is a slip whereby the ideogram of the word *nfr* is anticipated, being written before *jꜣw* instead of after *ꜥꜣ.t*, at the end of the right long side of the coffin, whereas its complements *f* and *r* are in the right place, after *ꜥꜣ.t*, at the beginning of the left long side of the box.

Scientific examination

Radiocarbon dating (^{14}C)

Wood, calibrated age (95% probability): 770–430 BC

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 338, no. 2395 [72]; Kessler, *Die heiligen Tiere*, 1989, p. 176, pl. 2; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 21.

Parallels: No parallels.

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Rectangular box surmounted by animal	Yes	Yes	Red Green White Blue Yellow	Seven pieces of wood	One peg between lid and box, and four dowels on each short side	Two tenons between fish and box	No

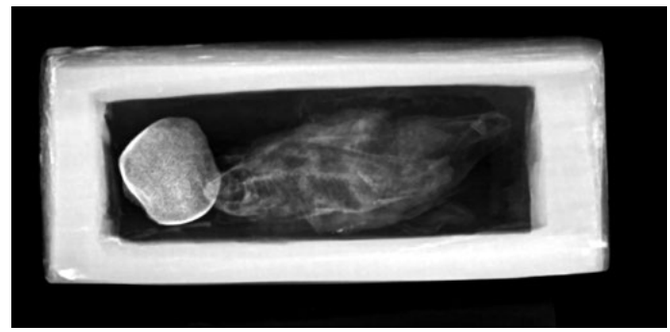
Coffin technical notes

[212] Raven and Taconis, *Egyptian Mummies*, 2005, p. 129 (CI 335).
[213] Loat, *Gurob*, 1905, pp. 3–6.
[214] Raven and Taconis, *Egyptian Mummies*, p. 318, L.XII.6.

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Inventory number: Cat. 2396
Object: Fish mummy in a coffin

MUMMY

Dimensions: L: 8.2, W: 2.3
Acquisition: Acquired before 1882

Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT

Description: The coffin contains a tiny mummy, a second envelope of bandages about 1 cm in diameter, and a proximal unfused epiphysis of a calcaneus, possibly of a very young cow. The mummy is tightly wrapped spirally using a small bandage (T1) (4–4.5 cm wide), then knotted in the centre.[215] Two other textiles are inside the coffin: T2, a fragment of a textile in basket weave rolled up on itself, and T3, a small piece of textile, very fragile and badly preserved; it might once have served to further secure the mummy inside the coffin.

Scientific examination

CT investigations

The CT scans show a tiny fish mummy, possibly of a Nile barbel, and a proximal epiphysis of a calcaneus, possibly of a very young cow.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	36 x 17	Undyed	
T2	Linen	S	Basket	28–30 x 10	Undyed	
T3	Linen	S		Too badly preserved for thread count	Undyed	

Textile notes

[215] This fits with Padikhnum's dedication of this encoffined fish mummy to Mehyt, with the hope that this offering to the goddess ensures the dedicators' long, healthy, and prosperous life, as was the case for the dedication on Cat. 2393/2 **No. 167**.

COFFIN

Dimensions: L: 11.2, W: 4.5, H: 8.5
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Late Period to Ptolemaic Period (722-30 BCE), based on onomastics and style
Scientific analyses: X-ray, CT
Description: Rectangular wooden coffin made from one piece of wood surmounted by a carved image of a fish on the horizontally sliding lid. The fish has two dorsal fins and its eyes and mouth are painted black and red, respectively, so although at first glance it looks like a Nile barb, it is more like a *Synodontis* or *Bagrus* type of fish, or maybe even a *Mugil*. The shape of the coffin is unusual: although overall it is rectangular, the trough is curved slightly at the front to produce a sort of U-shape in section. On the sides there is an inscription painted in black.

Inscription



(1) *Mḥ.yt dì(.t) ꜥnḫ wḏꜣ* (2) *snb ꜥḥꜥ.w ḳꜣ jꜣw ꜥꜣ n*(3)*fr{t} nḏm-jb* (4) *rš.wt* (*n*) *Pꜣ-dì-Ḫnsw sꜣ Pꜣ-dì-ḥr-pꜣ-ḫrd*
"Mehyt, who gives life, prosperity, health, a long lifetime, a great and good old age, happiness and joy (to) Padikhonsu son of Padihorpakhered."
Comment
The *w* and *ḏꜣ* signs in *wḏꜣ* are inverted.
The sportive writing of *rš.wt* is attested since the Eighteenth Dynasty.[216]
The name Padikhonsu (*PN* I, 125.21) is attested from the New Kingdom to the Ptolemaic Period, the name Padihorpakhered (*PN* I, 124.24) in the Late Period and Ptolemaic Period.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 338, no. 2396 [73]; Kessler, *Die heiligen Tiere*, 1989, p. 176, pl. 2; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 21.
Parallels: Leiden, RMO AH 3b (Raven and Taconis, *Egyptian Mummies*, 2005, p. 322, cat. 132).

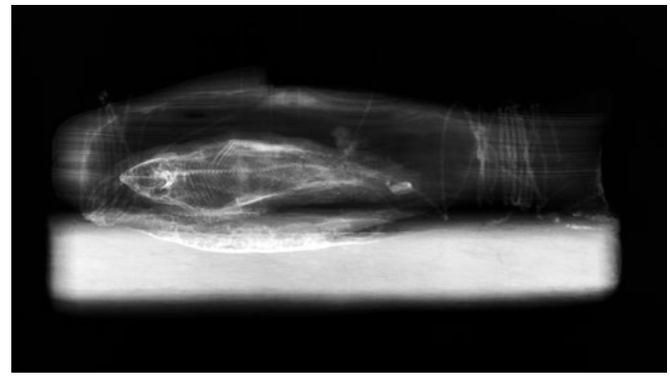
Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Rectangular box surmounted by animal	No	Yes	Red Black	From the same piece of wood	No	No	No

Coffin technical notes

[216] *Wb* II, 454,15.

171





Inventory number: Cat. 2391
Object: Fish mummy and its coffin
Dimensions: L: 19.5, W: 6, H: 8.9; Base H: 3; Fish sculpture H: 5.9
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT
Description: Wooden coffin in the shape of a fish with a dorsal fin, reminiscent of the Nile barbel (*Labeobarbus bynni*). It is set onto a rectangular base with a dowel. The coffin is made from three pieces: the base and two halves (like those of a bivalve shell) made from the same piece of wood. This was sealed with plaster and the whole of the fish is coloured dark brown. Twine is wrapped around the head and the base of the tail to further secure it. The pisciform coffin contains a linen-wrapped fish mummy.

Scientific examination

CT investigations

The CT scans show a complete fish skeleton, whose dorsal fin is visible. The body of the animal is wrapped in several layers of fabric. The identification is difficult but, given the shape of the coffin, it is most likely a juvenile Nile barbel (*Labeobarbus bynni*).

Bibliography: Fabretti et al., *Regio Museo*, p. 337, no. 2391 [68].
Parallels: Leiden, RMO CI 335 (Raven and Taconis, *Egyptian Mummies*, 2005, p. 319).

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Theriomorphic container on base	Yes for seal	No	No	Two halves from the same piece of wood A base	No	No	Two strings close the coffin

Coffin technical notes

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Description: Fish mummy spirally wrapped and knotted with a small bandage (T1) (1.5 cm wide) made from a piece of fabric taken from close to the selvedge. At the upper part, an inner bandage (T2) can be seen, which is less dense (thread count 20 x 10) than the outer one.

Scientific examination

CT investigations

The CT scans show a complete fish skeleton, whose dorsal fin is visible. The body of the animal is wrapped in several layers of fabric. The species cannot be determined with any confidence.

Inventory number: Cat. 2392

Object: Fish mummy in a coffin

MUMMY

Dimensions: L: 5.5, W: 2

Acquisition: Acquired before 1882

Provenance: Unknown

Date: Undetermined

Scientific analyses: X-ray, CT

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	70 x 20	Undyed	Selvedge
T2	Linen	S	Warp-faced	20 x 10	Undyed	

Textile notes

COFFIN

Dimensions: L: 14, W: 5.7, H: 7.8
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT
Description: A wooden coffin carved from a single piece of wood, in the shape of a fish with a dorsal fin, reminiscent of the Nile barbel (*Labeobarbus bynni*), resting on a rectangular plinth. The coffin is made of two parts: one has the shape of the fish, the other encompasses the lower part of the fish's body and the plinth. The exterior is covered with stucco and then painted. The fish is coloured yellow, with lines detailing the head, the eye, the tail, and dorsal fin that are incised and then painted.

Bibliography: Fabretti et al., *Regio Museo,* 1882, p. 337, no. 2392 [69]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 20; Xiaolin (ed.), *Egypt*, 2018, p. 112, fig. 63.
Parallels: No parallels.

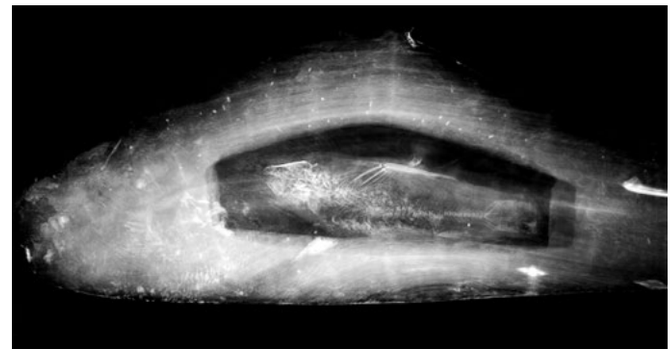
Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Theriomorphic container on base	Yes	Yes	Yellow red	Two halves from the same piece of wood	No	No	No

Coffin technical notes

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Scientific examination

CT investigations

The CT scans show a complete fish skeleton, whose dorsal fin is visible. The fish appears to be a small young barbel (*Labeobarbus bynni*).

Inventory number: Cat. 2387
Object: Fish mummy in a coffin

MUMMY

Dimensions: L: 18.2, W: 5
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT
Description: A fish mummy spirally wrapped with different pieces of bandages (T1) (1.8 cm to 2.5cm larges), knotted with a small strip (1 cm large) (T2) from a denser textile.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	25–26 x 11–12	Undyed	
T2	Linen	S	Warp-faced	36 x 16	Undyed	

Textile notes: Two kinds of textiles have been identified.

COFFIN

Dimensions: L: 51, W: 9, H: 18

Acquisition: Acquired before 1882

Provenance: Unknown

Date: Undetermined

Scientific analyses: X-ray, CT

Description: A brightly painted wooden coffin carved from a single piece of wood in the shape of a fish with a dorsal fin, reminiscent of the Nile barbel (*Labeobarbus bynni*), which is indeed what the species of the mummy inside appears to be. The head is plain, save for the round eyes painted in black and the mouth painted in red. The rest of the body is more elaborately coloured, with the area around the face (stylised gills?) indicated by a red line followed by a blue band and a red band that delimit an area in which groups of three rectangles of red, black and blue alternate. There follows another space delimited by another blue line decorated with a black zigzag line that separates a band of triangular spaces filled with red and blue. The body of the fish is covered by a red criss-cross net pattern that is filled in with blue and yellow paint; the pattern is likely meant to give the stylised impression of scales. Two small red fins are painted on both sides. The tail is separated from the body by a green and yellow line and is painted red with yellow lines running diagonally on each side. The first colour used was red, then blue, yellow and black. On the left side there is a recess closed by a rectangular arched piece of wood. This lid rests on a ledge. There are traces of the same net decoration on it, but it is rather damaged.

Bibliography: Fabretti et al., *Regio Museo,* 1882, p. 337, no. 2387 [64]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 20; Grewenig (ed.), *Ägypten*, 2014, p. 190. Xiaolin (ed.), *Egypt*, 2018, p. 113, fig. 64; Marini and Tjabbes (eds.), *Egito Antigo*, 2020, pp. 128–29.

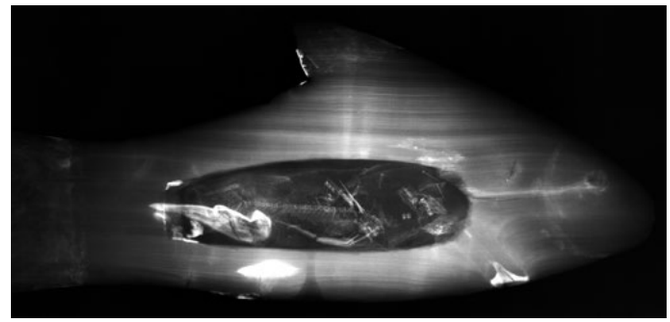
Parallels: Lortet and Gaillard, *La faune momifiée*, 1909, p. 305 (but not painted in the same way); Donadoni Roveri, *Art of Weaving*, 2001, p. 89; Leiden, RMO CI 259 (Raven and Taconis, *Egyptian Mummies*, 2005, p. 320); Marseille, MAM 860.1.792, 863.8.3 (paint vanished, but otherwise very similar; Charron, *Les momies animales*, 2020, pp. 58–65); Paris, Louvre N2898L.

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Theriomorphic container without base	No	Yes	Black Red Blue Yellow Green	The same piece of wood	No	No	No

Coffin technical notes

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Scientific examination

CT investigations

The CT scans show a complete fish skeleton, whose dorsal fin is visible. It is difficult to determine the species, but it is most likely a barbel, as a dorsal spine seems visible.

Inventory number: Cat. 2388
Object: Fish mummy in a coffin

MUMMY

Dimensions: L: 24.5, W: 11
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT
Description: Fish mummy spirally wrapped with coarse linen bandage (3 cm width).

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	30 x 10	Undyed	

Textile notes: Only one quality of textile was used.

COFFIN

Dimensions: L: 24.5, W: 11, H: 12
Acquisition: Acquired before 1882
Provenance: Unknown
Date: 910–790 BC (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating
Description: Coffin of a fish carved from a single piece of wood. A hole in the fish's belly indicates that the coffin was once pegged onto a base. On the right side, there is a rectangular opening to insert the mummy. The profile of the snout, the eyes, the fin on top and the tail are painted in red. The form of the fish is reminiscent of that of the Nile barbel (*Labeobarbus bynni*).

Scientific examination

Radiocarbon dating (^{14}C)

Wood, calibrated age (95% probability): 910–790 BC. It seems as if the wood might have been reused, or that fish mummies were amongst the earliest to be made.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 337, no. 2388 [65]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 20.
Parallels: Lortet and Gaillard, *La faune momifiée*, 1909, p. 305; Leiden, RMO L.XII.6, CI 259 (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 318, 320); Aix-en-Provence, MG 860.1.792, 863.8.3; Florence, MAF 2661; Paris, Louvre N2898A; London, BM EA20764.[217]

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Theriomorphic container without base	No	Yes	Red	Carved from a single piece of wood	No	No	No

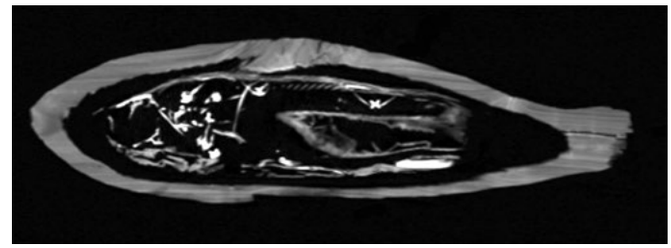
Coffin technical notes

[217] From Akhmim, which is not far from Lepidontopolis.

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Inventory number: Cat. 2389
Object: Fish mummy in a coffin

MUMMY

Dimensions: L: 42, W: 9
Acquisition: Acquired before 1882
Provenance: Unknown
Date: 830–540 BC (^{14}C date)
Scientific analyses: CT, ^{14}C dating
Description: The fish is fully wrapped in an undyed textile. Interestingly, the bandages closest to the fish are not discoloured with embalming agents; only the exterior bandages are so coloured, indicating that a black resin-like substance was smeared over the completely wrapped mummy.

Scientific examination

CT investigations

The CT scans show a complete fish skeleton, whose dorsal fin is visible. The animal was dried, eviscerated and wrapped with bandages. It is slightly damaged, and it is not possible to securely identify the species from the CT scans, but it is most likely a barbel, or possibly a small perch.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 830–540 BC. Either this is quite an early fish mummy or the textile is older than the fish.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S		Too badly preserved for thread count	Undyed	

Textile notes

COFFIN

Dimensions: L: 48.1, W: 13.8, H: 11

Acquisition: Acquired before 1882

Provenance: Unknown

Date: 1880–1640 BC (^{14}C date)

Scientific analyses: CT, ^{14}C dating

Description: A wooden fish coffin carved in two halves from a single piece of wood, containing the semi-wrapped mummy of a fish. The coffin is not quite symmetrical, as one side is smaller than the other, and lacks the tail. Originally, the fish might have had round eyes painted on the head/face – something that might be an eye is still visible on the left side of the head. No evidence for dowels was noted, nor were there remains of plaster to secure the two portions of the coffin. Thus, it seems that the two sides would have been secured with small dabs of a black resin-like substance, reinforced by thread or bandages tied around them. The interior of the two halves has some random smears of a black resin-like substance, matching those on the bandages; these smears were possibly acquired when the interior touched the fish mummy when it was freshly made and still wet. The date of the wood is much older than that of the mummy; this points to a reuse of the coffin or, more likely, of the wood.

Scientific examination

Radiocarbon dating (^{14}C)

Wood, calibrated age (95% probability): 1880–1640 BC. As this is much older than the mummy and all other fish mummies that have been radiocarbon-dated thus far, it is very likely that the coffin was made of reused wood.

Bibliography: Fabretti et al., *Regio Museo,* 1882, p. 337, no. 2389 [66]; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, p. 45, fig. 5.

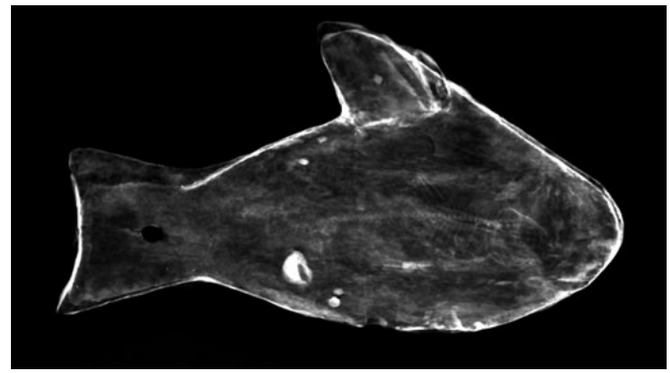
Parallels: Leiden, RMO CI 335, CI 259, CI 281 (Raven and Taconis, *Egyptian Mummies*, 2005, pp. 317, 319–21); New York, BM 37.2041.3E.

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Theriomorphic container without a base	No	No	No	Two halves from the same piece of wood	No	No	A string closes the coffin

Coffin technical notes

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Inventory number: Cat. 2390
Object: Fish mummy and its coffin
Dimensions: L: 8.4, W: 2, H: 11
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT
Description: A wooden container in the form of a barbel (*Labeobarbus bynni*), carved from a single piece of wood. It is bipartite (like a bivalve shell) and both parts seem equal in shape and size. A square hole on the bottom indicates that it was once mounted onto a base. The two sides are secured with pegs. One pierces the mouth edge and the other, now missing, the tail area. In addition, two strips of 2 cm wide bandages secured it, one around the head and the other at the base of the tail (T1). A square hole on the bottom indicates that it was once mounted onto a base. A black resin-like substance is visible on the top and on the tail. It is painted with a scale pattern outlined in black and then filled in with red and black; the brightness of the colours is reminiscent of **No. 166**. The face is painted with concentric circles for eyes with dots outside; the mouth is clearly defined, as are the gills. The top fin is black, and the tail has red and black stripes. The box contains a fish mummy that is quite small.

Scientific examination

CT investigations

The CT scans show a complete fish skeleton, whose dorsal fin is visible. The body of the animal is wrapped in several layers of cloth. The fish is quite small, possibly a barb.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 337, no. 2390 [67]; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 12, 20; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 39–40, fig. 3A.
Parallels: Lortet and Gaillard, *La faune momifiée*, 1909, p. 305 (but without the painting); Leiden, RMO CI 259 (Raven and Taconis, *Egyptian Mummies,* 2005, p. 320); Aix-en-Provence, MG 860.1.792, 863.8.3 (paint gone, but otherwise very similar).

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Theriomorphic container on base	No	Yes	Black Red	Two halves from the same piece of wood A lost base	No	No	Two bandages and two pegs (one missing) close the coffin

Coffin technical notes

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S		Too badly preserved for thread count	Undyed	

Textile notes

8.14 Victual Mummies

A most curious, but particularly Egyptian type of animal mummy is the victual or food mummy. These consist of joints of meat or complete fowls prepared to be consumed in the afterlife: after butchery, they were cleaned of hair and feathers and eviscerated. In the case of poultry, they were eviscerated and sometimes the internal organs were returned to the body.[218] The birds and the joints were cooked and/or salted in some way, anointed with a black resin-like substance,[219] then wrapped in linen bandages. Often, they were placed in wooden coffinets that are painted or gessoed white externally, with the interior covered with a black resin-like substance. In some instances, where it has been tested, this substance has been identified as a compound containing terebinth or coniferous resin (for example, **Nos. 199**–**200**), often mixed with beeswax.[220] The tradition of food offerings dates from the Predynastic Period, but the preparation of meat and poultry as a proper mummy dates from the early New Kingdom.[221]

The group in Museo Egizio all comes from a single context, that of the tomb of Imhotep, who was buried in the Valley of the Queens (QV 46).[222] Imhotep was a vizier who served under King Tuthmosis I, whose reign is currently dated to about 1493–1482 BC. However, radiocarbon dating of the meat from **No. 200** yielded a date of 1760–1530 BC (cal. 95%). If this date is accurate, then this affects the current chronology (always a vexed issue)[223] for ancient Egypt by forty years at the very least, and provides food for thought. Perhaps the dating is inaccurate, or maybe Imhotep served Tuthmosis's predecessor – it would be useful to sample more of these victual mummies and to test their radiocarbon dates. In the catalogue below, the dates for the collection provided are the more traditional ones assigned to the reign of Tuthmosis I, save for **No. 200**, as that is the only victual mummy of the whole collection to be radiocarbon-dated.

The mummified remains indicate that portions of at least one and a half cattle under 16 months were offered. In the catalogue entries the term cow/ox has been used for convenience, though the sex of the animal could not be established. In addition, at least five fowl (two pigeons, two ducks, and one goose), the traditional ideal (or minimal) poultry offerings from the Old Kingdom onwards.[224] From the remains from Imhotep's tomb, it is clear that the complete animals were not prepared for the deceased – either the meat from the animals was shared between the deceased and those preparing the meats as part of the payment, or were preserved and eaten as part of the funerary banquet. Of course, the picture from Imhotep's tomb is far from complete, so new evidence might change our understanding of his funerary assemblage of "Victual Mummies".

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[218] Ikram, *Choice Cuts*, 1995, Appendix II.
[219] Ikram, *JARCE* 48 (2012), pp. 119–35.
[220] Ikram, *JARCE* 48 (2012), pp. 119–35; Clark et al., *PNAS* 110.51 (2013), pp. 20392–95: https://doi.org/10.1073/pnas.1315160110.
[221] Ikram, *Choice Cuts*, 1995; Ikram, in Barta (ed.), *Abusir* XIII, 2009, pp. 294–98; Ikram, *JARCE* 48 (2012), pp. 119–35; Appendix II; Ikram, *PAM* 20 (2011), pp. 361–71.
[222] See Auenmüller, "Territorialität", 2013, pp. 815–16, WS18-2 for the prosopographical data for the vizier Imhotep.
[223] Considerable amounts of ink have been spilled on the issue of ancient Egyptian chronology. For a brief overview see Bietak and Czerny (eds.), *The Synchronisation of Civilisations*, 2000; Hornung et al., *Ancient Egyptian Chronology*, 2006; Kitchen, *ÄgLev* 16 (2006), pp. 293–308; Müller, *ÄgLev* 16 (2006), pp. 203–30; van Dijk, *JARCE* 44 (2008), pp. 193–200; van Dijk, in Bourriau et al. (eds.), *Under the Potter's Tree*, 2011, pp. 325–32; Aston, *ÄgLev* 22 (2012), pp. 289–315; Schneider, *Archéologie* 413 (2012), pp. 29–33.
[224] Ikram, *PAM* 20 (2011), pp. 361–71.

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Inventory number: Suppl. 5077
Object: Victual mummy in a coffinet

MUMMY

Dimensions: L: 87, W: 19.5
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: The mummy consists of the right foreleg of a calf (probably under 13 months of age based on epiphyseal fusion of the bones) from the scapula to the carpals. It was cured with salt/natron, oiled and spirally wrapped in several layers of bandages. All bandages are very coarse, one of them (T2) is too badly preserved for thread count. They were kept in place by thick dabs of a black resin-like substance that might also have been applied directly on the leg.

COFFINET

Dimensions: L: 97, W: 28.3, H: 21; Depth (box): 7; Depth (lid): 4–5
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: Long coffinet in the shape of an entire foreleg, with the outside painted white to mimic limestone and the interior painted black with a black resin-like substance. The case is dowelled at the foot and shoulder ends.

Bibliography: Schiaparelli, *Esplorazione della Valle delle Regine*, 1923, p. 25, fig. 26, p. 31; Ikram, *Choice Cuts*, 1995, pp. 264–68.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Cairo, EMC CG 24048–56 *bis*, 29628, 29676, 29859–63 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 1–3, 7, 12, 34–36, 70, 77, 91).

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S		7 x 5		
T2	Linen	S		Too badly preserved for thread count		

Textile notes: Two bandages were used to spirally wrap the content. T1 bandages (6 cm wide) are very sparse. The fabric of the T2 bandage (4–4,5 cm wide) is thicker. Both are very impregnated with resinous-oily material.

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Inventory number: Suppl. 5078
Object: Victual mummy in a coffinet

MUMMY

Dimensions: L: 43, W: 15.5
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: The meat is spirally wrapped in several layers of bandages that are fairly coarse and loosely woven, and were also covered with a black resin-like substance, before being covered with bandages that only had some oil or black resin-like substance painted on top. Without radiographs it is impossible to ascertain the cut/joint, though it is probably part of a leg.
Textile notes
Two bandages were used to spirally wrap the content. The inner bandages (T1) are very sparse. The fabric of the outer bandage (T2) is denser. Both are very impregnated with a black resin-like substance so that counting the threads is impossible.

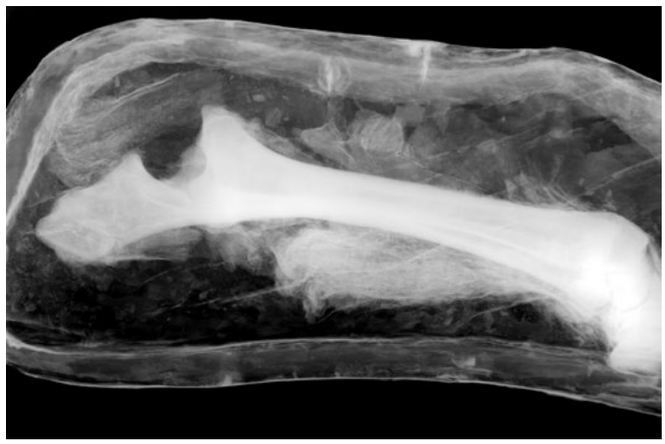
COFFINET

Dimensions: L: 59, W: 28.5, H: 19; Depth (box): 3; Depth (lid): 8.2
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: A coffinet, made in the same way as the others in the group, shaped as the rump and start of a hind leg. Some dribbles of black resin-like substance adhere to the top and sides. One section is like a tray and the other is more domed. The coffinet contains the left tibia and fibula (with meat attached) of a calf (under 1.5 years of age), together with some of the tarsals, all of which were covered with a thin layer of a black resin-like substance.

Bibliography: Schiaparelli, *Esplorazione della Valle delle Regine*, 1923, p. 25, fig. 26, p. 31; Grilletto, *Materiali antropologici e zoologici*, 1991, p. 11; Ikram, *Choice Cuts*, 1995, pp. 264–68.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II.

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Inventory number: Suppl. 5079
Object: Victual mummy in a coffinet

MUMMY

Dimensions: L: 39.5, W: 9.3
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: X-ray
Description: The meat was covered with a black resin-like substance, then wrapped in only about two layers of bandages anointed with more black resin-like substance, which gave the bandages a dark brown hue.



Scientific examination

X-ray investigation

The X-ray shows that the wrapped remains contain the right radius and ulna of a cow/ox, with some of the carpals. This animal was at least 12 months old at death, possibly as old as 15 months, based on epiphyseal fusion.

Textile notes

The textile is fragmentary and very badly preserved, and it is impossible to calculate thread count.

COFFINET

Dimensions: L: 49, W: 19.4, H: 17; Depth (box): 6; Depth (lid): 4
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: X-ray
Description: A coffinet that is roughly trapezoidal, with curved corners. It is the usual white coffinet with black on the interior and along the edge. On one of the short sides there is a vertical break, which has a black resin-like substance on it, indicating that this occurred prior to the burial. The lid also shows a modern break – a chunk of the wood is missing.

Bibliography: Schiaparelli, *Esplorazione della Valle delle Regine*, 1923, p. 25; Grilletto, *Materiali antropologici e zoologici*, 1991, p. 11; Ikram, *Choice Cuts*, 1995, pp. 264–68.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Cairo, EMC CG 24048–56 *bis*, CG 29628, CG 29676, CG 29859–63 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 1–3, 7, 12, 34–36, 70, 77, 91).

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Inventory number: Suppl. 5080
Object: Victual mummy in a coffinet

MUMMY

Dimensions: Unverifiable
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: The meat and unidentifiable (without a radiograph) bones are spirally wrapped in several layers of bandages that are fairly coarse and loosely woven.

COFFINET

Dimensions: L: 35.3, W: 21.6, H: 15.9; Depth (lid): 3.4
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: The roughly rectangular lid of a victual mummy coffinet that is white on the exterior and covered with a black resin-like substance on the interior.

Bibliography: Ikram, *Choice Cuts*, 1995, pp. 264–68.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Ikram, *JARCE* 48 (2012), pp. 119–35.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	14 x 7	Too badly preserved	

Textile notes: The content is wrapped in several fragments of a single fabric, T1, now very dry and impregnated.

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Inventory number: Suppl. 5081
Object: Victual mummy and its coffinet
Dimensions: Coffinet L: 32.3, W: 16, H: 15; Mummy L: 20, W: 8.5
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: A kidney-shaped coffinet of the usual type that is black inside and white externally. The coffinet still contains animal remains. Without histological or other tests, it is difficult to determine if the wrapped object is the liver or a cut of meat.

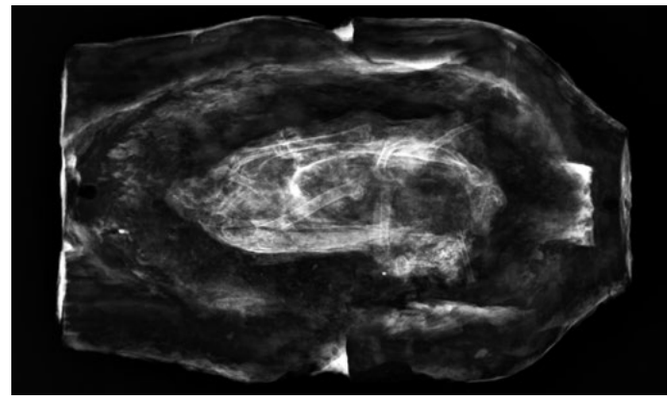
Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, p. 11; Donadoni Roveri, *Art of Weaving*, 2001; *Nefertari and the Valley of the Queens*, 2017, p. 215; Ikram, *Choice Cuts*, 1995, pp. 264–68.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Cairo, EMC CG 24048–56 *bis*, CG 29628, CG 29676, CG 29859–63 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 1–3, 7, 12, 34–36, 70, 77, 91).

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Balanced	7 x 6	Too badly preserved	

Textile notes: Only few fragments of textile, very impregnated, are visible.

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Inventory number: Suppl. 5082
Object: Victual mummy in a coffinet

MUMMY

Dimensions: L: 13.2, W: about 6.8
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: X-ray
Description: The mummified remains of a bird, possibly a dove, prepared using natron/salt. Black resin-like substances were painted on it before it was spirally bandaged in two to three layers of poor-quality linen. The bird, or the interior of the coffin, was wet due to the application of the black resin-like substance, as some of the cloth is stuck to one side of it.

Scientific examination

X-ray investigation

The X-ray shows the incomplete skeleton of a bird, probably a pigeon. It was eviscerated and possibly cured with natron or salt.

Textile notes

The textile is fragmentary and very badly preserved, so it is impossible to take measurements.

COFFINET

Dimensions: L: 23, W: 14, H: 13.6; Depth: 3–2.7
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: X-ray
Description: A small box in the shape of a beheaded, de-footed, and dewinged bird. The box is held together by two wooden nails, one at the head and the other at the tail. The neck is quite thick.

Bibliography: Schiaparelli, *Esplorazione della Valle delle Regine*, 1923, p. 25; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 11, 19; Ikram, *Choice Cuts*, 1995, pp. 264–68.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Grilletto, *Materiali antropologici e zoologici*, 1991, p. 11; Ikram, *JARCE* 48 (2012), pp. 125–33; Clark et al., *PNAS* 110.51 (2013), p. 20393: https://doi.org/10.1073/pnas.1315160110.

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Inventory number: Suppl. 5083
Object: Victual mummy in a coffinet

MUMMY

Dimensions: L: 9.5, W: 3.2
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: It contains what appears to be a pigeon, based on the size and the visible bones, though this identification could be revised with radiographs. It is smeared with a black resin-like substance, as are the wrappings.

Textile notes
The textile is fragmentary and very badly preserved, so it is impossible to take a thread count.

COFFINET

Dimensions L: 25, W: 15.5, H: 12.5; Depth (box): 4.2; Depth (lid): 3.8
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: A coffinet in the shape of a bird. It was secured by a dowel at the neck end, and covered with a dark substance internally and plastered externally.

Bibliography: Schiaparelli, *Esplorazione della Valle delle Regine*, 1923, p. 25; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 11, 19; Ikram, *Choice Cuts*, 1995, pp. 264–68.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II.

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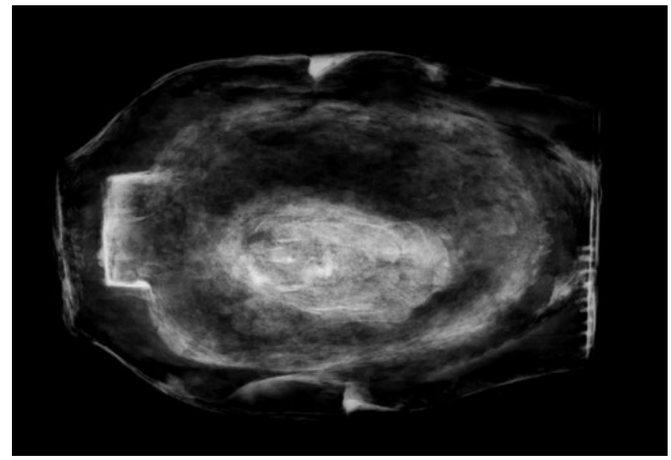


Inventory number: Suppl. 5084
Object: Coffinet for a victual mummy
Dimensions: L: 26, W: 16.5, H: 13.4
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: Wooden coffinet in the shape of a small duck or pigeon without wingtips or feet, plastered white.

Bibliography: Schiaparelli, *Esplorazione della Valle delle Regine*, 1923, p. 25; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 11, 19; Ikram, *Choice Cuts*, 1995, pp. 264–68.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II.

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Inventory number: Suppl. 5085
Object: Coffinet for a victual mummy
Dimensions: L: 21, W: 14, H: about 10.8
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: X-ray, CT
Description: Sealed wooden coffinet in the shape of a small duck or pigeon without wingtips or feet, plastered white.

Scientific examination

CT investigations

The X-ray shows shows that the box contains a wrapped package holding what is probably a pigeon, although the bones are not clearly visible.

Bibliography: Schiaparelli, *Esplorazione della Valle delle Regine*, 1923, p. 25; Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 11, 19; Ikram, *Choice Cuts*, 1995, pp. 264–68.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Cairo, EMC CG 24048–56 *bis*, CG 29628, CG 29676, CG 29859–63 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 1–3, 7, 12, 34–36, 70, 77, 91); Ikram, *JARCE* 48 (2012), pp. 125–33; Clark et al., *PNAS* 110.51 (2013), p. 20393: https://doi.org/10.1073/pnas.1315160110.

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Inventory number: Suppl. 5086
Object: Coffinet for a victual mummy
Dimensions: L: 49.6, W: 19.3, H: 16.1; Depth (box): 5.6; Depth (lid): 5
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: A wooden coffinet that takes the form of a very elongated triangle. It is empty. It might have contained part of a bovid leg. Its interior is coated with a dark substance and the exterior is whitewashed.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, p. 11; Ikram, *Choice Cuts*, 1995, pp. 264–68.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Cairo, EMC CG 24048–24056 *bis,* CG 29628, CG 29676, CG 29859–29863 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 1–3, 7, 12, 34–36, 70, 77, 91).

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Inventory number: Suppl. 5087
Object: Coffinet for a victual mummy
Dimensions: L: 41.8, W: 19, H: 16.7; Depth (box): 3.6; Depth (lid): 7.2
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: A wooden coffinet in a very elongated kidney shape that is now empty. Its interior is covered with a black substance and the exterior is plastered.

Bibliography: Unpublished.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Cairo, EMC CG 24048–56 *bis,* CG 29628, CG 29676, CG 29859–63 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 1–3, 7, 12, 34–36, 70, 77, 91).

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Inventory number: Suppl. 5087 (sic)
Object: Coffinet for a victual mummy
Dimensions L: 53.2, W: 18, H: 16.7; Depth (box): 4.6; Depth (lid): 4.3
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: A coffinet in an elongated kidney shape. It now contains crumbled remains of meat, some bandages, and nothing else. Its interior is coated with a dark substance and the exterior is whitewashed.

Bibliography: Ikram, *Choice Cuts*, 1995, pp. 264–68.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Cairo, EMC CG 24048–56 *bis*, CG 29628, CG 29676, CG 29859–63 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 1–3, 7, 12, 34–36, 70, 77, 91).

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Inventory number: Suppl. 5088
Object: Victual mummy in a coffinet

MUMMY

Dimensions: L: 22.5, W: 13
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: The victual mummy is wrapped in slightly coarse linen impregnated with black resin-like material. It looks like a piece of meat, possibly without bone. Knife cuts are visible, showing where the meat was cut.

Textile notes

The textile is fragmentary and very badly preserved so thread count is not possible.

COFFINET

Dimensions L: 31, W: 18.5, H: 13; Depth (box): 6.5; Depth (lid): 2.5
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: A coffinet in an elongated kidney shape that is plastered white externally and whose interior is covered with a shiny black resin-like substance.

Bibliography: Schiaparelli, *Esplorazione della Valle delle Regine*, 1923, p. 31, fig. 26; Ikram, *Choice Cuts*, 1995, pp. 264–68.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Cairo, EMC CG 24048–56 *bis*, CG 29628, CG 29676, CG 29859–63 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 1–3, 7, 12, 34–36, 70, 77, 91).

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Inventory number: Suppl. 5089
Object: Coffinet for a victual mummy
Dimensions: L: 27, W: 14.2, H: 3; Depth: 1
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: A roughly rectangular lid with curved corners belonging to a victual mummy coffinet. It is white on the outside and covered with a black resin-like substance on the inside, where some fragments of bandages have stuck. It has two holes for pegs (like all such coffinets, save for those for poultry, which may have only one). It might match **No. 191**, but it is not a perfect fit.

Bibliography: Ikram, *Choice Cuts*, 1995, pp. 264–68.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II.

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Inventory number: Suppl. 5090
Object: Coffinet for a victual mummy
Dimensions: L: 28.5, W: 13.6, H: 8.5; Depth: 7
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: Bottom part of an oval coffinet that is white outside and black inside, with a bit of linen still stuck to the inner side. Two pegs held the lid in place. It might match **No. 190**, but it is not a perfect fit.

Bibliography: Ikram, *Choice Cuts*, 1995, pp. 264–68.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II.

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Inventory number: Suppl. 5091
Object: Coffinet for a victual mummy
Dimensions: L: 45.5, W: 26, H: 8.3; Depth: 3.8
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: Half of a large coffinet, almost in the shape of a solid number "8", which is empty. The exterior is covered with white plaster and the interior is coated with a black resin-like substance.

Bibliography: Ikram, *Choice Cuts*, 1995, pp. 264–68.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Cairo, EMC CG 24048–56 *bis*, CG 29628, CG 29676, CG 29859–63 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 1–3, 7, 12, 34–36, 70, 77, 91).

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Inventory number: Suppl. 5092
Object: Victual mummy in a coffinet

MUMMY

Dimensions: L: 21, W: 9, H: about 2.7
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: The mummy is not of a bird, but of a piece of boneless meat. Quite possibly this mummy is not original to this coffin as the victual mummies seem to have been removed from the coffinets for study by the excavators and earlier scholars, and either not replaced, or possibly not replaced in their original containers. Some of the wrapping remains, and consists of coarse linen, heavily impregnated with a black resin-like substance.

Textile notes
The textile is fragmentary and too rigid due to embalming material, making it impossible to properly study the textiles.

COFFINET

Dimensions: L: 31.5, W: 17.5, H: 4.5; Depth: 4
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: The bottom half of a victual mummy coffin in the shape of a bird. The exterior is plastered and the interior is covered with what appears to be a black resin-like substance.

Bibliography: Schiaparelli, *Esplorazione della Valle delle Regine*, 1923, p. 25; Ikram, *Choice Cuts*, 1995, pp. 264–68.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Cairo, EMC CG 24048–56 *bis*, CG 29628, CG 29676, CG 29859–63 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 1–3, 7, 12, 34–36, 70, 77, 91).

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Inventory number: Suppl. 5093
Object: Coffinet for a victual mummy
Dimensions: L: 39, W: 25, H: 7; Depth: 3.6
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: Half of an irregularly shaped coffinet that is white on the outside and whose interior was once covered with a 2–3 mm thick layer of a black, shiny resin-like substance, much of which has peeled/chipped off. Two pegs secured the top to the bottom. Adze marks are still visible on the wood on the interior surface. This is a curious shape for meat, as it does not imitate any known hieroglyph related to joints of meat.

Bibliography: Ikram, *Choice Cuts*, 1995, pp. 264–68.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II, but no exact parallels.

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Inventory number: Suppl. 5094
Object: Coffinet for a victual mummy
Dimensions: L: 40.5, W: 17.2, H: 5; Depth: 4
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: Possibly the lid of a wooden coffinet that curves slightly. The exterior is white and the interior is covered by the usual shiny black substance, to which fragments of an open-weave linen bandage are stuck. One peg secured the two parts of the coffinet. It is empty.

Textile notes
The textile is fragmentary and too rigid due to embalming material, so it is impossible to take measurements or obtain details.

Bibliography: Ikram, *Choice Cuts*, 1995, pp. 264–68.
Parallels: No precise parallels, but in the genre of: Ikram, *Choice Cuts*, 1995, Appendix II.

196



Inventory number: Suppl. 5095
Object: Coffinet for a victual mummy
Dimensions: L: 28.5, W: 21, H: 10.5; Depth: 8
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: Empty bottom part of a coffinet with a shape between an oval and a rectangle. The exterior is white and the interior is blackened by a black resin-like substance. It was secured with two wooden pegs.

Bibliography: Ikram, *Choice Cuts*, 1995, pp. 264–68.
Parallels: Ikram, *Choice Cuts,* 1995, Appendix II.

197



Inventory number: Suppl. 5096?[225]
Object: Coffinet for a victual mummy
Dimensions: L: 26.5, W: 17; Depth: 4.5
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: Coffinet for a bird, only half, and empty.

Bibliography: Schiaparelli, *Esplorazione della Valle delle Regine*, 1923, p. 25; Ikram, *Choice Cuts*, 1995, pp. 264–68.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Cairo, EMC CG 24048–56 *bis,* CG 29628, CG 29676, CG 29859–63 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 1–3, 7, 12, 34–36, 70, 77, 91); Ikram, *JARCE* 48 (2012), pp. 125–33; Clark et al., *PNAS* 110.51 (2013), p. 20393: https://doi.org/10.1073/pnas.1315160110.

[225] It was originally assigned the number Suppl. 5080 incorrectly.

198



Inventory number: Suppl. 5097
Object: Coffinet for a victual mummy
Dimensions: L: 25.4, W: 14.5, H: 9; Depth: 4.2
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: Lid of a coffinet of a victual mummy in the form of a bird, black inside and white outside. There was probably a hole in the tail end for a peg, but if so it is filled in with black material. No space for a peg is visible at the neck end.

Bibliography: Ikram, *Choice Cuts*, 1995, pp. 264–68.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II.

199



Inventory number: Suppl. 5099 ?
Object: Victual mummy
Dimensions: Unverifiable
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: Pyrolysis-GC/MS
Description: A fairly damaged poultry mummy, probably a goose (*Anser* spp.), possibly *Anser anser*, the Greylag goose, or a goose of a similar size (breadth of the left distal humerus is 20.6 mm and of the left distal femur is 20 mm; breadth of the right proximal femur is 21.5 mm; of the left tibiotarsus, total length is 172 mm, distal breadth is 15 mm and proximal breadth is about 17 mm – but it is engulfed by flesh and the measurements are not completely reliable). It was beheaded and eviscerated, and its feet and wing tips were severed, before it was dried in natron. After desiccation, it was covered in an oily, slightly resinous substance.

Scientific examination
Analysis of organic residue
The resinous material that covers the animal was subjected to Pyrolysis-GC/MS analysis. Markers for protein-based material and coniferous resin were found.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 17, 19.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Cairo, EMC CG 24048–56 *bis*, CG 29628, CG 29676, CG 29859–63 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 1–3, 7, 12, 34–36, 70, 77, 91).

200



Inventory number: Suppl. 5100
Object: Victual mummy
Dimensions L: 28, W: 14.4
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: 1760–1530 BC (^{14}C date)
Scientific analyses: ^{14}C dating, Pyrolysis-GC/MS
Description: Poultry mummy that is wrapped loosely, or covered, with fine undyed linen stained to a darker colour (light brown) in places. This is probably not the original wrapping, but rather was put over the bird after looters or excavators had seen what it was. The animal was treated in the usual way victual mummies are, with its head, feet, viscera, and wingtips removed, and natron or some salt used for desiccation. The skin is golden brown, possibly through cooking or the application of oils or other materials. Coarse linen bandages are wound around it, saturated with a black resin-like substance. This substance was applied to the bandages after they were placed around the bird. The bandages were pressed onto the skin when it was oiled or damp, as the textile pattern can be seen on it. The trachea is well preserved. It is possibly a pintail duck (*Anas acuta*), but without radiographs there can be no certainty.

Scientific examination

Radiocarbon dating (^{14}C)
Biological tissue from the mummy, calibrated age (95% probability): 1760–1530 BC.
Analysis of organic residue
Pyrolysis-CG/MS of the dark substance on the flesh showed it to be fatty acids derived from vegetal oils. Another fatty acid of a higher molecular weight was also noted, although its origins are unknown. It is possible that it was from wax. Traces of coniferous resin were also identified.

Textile notes

The textile is too fragmentary and badly preserved for a thread count to be possible.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, pp. 17, 19.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Cairo, EMC CG 24048–56 *bis*, CG 29628, CG 29676, CG 29859–63 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 1–3, 7, 12, 34–36, 70, 77, 91); Ikram, *JARCE* 48 (2012), pp. 125–33; Clark et al., *PNAS* 110.51 (2013), p. 20393: https://doi.org/10.1073/pnas.1315160110.

201



Inventory number: Suppl. 5101
Object: Victual mummy
Dimensions: L: 50, W: 35
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: Victual mummy consisting of six cattle ribs, one of which is missing its proximal end. They do not appear to be fused, so the animal must have been under 4 years of age at death, though it was most probably far younger, as beef is more tender and palatable before the age of 2.5 year. The ribs are covered with a black resin-like substance and the remains of densely woven textiles that are also impregnated with this black substance.

Textile notes
Four layers of tissue can be seen wrapping the ribcage, secured by a band of about 1 cm. Undetectable thread count (impregnated and stiff textile).

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, p. 17.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Cairo, EMC CG 24048–56 *bis*, CG 29628, CG 29676, CG 29859–63 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 1–3, 7, 12, 34–36, 70, 77, 91).

202



Inventory number: Suppl. 5102
Object: Victual mummy
Dimensions: L: 47.3, W: 27
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: Victual mummy consisting of six long ribs, one of which is missing its proximal end. The epiphyses do not appear to be fused. They are covered with a black resin-like substance and the remains of densely woven textiles that are also impregnated with this black substance.

Textile notes
A few fragments of textile can be seen wrapped around the ribcage, secured by a band of about 2 cm. Undetectable thread count (impregnated and stiff textile).

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, p. 17.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Cairo, EMC CG 24048–56 *bis*, CG 29628, CG 29676, CG 29859–63 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 1–3, 7, 12, 34–36, 70, 77, 91).

203



Inventory number: Suppl. 5103
Object: Victual mummy
Dimensions: L: 29, W: 14
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: Part of a mummified joint of beef comprising five and a half lumbar vertebrae (unfused), with most of the transverse processes severed. The yellowish flesh is showing evidence of salt or natron precipitation. The joint remains meaty in odour and flavour. It should be noted that the knife used to hack through the bone was not too sharp, as is attested by the crude cuts. The outer part of the flesh and the bandages are darkened by a black resin-like substance.

Textile notes
The fabric is very dense, but thread count is not possible because the textile is too impregnated by a black resin-like substance.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, p. 17.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Cairo, EMC CG 24048–24056 *bis*, CG 29628, CG 29676, CG 29859–63 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 1–3, 7, 12, 34–36, 70, 77, 91).

204



Inventory number: Suppl. 5104
Object: Victual mummy
Dimensions: L: 10.5, W: 20
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: Part of a beef mummy consisting of three lumbar vertebrae, all of whose epiphyses are unfused. Parts of the processes are broken off. The flesh is yellowish due to the natron, and salt precipitation is observable. The outer surface of the flesh was covered with a black resin-like substance.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, p. 11.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Cairo, EMC CG 24048–56 *bis*, CG 29628, CG 29676, CG 29859–63 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 1–3, 7, 12, 34–36, 70, 77, 91).

205



Inventory number: Suppl. 5105/1
Object: Victual mummy
Dimensions: L: 34.5, W: 19
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: Victual mummy consisting of a left scapula of a relatively young cow/bull, covered with a dark substance, and dense bandages that are soaked in the same substance. The breadth of the bone's proximal articulation is 8 cm.

Textile notes
The textile is fragmentary and too rigid due to the embalming material for thread count to be taken.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, p. 11; Ikram, *Choice Cuts*, 1995, p. 266.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Cairo, EMC CG 24048–56 *bis*, CG 29628, CG 29676, CG 29859–63 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 1–3, 7, 12, 34–36, 70, 77, 91).

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Inventory number: Suppl. 5105/2
Object: Victual mummy
Dimensions: L: 32.5, W: 14
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description Victual mummy consisting of four cattle half-ribs, covered with a black resin-like substance and spirally wrapped linen bandages of a very loose weave that are soaked in the usual dark substance. The ribs appear to be fused, but it is hard to determine without a radiograph.

Textile notes
The textile is fragmentary and too rigid due to embalming material to be measured.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, p. 11.
Parallels: Ikram, *Choice Cuts*, 1995: Appendix II; Cairo, EMC CG 24048–56 *bis*, CG 29628, CG 29676, CG 29859–63 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 1–3, 7, 12, 34–36, 70, 77, 91).

207



Inventory number: Suppl. 5105/3
Object: Victual mummy
Dimensions: L: 43.5, W: 7–13.5
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: Victual mummy consisting of three complete ribs (the proximal epiphyses are unfused) of a cow/bull/ox with meat attached. There is a blackish substance on the meat as well as soaked into the wrappings.

Textile notes
The textile is fragmentary, and too rigid due to embalming material for thread count to be taken.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, p. 11.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Cairo, EMC CG 24048–56 *bis*, CG 29628, CG 29676, CG 29859–63 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 1–3, 7, 12, 34–36, 70, 77, 91).

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Inventory number: Suppl. 5105/4
Object: Victual mummy
Dimensions: L: 45, W: 16.3
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description:Victual mummy consisting of three complete ribs of a cow/bull. It is impossible to see if they are fused or not, as they are covered with flesh/cartilage, a black resin-like substance and textiles. The marks that the knife made to cut the flesh are clearly visible.

Textile notes
Fragments of bandages wrapped spirally (orthogonal to the rib), heavily impregnated by embalming materials. Thread counts are not possible, but the textiles seem dense.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, p. 11.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Cairo, EMC CG 24048–56 *bis*, CG 29628, CG 29676, CG 29859–63 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 1–3, 7, 12, 34–36, 70, 77, 91).

209



Inventory number: Suppl. 5105/5
Object: Victual mummy
Dimensions: L: 21–32, W: 17
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: Victual mummy consisting of four ribs, nearer to the cranial end of the animal. The proximal sides are not completely fused, but are in the process of fusing. The flesh is covered with a black resin-like substance that also penetrates the linen wrappings. The linen is of different qualities, but the majority is a loose, crude weave.

Textile notes
Very sparse textile. It is fixed in some small areas by a black resin-like substance.

Bibliography: Unpublished.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Cairo, EMC CG 24048–56 *bis*, CG 29628, CG 29676, CG 29859–63 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 1–3, 7, 12, 34–36, 70, 77, 91).

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Inventory number: Suppl. 5106/1
Object: Victual mummy
Dimensions: L max: 38
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: Victual mummy consisting of a left femur of a cow/bull (breadth proximal: 11 cm, breadth distal: 10.5 cm). There is a vast amount of flesh still adhering to the bone, particularly on the proximal side. The exterior of the flesh is covered with a black resin-like substance as well as dirt. The interior is dried and yellow with salts precipitating. It might have been preserved with natron. It is not possible to determine the age through fusion, as the epiphyses are covered. The proximal ones look as if they are fusing, rather than fused, which would make the animal younger than 36 months. Different qualities of linen are used in the spiral wrapping, some very tight, some very loose.

Textile notes
The bandages are spirally wrapped. The fabric is sparse and impregnated with a black resin-like substance. Thread count is not calculable.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, p. 11.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Cairo, EMC CG 24048–56 *bis*, CG 29628, CG 29676, CG 29859–63 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 1–3, 7, 12, 34–36, 70, 77, 91).

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Inventory number: Suppl. 5106/2
Object: Victual mummy
Dimensions: L: 37, W: 14
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: Victual mummy consisting of the right tibia of a cow/bull/ox with flesh surviving on the proximal end, but not on the rest of the bone. The offering was covered with blackish-brown substance and linen bandages. It is salty, due to salt or natron. Based on what is visible in terms of fusion to the naked eye, the animal was less than 3 years of age, possibly younger, at death.

Textile notes

The bandages (about 5 cm) are spirally wrapped, fixed by small strips of about 2 cm. Thread count is not calculable.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, p. 11; Ikram, *Choice Cuts*, 1995, p. 266.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Cairo, EMC CG 24048–56 *bis*, CG 29628, CG 29676, CG 29859–63 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 1–3, 7, 12, 34–36, 70, 77, 91).

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Inventory number: Suppl. 5106/3
Object: Victual mummy
Dimensions: L max: 37
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: Victual mummy consisting of a left femur of a cow/bull (breadth proximal: 12 cm; breadth distal: 10 cm). There is flesh still adhering to the bone. The exterior of the flesh is dark — probably due to black resin-like substance as well as dirt. The interior of the flesh is dried and yellow with salts precipitating. It might have been preserved with natron. There is some white plaster adhering to the bandages on the femoral head, which might be from a wooden box. It is not really possible to determine the age through epiphyseal fusion without a radiograph; from the robustness of the bone and what can be seen of the epiphyses, however, it seems to have recently fused.

Textile notes

The textile is fragmentary, and too rigid due to embalming material for thread count to be taken. The linen is relatively dense.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, p. 11.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Cairo, EMC CG 24048–56 *bis*, CG 29628, CG 29676, CG 29859–63 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 1–3, 7, 12, 34–36, 70, 77, 91).

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Inventory number: Suppl. 5106/4
Object: Victual mummy
Dimensions: L: 31.5, W: 16.5
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: Victual mummy consisting of a left humerus of a cow/bull/ox with a great deal of meat attached to it (the distal breadth of the bone is 9.2 cm and the greatest length of the bone 31.5 cm). It is precipitating an unidentified white material (not salt) and there is a tacky black and slightly shiny, black resin-like substance on both the meat and the few preserved bandages.

Textile notes
The textile is fragmentary, and too rigid due to embalming material for thread count to be taken. The majority of bandages are of the loose weave.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, p. 11; Ikram, *Choice Cuts*, 1995, p. 266.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Cairo, EMC CG 24048–56 *bis*, CG 29628, CG 29676, CG 29859–29863 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 1–3, 7, 12, 34–36, 70, 77, 91).

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Inventory number: Suppl. 5107
Object: Victual mummy
Dimensions: L: 23.3, W: 10
Acquisition: Italian Archaeological Mission (1904)
Provenance: Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: None
Description: A large chunk of beef that was preserved by natron or salt. It was oiled and could be from the rump area of the animal. It might belong to Suppl. 5091, **No. 192**, or one of the other empty coffinets for meat.

Bibliography: Grilletto, *Materiali antropologici e zoologici*, 1991, p. 11.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Cairo, EMC CG 24048–56 *bis*, CG 29628, CG 29676, CG 29859–63 (Ikram and Iskander, *Non-Human Mummies*, 2002, pp. 1–3, 7, 12, 34–36, 70, 77, 91); Ikram, *JARCE* 48 (2012), pp. 125–33; Clark et al., *PNAS* 110.51 (2013), p. 20393: https://doi.org/10.1073/pnas.1315160110.

215



Inventory number: Provv. 6116
Object: Victual mummy of a duck
Dimensions: L: 26.3, W: 17.5
Acquisition: Unknown
Provenance: Probably Thebes, Valley of the Queens, tomb of Imhotep (QV46)
Date: Probably New Kingdom, 18th Dynasty, reign of Tuthmosis I (1493–1482 BC)
Scientific analyses: Pyrolysis-CG/MS, UVF
Description: A victual mummy of a duck (*Anas* sp., possibly a pintail duck, *Anas acuta*), probably from the tomb of Imhotep. The head was severed from the body — knife cuts are visible on two of the vertebrae. The legs and wings are broken off, but presumably the feet and wing tips were cut off, as was the norm with such mummies. The internal organs (liver and gizzard) were removed, cleaned, desiccated, oiled/resined, wrapped with linen and thread, and returned to the body cavity. The meat is very salty, probably due to the salt or natron that was used as a preservative. After drying, the bird was oiled and some resin applied as well. Then it was wrapped in bandages, some of which are quite coarse. In many places they are black with globs of dark resinous material adhering to them; this substance has been painted over them, rather than having seeped out from below. Above it, near the tail, on the ventral side, is a piece of wadded-up bandage that is gauzy and of fine quality. The linen that is closest to the body (T1) is coarser and very much impregnated. The outer one (T2) is finer and darker.

Scientific examination

Analysis of organic residue

Pyrolysis-GC/MS of the resinous material, already detached and stored separately, showed markers for lipid-based material and some traces of diterpenic resin.

Bibliography: Unpublished.
Parallels: Ikram, *Choice Cuts*, 1995, Appendix II; Ikram, *JARCE* 48 (2012), pp. 125–33; Clark et al., *PNAS* 110.51 (2013), p. 20393: https://doi.org/10.1073/pnas.1315160110.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	12 x 6	?	
T2	Linen	S	Warp-faced	31 x 14	?	

Textile notes

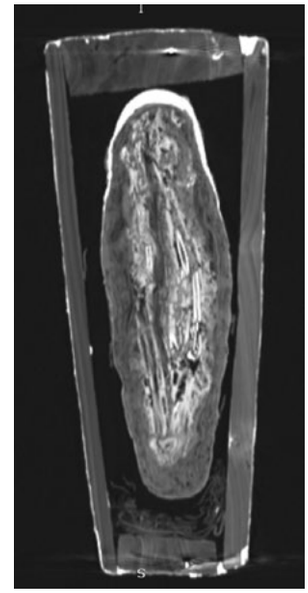
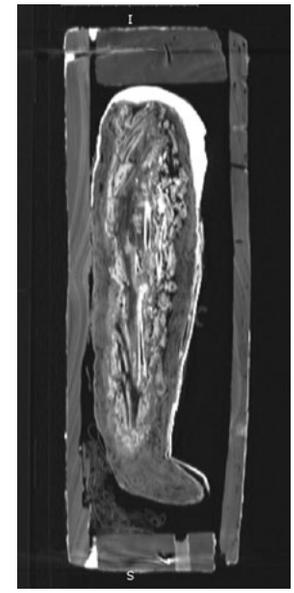
8.15 Masquerading Mummies

A group of mummies preserved in the Museo Egizio as well as other museums throughout Europe and variously labelled as baby or animal mummies form part of the Museo Egizio's collection. The mummies themselves are decorated with crude cartonnage or painted details and to all intents and purposes look like miniature human mummies. They are placed in roughly rectangular, tapering wooden coffins, often with a vertical band of inscription on the coffin's lid. This group of mummies have been thought to be nineteenth-century fakes or amalgams. Alessia Amenta[226] is currently carrying out a detailed study on this genre of mummies, which should elucidate their history and purpose. While the mummies look like miniature humans, they are masquerading as such. The actual mummy bundles contain the remains of birds, shrews, bandages, human bones, sticks, and other materials.[227] The great similarity between all mummies of this type, the use of metal nails and the very probable single origin of the wooden boards used to construct the small coffins (two coffins have two parts of the same inscription), all suggest that these mummies were produced *en masse* in modern times, but using ancient elements, and most probably in a single workshop.

[226] The work is currently in progress and entitled *Child Pseudo-Mummies: Analysis and Study of a Phenomenon and a Singular Production*.
[227] We are grateful to Alessia Amenta for this information.

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Inventory number: Cat. 2247/1
Object: Masquerading mummy in a coffin

MUMMY

Dimensions: L: 30.5, W: 9
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: CT
Description: Mummy that is wrapped in linen and whose top is covered by a cartonnage covering with a painted and crudely modelled face, so that it looks like a small human mummy. The cartonnage has been secured by a bandage that was folded over (but loose in some places, now), that criss-crosses around the mummy's head, neck, and body. The cartonnage that is visible under the bandages, beneath the face, shows, on a white background, a standing mummiform figure of the canine-headed Duamutef, facing left proper, with a column of text identifying him before him. This vignette is set within a frame consisting of a multi-coloured band (red, blue, white, beige), with the base being augmented by an extension of this pattern on a solid blue base. The foot area is decorated with bands of abstract vegetal motifs. It is probable that the cartonnage is reused. Extra textiles are stuffed in at the foot end to stabilise the mummy.

Scientific examination

CT investigations

The CT scans show an incomplete skeleton of a juvenile ibis, according to epiphyseal fusion. The banding wraps some long bones, probably referable to upper limbs (radio-ulna portions) and lower limbs. Calami of the feathers are visible.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	37 x 14	Undyed	Self-bands
T2	Linen	S	Warp-faced	24 x 12	Undyed	Self-bands
T3	Linen	S	Warp-faced	22 x 11	Undyed	
T4	Linen	S	Warp-faced	22 x 10	Undyed	

Textile notes: One bandage 1.5 cm large, folded on itself (total 3 cm), is used to keep in place the cartonnage. This bandage is covering the front and then is crossed over the body. Inside the coffins there are many fragments of textiles: T2 shows two lines of self-bands, T3 is 5.5 cm large and 33 cm long and T4 is worn out and very badly preserved.

COFFIN

Dimensions: L: 40, W: 15.5, H: 13.5
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: CT
Description: A trapezoidal box made up of six pieces of wood of different thickness, evidently reused. The wood is covered with a thick layer of black resin-like substance on all its sides, save for the lid. The upper half of the lid is smoothed either to attach another piece or as primer for decoration. The rest of it was covered with a white (now totally discoloured) wash. A text band is set within a black frame and glyphs are picked out in a black outline. They might have originally been filled in by other colours, but this is difficult to discern due to the discoloration of the box.

The lid is made from the same reused inscribed wood as the lid of coffin **No. 217** below, which bears the direct continuation of the inscription.

Inscription



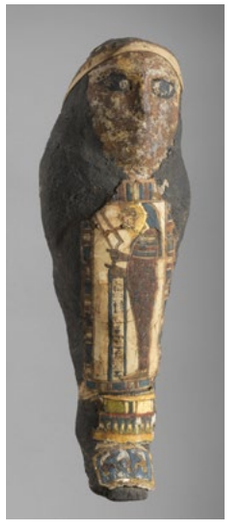
ḥtp-dì-nswt n Wsjr [...]
"An offering the king gives to Osiris [...]"
Comment
This standard offering formula continues uninterruptedly on the lid of coffin (see coffin **No. 217**, next entry), made from the same reused piece of wood.

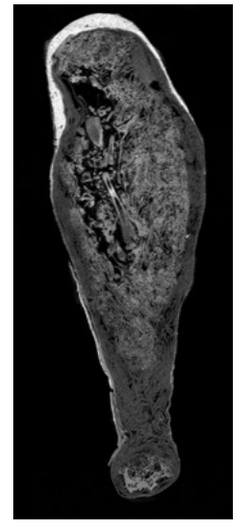
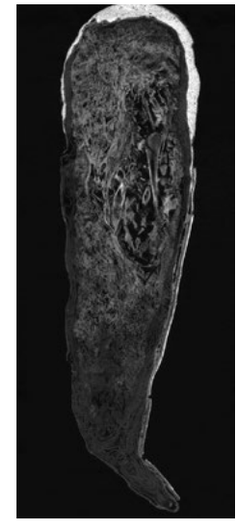
Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 319, no. 2247 [10–11].
Parallels: Florence, MAF 5740–1; **Nos. 217**– **219**.

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Rectangular coffin	No	Yes	Blue	Six pieces of wood	Twelve for the box, four for the lid	No	No

Coffin technical notes

217



Inventory number: Cat. 2247/2
Object: Masquerading mummy in a coffin

MUMMY

Dimensions: L: 31, W: 10.2
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: CT
Description: A mummy that is wrapped in linen and whose top is covered by a reused cartonnage covering, most likely from a human mummy, with a painted and crudely modelled face, so that it looks like a miniature human mummy. The cartonnage that is visible under the bandages, beneath the face, shows, on a white background, a long rectangular panel decorated with an image of Qebehsenuf, one of the Four Sons of Horus, as a falcon-headed mummy. A column of text painted in black between black framing lines is in front of him. This vignette is set within a frame consisting of a multi-coloured band (red, blue, white, beige), with the base being augmented by an extension of this pattern on a solid blue base. The foot area is decorated with bands of abstract vegetal motifs.

Inscription



ḏd-mdw jn {n} Ḳbḥ-snw=f: "jnk <sꜣ>=k wnn m ḥr=k"
"Saying the words by Qebehsenuf: 'I am your protection that is in front of you.'"
Comment
One sees what looks like a black dot followed by a smudge after *jnk*, where one would expect *sꜣ*; no traces of faded ink are visible.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	37 x 14	Undyed	Self-bands

Textile notes: One bandage (T1), 1 cm wide, folded on itself, covers the front.

Scientific examination

CT investigations

The CT scans show an incomplete skeleton of a raptor, possibly a kestrel, *Falco tinnunculus*. No bone structures attributable to the cranium or sternum were identified. The animal's upper limbs are also not present. The skeletal remains are gathered in the upper part of the bundle, wrapped in bandages more compressed and characterised by a higher radiopacity than the external layers, probably due to the black resin-like substance covering them. Thus, the images are less clear than they would be otherwise.

COFFIN

Dimensions: L: 41, W: 10–14.7, H: 14.9
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: CT
Description: The coffin is trapezoidal and is made up of six parts, one for the lid and five for the trough, four of which for the sides dowelled onto the bottom. Two dowels join the trough and the lid. Each side of the trough is linked to the others with a dowel, to the bottom with two base. The trough is partly covered with a black resin-like substance. The lid is covered with a white wash. A central column of glyphs is picked out in black and filled in with blue. The white of the sides is covered with a red wash that is carelessly applied.

The lid is made from the same reemployed piece of wood used for the lid of **No. 216** above, where the beginning of the text is.

The top half of the inner part is painted with a series of decorative bands, followed by a plain white section. The bands of decoration consist of yellow, white, and red lines, a row of white rosettes with red centres, yellow triangles with red dots interrupted by brown triangles, small panels consisting of white, red, brown and yellow bands overlaid by *ankh* signs, and finally, a part of a wing picked out in brown, red, white, and black.

The lid is made from the same reused piece of inscribed wood as the lid of coffin **No. 216** above, bearing the beginning of the text column, which continues uninterruptedly into this one.

Inscription



[…] *ḫnt.j jmn.tyw nṯr ᶜ₃ nb ₃bḏ.w dì=f t ḫnḳ.t* […] [*k₃.w?*] *₃pd.w*
"[...] foremost of the Westerners, great god, lord of Abydos, may he give bread, beer [...] and cattle and fowl [...]"

Comment

The beginning of this standard offering formula is on the lid of coffin **No. 216**, recycled from the same piece of wood.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 319, no. 2247 [10–11]; Piccirillo et al., in Malitesta (ed.), *Atti del XVI ABC Congresso Nazionale*, 2016, pp. 99–100.
Parallels: Florence, MAF 5740–1; **Nos. 216, 219**.

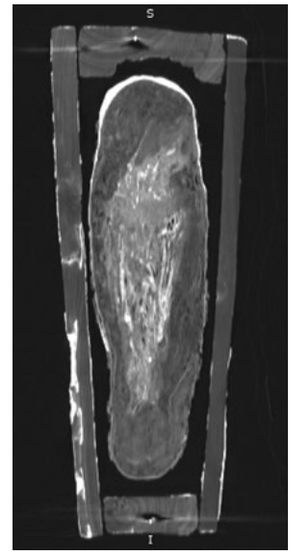
Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Rectangular coffin	No	Yes	Grey White Yellow Red	Six pieces of wood	Six for the box, two for the lid	No	No

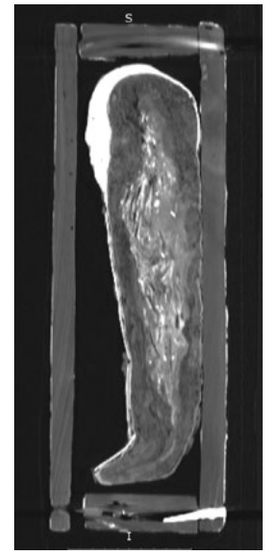
Coffin technical notes

218









Inventory number: Cat. 2248
Object: Masquerading mummy in a coffin

MUMMY

Dimensions: L: 33.5, W: 9.5
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: CT
Description: A mummy that is wrapped in linen and whose top is covered by a cartonnage covering with a painted and crudely modelled face, so that it looks like a small human mummy. The cartonnage is visible under the bandages, beneath the face, and is kept in place by a criss-crossed bandage (T1), 1.5 cm large and folded on itself. It is decorated with a geometric pattern divided into many registers.

Scientific examination

CT investigations

The CT scan shows that the mummy consists of a bundle of feathers (calami of different sizes are visible) and some disorganised bone fragments located mainly in the upper part of the mummy bundle.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	30 x 11	Undyed	

Textile notes: One bandage (T1), 1.5 cm wide, folded on itself, covers the front.

COFFIN

Dimensions: L: 40.2, W: 12–15, H: 13.8

Acquisition: Acquired before 1882

Provenance: Unknown

Date: Late Period (based on inscription style)

Scientific analyses: CT

Description: The coffin is trapezoidal, made from six pieces of wood. Two dowels join the box and lid and hold the pieces of the box together. The underside of the lid is hollowed out to accommodate the mummy's head. There are vestigial dowels and dowel holes in various parts of the coffin, indicating that it is made of reused wood. The box is painted and in some parts covered with a black resin-like substance. On the lid, on a white background, there is a black inscription that runs in the opposite direction to the coffin.

Inscription



[…]-*m-jb-Ptḥ sꜣ Pꜣ<di?>-bꜣstt* {*m*} *msỉ nb*(*t*)*-pr*

"[...]-em-ib-Ptah son of Pa(di?)bastet and whom the lady of the house (?) (...) bore."

Comment

I could find no name in Ranke, *PN* ending with "*m-ỉb-Ptḥ*" or similar. A possibility would be **Nḏm-ỉb-Ptḥ*, on the template of names such as *Ḥr-ỉb-ỉmn* and *Ḥr-ỉb-ỉnp.w* (*PN* 230.8, 230.9).

The style of the inscription is suggestive of a date in the Late Period.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 319, no. 2248 [12].

Parallels: Florence, MAF 5740–1; **Nos. 216–219**.

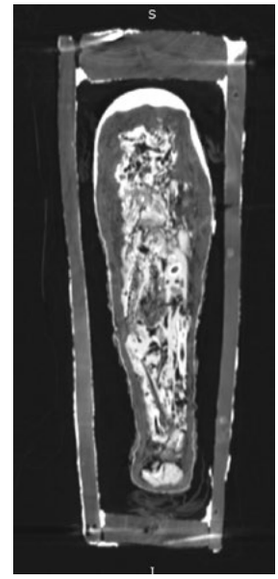
Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Rectangular coffin	No	Yes	Black	Six pieces of wood	No	No	No

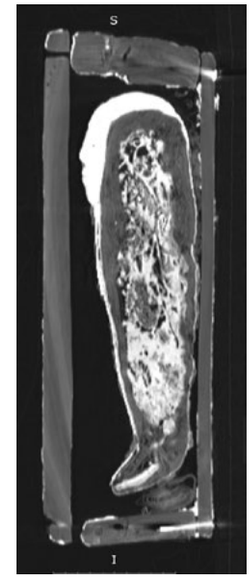
Coffin technical notes

219









Inventory number: Cat. 2249
Object: Masquerading mummy in a coffin

MUMMY

Dimensions: L: 32.5, W: 9
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: CT
Description: A mummy wrapped in linen whose top is covered by a reused cartonnage covering with a painted and crudely modelled face, so that it looks like a small human mummy. The cartonnage is kept in place by a criss-crossed bandage. The face is crudely painted with large eyes. The zone beneath the neck appears to be decorated with a blue pattern of wings, and beneath it are at least two diagonal rows: the first consists of crudely painted round flowers on a red background and the second shows pendent teardrops or petals on a yellowy-white background. After this is a zone that is hard to decipher, as it is partially obscured by the bandages that keep it in place, as well as discoloured by oils, resins, and dirt. It seems to show deities painted in green on a red background that are oriented sideways. The foot area is demarcated by a blue band and the feet, at toe level, are decorated with a band of petals on a red background. It is possible that the cartonnage is reused. Some fragments of textile are inside the coffin.

Scientific examination

CT investigations

The CT scan shows within the bandage the presence of portions and bone fragments of a bird: the legs, synsacrum, and pelvis, not arranged in any anatomical order, together with feather calami. They are immersed in an abundant matrix (perhaps resin). The shape of the pelvis/synsacrum and the size of the bones are compatible with those of an ibis.

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	32 x 11	Undyed	

Textile notes: One bandage (T1), 1 cm wide, folded on itself, covers the front.

COFFIN

Dimensions: L: 41.2, W: 11–13, H: 10–11
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: CT
Description: A trapezoidal wooden coffin made up of six re-used pieces of wood: one for the base, four for the sides of the box and one for the lid. The whole coffin is covered with a layer of stucco. Between the bottom and the piece used for the side of the box there is, internally and externally, a thick layer of stucco. All the pieces are held together by modern iron nails, which are either from restorations or evidence that the coffin is a modern fake. A layer of black resin-like substance remains on the exterior of the lid. There are filling bandages at the base of the mummy.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 319, no. 2249 [13].
Parallels: Florence, MAF 5740–1; **Nos. 216–217**.

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Rectangular coffin	Yes	No	No	Six pieces of wood	No	No	Iron nails

Coffin technical notes

8.16 Osirian Obelisk Figures

The Osirian obelisk figures constitute an unusual small group of wooden and stone figures (with one metal one) showing Osiris seated or standing before an obelisk, or just an obelisk, that serve as containers for animal mummies associated with the sun god: raptors and shrews. Examples are known from the Museo Egizio as well as other museums and from some sites, notably Saqqara.[228] The radiocarbon dates for some of these are quite early (eight century BC), which might be a true reflection of their time of manufacture or, more likely, based on style, just the date of the reused wood. The other end of the date range puts most of these figures in the Ptolemaic Period, with one possible Roman example (**No. 227**). Stylistically and archaeologically[229] these objects seem to have been manufactured from the early Ptolemaic into the early Roman Period. It should also be remembered that wood, particularly, as well as linen, could be reused for producing all kinds of objects, particularly accessories for the dead.

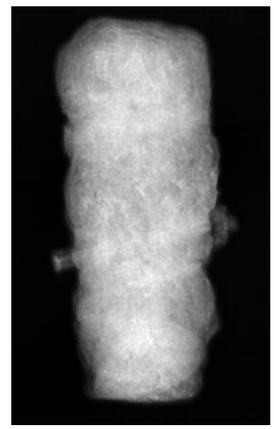
[228] See Musso and Petacchi, in Kóthay (ed.), *Burial and Mortuary Practices*, 2017, pp. 337–45 for an initial discussion of this type of objects with specimens mostly known in wood and stone; other examples, including excavated ones, can be seen in: Martin, *Sacred Animal Necropolis: Southern Dependencies*, 1981, pl. 33.1407; Guidotti, in Franci et al. (eds.), *Rethinking Osiris*, 2021, pp. 35–40 (notably Florence Inv. 132–33).

[229] Martin, *Sacred Animal Necropolis: Southern Dependencies*, 1981, pl. 33.1407.

220







Inventory number: Cat. 2407
Object: Unidentifiable mummy in an obelisk figure

MUMMY

Dimensions: L: 9.8, W: 3.4
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Possibly 900–760 BC, based on the ^{14}C date of its coffin
Scientific analyses: X-ray, CT
Description: The mummy is wrapped very loosely in wadded cloth and linen bandages (3 mm wide), all taken from the same fabric. Some stains of oils or other embalming materials are visible on the side. On one side of the mummy bandages are a bit squashed due to having been pushed against the interior of the box.

Scientific examination

X-ray, CT investigations

Radiographs show that the mummy bundle is empty, although it is possible that its contents are not visible on the radiograph due to the small size and difficulty in imaging something that is small and fine.

Textile notes

Very loose fabric whose thread count cannot be calculated. The mummy bundle is tightly bound with thin 3-mm ties made from the same fabric.

OBELISK

Dimensions: L: 10.5, W: 26, H: 37
Acquisition: Acquired before 1882
Provenance: Unknown
Date: 900–760 BC (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating
Description: Wooden obelisk figure on a rectangular base, both are painted white.

The base has a small rectangular opening on top that is sealed by a piece of wood that rests on two ledges, each on the short side of the rectangle. The recess contains a mummy. The obelisk figure is covered with plaster. There is a vertical inscription picked out in green on the obelisk.

Inscription



Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Singular obelisk on base	Yes	Yes	White Green	Two pieces of wood	No	No	No

Coffin technical notes

Wsỉr ḥm-nṯr n Jmn-Rᶜ nswt nṯr.w zḫɜw ḫmn(.w?) n pr Jmn Ḥr-sɜ-ɜs.t mɜᶜ-ḫrw
"The Osiris, the priest of Amun-Re, king of the gods, scribe of the dependents (?) of the Temple of Amun, Harsiese, justified."

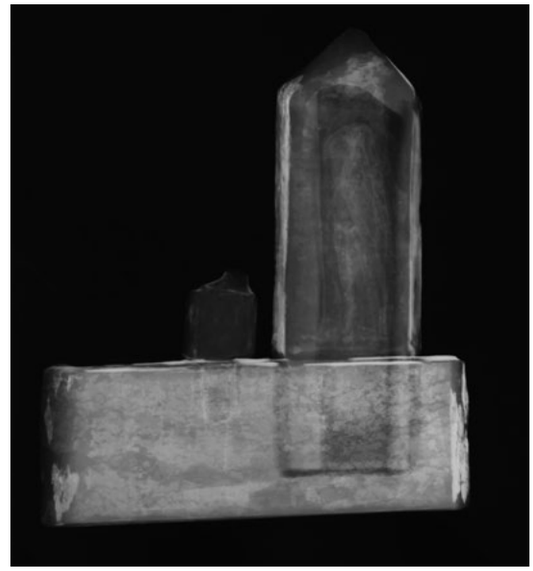
Scientific examination

Radiocarbon dating (^{14}C)
Wood, calibrated age (95% probability): 900–760 BC. It is worth noting that in comparison with other Osiris obelisk mummies, this date is somewhat in agreement with the radiocarbon dates of the textile of **No. 226**, but is much earlier than the textiles of **No. 227**.

Bibliography: Fabretti et al., *Museo Regio*, 1882, p. 339, no. 2407 [84]; Heimann (ed.), *Ägyptens Schätze entdecken*, 2012, p. 237, fig. 84; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 39–40, fig. 3F.
Parallels: Martin, *Sacred Animal Necropolis: Southern Dependencies*, 1981, pl. 33.1407; Florence, MAF 132–33 (Guidotti, in Franci et al. [eds.], *Rethinking Osiris*, 2021, pp. 35–40).

221





Inventory number: Cat. 2408
Object: Obelisk figure
Dimensions: L: 5.5, W: 10.2, H: 14; Mummy W: 1.7, H: 8
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT
Description: Wooden obelisk on a rectangular base. It is made of three pieces of wood. The obelisk is inserted into the base. In front of it, on the left proper, is a cubic base with the remains of gilded feet. On the right is a hole for a dowel for another such base, a slightly larger one. One of these would presumably have been for a standing Osiris figure and the other might have hosted another deity, perhaps Isis. The obelisk, accessed from the back and bottom, seems to contain a mummy bundle. The whole artefact is plastered and gilded. The container is sealed from the back. The mummy bundle can only be seen from the bottom of the obelisk.

Scientific examination

X-ray, CT investigations

The CT scan reveals that the obelisk figure contains the partial remains of a small bird, probably a chick judging from its size, wrapped in textile. The skeleton, about 7 cm long, is in an upright position with the lower limbs distended. The skull is not clearly visible and the calami are not evident.

Textile notes

The warp and weft count cannot be calculated.

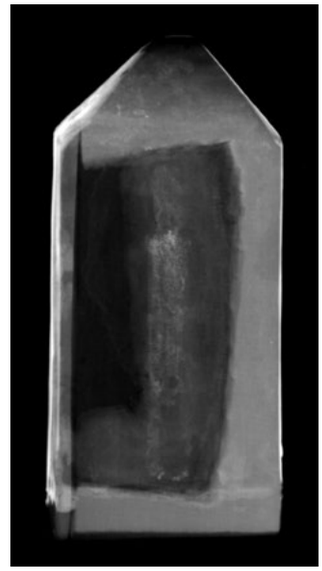
Bibliography: Fabretti et al., *Museo Regio*, 1882, p. 339, no. 2408 [85].
Parallels: Martin, *Sacred Animal Necropolis: Southern Dependencies at North Saqqara*, 1981, pl. 33.1407; Florence, MAF 132–33 (Guidotti, in Franci et al. [eds.], *Rethinking Osiris*, 2021, pp. 35–40); Paris, Louvre E 195.

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Obelisk on base	Yes	Yes	Gilded	Three pieces of wood, one for each part	No	No	No

Coffin technical notes

222





Inventory number: Cat. 2409
Object: Obelisk figure
Dimensions: L: 6, W: 9.5, H: 11
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT
Description: Wooden obelisk figure on a low rectangular base; both the figure and the base are plastered and the obelisk's pyramidion is gilded. The obelisk is carved from a single piece of wood and the base from another. The sides of the obelisk have a *serekh*-type pattern painted in white, green, white and red, which could also be likened to a false door. The base is painted in green, evocative of rebirth and resurrection, and a colour associated with Osiris. The obelisk was once fronted by an image, probably of Osiris, as the rectangular hole for the peg survives. The obelisk is hollow and accessed through the back. It contains a mummy bundle, but the obelisk is sealed.

Scientific examination

X-ray, CT investigations

The CT scan reveals a mummy bundle within the obelisk. The textile is wrapped around either a juvenile bird or a small mammal (shrew?), but it is impossible to identify it with any confidence.

Bibliography: Fabretti et al., *Museo Regio*, 1882, p. 339, no. 2409 [86].
Parallels: Martin, *Sacred Animal Necropolis: Southern Dependencies at North Saqqara*, 1981, pl. 33.1407; Florence, MAF 132–33 (Guidotti, in Franci et al. [eds.], *Rethinking Osiris*, 2021, pp. 35–40).

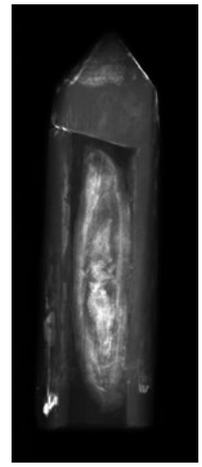
Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Obelisk on base	Yes	Yes	White Green Red Gilded	Two pieces of wood	No	No	No

Technical notes

223







Inventory number: Cat. 2410
Object: Osirian figure
Dimensions: L: 6.5, W: 5, H: 14.8; Mummy W: 1.8, H: 9
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT
Description: A wooden obelisk on a narrow rectangular base, both of which are plastered and were possibly gilded. Each part is carved from a single piece of wood. There are two holes in front of the obelisk, in the wider part of the base, which might have accommodated a standing Osiris figure. The obelisk, accessed from the back and bottom, contains the wrapped mummy. The base was secured with some black resin-like substance.

Scientific examination
X-ray, CT investigations
The CT scans reveal that the obelisk contains the wrapped mummy of a small mammal, maybe a shrew (*Crocodura* spp.), a solar creature, which would fit with the solar iconography of the obelisk.

Bibliography: Fabretti et al., *Museo Regio*, 1882, p. 339, no. 2410 [87].
Parallels: Martin, *Sacred Animal Necropolis: Southern Dependencies at North Saqqara*, 1981, pl. 33.1407; Florence, MAF 132–33 (Guidotti, in Franci et al. [eds.], *Rethinking Osiris*, 2021, pp. 35–40).

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Obelisk on base	Yes	Yes	Gilded	Two pieces of wood	No	No	No

Technical notes

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	26 x 13	Undyed	

Textile notes: One piece of textile was used to create the bundle.

224





Inventory number: Cat. 2411
Object: Osirian figure
Dimensions: L: 4.5, W: 4.5, H: 8.2
Acquisition: Acquired before 1882
Provenance: Unknown
Date: 360–40 BC (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating
Description: Wooden Osirian obelisk figure on a square base; both the obelisk and the base are plastered. Each part is carved from a single piece of wood. The obelisk has a slightly damaged tip. The standing Osiris, who wears an *atef* crown, leans against one side of the obelisk. The eyes are made of different materials; only one is preserved. A mummy bundle was inserted into the base through a hole in its base, through which one can now see the mummy bundle. On the base, where the obelisk is located, there are traces of a black resin-like substance.

The mummy is wrapped in a textile that is tightly held by an S-spun thread. The bottom end of the cavity is further cushioned with extra fragments of cloth.

Scientific examination

X-ray, CT investigations

The CT scans reveal that the Osirian obelisk contains an object wrapped in linen, although it is currently not possible to identify what it is. The linen package might only contain feathers or bone fragments.

Radiocarbon dating (^{14}C)

The textile was tested, yielding a calibrated age (95% probability) of 360–40 BC. It is worth noting that this is a very different date from the wood of **No. 220**, a similar piece to this one, that was ^{14}C dated, and to the textile of **No. 226**. It is always possible that both wood and textile are of earlier dates than the animal, as these can be reused, and thus when all three are tested, they sometimes yield different dates.

Textile notes

Warp and weft thread count cannot be calculated.

Bibliography: Fabretti et al., *Museo Regio*, 1882, p. 339, no. 2411 [88]; Musso and Petacchi, in Kóthay (ed.), *Burial and Mortuary Practices*, 2017, pp. 337, 341.
Parallels: Florence, MAF 132–33 (Guidotti, in Franci et al. [eds.], *Rethinking Osiris*, 2021, pp. 35–40); Paris, Louvre E 2707.

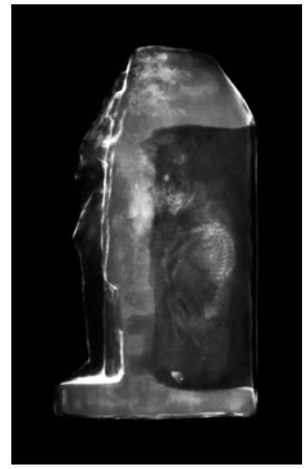
Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Osiris standing in front of an obelisk	Yes	Yes	Gilded	One piece of wood	No	No	The eyes are made of different materials

Technical notes

225







Inventory number: Cat. 2412
Object: Osirian figure
Dimensions: L: 2.5, W: 4.2, H: 8.5; Mummy W: 1.4, H: 6
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT
Description: Wooden plastered and gilded (on the front) Osiris figure wearing the typical *atef* crown, standing on a rectangular base in front of an obelisk. It is carved from a single piece of wood. The eyes are painted. There is an indentation to the left of Osiris where some other image or object (Isis?) had been inset. The back of the obelisk had an opening into which the mummy was inserted; the cover for this aperture is lost. The recess contains a mummy wrapped in undyed linen bandages that are tightly held in place by an S-spun thread. The sides of the cavity are further cushioned with fragments of dark brown fabric.

Scientific examination

X-ray, CT investigations

The CT scans reveal that the Osirian obelisk figure contains an animal mummy consisting of a juvenile bird, probably a raptor, which has solar connotations. Its legs are flexed toward its belly and the wings folded over the ventral side.

Textile notes

Warp and weft thread count cannot be calculated.

Bibliography: Fabretti et al., *Museo Regio*, 1882, p. 339, no. 2412 [89]; Musso and Petacchi, in Kóthay (ed.), *Burial and Mortuary Practices*, 2017, pp. 337, 341.
Parallels: Florence, MAF 133 (Guidotti, in Franci et al. [eds.], *Rethinking Osiris*, 2021, p. 38, fig. 8); Paris, Louvre E 2707.

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Osiris standing in front of an obelisk	Yes	Yes	Gilded Black	One piece of wood	No	No	No

Technical notes

226







Inventory number: Cat. 2415
Object: Osirian figure
Dimensions: L: 4, W: 5.5, H: 10.3; Mummy W: 1.8, H: 6
Acquisition: Acquired before 1882
Provenance: Unknown
Date: 750–400 BC (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating
Description: A wooden enthroned Osirian figure of the obelisk type, on a rectangular base that is carved from a single piece of wood. Osiris wears the *atef* crown and leans against a low obelisk whose top ends where the crown begins. The god holds the *heka* sceptre and the flail, both of which are rendered with incised lines. The now-lost eyes were probably inlaid in another material. The sides of the throne are graced with an incised feather (*rishi*) pattern. Carved into the side of the obelisk is a standing female figure, wearing a dress graced with a net pattern. Her head is damaged, but she could be either Isis or Nepthys. A *djed* pillar is incised on the back of the obelisk. There might have been some glyphs on the pyramidal portion of the obelisk, but these are now missing. The obelisk, which is accessible from the base, contains a linen package.

Scientific examination
X-ray, CT investigations
The CT scans reveal that the obelisk contains a textile package which might hold part of an unidentifiable animal, as well as some radiopaque substance, such as resin.
Radiocarbon dating (^{14}C)
Textile, calibrated age (95% probability): 750–400 BC. This date is somewhat similar to that of the wood of **No. 220** (900–760 BC), and is earlier than the radiocarbon dates for the textiles of **Nos. 224, 227**. However, stylistically and in terms of what is depicted, this group of objects should have a similar date.

Textiles notes
Warp and weft thread count cannot be calculated.

Bibliography: Fabretti et al., *Museo Regio*, 1882, p. 340, no. 2415 [92]; Musso and Petacchi, in Kóthay (ed.), *Burial and Mortuary Practices*, 2017, pp. 338, 343, pl. 80.
Parallels: Florence, MAF 132 (Guidotti, in Franci et al. [eds.], *Rethinking Osiris*, 2021, p. 38, fig. 7); Paris, Louvre E 22307.

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Osiris seated in front of an obelisk	No	Yes	Gilded	One piece of wood	No	No	No

Coffin technical notes

227







Inventory number: Cat. 2416
Object: Osirian figure
Dimensions: L: 3.5, W: 5.5, H: 11.3; Mummy W: 1.8, H: 7
Acquisition: Acquired before 1882
Provenance: Unknown
Date: 170 BC – AD 60 (^{14}C date)
Scientific analyses: X-ray, CT, ^{14}C dating
Description: A wooden seated Osirian obelisk figure on a rectangular base that is rounded at the front and carved from a single piece of wood. The image of the god is gilded, while the rest of the object is coloured white. Osiris wears an *atef* crown and his eyes are painted in blue. The base and the back of the statuette/coffin can be removed to allow for the introduction of the animal mummy. The lid was secured using a black resin-like substance. Within, the small animal is carefully wrapped to look like a standing human mummy with the face and head indicated, as are the protruding feet. It is wrapped in plain undyed textile decorated with thin (3 mm wide) bands in a diamond pattern that are further secured with linen thread (S-spun). Fragments of fabric are packed into the base to cushion the mummy.

Scientific examination

X-ray, CT investigations

Radiographs and CT scan show that there is a small object/body inside the textile package. It is very difficult to determine what kind of animal the bundle contains. It looks as if it might be a shrew, with the snout facing upward and the teeth just visible. It should be noted that its being a very small mammal with delicate bones would explain the difficulty in seeing it in a radiograph. However, this identification is far from assured.

Radiocarbon dating (^{14}C)

Textile, calibrated age (95% probability): 170 BC – AD 60. This is the latest radiocarbon date provided for objects of this type at the Museo Egizio.

Textile notes

Warp and weft thread count cannot be calculated.

Bibliography: Fabretti et al., *Museo Regio*, 1882, p. 340, no. 2416 [93]; Musso and Petacchi, in Kóthay (ed.), *Burial and Mortuary Practices*, 2017, p. 343.
Parallels: Vienna, KHM ÄS 955 (Satzinger, in Clarysse et al, [eds.], *Egyptian Religion*, 1998, pl. 2.2); Florence, MAF 111–12 (Guidotti, in Franci et al. [eds.], *Rethinking Osiris*, 2021, p. 38, figs. 5–6); Paris, Louvre E 13343.

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Osiris seated in front of an obelisk	No	Yes	Gilded Blue	One piece of wood	No	No	No

Coffin technical notes

228





Inventory number: Cat. 2417
Object: Osirian figure
Dimensions: L: 3.2, W: 6, H: 11.2
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT
Description: A wooden Osirian obelisk figure on a rectangular base with a rounded front on which traces of plaster and gilding survive. The Osiris figure is seated and wears an *atef* crown. The eyes are painted. The figure was hollow, accessed through the bottom of the base and back (still sealed), and contains an animal mummy.

Scientific examination

X-ray, CT investigations

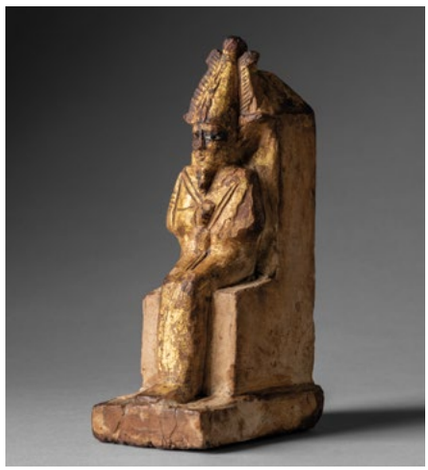
The CT scans reveal that the Osirian obelisk figure contains an animal mummy that seems to consist of parts of a juvenile bird that is disarticulated and wrapped in linen.

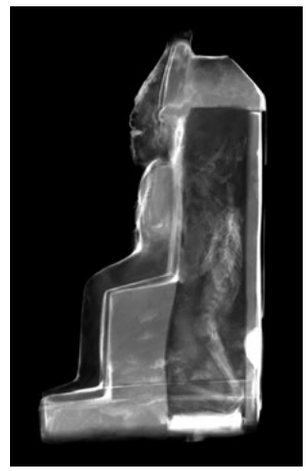
Bibliography: Fabretti et al., *Museo Regio*, 1882, p. 340, no. 2417 [94]; Musso and Petacchi, in Kóthay (ed.), *Burial and Mortuary Practices*, 2017, p. 343.
Parallels: Vienna, KHM ÄS 955 (Satzinger, in Clarysse et al. [eds.], *Egyptian Religion*, 1998, pl. 2.2); Florence, MAF 111–12 (Guidotti, in Franci et al. [eds.], *Rethinking Osiris*, 2021, p. 38, figs. 5–6).

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Osiris seated in front of an obelisk	Yes	Yes	Gilded	One piece of wood	No	No	No

Coffin technical notes

229





Inventory number: Cat. 2418
Object: Osirian figure
Dimensions: L: 5, W: 7.5, H: 14.7
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT
Description: A wooden seated Osirian obelisk figure wearing an *atef* crown resting on a rectangular base. It is covered with plaster and the Osiris figure and the top of the obelisk that serves as Osiris's back support are gilded. It is carved from a single piece of wood. The obelisk's tip ends just before the top of the *atef* crown. The eyes were inlaid and their components cannot be identified – only part of one survives. The god holds the flail and the *heka* sceptre, rendered with incised lines. The sealed figure is hollow and contains an animal mummy.

Scientific examination

X-ray, CT investigations

The CT scans reveal that the object probably contains a bird mummy, possibly *Accipiter* sp. due to the leg-length and overall size. While kites are associated with Isis/Nepthys, other raptors have solar connotations. The animal is in an upright position with the upper limbs flexed and the lower limbs partly extended.

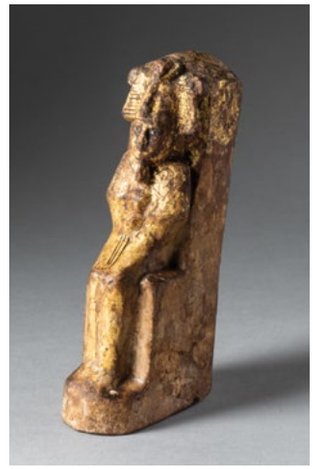
The skeleton is incomplete, the skull and the calami are not visible, and the rib cage is fragmentary.

Bibliography: Fabretti et al., *Museo Regio*, 1882, p. 340, no. 2418 [95]; Musso and Petacchi, in Kóthay (ed.), *Burial and Mortuary Practices*, 2017, pp. 338, 343, pl. 80; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, pp. 39–40, fig. 3G.
Parallels: Florence, MAF 132 (Guidotti, in Franci et al. [eds.], *Rethinking Osiris*, 2021, p. 38, fig. 7); Paris, Louvre E 5766.

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Osiris seated in front of an obelisk	Yes	Yes	Gilded	One piece of wood	No	No	No

Coffin technical notes

230


Inventory number: Cat. 2419
Object: Osirian figure
Dimensions: L: 3, W: 5.5, H: 12; Mummy W: 2, H: 8
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: X-ray, CT
Description: A wooden seated Osirian obelisk figure on a rectangular base with a rounded front; the obelisk serves as a back pillar and both are plastered. Osiris and the top of the obelisk are gilded. It is carved from a single piece of wood. Osiris wears the *atef* crown, which shows some remnants of blue paint under the gilding. The inlaid eyes are made of paste or similar. The god's arms are crossed over his chest and he holds an incised flail in one hand and the crook (*heka* sceptre) in the other. The figure is opened from the back and contains an animal mummy. The small animal is carefully wrapped in a plain undyed textile. The bundle is tightly secured by a string (S-spun).

Scientific examination

X-ray, CT

The CT scans show an animal mummy, probably a small young bird. The skeleton appears complete, although damaged. The animal is positioned with its wings wrapped tightly and the legs extended.

Bibliography: Fabretti et al., *Museo Regio*, 1882, p. 340, no. 2419 [96]; Musso and Petacchi, in Kóthay (ed.) *Burial and Mortuary Practices*, 2017, pp. 338, 343, pl. 80.
Parallels: Vienna, KHM ÄS 955 (Satzinger, in Clarysse et al., [eds.], *Egyptian Religion*, 1998, pl. 2.2); Florence, MAF 111–12 (Guidotti, in Franci et al. [eds.], *Rethinking Osiris*, 2021, p. 38, figs. 5–6); Paris, Louvre E 13343.

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Osiris seated in front of an obelisk	Yes	Yes	Gilded Blue	One piece of wood	No	No	No

Coffin technical notes

	Material/ fibre type	Spin form	Weave	Thread count/density	Colour/dyes	Technical details/ sewn features
T1	Linen	S	Warp-faced	42 x 16	Undyed	

Textile notes

231



Inventory number: Cat. 2420
Object: Osirian figure
Dimensions: L: 2, W: 4, H: 10
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: None
Description: A wooden Osirian obelisk figure on a rectangular base, on which traces of plaster and gilding survive. The seated Osiris wears his false beard and *atef* crown; the crown extends well above the tip of the obelisk. The eyes were inlaid, but their materials cannot be identified as they are not preserved. In one hand, the god holds the flail, in the other the *heka* sceptre; both are rendered by incised lines. The statuette is hollow, accessed through the bottom and back, and contains an animal mummy. The container remains sealed.

Bibliography: Fabretti et al., *Museo Regio*, 1882, p. 340, no. 2420 [97].
Parallels: Florence, MAF 132 (Guidotti, in Franci et al. [eds.], *Rethinking Osiris*, 2021, p. 38, fig. 7); Paris, Louvre E 22307.

Type	Plaster	Painting	Colours	Manufacturing technique	Dowels	Tenons	Additional elements
Osiris seated in front of an obelisk	Yes	Yes	Gilded	One piece of wood	No	No	No

Coffin technical notes

232



Inventory number: Cat. 2421
Object: Osirian figure
Dimensions: L: 2, W: 3.5, H: 7
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Probably Late Period to Ptolemaic Period (772–30 BC), based on parallels and general typology.
Scientific analyses: None
Description: Copper alloy image of Osiris standing in front of a hollow obelisk. The mummiform deity wears a beard and a (damaged) *atef* crown with the feather filaments incised. The facial details are summarily indicated and only the left ear is clearly delineated. Osiris's arms are flexed across his chest and he holds a crook in one hand and a flail in the other. The obelisk appears to be slightly warped in section and the rear face of the pyramid top is quite round. The obelisk is hollow and open at the bottom. In the original description of the object,[230] embalmed animal (?) remains from inside the obelisk are mentioned, but their current whereabouts are unknown.

Technical notes

The deity is solid cast and joined with the hollow-cast obelisk from the heels towards the tip of the crown. Due to extensive corrosion, technological elements such as chaplets cannot be made out. The Osiris figure and the obelisk were most likely moulded or formed individually in wax and then joined together to create the original wax model. Traces of the bonding seem to be recognisable at the back of the lower legs of Osiris where the corner of the obelisk is missing. The larger corroded bronze remains in the upper part of the obelisk indicate that the outer walls of the obelisk get thicker towards the top.

Bibliography: Fabretti et al., *Regio Museo*, 1882, p. 340, no. 2421 [98].
Parallels: No direct parallels in copper alloy are known to the author; a bronze Osiris seated in front of an obelisk is Lot 142 in Christie's Live Auction 3798, Antiquities, 9 December 2015 (https://www.christies.com/en/lot/lot-5958715); in wood and stone: **Nos. 225–228, 231, 234**, and Paris, Louvre E 172, E 2707.

[230] Fabretti et al., *Museo Egizio*, 1882, p. 72.

233



Inventory number: Cat. 2413
Object: Osirian figure
Dimensions: L: 5.5, W: 6, H: 16
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: None
Description: A limestone Osirian obelisk figure on a rectangular base that is curved in front. Osiris is standing, wearing an *atef* crown and holding the *heka* sceptre in one hand and the flagellum in the other; these two marks of office are engraved onto the figure. The long sides of the obelisk that flank Osiris are incised with vertical zigzag lines, possibly representing water. The statue has a cylindrical hole in the base, about 4 cm in diameter. Presumably this once held an animal mummy.

Bibliography: Fabretti et al., *Museo Regio*, 1882, p. 340, no. 2413 [90]; Musso and Petacchi, in Kóthay (ed.), *Burial and Mortuary Practices,* 2017, p. 337, pls. 78–79; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, p. 46, fig. 6.
Parallels: **No. 234**.

234



Inventory number: Cat. 2414
Object: Osirian figure
Dimensions: L: 5, W: 4.4, H: 12.4; hollow in the back L: 3.3, Depth: 2.6, H: 9.5
Acquisition: Acquired before 1882
Provenance: Unknown
Date: Undetermined
Scientific analyses: None
Description: A limestone Osirian obelisk figure without a base. It is covered with either plaster or whitewash. A standing Osiris figure is carved in bas relief on one side, wearing a schematic *atef* crown. The figure is outlined in red paint – possibly the object was painted red entirely, invoking the sun, as there are remains of red paint on the other sides of the obelisk. There are traces of paint of different colours around the god's body: blue at the top and red at the bottom, red paint on the sides and on the back near the hole. On his proper left is what might be another figure or even offerings. The hole where the mummy was housed follows the shape of the obelisk. The base is very short but has a rectangular shape. The shape of the obelisk is not regular, but slightly asymmetrical and roughly worked.

Bibliography: Fabretti et al., *Museo Regio*, 1882, p. 340, no. 2414 [91]; Musso and Petacchi, in Kóthay (ed.), *Burial and Mortuary Practices*, 2017, pp. 337, 341; Auenmüller and Facchetti, in Pirelli et al. (eds.), *Animals in Religion, Economy and Daily Life*, 2023, p. 46, fig. 6.
Parallels: **No. 233**.

REFERENCES

Concordance of Catalogue and Inventory Numbers

8.1 Baboons

No.	Inventory numbers
1	Cat. 2345/1
2	Cat. 2345/2
3	Provv. 1485

8.2 Cattle

No.	Inventory numbers
4	Cat. 2343/1
5	Cat. 2343/2
6	Cat. 2344
7	Provv. 6118

8.3 Gazelle

No.	Inventory numbers
8	Suppl. 1599

8.4 Dogs

No.	Inventory numbers
9	Provv. 1464
10	Cat. 2347/1
11	Cat. 2347/2
12	Provv. 1442
13	Provv. 1455
14	Suppl. 11004
15	Suppl. 11005
16	Suppl. 11007
17	Suppl. 11008
18	Suppl. 11009
19	Provv. 7938
20	Suppl. 11006
21	Suppl. 17016

8.5 Cats (Felines)

No.	Inventory numbers
22	Cat. 2348/1
23	Cat. 2348/2
24	Cat. 2348/3
25	Cat. 2349/1
26	Cat. 2349/2
27	Cat. 2349/3
28	Cat. 2349/4
29	Cat. 2349/5
30	Cat. 2349/6
31	Cat. 2349/7
32	Cat. 2349/8
33	Cat. 2350/3
34	Cat. 2350/4
35	Cat. 2350/5
36	Cat. 2350/7
37	Cat. 2350/6
38	Provv. 6117
39	Suppl. 11010
40	Suppl. 11011
41	Provv. 6125/1
42	Cat. 2358
43	Cat. 2359

44	Cat. 2360
45	Cat. 2361
46	Cat. 2362
47	Cat. 2363
48	Cat. 2364
49	Cat. 2368
50	Cat. 2369
51	Cat. 2371
52	Cat. 2372
53	Cat. 2370
54	Cat. 2450
55	Cat. 873
56	Cat. 874
57	Cat. 875
58	Cat. 876
59	Cat. 877
60	Cat. 886
61	Cat. 887
62	Suppl. 18201
63	Cat. 893
64	Cat. 894
65	Cat. 895
66	Suppl. 2917
67	Cat. 892

8.6 Mongooses/Ichneumons

No.	Inventory numbers
68	Cat. 928
69	Cat. 929 (≡ Provv. 3310)
70	Suppl. 19134/A

8.7 Shrews

No.	Inventory numbers
71	Suppl. 8191
72	Suppl. 8190
73	Cat. 2399
74	Cat. 926
75	Suppl. 18098
76	Suppl. 18099
77	Cat. 927
78	Cat. 931
79	Cat. 930
80	Cat. 2422

8.8 Ibises

No.	Inventory numbers
81	Provv. 1440
82	Cat. 2354/1 (≡ Provv. 1484)
83	Suppl. 11025
84	Suppl. 11026
85	Suppl. 11027
86	Suppl. 11037
87	Suppl. 11038
88	Provv. 1515/1
89	Suppl. 8188
90	Suppl. 8189
91	Suppl. 11013
92	Suppl. 11014
93	Suppl. 11015
94	Suppl. 11016/1
95	Suppl. 11016/2
96	Suppl. 11017
97	Suppl. 11018
98	Suppl. 11019/1
99	Suppl. 11019/2

100	Suppl. 11020
101	Suppl. 11021
102	Suppl. 11022
103	Suppl. 11023
104	Suppl. 11024
105	Suppl. 11028
106	Suppl. 11029
107	Suppl. 11032
108	Suppl. 11033
109	Suppl. 11034
110	Provv. 1515/3
111	Cat. 3506/1
112	Cat. 3506/2
113	Cat. 3506/3
114	Cat. 3507
115	Cat. 3508
116	Cat. 2383 (≡ Provv. 3594)
117	Cat. 2384 (≡ Provv. 3595)

8.9 Raptors

No.	Inventory numbers
118	Suppl. 11030
119	Provv. 6115
120	Provv. 1450
121	Provv. 1483
122	Provv. 1460
123	Suppl. 11039
124	Suppl. 11040
125	Cat. 2376
126	Cat. 2373
127	Cat. 2374
128	Cat. 2375
129	Cat. 2380
130	Cat. 2381
131	Cat. 2405
132	Cat. 2385
133	Cat. 2382
134	Cat. 980
135	Provv. 5220

8.10 Lizards/Skinks

No.	Inventory numbers
136	Cat. 2397
137	Cat. 2398
138	Suppl. 18071

8.11 Snakes/Eels

No.	Inventory numbers
139	Provv. 1515/2
140	Provv. 6110
141	Provv. 6111
142	Provv. 1441
143	Cat. 2402
144	Cat. 2403
145	Cat. 2406
146	Cat. 7380
147	Cat. 2400
148	Cat. 2401

8.12 Crocodiles

No.	Inventory numbers
149	Cat. 2351/1
150	Cat. 2351/2
151	Provv. 1443
152	Provv. 1444
153	Provv. 1447
154	Provv. 1458/1

155	Provv. 1458/2
156	Provv. 1458/3
157	Provv. 1461/1
158	Provv. 1461/2
159	Provv. 1461/3
160	Provv. 1462
161	Cat. 2353/1
162	Cat. 2353/2
163	Suppl. 9483/2

8.13 Fish

No.	Inventory numbers
164	Suppl. 19691/3
165	Provv. 6119
166	Cat. 2386
167	Cat. 2393
168	Cat. 2394
169	Cat. 2395
170	Cat. 2396
171	Cat. 2391
172	Cat. 2392
173	Cat. 2387
174	Cat. 2388
175	Cat. 2389
176	Cat. 2390

8.14 Victual Mummies

No.	Inventory numbers
177	Suppl. 5077
178	Suppl. 5078
179	Suppl. 5079
180	Suppl. 5080
181	Suppl. 5081
182	Suppl. 5082
183	Suppl. 5083
184	Suppl. 5084
185	Suppl. 5085
186	Suppl. 5086
187	Suppl. 5087
188	Suppl. 5087 (sic)
189	Suppl. 5088
190	Suppl. 5089
191	Suppl. 5090
192	Suppl. 5091
193	Suppl. 5092
194	Suppl. 5093
195	Suppl. 5094
196	Suppl. 5095
197	Suppl. 5096 ?
198	Suppl. 5097
199	Suppl. 5099 ?
200	Suppl. 5100
201	Suppl. 5101
202	Suppl. 5102
203	Suppl. 5103
204	Suppl. 5104
205	Suppl. 5105/1
206	Suppl. 5105/2
207	Suppl. 5105/3
208	Suppl. 5105/4
209	Suppl. 5105/5
210	Suppl. 5106/1
211	Suppl. 5106/2
212	Suppl. 5106/3
213	Suppl. 5106/4
214	Suppl. 5107
215	Provv. 6116

8.15 Masquerading Mummies

No.	Inventory numbers
216	Cat. 2247/1
217	Cat. 2247/2
218	Cat. 2248
219	Cat. 2249

8.16 Osirian Obelisk Figures

No.	Inventory numbers
220	Cat. 2407
221	Cat. 2408
222	Cat. 2409
223	Cat. 2410
224	Cat. 2411
225	Cat. 2412
226	Cat. 2415
227	Cat. 2416
228	Cat. 2417
229	Cat. 2418
230	Cat. 2419
231	Cat. 2420
232	Cat. 2421
233	Cat. 2413
234	Cat. 2414

Abbreviations

In this book we use the bibliographical abbreviations listed in Bernard Mathieu, *Abréviations des périodiques et collections en usage à l'Institut français d'archéologie orientale*, Le Caire 2019[7]. We have added further abbreviations for publications not listed therein.

Periodicals and series:

ÄAT = Ägypten und Altes Testament

AegGreg = Aegyptiaca Gregoriana. Museo Gregoriano Egizio

ÄgLev = Ägypten und Levante. Zeitschrift für ägyptische Archäologie und deren Nachgebiete

AJPA = American Journal of Physical Anthropology

AJR = American Journal of Roentgenology

AKCGazette = The American Kennel Club Gazette

AMHN = Annales du Muséum d'histoire naturelle

AnChem = Analytical Chemistry

Antiquity = Antiquity. A Review of World Archaeology

ARC = Academic Research Centre

ARC = Archaeological Review from Cambridge

ArchaeoEg = Archaeopress Egyptology

Archaeobiologiae = Documenta Archaeobiologiae

ArchAnthr = Archaeological and Anthropological Sciences

ASAE = Annales du Service des Antiquités de l'Égypte

ATRev = Archaeological Textiles Review

Atti SIP = Atti della Società italiana per il progresso delle scienze

BAR-IS = British Archaeological Reports, International Series

BBArch = Berliner Beiträge zur Archäometrie

BIFAO = Bulletin de l'Institut français d'archéologie orientale

BiGen = Bibliothèque générale. Institut français d'archéologie orientale

BMH = Bulletin du Musée hongrois des beaux-arts

BMMA = Bulletin of the Metropolitan Museum of Art

BMMGP = Bollettino. Monumenti, musei e gallerie pontificie

BMSAES = British Museum Studies in Ancient Egypt and Sudan

BMTRB = British Museum Technical Research Bulletin

BNF = Bibliothèque nationale de France

BSAE = British School of Archaeology in Egypt (and Egyptian Research Account)

BSEG = Bulletin de la Société d'égyptologie de Genève

BSFE = Bulletin de la Société française d'égyptologie

BullOrnith = Bulletin of the British Ornithologists' Club

BullPeabodyNH = Bulletin of the Peabody Museum of Natural History

CAENL = Contributions to the Archaeology of Egypt, Nubia and the Levant

CCEM = Contributions to the Chronology of the Eastern Mediterranean

CENiM = Cahiers d'Égypte nilotique et méditerranéenne

ChronEg = Chronique d'Égypte

DiscEg = Discussions in Egyptology

EAO = Égypte, Afrique & Orient

EES-TE = Egypt Exploration Society Texts from Excavations

EgArch = Egyptian Archaeology

GHP = Golden House Publications

GlenMus = Glencairn Museum News

GM = Göttinger Miszellen

HÄB = Hildesheimer ägyptologische Beiträge

HeritSci = Heritage Science

IJCS = International Journal of Conservation Science

IJO = International Journal of Osteoarchaeology

JAAS = Journal of Analytical Atomic Spectrometry

JAIC = Journal of the American Institute for Conservation

JARCE = Journal of the American Research Center in Egypt

JAS = Journal of Archaeological Science

JAS-Rep = Journal of Archaeological Science: Reports

JBR = Journal of Biological Research

JCH = Journal of Cultural Heritage

JEA = Journal of Egyptian Archaeology

JFRI = Journal of Forensic Radiology and Imaging

JGUAA = Journal of the General Union of Arab Archaeologists

JNES = Journal of Near Eastern Studies

JournMamm = Journal of Mammalogy

JSSEA = Journal of the Society of the Studies of Egyptian Antiquities

LÄ = Lexikon der Ägyptologie

LOCIM = La lettre de l'Ocim

MAA = Mediterranean Archaeology and Archaeometry

MAI = Missione Archeologica Italiana

MÄSB = Mitteilungen aus der ägyptischen Sammlung der Staatlichen Museen zu Berlin

MASCA = Museum Applied Science Center for Archaeology

MDAIK = Mitteilungen des deutschen archäologischen Instituts, Abteilung Kairo

MEES = Memoir of the Egypt Exploration Society

MedMus-Bull = Medelhavsmuseet Bulletin

MicJourn = Microchemical Journal

MJBK = Münchner Jahrbuch der bildenden Kunst

MMJ = Metropolitan Museum Journal

MolEco = Molecular Ecology

MonInstr = Monographies Instrumentum

NAWG = Nachrichten der Akademie der Wissenschaften zu Göttingen

NEA = Near Eastern Archaeology

OEAE = The Oxford Encyclopedia of Ancient Egypt

OIMP = Oriental Institute Museum Publications

OLA = Orientalia Lovaniensia Analecta

OPA = The Old Potter's Almanack

ORA = Orientalische Religionen in der Antike

PAM = Polish Archaeology in the Mediterranean

PapAnthr = Papers on Anthropology

PNAS = Proceedings of the National Academy of Sciences

Polis = Polis – Revista de ideas y formas políticas de la antigüedad clásica

PTRS = Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences

QAP = Quaderni di Archeologia del Piemonte

QuatRes = Quaternary Research

RdE = Revue d'Égyptologie

RiME = Rivista del Museo Egizio

RevLouvre = Revue du Louvre

RPC = Radiation Physics and Chemistry

RPTMS = Robb de Peyster Tytus Memorial Series

SAK = Studien zur altägyptischen Kultur

SANEM = Studies on the Ancient Near East and the Mediterranean

SAWM = Sitzungsberichte der Bayerischen Akademie der Wissenschaften, München

SC = Studies in Conservation

SciRep = Scientific Reports

SEP = Studi di Egittologia e di Papirologia

StudDem = Studia demotica

TierPrax = Tierärztliche Praxis

TUAT = Texte aus der Umwelt des Alten Testaments

VetRec = Veterinary Record

ZKK = Zeitschrift für Kunsttechnologie und Konservierung

Museums:

Aix-en-Provence, MG = Musée Granet, Aix-en-Provence

Aix-les-Bains, MF = Musée Faure, Aix-les-Bains

Amiens, MP = Musée de Picardie, Amiens

Antwerp, AV = Museum Vleeshuis, Antwerp

Baltimore, WAM = Walters Art Museum, Baltimore

Barcelona, MEB = Museu Egipci de Barcelona, Barcelona

Basel, MKB = Museum der Kulturen Basel, Basel

Berlin, ÄM = Ägyptisches Museum und Papyrussammlung, Berlin

Berkeley, HM = Phoebe A. Hearst Museum, Berkeley

Birmingham, BM&AG = Birmingham Museum and Art Gallery, Birmingham

Bolton, BM = Bolton Museum, Bolton

Boston, MFA = Museum of Fine Arts, Boston

Bristol, BMAG = Bristol Museum & Art Gallery, Bristol

Brussels, MRAH = Musées royaux d'Art et d'Histoire, Brussels

Bryn Athyn, GM = Glencairn Museum, Bryn Athyn

Budapest, MFA = Museum of Fine Arts, Budapest

Cairo, EMC = Egyptian Museum Cairo, Cairo

Cairo, GEM = Grand Egyptian Museum, Cairo

Cambridge, FM = Fitzwilliam Museum, Cambridge

Cambridge, HAM = Harvard Art Museums, Cambridge, MA.

Cambridge, MAA = Museum of Archaeology and Anthropology, Cambridge

Chicago, FMNH = Field Museum of Natural History, Chicago

Chicago, OIM = Oriental Institute Museum, Chicago

Copenhagen, CG = Ny Carlsberg Glyptotek, Copenhagen

Copenhagen, NM = Nationalmuseet, Copenhagen

Darmstadt, HLMD = Hessisches Landesmuseum, Darmstadt

Detroit, IoA = Detroit Institute of Arts Museum

Dublin, NMI = National Museum of Ireland, Dublin

Durham, OM = Oriental Museum, Durham

Edinburgh, NMS = National Museums Scotland, Edinburgh

Florence, MAF = Museo Archeologico Nazionale di Firenze, Florence

Frankfurt, LS = Liebieghaus Skulpturensammlung, Frankfurt

Geneva, MAH = Musées d'art et d'histoire de Geneva, Geneva

Geneva, FGA = Fondation Gandur pour l'Art, Geneva

Geneva, FMD = Fondation Maison Dufour, Geneva

Gotha, SSFG = Stiftung Schloß Friedenstein Gotha

Hannover, KM = August Museum August Kestner, Hannover

Hildesheim, RPMH = Roemer- und Pelizaeus-Museum, Hildesheim

Leiden, RMO = Rijksmuseum van Oudheden, Leiden

Liverpool, NML = National Museum, Liverpool

Lyon, MdC = Musée de Confluences, Lyon

London, BM = British Museum, London

London, Petrie = Petrie Museum of Egyptian Archaeology, London

London, RCT = Royal Collection Trust, London

Lucerne, CKT = Collection E. and M. Kofler-Truniger, Lucerne

Maidstone, MaM = Maidstone Museum, Maidstone

Manchester, MM = Manchester Museum, Manchester

Marseille, MAM = Musée d'Archéologie méditerranéenne, Marseille

Milan, CMA = Civico Museo Archeologico, Milan

Moscow, PM = Pushkin State Museum of Fine Arts, Moscow

Munich, ÄS = Staatliches Museum Ägyptischer Kunst, Munich

Naples, SAI = Museo della Società Africana d'Italia, Università di Napoli "L'Orientale", Naples

New Haven, YPM = Yale Peabody Museum, New Haven

New York, BM = Brooklyn Museum, New York

New York, MMA = Metropolitan Museum of Art, New York

Norwich, NC = Norwich Castle, Norwich

Oxford, Ash. = Ashmolean Museum, Oxford

Oxford, PR = Pitt Rivers Museum, Oxford

Paris, Louvre = Musée du Louvre, Paris

Philadelphia, PM = University of Pennsylvania Museum of Archaeology and Anthropology, Philadelphia

Plymouth, PHM = Plymouth Historical Museum, Plymouth

Rovigo, AC = Accademia dei Concordi, Rovigo

Stockholm, Medelhavsmuseet = Medelhavsmuseet, Museum of Mediterranean and Near Eastern Antiquities, Stockholm

Toronto, ROM = Royal Ontario Museum, Toronto

Tübingen, MUT = Museum der Universität Tübingen, Tübingen

Vatican City, MGE = Museo Gregoriano Egizio, Vatican City

Vienna, KHM = Kunsthistorisches Museum, Vienna

Washington, DO = Dumbarton Oaks Research Library and Collection, Washington

Washington, NMNH = Smithsonian National Museum of Natural History, Washington

Dimensions:

Circ. = Circumference

D = Diameter

H = Height

L = Length

W = Width

Scientific analyses:

^{14}C date = Radiocarbon dating

CT = Computed tomography

Pyrolysis-GC/MS = Pyrolysis Gas Chromatography/Mass Spectrometry

UVF = Ultraviolet Fluorescence Analysis

XRF = X-ray Fluorescence

Glossary

Baculum: *os penis*, penis bone.

Balanced weave: a weave form where an equal number of horizontal (***weft***) yarns alternately pass over and under the vertical (***warp***) yarns.

Basket weave: a weave form where two or more warps and two or more wefts are woven side by side.

Bib: a decoration on the front of some cattle mummies that looks like a bib .

Black resin-like substance: definition used for a material whose chemical composition is unknown because it has not been analysed.

Casting core: a preformed element placed in the casting mould to shape the interior of a hollow casting.

Casting mould: a form made from refractory material that contains a hollow cavity into which the molten metal is poured to produce a casting of the desired shape.

Cervical rachis: the portion of the spine located in the cervical region.

Cervico-thoracic dislocation: an abnormal distance between, or reciprocal position of, the cervical and thoracic portions of the spine.

Chaplet: a small metal pin used in casting moulds to ensure the casting core stays in position during the casting process; also called "core support".

Coffer: a term borrowed from architecture referring to a decorative pattern where the bandages are interlaced to form a square, rectangle or octagon.

Core support: see ***Chaplet***.

Crystallin lens: a transparent lens inside the ocular globe.

Darning: a sewing technique used for the repair of various types of worn areas, generally using a simple stitch, called "running stitch", which passes in and out of the fabric in a straight line.

Deciduous dentition: primary dentition formed by teeth that will later be replaced by definitive. teeth.

Degenerative arthropathy: a degenerative process of a joint producing morphological and structural modifications of the bone ends.

Disarticulated bones: bones whose connections with the soft tissues have been severed.

Dislocation of vertebral segments: abnormal distance between, or abnormal reciprocal position of, vertebrae.

Dowel: a thin cylindrical element that fits into corresponding holes to join two pieces of wood.

Epiphyseal fusion: the fusion of the end of a bone to its shaft, corresponding to the end of the growth in length of a bone.

Epiphysis: a portion of bone attached for a time to a bone by a growing cartilage, but subsequently fused with the bone.

Evisceration: the removal of internal organs.

Feeder: a reservoir channel that fills with molten metal to compensate for shrinkage losses during the solidification of the hot and liquid metal; also called "riser".

Fringe: loose, hanging threads or strands that come in different lengths and styles. A fringe is a way of beginning or ending a length of fabric. In this case it is referred to as a ***warp fringe***. Warp fringes are made at the beginning or end of the weaving process, leaving the ends of the rows hanging free (row-ended warp fringes). Some are gathered and twisted into a braid. Others are twisted and knotted at the end. ***Weft fringes*** are made by weaving an extra thread into a selvedge. Fringes are both structural and decorative.

Gating system: a network of connected channels in the casting mould that deliver the molten metal into the mould cavity.

Hem: a piece of fabric or of a garment is a transverse edge (usually the finishing cut edge) that is folded and sewn. A hem is referred to as "rolled hem" when the stitch rolls the fabric back over itself.

Maxillary bones: bones that delimit the dorsal part of the oral cavity and that contain the roots of the teeth of the upper dental arches.

Mesaticephalic (cranium): of medium proportions with a well-developed nasal region.

Metapodia: bones that connect the phalanx to the lower arm/leg bones.

Mortise: a rectangular hole made to receive a ***tenon.***

Natron: a naturally occurring mixture of sodium carbonate decahydrate, sodium bicarbonate, and small amounts of sodium chloride and sodium sulphate. It is found in the Wadi Natrun and ElKab region. It is a key component of mummification as it dehydrates and de-fats bodies.

Occipital condyle: a rounded eminence of the occipital bone articulating with the first cervical vertebra.

Occipito-atloid dislocation: an abnormal distance between, or reciprocal position of, the articular surfaces of the occipital bone and the first vertebra.

Peritoneal cavity: (in avian species) body cavity containing viscera of the respiratory, digestive, reproductive systems.

Physeal cartilages: discs of cartilage between the ends and the shaft of a bone, responsible for its growth.

Pouring cup: a part of the gating system that receives the molten material from the pouring vessel.

Punctiform foci of calcification: small dots of calcification.

***Qeresu* (coffin)**: a coffin with a rectangular box with small pillars. Its production started during the Twenty-fifth Dynasty and lasted until the Roman Period. The vaulted lid is decorated to represent the sky, on the two short sides are the symbol of the West, the land of Osiris, and on the opposite side the East.

Riser: see ***Feeder***.

Runner: channels branching out from the sprue base for guiding the molten metal into the casting-mould cavity.

Scapulohumeral subluxation: an abnormal distance between, or reciprocal position of, the scapular and humeral articular surfaces.

Seam: the line where two pieces of fabric are joined together by thread**.** The simplest seam is created by superimposing the edges (this is called an "overlapping seam").

Self-bands: bands of multiple undyed weft thread.

Selvedge: the longitudinal edge of a fabric that runs parallel to the warp and is formed by weft threads looping back at the end of each line.

Sewing thread: two types of sewing thread occur on animal mummies: Z,2s and 2s. They were used to join two pieces of cloth together ("seam") or to trim an edge of the cloth ("hem").

Skeletonised bones: bones deprived of soft tissues (muscles, tendons, ligaments).

Spin/twist direction: the spin (or twist) direction describes the direction of the fibres in a given yarn when observed in a vertical position. It is usually described as S-spun if the twist direction is anti-clockwise, Z-spun if it is clockwise, and I-spun if little spin is visible, or none.

Splicing: process whereby two bundles of linen fibres are twisted together, one alongside the other with the edges overlapping by a few centimetres, to form a single continuous thread at the point of junction.

Spinal cord: an anatomical structure located inside the vertebral canal and dedicated to the transmission of nervous impulses.

Spinning: the process of twisting two single threads together using a spindle to produce a strong, elastic yarn.

Sprue: the element of the gating system following the pouring cup and leading on to the runners.

Starting border: the beginning of a woven fabric that has been constructed from a number of multi-strand yarns. It is made up of a number of single yarns that run in parallel or are twisted together to make a stronger and thicker thread. The opposite side of a woven textile is referred to as a "finishing border".

Stitching: sewing technique. An overlock stitch is one that is sewn over the edge on one or two pieces of fabric to form a hem or seam.

Strip: a narrow band of fabric, dyed or undyed, usually folded, that is used to create a textile pattern or wrap a mummy.

Tenon: a rectangular element used to join two pieces of wood, usually used to fit a lid to a box. Tenons can be separately made or carved at the edge of a piece of wood. They fit into a rectangular hole called mortise.

Tibiotarsus: a large bone between the femur and the tarsometatarsus in the leg of a bird.

Unfused olecranon: an ulna in which the proximal part (olecranon) is not fused with the rest of the bone due to the presence of the proximal physeal growth plate.

Ventral spondylosis: an intra-vitam degenerative process producing bone spurs on the ventral aspect of the vertebrae.

Warp and weft: the technical names of the two sets of yarns in weaving. Basic woven fabrics are made of two sets of yarns. Vertical yarns (parallel to the fabric edge) are called "warp" and horizontal yarn (perpendicular to the fabric edge, are called "weft". In the basic system weft yarns (horizontal) alternately pass over and under the warp (vertical) yarns.

Warp-faced weave: a weave where the number of warp (vertical) threads is higher than the number of weft (horizontal) yarns.

Weft: see ***warp and weft***.

Weft-faced weave: a weave where the number of weft (horizontal) threads is higher than the number of warp (vertical) yarns.

Whipstitch: sometimes called "overcast stitch", is a hand sewing stitch that wraps the working thread around the edge of fabric or seams.

Thread (or yarn): a bundle of fibres joined and spun together in a continuous strand.

Thread (or yarn) count/ density: a thread count of the total number of warp and weft threads in a given area, measured in one centimetre squares. This count gives the relative density of the fabric and the weave form (see: ***balanced weave***, ***warp-faced weave***, ***weft-faced weave***).

Vents: channels that provide an escape for gases generated in the casting mould during the casting.

Yarn: see ***Thread***.

Timetable of Egyptian History

Predynastic Period (3900–3060 BC)

Dynastic Period 1st–2nd Dynasty (3060–2592 BC)

Old Kingdom 3rd–6th Dynasty (2592–2118 BC)

First Intermediate Period 7th–11th Dynasty (2118–1980 BC)

Middle Kingdom 11th–13th Dynasty (1980–1700 BC)

Second Intermediate Period 13th–17th Dynasty (1700–1539 BC)

New Kingdom 18th–20th Dynasty (1539–1076 BC)

Third Intermediate Period 21st–25th Dynasty (1076–722 BC)

Late Period 25th Dynasty – Second Persian Period (722–332 BC)

Ptolemaic Period (332–30 BC)

Roman Period (30 BC – AD 395)

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