

The cartonnage mummy-case of Irtieru (Egyptian Collection, Museu Nacional de Arqueologia): a reassessment

ÁLVARO FIGUEIREDO*

ABSTRACT

The Egyptian Collection of the Museu Nacional de Arqueologia (Lisbon, Portugal) exhibits a beautifully decorated cartonnage mummy-case made for an individual with the name of Irtieru. Recent studies concerning the history of cartonnage mummy-cases call for a reassessment of the chronological life-span of funerary objects of this nature, placing them into the Twenty-second and Twenty-third Dynasties. Manufacturing techniques, form and decoration of the cartonnage case of Irtieru conform to the fashion current at the time. These reflect a set of beliefs connected with the need to ensure the integrity of the mummified body, while helping the rebirth of the deceased into an afterlife existence filled with ease. From a practical perspective, cartonnage mummy-cases also offered the mummy protection from the destructive forces of natural and human agents. Having been in use for approximately 200 years, from the reign of Osorkon I (924-889 BCE) to the end of the Twenty-third Dynasty (c. 715 BCE), cartonnage mummy-cases eventually disappear completely from the archaeological record, being replaced by a new type of inner coffin made of wood.

Key-words: Irtieru – cartonnage mummy-case – mummification – Museu Nacional de Arqueologia – Egyptology

* Ph.D. researcher (a.figueiredo@ucl.ac.uk), Institute of Archaeology (University College London) and Museu Nacional de Arqueologia.

RESUMO

A colecção egípcia do Museu Nacional de Arqueologia possui um exemplar de cartonagem de uma múmia, ricamente decorado, pertencente a um indivíduo de nome Irtieru. Recentes investigações conduziram a uma redefinição da cronologia deste tipo de objectos funerários, situando-os entre a XXII e a XXIII dinastias. A cartonagem de Irtieru, pela técnica de fabrico, forma e decoração, integra-se perfeitamente neste período, caracterizado por um conjunto de crenças relacionadas com a necessidade de assegurar a integridade do corpo mumificado, ao mesmo tempo que deveriam ajudar ao renascimento do falecido para a existência além túmulo. Numa perspectiva prática, as cartonagens constituíam uma forma de protecção da múmia face a agentes de destruição, naturais e humanos. A sua utilização durou aproximadamente 200 anos, do reinado de Osorkon I (924-889 a.n.e.) até ao final da XXIII dinastia (c. 715 a.n.e.), altura em que este tipo de artefacto desaparece completamente do registo arqueológico, sendo substituído por um novo tipo de sarcófago interno em madeira.

Palavras-chave: Irtieru – cartonagem – mumificação – Museu Nacional de Arqueologia – Egiptologia

1. INTRODUCTION

The cartonnage mummy-case E135 in the Egyptian Collection of the Museu Nacional de Arqueologia, made for an individual with the name of Irtieru (Araújo 1993; Figueiredo 2005), was previously dated to the Late Period (525-332 BCE). However, recent studies concerning the development and use of cartonnage mummy-cases (Dunand & Lichtenberg 1998; Ikram & Dodson 1998; Taylor 2001), call for a reassessment of the chronological life-span of this type of funerary artefacts. Mummy-cases made from rigid cartonnage were in fashion only during the period corresponding to the Twenty-second and Twenty-third Dynasties (945-712 BCE).¹ The innovation took place during the reign of Osorkon I (924-889 BCE), second ruler of the Twenty-second Dynasty, when all-enveloping cartonnage mummy-cases made their first appearance as part of the standard funerary equipment in the burial of wealthy individuals. Cartonnage cases seem to have developed from the practice of equipping the deceased with a mummy-board, common from the late New Kingdom to the beginning of the Twenty-second Dynasty. From that time onwards until the end of the Twenty-third Dynasty (c. 715 BCE),² the mummified body was enclosed in a mummy-case made of rigid cartonnage, that was then placed inside a wooden coffin(s).

¹ Third Intermediate Period (1069-525 BCE).

² In fact, the end of the Twenty-third Dynasty is contemporary with the Twenty-fourth Dynasty (727-715 BCE), and the early part of the Twenty-fifth Dynasty (747-656 BCE).

2. THE MUMMY-CASE OF IRTIERU

The mummy-case of Irtieru is made of cartonnage, a rigid material manufactured from linen, gum and gypsum plaster (Shaw & Nicholson 1995: 61). Like other cartonnage mummy-cases and wooden coffins of the period, it is of anthropoid shape representing the deceased in a mummified form. An inscription of the *hṯp dī nsw* type, painted vertically along the front of the mummy-case identifies the deceased as *3rtyrw*³ (Araújo 1993: 308). The face on the cartonnage is painted red-brown, the standard colour used in the representation of male portraits, and is framed by a heavy black wig and a large floral pectoral. A socket for a false beard (now lost) is clearly visible on the chin. The rest of the body of the mummy-case is covered with scenes representing funerary deities, arranged horizontally and painted on a white background. On the upper register is portrayed the symbol of the Osiris sanctuary at Abydos surmounted by the winged solar disc crowned by two *kachuti* plumes. To either side of this are represented, in two registers, the Four Sons of Horus alongside other deities responsible for the protection of the body and its internal organs. To the left are Isis and Selqet, and on the opposite side, Nephthys and Neith. In the second register to the left Thoth is represented, followed by Imseti and Duamutef, and opposite them Horus, followed by Hapy and Qebehseuef. They all face toward the sanctuary in adoration. According to tradition, the Four Sons of Horus were responsible for the protection of the four organ packages: the human-headed Imseti protected the liver, the canine-headed Duamutef was responsible for the stomach, the baboon-headed Hapy was in charge of the lungs, and the falcon-headed Qebehseuef protected the intestines. To each of the Four Sons of Horus corresponded a goddess: Isis and Neith to Imseti and Duamutef, respectively, while to Hapy and Qebehseuef correspond Nephthys and Selqet. The representation of deities connected with the protection of the internal organs in the decorative scheme of cartonnage mummy-cases was intimately connected with the mummification practices and funerary beliefs in vogue during the period when the case was made. In the middle of the mummy-case there is a large representation of a falcon with outstretched wings and a winged solar disc over its head. The vertical *hṯp dī nsw* inscription that stretches from this point down to the area between the feet of the coffin is surrounded on either side by large winged figures of Isis and Nephthys, first in human and then bird form. The foot base of the mummy-case was closed by a wooden board, with a painted

³ Irtierw; normally rendered as Irtieru, in Portuguese.

representation of the Apis bull in its centre. This has been removed and is undergoing restoration. The back of the coffin is almost entirely covered by a large *djed* pillar, painted on a white background, and surmounted by the upper portion of the body of Osiris, similar to representations on some contemporary wooden coffins (Dunand & Lichtenberg 1998: 88). The hieroglyphic inscription identifies him as "Osiris, Lord of Djedu."

The cartonnage mummy-case formed an envelope around the mummified body of the deceased person, and would have been placed inside a wooden coffin or set of coffins. At present, inspection of the contents of the cartonnage mummy-case of Irtieru is possible only through the opening at the base of the feet, due to the temporary removal of the wooden foot-board. The mummy of Irtieru is still inside, fully wrapped and untouched since the time of burial. Modern radiographic techniques (conventional flat plate radiography and CT scanning) will allow a full examination of the mummy inside the cartonnage, without the need for unwrapping or dissection (Figueiredo 2005; Figueiredo *et al.* 2002). This will guarantee the integrity of the mummy-case and body while providing valuable bioarchaeological and cultural data concerning the life and death of Irtieru (Brown & Wood 1999; Filer 1997, 1998 & 2002; David 1979; Dawson and Gray 1968; Gray 1973; Harris and Wente 1980; Isherwood *et al.* 1979 & 1984; Melcher *et al.* 1997; Pickering *et al.* 1990; Ruhli & Boni 2000; Stanworth *et al.* 1986).

3. DISCUSSION

Cartonnage mummy-cases seem to have developed from the practice of equipping the deceased with a mummy-board, common from the late New Kingdom to the beginning of the Twenty-second Dynasty (Ikram & Dodson 1998: 171-175; Taylor 1995: 65). Although cartonnage mummy-cases didn't develop from coffins, their shape and iconography was closely paralleled by contemporary wooden coffins. In fact, their demise towards the end of the Twenty-third Dynasty seem to be associated with the rise of a wooden inner coffin resembling, in form and decoration, the last cartonnage cases that were made. Consisting of an envelope, and forming a protective shell around the mummified body, the cartonnage mummy-case could also be interpreted as an inner coffin. In ancient Egypt, the origins of the coffin were probably related with the need to protect the body of the deceased from scavenging animals, and from the desert sand into which the grave was dug. The earliest examples made their appearance during the Predynastic Period. At Hierakonpolis, for example, some of the bodies

buried in the Naqada IIB-C (c. 3500-3400 BCE) cemetery at Locality HK43 were protected by reed matting, while remains of the same material were also found at Locality HK6, the élite necropolis at that site (Figueiredo 2004: 6).⁴ As time progressed, coffins also acquired a symbolic role related to the belief in a life beyond death. During the Early Dynastic Period (c. 3100-2686 BCE), for example, short wooden coffins⁵ were made to represent the dwelling of the deceased, through the use of panelled façade decoration and a lid resembling the roof of a shrine. Although Egyptian coffins would undergo several changes through time (Ikram & Dodson 1998: 195-243), their shape and decoration (iconography and texts) always reflected a belief in the need to safeguard the integrity of the body, through the use of magical devices. The iconography, especially, represented a magical environment propitious to the transfiguration of the deceased into an afterlife existence blessed with ease. From a practical perspective, however, the use of a coffin(s) continued to offer protection against natural and human agents.

By the Twenty-second Dynasty the anthropoid type of coffin was already old, its origins dating back to the Middle Kingdom (2040-1782 BCE),⁶ and had undergone many transformations during the course of its history (Ikram & Dodson 1998: 202-233). During the Twenty-second Dynasty changes were introduced in the shape and decoration of anthropoid coffins, involving the disappearance of the arms and hands from the lid. With few exceptions,⁷ this rule also applied to cartonnage mummy-cases. In terms of iconography, the complex decorative scheme observed in coffins of the Twenty-first Dynasty (Taylor 1995: 61) was abandoned, and is substituted now by the depiction of funerary deities responsible for the protection of the body and internal organs, and deities who guarded the gates of the Netherworld. The early kings of the dynasty may have imposed these changes (Taylor 2001: 233), possibly to suppress the independence of the southern priesthood of Thebes. If true, this could have happened only during the earlier part of the dynasty, when a single line of kings from Tanis ruled the country (Kitchen 1985; Mysliwiec 2000). As mentioned above, mummy-boards formed part of the standard burial assemblage of élite burials until the reign of

⁴ During the 2004 field season at Hierakonpolis, in Locality HK43 cemetery, were found a number of contracted burials carefully wrapped in elaborately made reed matting fastened with rope, dating to Naqada IIB-C.

⁵ During the Predynastic and Early Dynastic Periods, bodies were buried in a contracted position. Full-length coffins, for burial of the body in the extended position, made their first appearance in some élite burials of the Third Dynasty. This change was probably related to the introduction of the practice of evisceration during the mummification process.

⁶ The earliest known example was made for Ashayet, one of the royal women of Nebhepetre Mentuhotep II (Ikram & Dodson 1998, p. 202).

⁷ The cartonnage mummy-case of the Lady Tentqerel, depicting her as alive with a full-length dress, uncovered arms and feet. From KV44, Twenty-second Dynasty, Cairo Museum JE 35055.

Osorkon I (924-889 BCE), second ruler of the Twenty-second Dynasty, when they were replaced by a rigid anthropoid mummy-case made of cartonnage. The earliest surviving example dates to the reign of that king and was made for Nakhtefmut⁸ (Ikram & Dodson 1998: 175). Since the earliest examples known come from the necropolis of ancient Thebes (Luxor), and appear in the archaeological record rather suddenly, some authors have suggested their possible origin and early development in the north of the country, where preservation of organic materials is poor (Ikram & Dodson 1998: 175). The remains of cartonnage mummy-cases were also found at Tanis, in the tombs of Shoshenq II (c. 890 BCE), Osorkon II (874-850 BCE) and Osorkon III (787- 759 BCE), implying perhaps that they were also part of the standard royal burial assemblage during that period (Ikram & Dodson 1998: 185; Iskander Hanna 1940).

Cartonnage mummy-cases were manufactured from linen soaked with gum and gypsum plaster (Dunand & Lichtenberg 1998: 88; Ikram & Dodson 1998: 175-176; Iskander Hanna 1940). To achieve the required shape, strips of linen were worked over a mould made of mud and straw, the gum being used as an adhesive and the plaster to give its final rigid shape. Through this method of manufacture resulted a rigid case, shaped like an anthropoid coffin, with an opening along the back and at the base of the feet, necessary for the insertion of the mummified body. Most cartonnage mummy-cases have the shape of a wrapped mummy but, as already mentioned a few examples survive where the arms and hands are represented separate from the body and unwrapped.⁹ When the process of drying of the cartonnage was completed, the mould was removed and the case was ready to be used. The wrapped mummy was placed inside, the aperture at the back laced up and the opening at the base of the feet boarded up. A fine layer of gypsum plaster was then applied to the entire surface of the case in preparation for the painted decoration, done with a choice of bright colours on a white, yellow or, in a few cases, blue background. In some known examples a yellow varnish was applied to parts or the entire decorated surface. Some cartonnage mummy-cases seem to have been made as stock pieces, and the name of the deceased added to the end of the funerary inscription only when the piece was bought. In some cases those responsible to add the name to the inscription forgot to do so, as happened with the cartonnage mummy-case of an unnamed woman from Thebes (c. 850 BCE), in the British Museum (Taylor 2001: 235).

⁸ In the Fitzwilliam Museum, Cambridge.

⁹ See Cairo Museum JE 35055, discussed above.

The decorative scheme of cartonnage mummy-cases shows Osirian and Solar iconography, where winged gods and goddesses predominate. The falcon with outstretched wings, crowned by the solar disc, and winged scarabs, representing the rising sun at dawn, are perhaps an allegory to the symbolic rebirth of the deceased. The Osirian fetish, the Four Sons of Horus and their respective tutelary goddesses, arranged in symmetrical groups on either side of a central funerary inscription, and the *djed* pillar on the back of the case, are related to the myth of Osiris, Lord of the Netherworld. Lower down the case, winged representations of Isis and Nephthys in human and bird form, complete the group of deities forming a magical shield around the body of the case and mummy. These features are present in the cartonnage mummy-case of Nakhtefmut (the earliest datable example of this type of artefact)¹⁰ and in the mummy-case of Irtieru. The choice of iconographic decoration and texts is characteristic of the Twenty-second and Twenty-third Dynasties (Dunand & Lichtenberg 1998: 86 & 88; Ikram & Dodson: 1998: 175; Taylor 2001: 232 & 235), and seems to reflect mummification practices and funerary beliefs current during the period. Most of the surviving evidence concerning burial practices for this period comes from work carried out in Upper Egypt, the exception being the Royal Tombs at Tanis (San el-Hagar), located in the eastern Delta. Many of the customs associated with the preparation of the deceased for burial and accompanying funerary equipment, had their origins in some of the innovations introduced during the earlier part of the Third Intermediate Period. During the early Twenty-first Dynasty (1064-945 BCE), a series of changes were introduced in the preparation of the body and in the funerary equipment provided for the burial of the deceased, indicating perhaps a change in beliefs concerning the needs of the individual in the afterlife. The most elaborate method of mummification continued the practice of evisceration of the body, developed to its perfection during the New Kingdom (1570-1070 BCE). Except for the heart, believed to be the seat of intelligence,¹¹ the intestines, stomach, liver and lungs were removed and desiccated with dry natron.¹² Following this process, the organs were treated with molten resin and separately wrapped

¹⁰ In the Fitzwilliam Museum, Cambridge; discussed above.

¹¹ As well as the heart, the kidneys were often left *in situ*, probably because they are hidden at the back of the abdomen under a mass of fat and loose areolar tissue.

¹² The brain was also removed through the nasal channel and discarded. To achieve this, the embalmer introduced a metal probe through the nose, breaking the ethmoid bone and gaining access to the endocranium. In several mummies, however, remains of the brain are still left *in situ*, revealing that the embalmer had failed to remove all of the brain tissue.

in linen bandages. The dehydration process with natron helped to prevent the growth of fungi and bacteria by removing most of the moisture from the tissues. Resin was also an excellent anti-fungal and anti-bacterial agent (Lucas 1911; Winlock 1941). Contrary to the preceding New Kingdom period, when the internal organs were stored in canopic jars, the packages are now returned to the body (Taylor 2001: 72),¹³ after the latter had also been dehydrated with natron.¹⁴ Wax figurines representing the Four Sons of Horus were often added to the organ packages (Taylor 2001: fig. 40) and are, for example, clearly visible in an X-ray of the mummy of Queen Nodjmet of the Twenty-first Dynasty (Harris & Wente 1980). However, the practice of returning the organ packages to the body cavity did not result in the total deletion of canopic jars from the standard funerary equipment, dummy substitutes being sometimes provided. Two solid canopic dummies (MNA E121 and MNA E122) dating to the Third Intermediate Period are also displayed in the Egyptian Collection of the Museu Nacional de Arqueologia (Araújo, 1993, p. 312).

Contemporary wooden coffins are similar to cartonnages in design and iconography (Dunand & Lichtenberg, 1998, p. 86; Taylor, 2001, p. 232). As in private burials, the cartonnage case of Shoshenq II (Iskander Hanna, 1940), in a very decayed state but complete, followed the standard decorative pattern of contemporary coffins. His cartonnage mummy-case is similar to the silver coffin provided for the burial.¹⁵ The difference with private cartonnage mummy-cases and coffins is the head in the form of a falcon, perhaps identifying the deceased king Shoshenq II with Sokar-Osiris.

During the later part of the Twenty-third Dynasty there was a gradual replacement of cartonnage mummy-cases by inner wooden coffins, with a pedestal base under the feet. The coffin of Kephase, in Copenhagen (Ikram & Dodson, p. 236), with its pedestal base, is one of the examples marking the transition between cartonnage mummy-cases and inner wooden coffins of the late Twenty-third Dynasty. The appearance of a pedestal, or plinth, is also accompanied by a pillar supporting the back of the coffin, and seems to follow the standard method employed in the representation of *ushabti* figurines and Ptah-Sokar-Osiris

¹³ See also fig. 39 in J. H. Taylor (2001).

¹⁴ For a good account of the process of mummification, during the New Kingdom and Third Intermediate Period, see S. Ikram & A. Dodson (1998: 118-128), and J. H. Taylor (2001: 51-78).

¹⁵ Compare fig. 215 with fig. 309 in S. Ikram & A. Dodson (1998).

statuettes, implying resurrection of the deceased person. The inner wooden coffin of the Priest of Amun, Penamun-nebnebtawy, from Thebes (c. 680 B.C.E.), in the British Museum, with plinth and a back pillar decorated with the *djed* pillar, is characteristic of this new type of coffin that replaces cartonnage mummy-cases at the end of the Twenty-third Dynasty (Taylor, 2001, fig. 175).

4. CONCLUSION

Anthropoid mummy-cases made of rigid cartonnage made their first appearance in burials dated to the reign of Osorkon I (924-889 BCE), second ruler of the Twenty-second Dynasty, and seem to have developed from the tradition of equipping the deceased with a mummy-board during the previous dynasty. The earliest datable surviving specimen, made for a man named Nakhtefmut, marks the beginning of a practice that was to last approximately 200 years, until the end of the eight-century BCE. Anthropoid mummy-cases of cartonnage formed an essential item in the standard funerary equipment of élite burials during the Twenty-second and Twenty-third Dynasties.

In the decorative scheme of cartonnage mummy-cases predominate motifs related to the Osirian and Solar mythology. The choice to incorporate them into the decoration of mummy-cases and coffins of that period was directly connected with the funerary customs current during the period, particularly the practice of returning to the body the mummified organ packages instead of storing them in separate canopic jars. In this context are relevant the images of the Four Sons of Horus and their respective tutelary goddesses, widely employed in the decoration of mummy-cases, and also seen on the cartonnage case of Irtieru in the Museu Nacional de Arqueologia. Cartonnage mummy-cases of the type made for Irtieru were one of the essential items of the burial equipment of wealthy élite burials during the Twenty-second/Twenty-third Dynasties, and their use was confined solely to that period of time. Toward the end of the eight-century BCE they disappear completely from the archaeological record, being replaced by a wooden inner coffin with a pedestal base and a back pillar.

ACKNOWLEDGEMENTS

I would like to express my thanks to Dr. Salima Ikram, American University in Cairo, for the helpful comments on the cartonnage mummy-case of Irtieru, on the occasion of her visit to the Museum.

BIBLIOGRAPHY

- ARAÚJO, L. M. (1993) – *Antiguidades Egípcias. Museu Nacional de Arqueologia*. Lisboa: Instituto Português de Museus.
- BROWN, K. R.; WOOD, H. (1999) – The Utility of Minimal CT Scanning in the Study of Two Egyptian Mummy Heads. *International Journal of Osteoarchaeology*. 9: 199-204.
- DAVID, A. R., ed. (1979) – *The Manchester Museum Mummy Project*. Manchester: Manchester University Press.
- DAWSON, W. R.; GRAY, P. H. K. (1968) – *Catalogue of Egyptian Antiquities in the British Museum 1: Mummies and Human Remains*. London: British Museum Press.
- DUNAND, F.; LICHTENBERG, R. (1998) – *Les Momies et la Mort en Égypte*. Paris: Editions Errance.
- FIGUEIREDO, A. (2004) – Locality HK6 at Hierakonpolis: Results of the 2000 Field Season. In HENDRICKX, S.; FRIEDMAN, R. F.; CIALOWICZ, K. M.; CHLODNICKI, M. eds. - *Egypt at its Origins. Studies in Memory of Barbara Adams*. Leuven: Peeters Publishers. p. 1-23. (Orientalia Lovaniensia Analecta).
- FIGUEIREDO, A. (2005) – The Lisbon Mummy Project: The employment of non-destructive methods in mummy studies. In PIQUETTE K.; LOVE, S., eds. – *Current Research in Egyptology 2003 – Proceedings of the Fourth Annual Symposium. University College London 2003*. Oxford: Oxbow Books. p. 29-40.
- FIGUEIREDO, A., OWENS, L. S. and OSWALD, R. (2002) – Egyptian Mummies at the Museu Nacional de Arqueologia, Lisbon: A Proposed Programme of Study. *Papers from the Institute of Archaeology*. London. 13, p. 101-105.
- FILER, J. M. (1997) – Revealing Hermione's Secrets. *Egyptian Archaeology*. 11, p. 32-34.
- FILER, J. M. (1998) – Revealing the Face of Artemidorus. *Minerva*. 9: 4, p. 21-24.
- FILER, J. M. (2002) – Ancient Bodies, But Modern Techniques: the Utilisation of CT Scanning in the Study of Ancient Egyptian Mummies, in ARNOTT, R., ed. – *The Archaeology of Medicine*. Oxford: Hadrian Books. p. 33-40 (BAR International Series; 1046).
- GRAY, P. H. K. (1973) – The radiography of mummies of ancient Egyptians. *Journal of Human Evolution*. 2, p. 51-53.
- HARRIS, J. E.; WENTE, E. F. (1980) – *An X-ray Atlas of the Royal Mummies*. Chicago: Chicago University Press.
- IKRAM, S.; DODSON, A. (1998) – *The Mummy in Ancient Egypt: Equipping the Dead for Eternity*. London: Thames and Hudson.
- ISHERWOOD, I., FAWCITT, R. A. and JARVIS, H. (1984) – X-raying the Manchester mummies. In DAVID, A. R.; TAPP, E., eds. – *Evidence Embalmed*. Manchester: Manchester University Press. p. 45-64.
- ISHERWOOD, I., JARVIS, H.; FAWCITT, R. A. (1979) – Radiology of the Manchester mummies. In DAVID, A. R., ed. - *The Manchester Museum Mummy Project*. Manchester: Manchester University Press. p. 25-64.
- ISKANDER HANNA, Z. (1940) – Cleaning, Preservation and Restoration of the Silver Coffin and Cartonnage of Shashanq. *Annales du Service des Antiquités de l'Égypte*. 40, p. 581-588.

- KITCHEN, K. A. (1985) – *The Third Intermediate Period in Egypt (1100-650 BC)*. Warminster: Aris and Phillips.
- LUCAS, A. (1911) – *Preservative Materials Used by the Ancient Egyptians in Embalming*. Cairo: Ministry of Finance; National Printing Department.
- MELCHER, A. H., HOLOWKA, S., PHAROAH, M.; LEWIN, P. K. (1997) – Non-invasive computed tomography and three-dimensional reconstruction of the dentition of a 2,800 year old Egyptian mummy exhibiting extensive dental disease. *American Journal of Physical Anthropology*. 103, p. 329-340.
- MYSLIWIEC, K. (2000) – *The Twilight of Ancient Egypt: First Millennium B.C.E.* Ithaca; London: Cornell University Press.
- PICKERING, R. B., CONCES, D. J., BRAUNSTEIN, E. M.; YURCO, F. (1990) – 3-dimensional computed tomography of the mummy Wenuhotep. *American Journal of Physical Anthropology*. 83, p. 49-55.
- RUHLI, F. J. and BONI, T. (2000) – Radiological Aspects and Interpretation of Post-mortem Artefacts in Ancient Egyptian Mummies from Swiss Collections. *International Journal of Osteoarchaeology*. 10, p. 153-157.
- SHAW, I.; NICHOLSON, P. (1995) – *The British Museum Dictionary of Ancient Egypt*. London: British Museum Press.
- SMITH, G. E. (2000) – *The Royal Mummies. Catalogue Général des Antiquités Égyptiennes du Musée du Caire*. London: Duckworth.
- STANWORTH, P., WILD SMITH, K.; TAPP, E. (1986) – A neurosurgical look inside the Manchester mummy heads. In DAVID, A. R., ed. - *Science in Egyptology*. Manchester: Manchester University Press. p. 371-374.
- TAYLOR, J. H. (1995) – *Unwrapping a Mummy: the Life, Death and Embalming of Horemkenesi*. London: British Museum Press.
- TAYLOR, J. H. (2001) – *Death and the Afterlife in Ancient Egypt*. London: British Museum Press.
- WINLOCK, H. E. (1941) – *Materials Used at the Embalming of King Tut-'Ankh-Amun*. New York: The Metropolitan Museum of Art.



Fig. 1 – Anterior view of the cartonnage mummy case of Irtierw. Twenty-second Dynasty, Third Intermediate Period. Unprovenanced. (photo: Divisão de Documentação Fotográfica do Instituto Português de Museus, Lisbon).

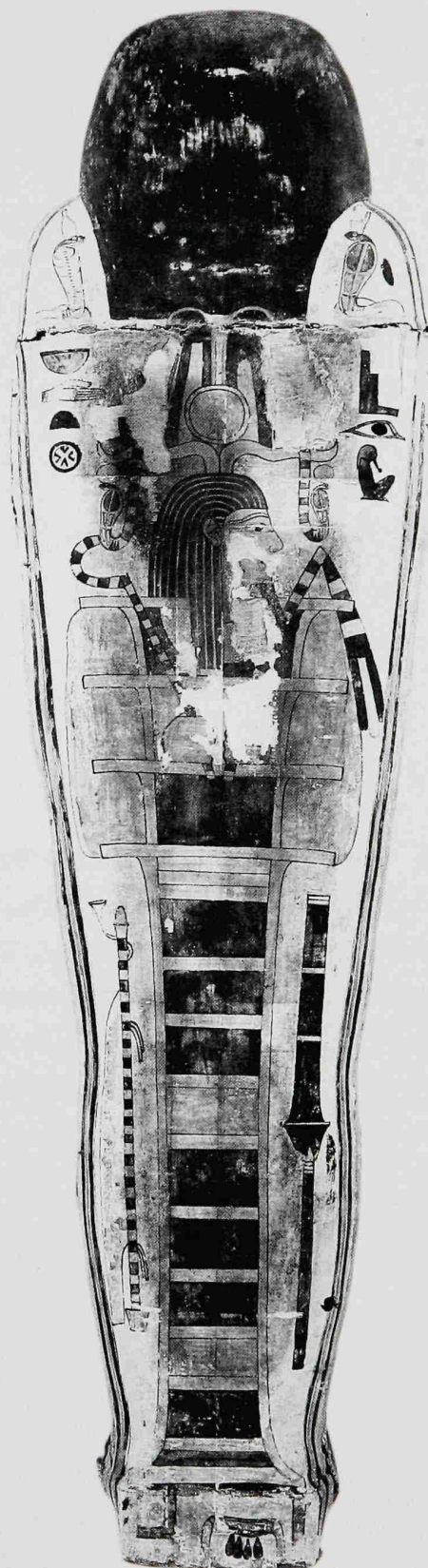


Fig. 2 – Cartonnage mummy case of Irtierw, Posterior view. (photo: Divisão de Documentação Fotográfica do Instituto Português de Museus, Lisbon).