

# Mechanical Engineering in Ancient Egypt, Part XXVIII: Wooden Coffins Industry

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**Abstract:**

*The objective of this paper is to investigate the development of mechanical engineering in ancient Egypt through wooden coffins industry in the dynastic periods. This study covers the design and manufacturing of wooden coffins in dynasties from the 2<sup>nd</sup> up to the 27<sup>th</sup> dynasties showing the type and characteristics of each coffin. The decoration and inscriptions of the wooden coffins in the different ages were highlighted.*

**Keywords** – Mechanical engineering history, wooden coffins, dynastic periods.

## I. INTRODUCTION

Ancient Egyptians experienced an outstanding mechanical engineering technology accumulated through thousands of years. The ancient Egyptian mechanical technology left amazing products and establishments survived for thousands of years. This is the 28th part in a research papers series aiming at exploring the evolution of mechanical engineering in ancient Egypt. It handles one of the fascinating products of ancient Egypt, the wooden coffin as a funerary product.

Johnson, Head and Green (1995) described the conservation of an ancient Egyptian polychrome wooden coffin dated 960-900 BC. They presented a qualitative analysis of the selection of materials from the coffin [1]. El-Hadidi (1998) stated that preserving the wood as it represents one of the main archaeological and antiquity items that are left behind over the different historical eras. The aim of her research study was to find and apply suitable conservation techniques for two wooden coffins at the Egyptian Museum at the Faculty of Archaeology of Cairo University [2]. The Education Division of the National Gallery of Art at Washington (2002) issued a volume about the treasures of ancient Egypt. This volume included describing the coffin of Isis-em-akhbit and sarcophagus of Khonsu [3]. Andelkovic and Amoros (2005) studied the construction and wood identification of Nesmin coffin from the early Ptolemaic Period. They analysed the coffin lid, trough, tenon and peg. They discussed the coffin construction, decoration

techniques and use of Tamarix wood in ancient Egypt [4].

Grajetzki (2006) investigated a coffin model of Teti from the Second Intermediate Period and in display in the British Museum. It is a wooden decorated coffin having a box and a lid. He studied all the inscriptions on the model and its various dimensions [5]. Coony (2007) presented a contextual approach to Egyptian funerary materialism. She considered a case study of funerary material, particularly coffins of the Ramesside Period and the 21<sup>st</sup> Dynasty. She stated that funerary objects, especially coffins were multi-functional, holding social economic and ideological meanings [6]. Lacovara (2007) studied fragment of 'rishi' type coffin extracted in Giza and in display now in the Museum of Fine Arts at Boston and dated to the early 18<sup>th</sup> Dynasty [7]. Cooney (2012) worked on Theban 21<sup>st</sup> Dynasty coffins in museums with Egyptian collections: Italy including the Museo Egizio in Turin, the Museo Archeologico in Florence, the Vatican collections in Rome and the Museo dell' Accademia in Cortona. She examined more than 35 coffin sets and concluded that some coffins seem to have been used two or three times [8].

Bartos (2014) showed through the analysis of the excavated coffins from Tomb TT65 at Sheikh Abdel-Gurna examples of the reuse of the originally 18<sup>th</sup> Dynasty tomb during the whole Third Intermediate Period [9]. Bettum (2014) demonstrated the use of the 'nesting principle' in various contexts and explored the implications of nesting to coffin decoration, funerary rituals and the mythical environment of the Netherworld [10]. Mann (2015) studied four coffin sets from Bab el-Gasus cache of Egypt and now belonging to the collection of the Rijks Museum in Leiden. He looked for the construction techniques used, materials used, signature of the production workshop or artist and the features of the coffins [11]. Dodson (2015) stated that collection in the Medelhavsmuseet included coffins covering two millennia from the end of the First Intermediate Period to the Ptolemaic Period. During this time span, coffins transformed from simple decorated boxes to elaborately painted cases taking

the shape of the mummy with a series nested within each other (in some cases) [12].

## II. EARLY DYNASTIC PERIOD

The 18<sup>th</sup> dynasty had pioneers in all aspects of This period covers the 1<sup>st</sup> and 2<sup>nd</sup> Dynasties over the time span 3100-2686 BC [13]. According to the University College London, elite burial of ancient Egyptians during the Early Dynastic Period was in wooden coffins such that shown in Fig.1 [14]. The trough takes the shape of a parallelogram and the lid has a domed shape and flat sides at its ends. The trough surface is not flat and there no clear decoration or inscriptions.



Fig.1 Coffin from the Early Dynasties Period [14].

## III. OLD KINGDOM

The Old Kingdom of ancient Egypt covers the 3<sup>rd</sup> to 6<sup>th</sup> Dynasties over a time span from 2686 to 2181 BC [15]. According to the University College London, the box type coffin continued to be in use up to the end of the Old Kingdom [16]. In the 6<sup>th</sup> Dynasty, a standard box-type coffin was developed with two eyes symbol and one line of inscriptions as shown in Fig.2 from Tomb 421 at Sedment of Egypt [16].

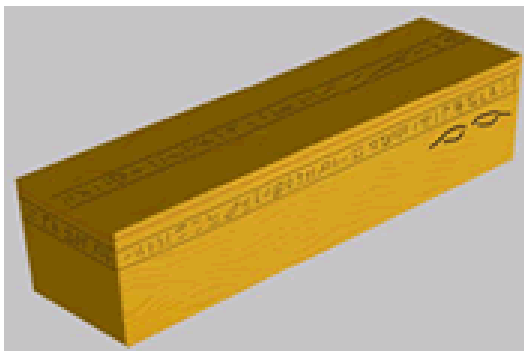


Fig.2 Coffin from the 6th Dynasty [16].

## IV. FIRST INTERMEDIATE PERIOD

The First Intermediate Period of ancient Egypt covers from the 7<sup>th</sup> Dynasty to the 9<sup>th</sup> Dynasty over the time span from 2181 to 2055 BC [17]. We have two examples of wooden coffins in this period detailed as follows:

- Fig.3 shows wooden coffin of Menkabu (2140-204BC) from the 9<sup>th</sup> - 10<sup>th</sup> Dynasties as displayed in the Fine Museum of Art at Boston [18]. It is of the classical coffin design practiced in the Old Kingdom with flat cover. The wood is covers by stucco and painted in brown with a longitudinal band including the inscriptions and two eyes under the right corner of the band. The inscriptions are neat and colored. The two eyes represent a crying human looking to the future coming in the afterlife. The coffin length is 1.95 m.



Fig.3 Coffin of Menkabu from the 9<sup>th</sup> -10<sup>th</sup> Dynasties [18].

- The second example from the First Intermediate Period is a wooden coffin of the Commander and Scribe Ipi-ha-ishutef (2064 BC) found at Saqqara and in display in the Oriental Institute Museum at Chicago and shown in Fig.4 [19]. It is of the parallelogram design . The two eyes little bit below the inscriptions band, closer to the vertical centerline of the coffin.



Fig.4 Coffin of Ipi-ha-ishutef from the 9<sup>th</sup> -10<sup>th</sup> Dynasties [19].

## V. MIDDLE KINGDOM

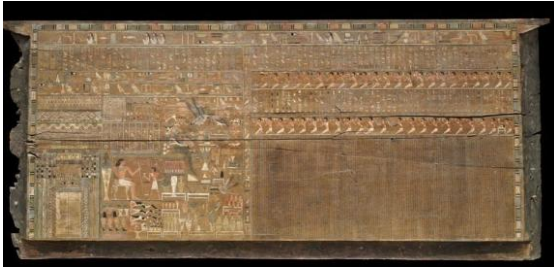
The Middle Kingdom of ancient Egypt covers the 11<sup>th</sup> and 12<sup>th</sup> Dynasties during a time span from 2000 to 1700BC [20]. The development of wooden coffins during this rich period will be illustrated through the presentation of six coffins from both dynasties 11 and 12.

- The first example of wooden coffins from the Middle Kingdom is for a child called Myt from the 11<sup>th</sup> Dynasty (2051-2030 BC) during the reign of King Mentuhotep II in display in the Metropolitan Museum of Art at NY and shown in Fig.5 [21]. It is of the standard parallelogram type with flat lid, horizontal band for inscriptions and two eyes sign under the left end of the band. The inscriptions and eyes sign are written with light-blue painting. The coffin length is 1.95 m.



**Fig.5 Coffin of Myt from the 11<sup>th</sup> Dynasty [21].**

- The second example of wooden coffins is from late 11<sup>th</sup> Dynasty-early 12<sup>th</sup> Dynasty (2010-1961 BC) belongs to Djehutynakht, in display in the Museum of Fine Arts and shown in Fig.6 [22]. It is of the standard parallelogram type manufactured from cedar and extensively decorated through painting by scenes from the book of dead and other scene for the deceased.



**Fig.6 Coffin of Djehutynakht from the 11<sup>th</sup>-12<sup>th</sup> Dynasties [22].**

- The third example is a coffin from the 12<sup>th</sup> Dynasty for Nakht-ankh found at Beni-Hassan, in display in the Liverpool Museum at UK and shown in Fig.7 [23]. Again, it is of the standard parallelogram type with flat cover (not shown in Fig.7), inscriptions in a horizontal band all around the trough near its end and in vertical bands from the horizontal band to the bottom of the coffin. The two eyes are in the standard position assigned in the previous designs.



**Fig.7 Coffin of Nakht-ankh from the 12<sup>th</sup> Dynasty [23].**

- The fourth example is a painted wooden coffin from the 12<sup>th</sup> Dynasty (1981-1802 BC) belongs to Senbi, in display in the Cleveland Museum of Art and shown in

Fig.8 [24]. It is similar to that of Nakht-ankh in Fig.7. It has a flat lid and may be manufactured in the same workshop produced Nakht-ankh coffin.



**Fig.8 Coffin of Senbi from the 12<sup>th</sup> Dynasty [24].**

- The fifth example of wooden coffins in the Middle Kingdom is from the Late 12<sup>th</sup> Dynasty-Early 13<sup>th</sup> Dynasty (1940-1760 BC) for Khnumhotep in display in the National Museums Scotland and shown in Fig.9 [25]. This is a new coffin type taking the shape of a human (the deceased). It is painted white with three lateral bands, longitudinal band and a head. The head simulates the deceased during his life.



**Fig.9 Coffin of Khnumhotep from the 12<sup>th</sup>-13<sup>th</sup> Dynasties [25].**

## **VI. SECOND INTERMEDIATE PERIOD**

The Second Intermediate Period covers the ancient Egyptian Dynasties from the 13<sup>th</sup> to the 17<sup>th</sup> Dynasties over a time span from 1802 to 1550 BC [26]. The development of wooden coffins through this intermediate period is investigated through the presentation of four coffins from the 13<sup>th</sup> and 17<sup>th</sup> Dynasties.

- Fig.10 shows a wooden coffin from the 13<sup>th</sup> Dynasty for Nakhtkhnum (1802-1640 BC) in display in the Metropolitan Museum of Art [27]. It is of the parallelogram design, painted and extensively decorated by symbols and inscriptions in horizontal and vertical bands.



**Fig.10 Coffin of Nakhtkhnum from the 13<sup>th</sup> Dynasty [27].**



- The second example of wooden coffins in the Second Intermediate Period is for Hekaib-Hapy from the 13<sup>th</sup> Dynasty (1640-1550 BC) found at Thebes, in display in the Metropolitan Museum and shown in Fig.11 [28]. It is of the parallelogram design as this of Nakhtknum of Fig.10 but with less decoration inscriptions.



**Fig.11 Coffin of Hekaib-Hapy from the 13<sup>th</sup> Dynasty [28].**

- The third example is from the 17<sup>th</sup> Dynasty for the King Nebkheperre Intef of Thebes during the period 1571-1560 BC in display in the British Museum and shown in Fig.12 [29]. It is of the human-shape design appeared in the end of the 12<sup>th</sup> Dynasty. It is manufactured from wood and layer of gesso which was painted.



**Fig.12 Coffin of Nebkheperre Intef from the 17<sup>th</sup> Dynasty [29].**

- The last example is a wooden coffin from the Late 17<sup>th</sup> Dynasty Early 18<sup>th</sup> Dynasty (1580-1479 BC) for Puhorsenbu which is in display in the Metropolitan Museum of Art and shown in Fig.13 [30]. The coffin is a wonderful artifact manufactured from wood, covered by a layer of stucco, then painted to simulate the deceased in a wonderful way seeming that it is a photographic shot taken by a digital camera. However, they did not have this technology but they had their own 3500 years old technology which produced articles still amazing the whole world till now.



**Fig.13 Coffin of Puhorsenbu from the 17<sup>th</sup> – 18<sup>th</sup> Dynasties [30].**

## VII. NEW KINGDOM

The New Kingdom of ancient Egypt covers the Dynasties from the 18<sup>th</sup> to the 20<sup>th</sup> over a time span from 1570 to 1069 BC [31]. The New Kingdom is the richest and strongest period in the ancient Egyptian history. It is expected to find outstanding wooden coffin designs in the three dynasties of the New Kingdom compared with other ones.

- The first example of wooden coffins in the New Kingdom is from the 18<sup>th</sup> Dynasty. It is the outer coffin of Queen Ahmose Merit-Amun, wife of Pharaoh Amenhotep I, the second Pharaoh of the 18<sup>th</sup> Dynasty. The coffin is in display in the Egyptian Museum at Cairo and shown in Fig.14 [32]. The coffin is a wonderful piece of artifacts manufactured from cedar, inlaid and painted with colors simulating the Queen holding a symbol in each hand while her both hands are on her chest. It is of the human-shape type emerged in the end of the 12<sup>th</sup> Dynasty. The details of the Queen face are amazing displaying the serious look and strong character of the Queen.



**Fig.14 Outer coffin of Queen Ahmose-Meritamun from the 18<sup>th</sup> Dynasty [32].**

- The second example is for the middle coffin of Yuya, a courtier during the 18th Dynasty in display in the Egyptian Museum at Cairo and shown in Fig.15 [33]. The three nested coffins of Yuya were of the human-shape design. Even Yuya was just a courtier, his coffins show how rich he was. The coffin in hand is manufactured from wood, coated by stucco, painted, decorated by gold and silver foils and inlaid with colored glass. The headdress is inlaid by alternate bands of gold and silver, the hands are covered by gold foil holding a symbol in each hand [33].



**Fig.15 Middle coffin of Yuya from the 18<sup>th</sup> Dynasty [33].**

- The third example from the 18<sup>th</sup> Dynasty is a wooden coffin lid for Ladi Teti, the Servant of the Great Place at Thebes (1580-1479 BC) in display in the Brooklyn Museum and shown in Fig.16 [34]. The lid takes the shape of Teti wearing a headdress of alternate yellow and black bands, putting her hands on her chest, inscriptions in a vertical bounded band and wearing a Tunic dress decorated by bird wings. The artist simulated Teti as a serious Egyptian Ladi.



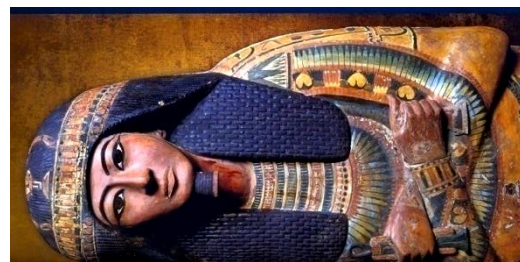
**Fig.16 Coffin of Teti from the 18th Dynasty [34].**

- The fourth example of wooden coffins in the New Kingdom is from the 19<sup>th</sup> th Dynasty. It is for Khonsu, the son of Sennedjem (artist worked in the decorations of the Royal Tombs during the reign of Pharaohs Seti I and Ramses II). The nested coffins of Khonsu were found in the Tomb of his father Sennedjem and in display in the Metropolitan Museum of Art and shown in Fig.17 [35]. Khonsu had two nested coffins, the outer of them is shown in Fig.17. It is of the classical human-shaped one emerged in the end of the 12<sup>th</sup> Dynasty. It is decorated by alternate colors in yellow and black for his headdress and scenes for some gods and goodness of ancient and for himself with his wife. It is produced from wood, gesso, paints and varnish and has 2 m length [35].



**Fig.17 Outer coffin of Khonsu from the 19<sup>th</sup> Dynasty [35].**

- The fifth example is again from the 19<sup>th</sup> Dynasty which is an outer coffin found in the Tomb of Sennedjem (may be for Sennedjem himself) shown in Fig.18 [36]. The coffin is a master part in the art of the ancient Egyptians. It is highly decorated through very accurate design and production of the Sennedjem-shaped coffin. His headdress is elaborately decorated through its colors and scenes, his ornament and dress. He is holding a symbol in each hand. His face reflects how serious he was.



**Fig.18 Outer coffin of Sennedjem from the 19<sup>th</sup> Dynasty [36].**

- The sixth example of wooden coffins in the New Kingdom is an outer coffin for Lady Henutmehyt from the 19<sup>th</sup> Dynasty, found in Thebes, in display in the British Museum and shown in Fig.19 [37]. Her coffin is produced from wood covered by gold leaf and decorated by scenes, inscriptions and symbols. She is not holding any symbols in her hands, but extending her fingers and putting her hands on her chest. Her headdress is long and decorated by yellow bands and scenes. The details of her face show that she may be of a relation with Sennedjem (Fig.18). The coffin length is 1.87 m.



**Fig.19 Coffin of Henutmehyt from the 19<sup>th</sup> Dynasty [37].**



- The seventh example of wooden coffins in the New Kingdom is from the 20<sup>th</sup> Dynasty. It belongs to Panehsy, the Viceroy of Kush during the reign of Pharaoh Ramses XI in display in the National Museum of Antiquities at Leiden (Holland) and shown in Fig.20 [38]. Again, this is one of the wonderful wooden coffins manufactured during the reign of the last Pharaoh of the 20th Dynasty (1107-1078 BC). It is of the human-shape design and fully painted and decorated with scenes and inscriptions.
- The last example from the New Kingdom is again from Late 20<sup>th</sup> Dynasty and in display in the Metropolitan Museum of Art and shown in Fig.21 [39]. It is of the human-shape design, painted and decorated from both inside and outside and has a 1.91 m length. It is decorated by funerary scenes and the decorations are so neat and clear and have too many details specially on both surfaces. The artist did not show the hands of the deceased.



**Fig.20 Coffin of Panehsy from the 20<sup>th</sup> Dynasty [38].**



**Fig.21 Coffin from Late 20<sup>th</sup> Dynasty [39].**

### **VIII. THIRD INTERMEDIATE PERIOD**

The Third Intermediate Period covers the Dynasties from 21<sup>st</sup> to 25<sup>th</sup> over a time span from 1070 to 664 BC [40]. The development of wooden coffins during this historical period of Egypt is investigated through the presentation of 8 coffins as follows:

- Fig.22 shows a wooden coffin for the priest Amun Nes-pa-neb-imakh (1000-970 BC) from Thebes during the 21<sup>st</sup> Dynasty in display in the National Museum of Denmark [41]. The coffin is of the human-shape type and simulates the deceased with full decoration of the coffin through scenes of various designs and colors.



**Fig.22 Coffin of Amun Nes-pa-neb-imakh from the 21<sup>st</sup> Dynasty [41].**

- The second example is from Late 21<sup>st</sup> Dynasty (1000-945 BC) and belongs to Henettawy, a singer of Amun-Re in display in the Metropolitan Museum of Art and shown in Fig.23 [42]. It is of the human-type and simulates the singer with full decoration with funerary scenes with multi-colors. It is manufactured from wood, coated by a layer of gesso, painted, then a layer of varnish was applied. The coffin length is 1.91 m. The artist did not show the hands of the deceased.



**Fig.23 Coffin of singer Henettawy from Late 21<sup>st</sup> Dynasty [42].**

- The third example is a wooden coffin for a child from Late 21<sup>st</sup> Dynasty- Early 22<sup>nd</sup> Dynasty (1070-712 BC) displayed in a sale at NY in 4<sup>th</sup> June 2008 for 18750 US\$ and shown in Fig.24 [43]. It is of the human-type, manufactured from wood, gesso and paints. It is fully decorated by various scenes and inscriptions in two columns. The coffin length is 1.14 m and the face is for an old man. The artist did not show the hands of the deceased.



**Fig.24 Coffin of a child from 21<sup>st</sup> – 22<sup>nd</sup> Dynasties [43].**

- The fourth example is from the 22<sup>nd</sup> Dynasty (800 BC) for priest Nespernub in display in the British Museum and shown in Fig.25 [44]. The coffin is of the human-type and fully decorated with scenes and symbols in very shining colors showing too many details. The artist did not show the hands of the deceased.

the decease.



**Fig.25 Coffin of Nespernub from the 22<sup>nd</sup> Dynasty [44].**

- The fifth example is from the period 760-660BC (23<sup>rd</sup> -25<sup>th</sup> Dynasties) for Nesmutaatneru in display in the Museum of Fine Arts and shown in Fig.26 [45]. The coffin is of the human-type and slightly decorated through inscriptions in two longitudinal adjacent bands. Again, the artist did not show the hands of the decease.



**Fig.26 Coffin of Nesmutaatneru from the 23<sup>rd</sup> -25<sup>th</sup> Dynasties [45].**

- The sixth example is an inner coffin from the 25<sup>th</sup> Dynasty for priest Hor (700-680 BC) in display in the British Museum and shown in Fig.27 [46]. It is from the same design school of human-shaped wooden coffins extensively decorated by funerary scenes with multi-colors paints. The artist did not show the hands of the decease.



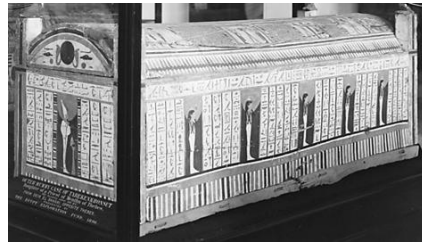
**Fig.27 Inner coffin of Hor from the 25<sup>th</sup> Dynasty [46].**

- The seventh example from the Third Intermediate Period is from the 25<sup>th</sup> / 26<sup>th</sup> Dynasties which is an inner coffin for Died Mut (715-525 BC) in display in the North Carolina Museum of Art and shown in Fig.28 [47]. It is of the human-type design and extensively decorated all over the surface of the coffin.



**Fig.28 Inner coffin of Died Mut from the 25<sup>th</sup> / 26<sup>th</sup> Dynasties [47].**

- The last example is an outer coffin of Tabakenkhonsu from the 25<sup>th</sup> Dynasty (680-670 BC) in display in the Metropolitan Museum of Art and shown in Fig.29 [48]. It is manufactured from wood, layer of gesso, then painted. The coffin is of the parallelogram type with domed lid. It is decorated by repeated scene of a deity and scenes in vertical adjacent bands.



**Fig.29 Outer coffin of Tabakenkhonso from the 25<sup>th</sup> Dynasty [48].**

## IX. LATE PERIOD

The Late Period of the ancient Egypt history covers the dynasties from the 26<sup>th</sup> to the 31<sup>st</sup> Dynasties over a time span from 664 to 332 BC [49]. We have three coffin examples from this period from the 26<sup>th</sup> and 27<sup>th</sup> Dynasties.

- Fig.30 shows a coffin of Thothirdes from the 26<sup>th</sup> Dynasty (died between 768 and 545 BC) and in display in the Brooklyn Museum [50]. It follows the same coffin design school in the Third Intermediate Period where it takes a human-shape, decorated by scenes covering the whole surface and no hands emerging from the body.



**Fig.30 Coffin of Thothirdes from the 26<sup>th</sup> Dynasty [50].**

- The second example from the Late Period is a painted coffin from the 26<sup>th</sup> Dynasty (664-525 BC) in display in the Australian Museum and shown in Fig.31 [51]. The



coffin is of the parallelogram type and decorated by scenes representing the deceased with a number of ancient Egypt deities.

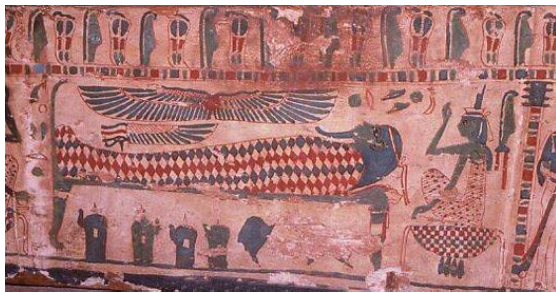


Fig.31 Coffin from the 26th Dynasty [51].

The last example is a wonderful wooden coffin from the 26<sup>th</sup> – 27<sup>th</sup> Dynasties (525-343 BC) in display in the Michael Carlos Museum, Emory University, Atlanta and shown in Fig.32 [52]. Again, the coffin is of the human-shape design with wonderful decorations over a layer of plaster covering the wood. It is decorated by scenes of some deities and inscriptions in five horizontal adjacent bands.



Fig.32 Coffin from the 26<sup>th</sup> -27<sup>th</sup> Dynasties [52].

## X. CONCLUSION

- This paper investigated the evolution of Mechanical engineering in ancient Egypt during the dynastic periods through the design and manufacturing of wooden coffins.
- The wooden coffins appeared in ancient Egypt since the Early Dynastic Period.
- They designed and manufactured wooden coffins in two main shapes: parallelogram design and human-shaped design.
- The parallelogram design starting from the Old Kingdom had a flat lid, inscriptions within a horizontal band near the top of its trough and two eyes symbol under the inscription band towards its left edge.
- Those characteristics continued in the First Intermediate Period, Middle Kingdom and Second Intermediate Period.
- More inscription bands were added in the Middle Kingdom, Second Intermediate and Third Intermediate Periods.
- Scenes from the 'Book of Dead' were added to wooden coffins during the Middle Kingdom.

- Human-shape wooden coffins appeared during the 12<sup>th</sup> Dynasty of the Middle Kingdom simulating the deceased.
- The human-shape design of wooden coffins continued during the Second Intermediate Period, New Kingdom, Third Intermediate Period and Late Period.
- Extensive decorations of the human-shape coffins appeared from the New Kingdom onwards.
- Decoration of the inner surfaces of the wooden coffin appeared in the New Kingdom.
- Regarding the hands of the deceased, two design took place: coffin with the two hands on each other on the chest and coffin without any hands appearing.
- The ancient Egyptians designed nested coffins to bury their deceased (up to three nested coffins).
- During the 18<sup>th</sup> Dynasty they produced wonderful coffins inlaid by gold and silver foils and semi-precious stones.
- They coated the wooden coffin by gesso and used multi-colors paints and varnish to generate their coffin-decoration.

## REFERENCES

- [1] C. Johnson, K. Head and L. Green, The conservation of a polychrome Egyptian coffin Studies in Conservation, vol. 40, issue 2, pp. 73-81, 1995.
- [2] N. El-Hadidi, Treatment and conservation of wood-application as two coffins at the Egyptian Museum of the Faculty of Archaeology- Cairo University, MA Thesis, Faculty of Archaeology, Cairo University, Egypt, 1998.
- [3] Education Division, Family guide to treasures of ancient Egypt, Board of Trustees, National Gallery of Art, Washington, 2002.
- [4] B. Anelkov and M. Amoros, The coffin of Nesmin construction and wood identification, Journal of Serbian Archaeological Society, vol.21, pp.349-364, 2005.
- [5] W. Grajetzki, The Second Intermediate Period model coffin of Teti in the British Museum, BMSAES, issue 5, 2006  
[www.thebritishmuseum.ac.uk/bmsaes/issue5/Grajetzki.html](http://www.thebritishmuseum.ac.uk/bmsaes/issue5/Grajetzki.html)  
[mlwww.thebritishmuseum.ac.uk/bmsaes/issue5/Grajetzki.html](http://mlwww.thebritishmuseum.ac.uk/bmsaes/issue5/Grajetzki.html)
- [6] K. Cooney, The functional materialism of death in ancient Egypt: A case study of funerary materials from the Ramesside Period, in Das Heilige und die Ware, M. Fitzenreiter, Ed., London, 2007, pp.273-299.
- [7] P. Lacovara, A Rishi coffin from Giza and the development of the type of mummy case, in The Archaeology and Art of Ancient Egypt, Z. Hawas and J. Richards, Ed., Publication du Conseil Suprem des Antiquites de L' Egypte, vol.II, 2007, pp.33-38.
- [8] K. Cooney, Reuse of Theban 21<sup>st</sup> Dynasty funerary arts: A case study of coffins in Italian collections, The 63<sup>rd</sup> Annual Meeting of the American Research Center in Egypt, 28th April 2012.
- [9] F. Bartos, An example of rare 22<sup>nd</sup> Dynasty cartonnage type and some reused 21<sup>st</sup> Dynasty yellow coffin fragments from TT65, in Ancient Egyptian coffins craft traditions and functionality, The Annual Egyptology Colloquium, British Museum, 28-2July, 2014.--
- [10] A. Bettum, The principle of nesting in elite burials and



- religious art, in Ancient Egyptian coffins craft traditions and functionality, The Annual Egyptology Colloquium, British Museum, 28-2July, 2014.--
- [11] L. Mann, The Leiden coffins of Bab el-Gasus: An archaeometric study, Master Thesis, Faculty of Archaeology, University of Leiden, August 2015.
- [12] JA. Dodson, Ancient Egyptian coffins: The Medelhavsmuseet collection, National Museums of World Culture, 2015.
- [13] Wikipedia, Early dynastic period (Egypt), [https://en.wikipedia.org/wiki/Early\\_Dynastic\\_Period\\_\(Egypt\)](https://en.wikipedia.org/wiki/Early_Dynastic_Period_(Egypt)), 2016.
- [14] University College London, Burial customs in the Early Dynastic Period, <http://www.ucl.ac.uk/museums-static/digitalegypt/burialcustoms/earlydynastic.html>, 2001.
- [15] Wikipedia, Old Kingdom of Egypt, [https://en.wikipedia.org/wiki/Old\\_Kingdom\\_of\\_Egypt](https://en.wikipedia.org/wiki/Old_Kingdom_of_Egypt), 2016.
- [16] University College London, Burial customs Coffins in the Old Kingdom, <http://www.ucl.ac.uk/museums-static/digitalegypt/burialcustoms/coffinsok.html>, 2001.
- [17] Wikipedia, First Intermediate Period of Egypt, [https://en.wikipedia.org/wiki/First\\_Intermediate\\_Period\\_of\\_Egypt](https://en.wikipedia.org/wiki/First_Intermediate_Period_of_Egypt), 2016.
- [18] Museum of Fine Arts, Coffin of Menqabu, <http://www.mfa.org/collections/object/coffin-of-menqabu-130624>
- [19] Oriental Institute Museum, Behind the scene of the Oriental Institute Egyptian coffin conservation project, <https://oi.uchicago.edu/museum-exhibits/bts-coffin-conservation-project>
- [20] Wikipedia, Middle Kingdom of Egypt, [https://en.wikipedia.org/wiki/Middle\\_Kingdom\\_of\\_Egypt](https://en.wikipedia.org/wiki/Middle_Kingdom_of_Egypt), 2016.
- [21] Metropolitan Museum, Outer coffin of the child Myt, <http://www.metmuseum.org/art/collection/search/545320>
- [22] Art Tattler, Front side panel of outer coffin of Djehutynakht, <http://arttattler.com/archivetomb10a.html>
- [23] Kemet, Sacofagu de Nakhtankh, <http://kemet-upuaut.blogspot.com/2012/02/sarcofago-de-nakhtankh.html>
- [24] B. Whoops, Coffin of Senbi, <http://www.pinterest.com/pin/491244271829081274/>
- [25] B. Whoops, Coffin of Khnumhotep, Egypt, <http://www.pinterest.com/pin/491244271829081270/>
- [26] Wikipedia, Second Intermediate Period of Egypt, [https://en.wikipedia.org/wiki/Second\\_Intermediate\\_Period\\_of\\_Egypt](https://en.wikipedia.org/wiki/Second_Intermediate_Period_of_Egypt), 2016.
- [27] Metropolitan Museum, Coffin of NakhtKhnum, <http://www.metmuseum.org/art/collection/search/544326>
- [28] Metropolitan Museum, Coffin of Hetaib-Hapy, <http://www.metmuseum.org/art/collection/search/555882>
- [29] [29] C. Coletrain, Nebkheperre Intef's wooden Rishi coffin Pharaoh of Egypt, <https://www.pinterest.com/pin/322007442078366965/>
- [30] Metropolitan Museum, Rishi coffin of Puhorsenbu, <http://www.metmuseum.org/art/collection/search/548510>
- [31] Wikipedia, New Kingdom of Egypt, [http://en.wikipedia.org/wiki/New\\_Kingdom\\_of\\_Egypt](http://en.wikipedia.org/wiki/New_Kingdom_of_Egypt), 2016.
- [32] Quizlet, Coffin of Queen Ahmose Merit-Amun, <https://quizlet.com/39410959/indianasickle-art-of-egypt-mid-term-flash-cards/>
- [33] Anubis 4, Yuya's second and inner coffin, [http://anubis4\\_2000.tripod.com/SpecialExhibits/YuyaTuy u.htm](http://anubis4_2000.tripod.com/SpecialExhibits/YuyaTuy u.htm)
- [34] H. Thomas, Egyptian woman, rishi coffin lid, 1580-147BC, <http://www.pinterest.com/pin/529735974897269609/>
- [35] Metropolitan Museum, Khonsu's anthropoid coffins, <http://www.metmuseum.org/toah/works-of-art/86.1.1.,2/>, 2016.
- [36] Madi, Outer Coffin, Tomb of Sennedjem, Deir el Medina, <http://www.pinterest.com/pin/314337248967120600>
- [37] Mountain Soft Travel, British Museum top 16 Henutmehyt gilded outer coffin, <http://www.mountainsofttravelphotos.com/England%20-%20London/London/British%20Museum%20Top%20%2020%2020%2016%20Henutmehyt%20Gilded%20Outer%20Coffin.html>, 2006.
- [38] M. Cuevas, Egypt-Panehsy viceroy of Kush during the reign of Ramses XI, <https://www.pinterest.com/pin/258534834836662683/>
- [39] Metropolitan Museum, Box of an anthropoid coffin, <http://www.metmuseum.org/art/collection/search/552634>, 2016
- [40] Wikipedia, Third Intermediate Period of Egypt, [http://en.wikipedia.org/wiki/Third\\_Intermediate\\_Period\\_of\\_Egypt](http://en.wikipedia.org/wiki/Third_Intermediate_Period_of_Egypt), 2016.
- [41] R. Casas, Coffin of priest Amun Nes-pa-neb-imakh, <http://www.pinterest.com/pin/10133167888464617/>
- [42] Metropolitan Museum, Coffin set of the singer of Amun-Re, Henettawy, <http://www.metmuseum.org/toah/works-of-art/25.3.182-184/>
- [43] Virtual Artifacts, An Egyptian painted wood child sarcophagus, <https://www.pinterest.com/pin/373658100310078536/>
- [44] E. Zhao, Mummy of Nesperennub in cartonnage case, <http://www.pinterest.com/pin/309692911857865584/>
- [45] A. Laurel, Middle coffin of Nesmutatneru, <https://www.pinterest.com/pin/395964992221834521/>
- [46] Google, Inner coffin of the priest Hor, <http://www.google.com/culturalinstitute/beta/asset/inner-coffin-of-the-priest-hor/fAGI4lh00tjliA>
- [47] J.Makovics, Inner coffin of Djed Mut, 715-525 BC, <https://www.pinterest.com/pin/139541288427836027/>
- [48] Metropolitan Museum, Outer coffin of Tabakenkhonsu, [www.metmuseum.org/art/collection/search/551128](http://www.metmuseum.org/art/collection/search/551128), 2016.
- [49] Wikipedia, Late Period of ancient Egypt, [https://en.wikipedia.org/wiki/Late\\_Period\\_of\\_ancient\\_Egypt](https://en.wikipedia.org/wiki/Late_Period_of_ancient_Egypt), 2016.
- [50] Brooklyn Museum, Coffin of Thothirdes, <http://www.brooklynmuseum.org/opencollection/objects/4170>
- [51] Australian Museum, Ancient Egyptian painted coffin, <http://australianmuseum.net.au/image/ancient-egyptian-painted-coffin>, 2009.
- [52] M. Williams, Shadow of the sphinx coffin, <https://www.pinterest.com/pin/46774111268640514/>