



## MECHANICAL ENGINEERING IN ANCIENT EGYPT, PART XXXV: HUMAN STONE STATUES IN THE 18<sup>TH</sup> DYNASTY

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Article Received on 11/11/2016

Article Revised on 30/11/2016

Article Accepted on 21/12/2016

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### ABSTRACT

This is the 35<sup>th</sup> research paper exploring the evolution of Mechanical Engineering in Ancient Egypt. The paper investigates the production of human stone statues in ancient Egypt during the 18<sup>th</sup> Dynasty. The design of the stone statues, the used stones, date and present location are investigated. The clothing and headdress of the statues is highlighted and the beauty aspects associated with the statues are clarified. The analysis outlined the degree of sophistication of the used

mechanical technology producing amazing stone statues of even high hardness level.

**KEYWORDS:** History of mechanical engineering, ancient Egypt, human stone statues, 18<sup>th</sup> Dynasty.

### INTRODUCTION

This is the 35<sup>th</sup> research paper in a series aiming at exploring the evolution of mechanical engineering in ancient Egypt through the different activities of their wonderful civilization. The ancient Egyptians used different stones for the production of their human stone statues of different hardness levels ranging from soft to very hard and could produce wonderful statues for their people from all ranks. This paper concentrates only on stone statues produced during the New Kingdom (1570-1069 BC).

Blackman, 1923 wrote a book about 'Luxor and its Temples'. He presented some stone statues such as Nefrettri statue in the Temple of Luxor, statue of a wife of Ramses II standing beside

his colossal statue, statues in the Ramsesum Temple, Amenhotep III colossal statue at Thebes.<sup>[1]</sup> Bull, 1943 investigated a quartzite head of Pharaoh Ramses II in the Metropolitan Museum of Art. He presented a fragment of a granite statue of Ramses II in the same museum. This fragment showed the Pharaoh wearing a long and well decorated Schenti.<sup>[2]</sup> Smith, 1960 in his book about ancient Egyptian as represented in the Museum of Fine Arts at Boston presented the statue of Amenhotep III and a head for Pharaoh Tutankhamun from the 18<sup>th</sup> Dynasty.<sup>[3]</sup> Mohammed, 1980 studied the reconstruction of the great temple of Abu-Simbel completed in September 1968. Among his presentations about the work was a stone statue for Ramses II from the courtyard of the temple.<sup>[4]</sup> Teeter, 2003 in her book about ancient Egyptian treasures from the collection of the Oriental Institute of Chicago presented a statue from the 18<sup>th</sup> Dynasty, a quartzite statue of Pharaoh Tutankhamun from the 18<sup>th</sup> Dynasty and a priest statue from the 22<sup>nd</sup>-25<sup>th</sup> Dynasties.<sup>[5]</sup> Bloxam, 2005 explored the answer of some questions about how ancient Egyptians quarried the massive rocks required for their statues, pyramids and other structures and whom did this task. She presented the gneiss statue of King Khafra of the 4<sup>th</sup> Dynasty and a scene for transporting a statue from the Hatnub travertine quarries.<sup>[6]</sup>

Bloxam, 2010 in an article about quarrying and mining for stone presented a gneiss statues for King Khafra from the 4<sup>th</sup> Dynasty and an Osiride statue from the New Kingdom lying in Aswan granite quarries.<sup>[7]</sup> Auenmules, 2014 discussed the notion 'distributed personhood' concerning the investigation of temple statues regarding viziers and mayors of the New Kingdom. He showed that the location of temple statues of viziers and mayors oscillated in area of tension between supra-regional territoriality and local provenance.<sup>[8]</sup> Laboury, 2014 tried to answer the question: how and why did Hatshepsut invent his image of her royal power ?. For comparison, he presented the statue head of Hatshepsut, Thutmose I, Thutmose II, Thutmose III, four setting statues of Hatshepsut and faces of Hatshepsut's Osiride colossi.<sup>[9]</sup> Wikipedia, 2016 in an article discussed the colossi of Memnon which is a massive stone statue for Pharaoh Amenhotep III of the 18<sup>th</sup> Dynasty. They showed that the two statues in the Theban Necropolis are made of sandstone blocks and the length of each of them is 18 m and its weight is about 720 ton and they have 15 m apart.<sup>[10]</sup> Hassaan, 2016 investigated the evolution of mechanical engineering in ancient Egypt through the stone statues industry during the periods from Predynastic to the 17<sup>th</sup> Dynasty Periods. He analysed a large number of human stone statues showing their characteristics.<sup>[11,12]</sup>

### The 18<sup>th</sup> Dynasty

The 18<sup>th</sup> Dynasty of ancient Egypt is one of the richest Dynasties and had an outstanding achievements in mechanical engineering. We expect to see these achievements also reflected on the human stone statues industry as will be illustrated through the following presentations:

- The first example of human stone statues is a limestone head for Pharaoh Ahmose I, the founder of the 18<sup>th</sup> Dynasty (1549-1514 BC) in display in the Metropolitan Museum of Art at NY and shown in Fig.1.<sup>[13]</sup> The head height is 0.56 m and the Pharaoh is shown wearing the White Crown of the Upper Egypt with the Cobra on its front.
- The second example is for Pharaoh Amenhotep I, the 3<sup>rd</sup> Pharaoh of the 18<sup>th</sup> Dynasty (1524-1503 BC) in display in the British Museum and shown in Fig.2.<sup>[14]</sup> The designer showed the Pharaoh standing, wearing a white cloak and the Double Crown of Upper and Lower Egypt and putting both hands crossed on his chest. The coloring of the crown means that the statue was produced using Limestone.



Fig.1 Statue of Ahmose I.<sup>[13]</sup>



Fig.2 Statue of Amenhotep I.<sup>[14]</sup>

- The third example is an 0.71 m height sandstone head for Pharaoh Thutmose I, the 3<sup>rd</sup> Pharaoh of the 18<sup>th</sup> Dynasty (1503-1493 BC) in display in the British Museum and shown in Fig.3.<sup>[15]</sup> The Pharaoh is shown wearing the Modius Crown with the cobra on its front.
- The fourth example is a gabbro seated statue of Iahmes, the Chief of the Granaries of Amun (1480 BC) in display in the State Museum of Egyptian Art, Munich, Germany and shown in Fig.4.<sup>[16]</sup> The designer showed him wearing a long cloak, a Khat headdress and putting his left hand on his chest and his right hand on his abdomen.



**Fig.3 Statue of Thutmose I.**<sup>[15]</sup>



**Fig.4 Statue of Iahmes.**<sup>[16]</sup>



- The fifth example is a limestone seated statue of Pharaoh Hatshepsut, the 5<sup>th</sup> Pharaoh of the 18<sup>th</sup> Dynasty in display in the Metropolitan Museum of Art at NY and shown in Fig.5.<sup>[17]</sup> The designer showed Hatshepsut in the form of a male Pharaoh wearing a short Schenti and the Nemes headdress with the cobra on its front as shown in the zoomed view of Fig.5. She is putting both palms on her thighs.



**Fig.5 Seating statue of Hatshepsut.**<sup>[17]</sup>



**Fig.6 Statue of Thutmose III.**<sup>[18]</sup>

- The sixth example is a limestone bust for Pharaoh Thutmose III, the 6<sup>th</sup> Pharaoh of the 18<sup>th</sup> Dynasty (1479-1425 BC) in display in the Egyptian Museum at Cairo and shown in Fig.6.<sup>[18]</sup> The Pharaoh is shown having a thin long beard and wearing a decorated Nemes headdress with cobra on its front. The details of his face were carved with high profession. The Nemes appears with three different colors with vertical and horizontal decoration bands.

- The seventh example is a granite kneeling statue of Senenmut, the High Steward of Pharaoh Hatshepsut (1475 BC) in display in the Brooklyn Museum and shown in Fig.7.<sup>[19]</sup> Senenmut is shown wearing a decorated Khat headdress and holding between his fingers a cobra wearing a Crown.
- The eighth example is a red quartzite block statue of Teti, the Viceroy of Kush (1475 BC) in display in the British Museum and shown in Fig.8.<sup>[20]</sup> The designer showed Teti sitting on the ground and crossing his hands on his knees and holding a flower in his right hand and wearing a decorated Khat headdress. He is wearing a necklace with an ankh amulet and his dress is full of inscriptions even on his both palms. Even though quartzite is one of the hardest Egyptian stones, the carver could show all the details characterizing Teti's block statue.



**Fig.7 Kneeling statue of Senenmut.**<sup>[19]</sup>



**Fig.8 Statue of Teti.**<sup>[20]</sup>

- The 9<sup>th</sup> example is a granite kneeling statue of Pharaoh Hatshepsut in display in the Metropolitan Museum and shown in Fig.9.<sup>[21]</sup> The designer showed Pharaoh Hatshepsut wearing a Nemes Headdress with Cobra on its front and having a fictitious long thin beard as some of the other male-Pharaohs did. She is holding a big ball between her palms in front of a Djed sign.
- The 10<sup>th</sup> example is a granite kneeling statue of Pharaoh Amenhotep II, the 7<sup>th</sup> Pharaoh of the 18<sup>th</sup> Dynasty (1425-1398 BC) in display in the Egyptian Museum at Turin and shown in Fig.10.<sup>[22]</sup> The Pharaoh is shown kneeling, wearing a short Schenti with belt and front tail and a decorated Nemes headdress with cobra in the front and has a thin long beard. He is holding an ointment container in each palm. The carver showed the Pharaoh having a strong body.



**Fig.9 Kneeling statue of Hatshepsut.**<sup>[21]</sup>



**Fig.10 Kneeling statue of Amenhotep II.**<sup>[22]</sup>

- The eleventh example is a painted limestone pair statue of Nebsen and his wife (1400-1352 BC) in display in the Brooklyn Museum with 0.4 m height and shown in Fig.11.<sup>[23]</sup> Both wore a long Schenti with inscriptions on its front, Nebsen and his wife are wearing a decorated headdress and putting a pectoral around their neck. They are in an intimate position as a married spouse. He is putting his left hand behind his wife while she is putting her right hand behind him.
- The twelfth example is a sandstone statue of Priest Amenhotep (1400 BC) in display in the Risd Museum at Providence, USA and shown in Fig.12.<sup>[24]</sup> The designer showed the Priest Amenhotep wearing a decorated Khat headdress. Even though the sandstone is one of the hardest stones, the carver could show the face in a very accurate way showing the Priest smiling and optimistic.



**Fig.11 Statue of Nefertiti & wife.**<sup>[23]</sup>



**Fig.12 Statue of Amenhotep.**<sup>[24]</sup>

- The thirteenth example is a head of Thutmose IV, the 8<sup>th</sup> Pharaoh of the 18<sup>th</sup> Dynasty (1398-1388 BC) in display in the Louvre Museum and shown in Fig.13.<sup>[25]</sup> The Pharaoh is shown wearing a decorated Blue Crown. Its stone type is not defined !.
- The fourteenth example is also for Pharaoh Thutmose IV which a granite statue in display in the Egyptian Museum at Cairo shown in Fig.14.<sup>[26]</sup> The Pharaoh is shown here wearing a decorated Khat headdress with a cobra on its front.



**Fig.13 Statue head of Thutmose IV.**<sup>[25]</sup>



**Fig.14 Statue of Thutmose IV.**<sup>[26]</sup>

- The fifteenth example is a colossal red granite head of Amenhotep III, the 9<sup>th</sup> Pharaoh of the 18<sup>th</sup> Dynasty (1388-1350 BC) in display in the British Museum and shown in Fig.15.<sup>[27]</sup> The head length is 2.9 m and the Pharaoh was shown wearing the Double Crown of ancient Egypt with the cobra sign on its front. The carver could produce this

wonderful huge piece with very clear details of the Pharaoh face using one of the hardest stones in Egypt, the granite.

- The sixteenth example is a colossal quartzite head of Pharaoh Amenhotep III in display in the British Museum and shown in Fig.16.<sup>[28]</sup> The Pharaoh is shown wearing a Modius Crown with cobra on its front end. The head height is 1.17 m and it is carved with very high professional manner since quartzite is one of the hardest stone.



**Fig.15 Granite head of Amenhotep III.**<sup>[27]</sup>



**Fig.16 Quartzite head of Thutmose IV.**<sup>[28]</sup>

- The seventeenth example is a pair setting statue for Pharaoh Amenhotep III and Queen Tiye in display in the Egyptian Museum at Cairo.<sup>[29]</sup> The Pharaoh is wearing a short Schenti and a Nemes headdress with cobra on its front and putting both hands on his thighs. The Queen is wearing a headdress with a Crown on it, a long Tunig and putting her right hand behind her husband and the left hand on her thigh.



**Fig.17 Pair statue of Amenhotep III and Queen Tiye.**<sup>[29]</sup>

- The eighteenth example is a sandstone statue of Akhenaten, the 10<sup>th</sup> Pharaoh of the 18<sup>th</sup> Dynasty (1351-1334 BC) in display in the Egyptian Museum at Cairo and shown in Fig.18.<sup>[30]</sup> The Pharaoh is wearing a well decorated short Schenti with belt, holding a crook and flail in his hands, with both arms crossed on his chest, wearing a Khat headdress with cobra on its front , a Double Crown on it and having a thin long beard. The height of the statue is 3.96 m.
- The nineteenth example is limestone bust of Queen Nefertiti, the Great Royal Wife of Pharaoh Akhenaten in display in the Neues Museum at Berlin and shown in Fig.19.<sup>[31]</sup> The Queen is shown wearing a pectoral and decorated Modius Crown with a symbol on its front. This may be the most wonderful piece generated in the 18<sup>th</sup> Dynasty. The carver could simulate the face of the Queen in a way that one can imagine that it is taken by a digital camera and not a carved piece. This high technology due to the accuracy of the carving process and the sophistication of the painting process with paints could sustain for more than 3300 years.



**Fig.18 Sandstone statue of Akhenaten.**<sup>[30]</sup>



**Fig.19 Limestone bust of Nefertiti.**<sup>[31]</sup>

- The twentieth example is a pair statue for Pharaoh Akhenaten and his wife Nefertiti (1345-1337 BC) in display in the Louvre Museum and shown in Fig.20.<sup>[32]</sup> The Pharaoh is wearing a short Schenti, a wide pectoral and a Blue Crown. The Queen is wearing a long Tunic, a wide pectoral and a Modius Crown. The designer showed them striding and holding hands. The panel behind the statue is used to authorize the Pharaoh and his wife through inscriptions in two vertical columns as clear in the Back view of Fig.20.'



Front view

Back view

**Fig.20 Pair statue of Akhenaten and Nefertiti.**<sup>[32]</sup>

- The twentieth one example is a limestone block statue for Ay, a powerful man during the reign of Pharaoh Tutankhamun (1332-1323 BC) in display in the Brooklyn Museum and shown in Fig.21.<sup>[33]</sup> The designer showed Ay setting on the ground and holding his knees by his arms, wearing a long Schenti and a Khat headdress. The front of the statue is completely inscribed. The height of the statue is 0.47 m.<sup>[33]</sup>
- The twentieth two example is colossal statue for Tutankhamun, the 13<sup>th</sup> Pharaoh of the 18<sup>th</sup> Dynasty in display in the Oriental Institute Museum, Chicago and shown in Fig.22.<sup>[34]</sup> This is a colossal statue having a 5 m height showing the young Pharaoh striding, wearing a short Schenti, decorated Nemes headdress with cobra in its front and a Double Crown as shown in the zoomed view of Fig.22. The designer showed the Pharaoh with a thin long beard.

**Fig.21 Limestone block statue of Ay.**<sup>[33]</sup>**Fig.22 Colossal statue of Tutankhamun.**<sup>[34]</sup>

- The last example is a limestone-pair-setting statue of Horemheb and one of his wives, the 15<sup>th</sup> and last Pharaoh of the 18<sup>th</sup> Dynasty (1319-1292 BC) in display in the British Museum and shown in Fig.23.<sup>[35]</sup> The designer showed the pharaoh wearing a decorated-medium Schenti, a half-sleeved shirt and a decorated Khat headdress. The Pharaoh is putting his left hand on the hand of his wife and holding an object by his right palm.



**Fig.23 Pair limestone statue of Horemheb and his wife.**<sup>[35]</sup>

## CONCLUSION

- The production of stone statues in the 18<sup>th</sup> Dynasty of ancient Egypt was investigated.
- Stone statues were one of the products that could sustain the environmental effects and stay shining and wonderful filling most of the International Museums.. .
- The ancient Egyptians of the 18<sup>th</sup> Dynasty produced stone statues for Pharaohs: Ahmose I, Amenhotep I, Thutmose I, Hatshepsut, Thutmose III, Amenhotep II, Thutmose IV, Amenhotep III, Akhenaten, Tutankhamun and Horemheb.
- The stone statues of the Pharaohs showed them wearing the standard Crowns and Headdresses such as: The White Crown, the Double Crown, the Modius Crown, the Nemes headdress, the Blue Crown, the Khat headdress, the Khat + Double Crown and the Nemes headdress + the Double Crown.
- The Egyptians of the 18<sup>th</sup> Dynasty designed and produced stone statues in different positions such as: standing, striding, setting, kneeling and blocking.

- They generated stone statues for persons holding objects in their hands such as: crook, flail, ointment jar, ball and Djed sign.
- Most of the men stone statues produced in the 18<sup>th</sup> Dynasty showed them wearing a short Schenti.
- Some of the men and women stone statues showed the owner wearing a pectoral.
- Pair stone statues of couples were common in the 18<sup>th</sup> Dynasty either for Royal or High-rank people.
- The ancient Egyptians of the 18<sup>th</sup> Dynasty succeeded to produce colossal stone statues up to 5 m height. The head of one of its Pharaohs reached 2.9 m height.
- They produced stone statues using: limestone, sandstone, gabbro, granite and red quartzite.
- The statue-examples presented show the women wearing either a Crown (Royal wives) or a headdress (elite women).

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