

Mechanical Engineering in Ancient Egypt, Part 94: Inscription of the 18th Dynasty Tombs

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ABSTRACT

This paper investigates the inscription of the tombs of the 18th Dynasty. This era is divided by the author into three divisions: Early, Middle and Late. In each division Royal and Noble tombs are scanned to extract the philosophy of tomb inscription during this era. A quantitative analysis is performed for reliefs and scenes, Royal and Noble tombs. The features of tomb inscription are outlined. A total number of 28 scenes and reliefs are studied and quantitatively analysed.

Keywords: *Mechanical engineering, ancient Egypt, tomb inscription, 18th Dynasty of Egypt*

INTRODUCTION

This research paper is the 94th paper in a series of research papers aiming at investigating the evolution of Mechanical Engineering in ancient Egypt through studying tomb inscription during the Pharaonic era of ancient Egypt.

Afshar (1993) in his study of the iconography of the wall paintings in Queen Nefertari Tomb outlined that the tomb paintings were accompanied by hieroglyphic inscriptions from the 'Book of Dead'. She presented some colored scenes in the Queen's tomb showing the Queen worshipping, playing 'senet', walking with Isis, walking with Horus and receiving an 'ankh' from Isis [1]. Polz (1998) in his study of the Ramsesnakht Dynasty and the fall of the New Kingdom studied a large tomb excavated in Deir Abu el-Naga at Thebes West Bank. The tomb was originally dated to Early 18th Dynasty and then reused for Ramsesnakht, High Priest of Amun at Late 20th Dynasty. He presented reliefs on sandstone fragments for an offering table list, extensive offering list, titles of one of Ramses ankh's sons, upper part fragment of a limestone stela of a Second Priest of Amun, sandstone fragment with titles of one of the Ramsesnakht sons carved in bounded rows [2].

Frood (2004) in her Ph. D. Thesis studied the biographical texts produced during the Ramesside Period. She studied the tombs of Djehutyemheb, Nakhtdjehuty, Samut, Anhurmosé, Paser, Nebwenenef and Nefer-sekheru [3]. Olivier

(2008) in her Master of Arts Thesis presented many artistic works including tomb wall scenes as evidence for the roles of elite women in events, practices and rituals. She presented scenes for Queen Ahmose, relief for Neithhotep hunting scene from tomb of Nefermaat, Medium Geese from the tomb of Nefermaat, relief for Pharaoh Akhenaten and Nefertiti, scene for fowling in the marshes from the tomb of Nebamun, scene of Queen Ahmose Ne-fertari, scene of Sennefer and his wife Meryt [4].

Brand (2010) in his work about reuse and restoration pointed out that private individuals made use of tombs and burial equipment of others. He presented examples on the restoration and reuse of some monuments over ages located in the Karnak [5]. Tafel (2013) studied a newly identified relief from the tomb chapel of Mose, Scribe of the Treasury of Ptah during the reign of Pharaoh Ramses II of the 19th Dynasty. He outlined that the relief was probably part of a limestone wall in his tomb. He presented reliefs from Mose's tomb at the time of excavation and a portion of a relief now in the Rosicrucian Egyptian Museum at San Jose, USA [6]. O'Neill (2015) in his thesis identified the funerary scenes of the 18th Dynasty Theban tomb of Païry, High Priest of Ptah. He presented wonderful colored scenes such as: Païry and his wife offering a table, Païry and his wife worshipping Osiris, receiving gifts, colored scene in the entrance of the sloping passage, scene for Païry, his wife and his son, extensive funerary scene, four boats

scene, opening the moth ceremony and funerary procession scenes [7].

Falk (2015) in his Ph.D. Thesis determined seven criteria common to most kinds of ritual processional furnishings. He presented a scene for a portion from Tomb TT226, a scene for a chest finished by two workers from the tomb of Ibi, relief of a sacred barque from the 22nd Dynasty, scene of servants dragging two shrines from the tomb of Djau, scenes of containers from Tomb 2 at Beni Hasan, scene for porters carrying chest in the tomb of Antefoker, scene of porters carrying chests from the tomb of Sennefer, scene for chests in the tomb of Huy, besides many other scenes and reliefs [8]. Motte (2017) in her paper about the definition of speech caption in private tombs presented an extensive line diagram of a scene from the tomb of Ti from the Old Kingdom, relief from the tomb of Mehu and an offering scene from the tomb of Ankhmahos both from the 6th Dynasty [9]. Schrieber (2018) studied Tomb TT400, a Ramesside tomb in the el-Khokha cemetery where two Kushite group burials were located in the tomb chapel. He presented the findings discovered in the mixed strata of the chapel and the forecourt [10].

Strong (2018) in her Ph.D. Thesis about the social and sacred power of the artificial light in the Pharaonic Period presented some scenes and reliefs from ancient Egypt supporting her analysis such as: a colored scene for Pharaoh Ramses III from the 20th Dynasty offering a bowl with flame in the tomb of Khaemwaset, offering scene from the tomb of Hori, banquet scene in the tomb of Huya from the 18th Dynasty, colored scene in the tomb of Sennefer from the 18th Dynasty, an offering scene from the tomb of Userhat from the 18th Dynasty, colored scene in the tomb of Nebenmaat from the 19th Dynasty, colored scene in the tomb of Khaw from the 19th Dynasty, scenes in the tombs of Puiemre, Rekhmire, Amenhotep-Sise and Menkheperasonob from the 18th Dynasty [11]. Pelt and Sharing (2019) proposed that certain type of figural graffiti may be regarded as pictorial prayers in their own right to protect the deceased in his afterlife. They presented a colored relief in the tomb of Maya and Meryt from the 18th Dynasty, relief in the tomb of Tia and Tia from the 19th Dynasty, scenes from the New Kingdom private tombs at Saqqara [12].

Mahran (2020) in her paper about scenes from the New Kingdom private tombs at Saqqara

outlined that Saqqara continued to be important during the New Kingdom where groups of High Officials built their tombs at Saqqara. She presented a corpus of 47 reliefs from the New Kingdom tombs at Saqqara. She presented scenes in the tombs of Maya and Merit from the 18th Dynasty, Paser and Raia, Tia and Tia from the 19th Dynasty, Iniuia, Thutmosis, Pay and Raya, Amenemone from the 18th Dynasty [13].

Hassaan (2020) investigated tomb inscription during the Old Kingdom and Dynasties 11 and 12 of the Middle Kingdom. He presented a lot of scenes and reliefs supporting the idea and methodology followed by the ancient Egyptians in inscribing their Elite and Royal Tombs [14], [15].

THE 18TH DYNASTY

The 18th Dynasty covers a time span from 1550 to 1292 BC [16]. I have divided this period into three equal sub-periods:

- Early 18th Dynasty, 1550-1464 BC.
- Middle 18th Dynasty, 1463-1378.
- Late 18th Dynasty, 1377-1292 BC.

EARLY 18TH DYNASTY, 1550-1464 BC

We have only four examples on the inscription of the 18th Dynasty tombs during the period 1550-1464 BC presented as follows:

- The first example is a relief in the tomb of Djehuty, Overseer of the stone carvers during the reign of Pharaoh Thutmose I, the 3rd Pharaoh of the 18th Dynasty, 1503-1494 BC shown in Fig.1 [17]. The relief depicts the tomb owner and the owner of another tomb called Carmeni both standing and worshipping an ancient Egyptian Deity. This relief was located in the entrance of the two tombs.

The second example is a colored scene in the tomb of Pahery, Nomarch during the reign of Thutmose III, the 6th Pharaoh of the 18th Dynasty, 1479-1425 BC shown in Fig.2 [18]. The scene authorise linen harvesting and combing (producing linen fibers). Men and women are cooperating in linen harvesting; one worker is gathering the linen in bands and tying them while one worker is carrying the linen-bands to where they are combed. An old man is performing the combing process. The scene presents four operations in the linen-fibers production. The operations are authorized using hieroglyphic inscriptions above all the workers.



Figure1. Worshipping relief in the tomb of Djehuty [17]



Figure2. Linen scene in the tomb of Pahery [18].

- The third example is a colored scene in the tomb of Amenemhat, a Steward of the Vizier of Pharaoh Thutmose III, 1479-1425 BC shown in Fig.3 [19]. The scene predicts the tomb owner seated on chairs with his lovely wife. He was shown holding a (may be) a piece of linen in his left hand while his wife holding his right shoulder and left arm expressing the intimate relations between the couple.



Figure3. Amenemhat and his wife in his tomb [19]

- The fourth example is a colored scene in the tomb of Puimre, Architect and Second Priest during the reign of Pharaoh Thutmose III, 1479-1425 BC shown in Fig.4 [20]. The scene predicts and industrial process which is fish gutting. One male-worker seated on a

stool uses a knife in his right hand while the fish is secured on an inclined stan with only two legs and another male-worker delivers the raw fish to him. The gutted fish is hanged until it is transferred to the kitchens.



Figure4. Fish gutting scene in the tomb of Puimre [19]

- The fifth example is a colored scene in the tomb of Menkheperraseneb, High Priest of Amun during the reign of Pharaoh Thutmose III, 1479-1425 BC in display in the Metropolitan Museum of Art and shown in Fig.5 [20]. The scene depicts two foreigners in an offering procession (may be to an ancient Egyptian official). The first one is a Syrian (from Asia) offering a girl (may be as a slave) and the second one is from Crete (Europe) offering a head of Oxen and a piece of cloth. The matter was authorized through a hieroglyphic text in four columns.

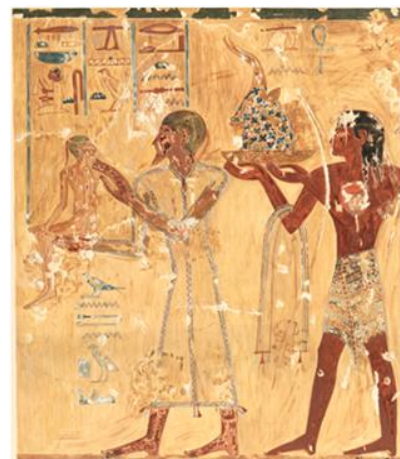


Figure5. Foreigners procession scene in the tomb of Menkheperraseneb [20].

MIDDLE 18TH DYNASTY, 1463 – 1378 BC

In this time period of the 18th Dynasty we have seven examples from its tombs exploring how the ancient Egyptians were fond of decorating their tombs and using them to authorise their daily activities and reflect even their emotions.

- The first example is a colored scenes in the tomb of Rekhmire, Vizier during the reign of Thutmose III and Amenhotep II of the 18th Dynasty, 1479-1390 BC shown in Figs.6, 7 and 8 [21].



Figure6. Stone drilling scene in the tomb of Rekhmire [21]



Figure7. Gold weighing scene in the tomb of Rekhmire [21]



Figure8. Materials transport scene in the tomb of Rekhmire [21].

- In Fig.6: The scene depicts a craftsman setting on a stool and getting ready to drill a stone jar using a manual weight drill.
- In Fig.7: The scene depicts a gold weighing process using a giant balance in a goldsmith factory. One man is weighing casted gold rings, A scribe is recording the weights and the weighed gold rings are stored in baskets in vertical stacks. The process is documented using a hieroglyphic text written in bounded columns
- In Fig.8: The scene depicts copper and charcoal transportation to a copper casting factory for purpose of casting doors in Karnak Temple. The copper ore was shown transported in baskets, while the charcoal

was shown transported in sacks. The process was completed under supervision of an overseer following the porters and recorded in hieroglyphic text written in bounded columns above the porters.

- The second example is two colored scenes in the tomb of Sennefer, Mayor of Thebes during the reign of Pharaoh Amenhotep II, 1425-1398 BC shown in Fig.9 [22] and Fig.10 [23].
- In Fig.9: The pillars carved in the rock were decorated by wonderful colored scenes for Sennefer and one of his wives with hieroglyphic identification above each of them with Wadjet Eye and Shen symbols above them. The ceiling was fully decorated by grapes.
- In Fig.10: The Mayor Sennefer was shown seated beside one of his lovely wives holding the Sekhem symbol in his left hand. His wife was shown wearing a flower diadem, holding a flower branch in her left hand and holding her husbands right shoulder by her right hand indicating the love status between them.

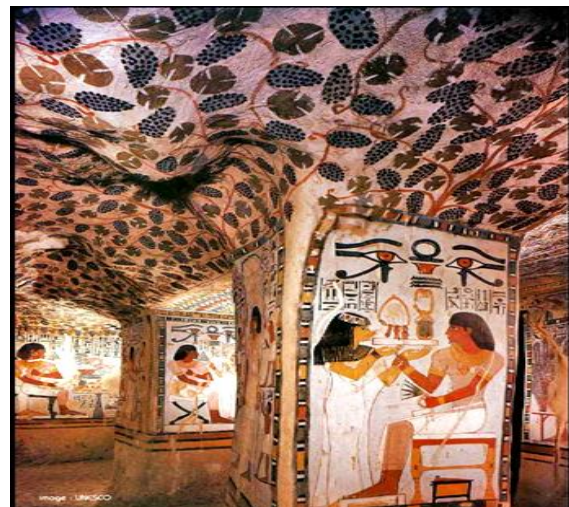


Figure9. Pillars and roof scenes in the tomb of Sennefer [22]



Figure10. Sennefer and his wife scene in his tomb [23]

- The third example is colored scenes in the tomb of Menna, Scribe and Overseer of the Fields of Amun during the reign of Thutmose IV, 8th Pharaoh of the 18th Dynasty, 1398-1388 BC shown in Fig.11 [24] and Fig.12 [25].

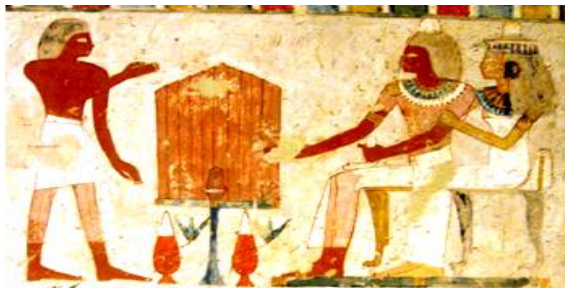


Figure11. Reporting scene in the tomb of Menna [24]

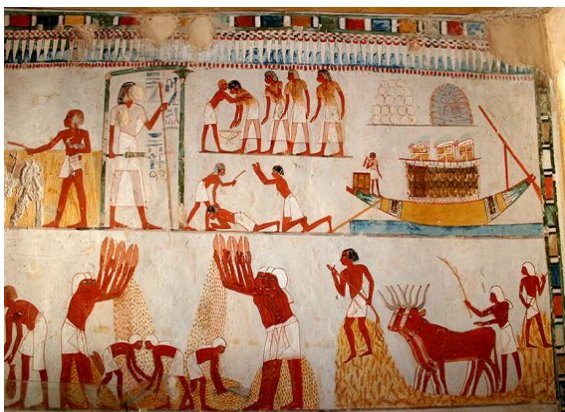


Figure12. Harvesting scene in the tomb of Menna [25]

- In Fig.11: The scene depicts the Overseer of the Fields Menna seated with his wife and receiving a report on the form of a stela from one of his officials who is presenting his works as documented in the stela. It reflects how the ancient Egyptians depended on documentation in their administration works and building their great civilization.
- In Fig.12: The scene depicts Menna in his shrine holding a long staff in his left hand and a sekhem symbol in his right hand while supervising some works within his duties:
 - Collecting taxes from farmers.
 - Punishment of a farmer failed to pay taxes.
 - Transporting gold rings and crops in a Nile-boat.
 - Threshing wheat crop.
 - Winnowing threshed wheat-crop.
- The fourth example is colored scenes in the tomb of Nakht, Scribe and Astronomer of Amun during the reign of Thutmose IV,

1398-1388 BC shown in Fig.13 [26] and Fig.14 [27].

- In Fig.13: The scene depicts the Scribe performing a number of daily activities:
 - Seating with his wife before an offering table.
 - Hunting birds in the marshes.
 - Receiving offering from a procession.
 - Wine production (shown in details in Fig.14).
 - There is an extensive use of the hieroglyphic script used in text written in vertical bounded columns authorizing the different activities.
- In Fig.14: The scene depicts two activities: Wine production and birds hunting and preparation for cooking. The scenes have the features:
 - Collecting grapes.
 - Squeezing the grapes by feet.
 - Collecting the grapes-juice in a large vessel.

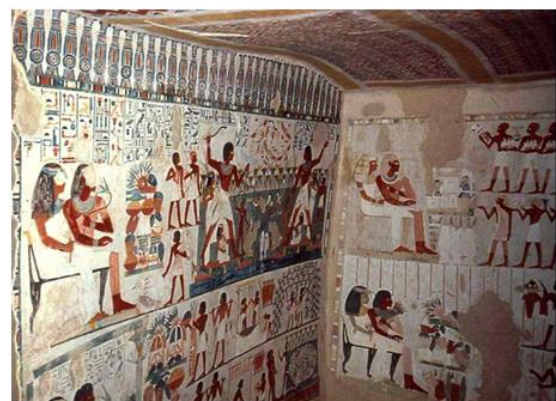


Figure13. Multi-activities scene in the tomb of Nakht [26]

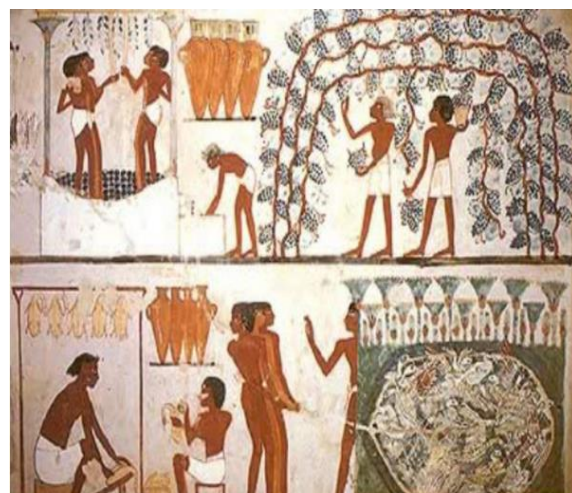


Figure14. Wine production and birds hunting scenes in the tomb of Nakht [27].

- Storing the juice in smaller containers.
- Hunting pet birds under supervision.
- Cleaning the birds and removing their feathers.
- Final check of birds cleaning.
- The fifth example is colored scenes in the tomb of Pharaoh Thutmose IV, 1398-1388 BC shown in Figs.15 [28] and 16 [29]. They have the features:



Figure15. Scene of Thutmose IV with some Deities in his tomb [28]



Figure16. Relief of Thutmose IV offering to a sphinx in his tomb [29]

- In Fig.15: The scene depicts the Pharaoh with an ancient Egyptian Deity blessing him with the 'Ankh Symbol' hoping long life for him.
- In Fig.16: The relief was carved with high profession depicting the Pharaoh presenting a lighting pot (in the left image) and a jar (probably) to a sphinx. The activity was registered using hieroglyphic text carved in vertical columns including the cartouches of the Pharaoh.
- The sixth example is a colored scene in the tomb of Djoserka, Scribe Counter of

the Grain of Amun during the reign of Pharaohs Thutmose IV and Amenhotep III, 1398-1350 BC shown in Fig.17 [30]. The scene depicts the Scribe seated and holding a long script watching a stack of food, fruits and drinks produced under his supervision. In front of his face it was hieroglyphic column including his name and titles, however they were destroyed (probably) [30].



Figure17. Scene in the tomb of Djoserka [30]

- The seventh example is a colored scene in the tomb of Nebamun, Scribe and Grain Accountant during the reign of Pharaoh Thutmose IV, 1298-1388 BC in display in the British Museum and shown in Figure 18 [31]. The scene depicts a flock of geese driven by three geese-keepers, a geese-accountant presenting a written report on a piece of papyrus to Nebamun and a group of farmers saluting Nebamun. The activities are authorized through hieroglyphic texts written in two bounded columns and a long bounded row.



Figure18. Scene in the tomb of Nebamun [31]

LATE 18TH DYNASTY, 1377-1292 BC

The wonderful inscriptions continued to appear during this Late Period of the 18th Dynasty as will be depicted by the following examples:

- The first example is a colored scene in the tomb of Amenhotep III, the 9th Pharaoh of the 18th Dynasty, 1388-1350 BC shown in Fig.19 [32]. The scene depicts the Pharaoh blessed by four of the ancient Egyptian Deities. Each Pharaoh sub-scene with one of the Deities was labeled above their heads by two of the Pharaoh's Cartouches and a hieroglyphic text written within un-bounded columns.



Figure19. Scene in the tomb of Pharaoh Amenemhat III [32]

- The second example is reliefs in the tomb of Kheruef, Steward of Queen Tiy, The Great Royal Wife of Pharaoh Amenhotep III, 2388-1350 shown in Figs.20 [33] and 21 [34].

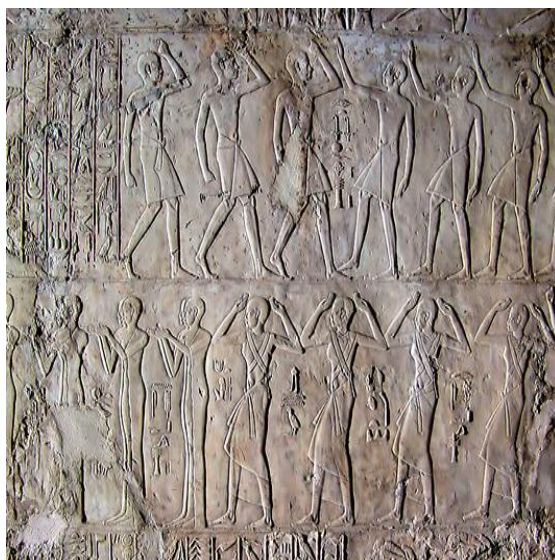


Figure20. Folklore band relief in the tomb of Kheruef [33]

- In Fig.20: The relief registers two Folklore Bands. One of them in the top depicts a men band of two groups facing each other, dancing and raising their right hands. They

are singing with words registers in four bounded columns using the hieroglyphic script. The bottom relief depicts a men band dancing and raising their two hands and some men are clapping. They may be singing with words registered between the dancers and below them in an un-bounded row.



Figure21. Stick-playing band relief in the tomb of Kheruef [34]

- In Fig.21: The relief registers a stick-playing band. Every player is holding a stick, one in his right hand and the facing player is holding the stick in his left hand. Each group of two players is labeled by a hieroglyphic text between them with another label between each group. This amusement is still acting in Egypt till now specially in Upper Egypt.

- The third example is a colored scene in the tomb of Paury, High Priest of Ptah during the reign of Pharaoh Amenhotep III, 1388-1350 BC shown in Fig.22 [35]. The scene depicts Priest Paury and his wife Henutnofret praying and offering a multi-level table. The activity was registered through neatly written hieroglyphic text in columns with red boundary. The whole scene was designed, painted and documented with very high quality that could sustain the underground environments for more than 3350 years.



Figure22. Praying scene in the tomb of Paury [35]

- The fourth example is a relief in the tomb of Ay, Royal Scribe during the reign of Akhenaten, the 10th Pharaoh of the 18th Dynasty, 1351-1334 BC shown in Fig.23 [36]. This is an example of the high carving profession and experience attained during the 18th Dynasty. The relief depicts the Scribe Ay and his wife Tiy praying to Aten with extensive praying text carved neatly in bounded columns in all the area surfaces allocated for the text.

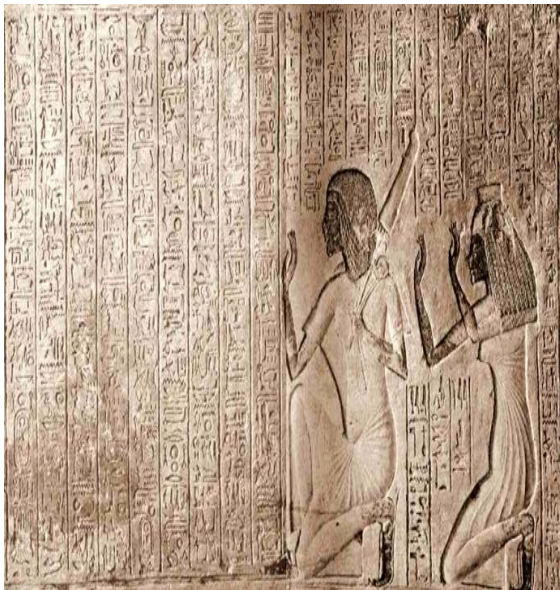


Figure23. Praying relief in the tomb of Ay [36]

- The fifth example is a colored scene in the tomb of Huya, Steward of Queen Tiye (mother of Pharaoh Akhenaten) shown in Fig.24 [37].



Figure24. Praying relief in the tomb of Huya [37].

- The scene depicts Pharaoh Akhenaten and his wife Nefertiti worshipping Aten and receiving salutation from some of their

citizens. The activity was documented through their Cartouches and hieroglyphic text written inside bounded columns above them.

- The sixth example is a colored scene in the tomb of Huy, Viceroy of Nubia during the reign of Tutankhamun, the 13th Pharaoh of the 18th Dynasty, 1332-1323 BC shown in Fig.25 [38]. The scene predicts the processions offering valuable goods such as golden rings and vehicle driven by oxen.

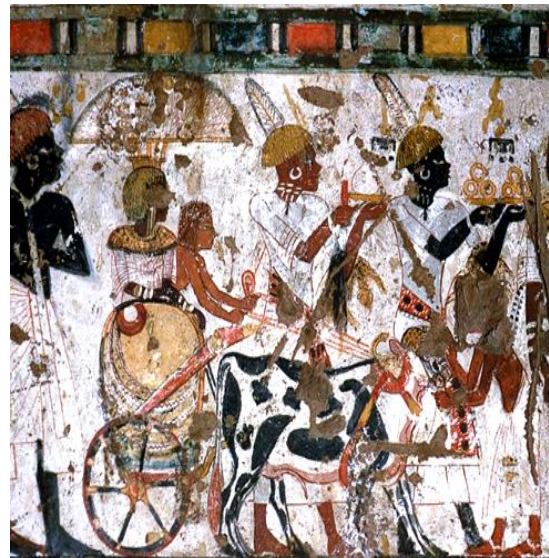


Figure25. Procession scene in the tomb of Huy [38]

- The seventh example is a relief in the tomb of General Horemheb at Saqqara, Army General during the reign of Pharaoh Tutankhamun, 1332-1323 BC shown in Fig.26 [39]. The relief depicts the Army General praying and the activity is authorized through a hieroglyphic text written inside bounded columns.
- The eighth example is a colored scene in the tomb of Pharaoh Tutankhamun, 1332-1323 BC shown in Fig.27 [40]. The scene depicts the Pharaoh holding a long script in his right hand and an Ankh and a Mace in his left hand whiling receiving a welcome from Maat. Maat is welcoming the Pharaoh through the water sign in her right hand welling him long life and eternity.
- The ninth example is a colored scene in the tomb of Horemheb, the 15th Pharaoh of the 18th Dynasty, 1319-1292 BC shown in Fig.28 [41]. The scene depicts the Pharaoh presenting two pots to one of the ancient Egyptian Goddess. The activity was authorized using hieroglyphic text written in short columns including two Cartouches for the Pharaoh.



Figure 26. Relief in the tomb of Horemheb [39]



Figure 27. Scene in the tomb of Tutankhamun [40]



Figure 28. Scene in the tomb of Horemheb [41]

CONCLUSION

- The paper investigated the evolution of mechanical engineering in ancient Egypt through studying the tomb inscription during the 18th Dynasty.
- During the Early 18th Dynasty, the ancient Egyptians inscribed reliefs in the tomb of

Djehuty and scenes in the tombs of Pahery, Amenemhat, Puimre and Menkheperaseneb.

- During the Middle 18th Dynasty, they inscribed reliefs in the tomb of Thutmose IV and scenes in the tombs of Thutmose IV, Rekhmire, Sennefer, Menna, Nakht, Djoserka and Nebamun.
- During the Late 18th Dynasty, they inscribed reliefs in the tomb of Ay and Kheruef and scenes in the tombs of Amenemhat III, Tutankhamun, Horemheb, Paury, Huya and Huy.
- The research work presented in this paper covered 28 reliefs and scenes in the tombs of the 18th Dynasty. 21.4 % of them were reliefs and 78.6 % of them were colored scenes.
- 25 % of the inscriptions were from Royal Tombs while 75 % of them were from Nobel Tombs.
- 89.9 % of the reliefs and scenes were inscribed by hieroglyphic texts.
- 88 % of the inscriptions used hieroglyphic text written in columns and 12 % used text written in rows.
- Some of the colored scenes reflected the intimate relations between the ancient Egyptian couples.
- Some of the tomb inscriptions of the 18th Dynasty reflected some of the industrial activities in the ancient Egyptian society such as: fish gutting, stone jars production, gold production, metal casting, grain harvesting, wine production and birds cleaning.
- Some reliefs reflected rare activities of the ancient Egyptians such as Folklore and Stick-playing bands.

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