

Mechanical Engineering in Ancient Egypt, Part 77: Temples Inscription

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Abstract:

This paper is the 77th research paper in a series investigating the evolution of mechanical engineering in ancient Egypt. It investigates the inscription of temple structures during a time span from the Middle Kingdom to the Late Period of ancient Egypt. It outlines the temples built during this period and how the ancient Egyptians inscribed them either with scenes or text. The type of script used, the carving technique and the carved surfaces were investigated.

Keywords — Mechanical engineering; ancient Egypt; temples inscription, Middle Kingdom to Late Periods.

I. INTRODUCTION

This is the 77 paper in a series of research papers aiming at exploring the role of ancient Egyptians in the evolution of mechanical engineering. The paper focuses on the inscription of temples and how the ancient Egyptians used them as huge surfaces to register their knowledge and history.

Shaltout and Belmonter (2005) in their study of the orientation of ancient Egyptian temples in Upper Egypt and Lower Nubia presented a scene of the 'stretching of the cord' ceremony in the Horus Temple at Edfu and a hieroglyphic text in the outer walls of the Temple of Hathor at Dendera [1]. Amr (2009) in his Ph. D. Thesis about the central hall in the Egyptian temples of the Ptolemaic Period presented the hieroglyphic script texts in the studied central halls and their English translation. He presented also scenes from the studied halls. [2].

Mertz (2009) in her book about temples, tombs and hieroglyphs presented the red chapel of Hatshepsut at Karnak, Abu Simbel Temple of Ramses II, Temple of Nefertari, Temple of Ramses III at Thebes and Luxor Temple [3]. Turner (2012) in his Ph. D. Thesis presented scenes and hieroglyphic texts from Thutmose I Temple at Nubt, Thutmose III Temple at Nubt, Gebel Adda-rock

Temple, Seti I Temple at Heliopolis and Temple of Edfu [4].

Collier (2013) in her Master of Arts Thesis presented illustrations on the Amun-Userhat in the New Kingdom from the East wall of Luxor Temple, the Third Pylon at Karnak the Temple of Khunsa at Karnak, the Great Hypostyle Hall of Karnak and the First Courtyard of Luxor Temple [5]. Shaltout and Ramzi (2014) studied the orientation of some ancient Egyptian Temples using the QuickBird images. Their studies covered the Luxor Temple, Karnak Temple, Hatshepsut Temple, Madinet Habu Temple and Ramesseum Temple. They provided photos for the studied temples showing their main centreline [6].

Colleen (2015) in her study of the transition period between the 18th and 19th Dynasties of ancient Egypt presented a scene for Pharaoh Seti I battle at the Karnak and reliefs from Seti I Temple at Abydos [7]. Elfadaly et. al. (2017) presented the main facade of Karnak Temple at East Luxor, the main facade of Luxor Temple at East Luxor, the main facade of Medinet Habu Temple at West Luxor, the main facade of Hatshepsut Temple at West Luxor. They showed the deterioration of some wall in Medinet Habu Temple, Luxor Temple and Hatshepsut Temple [8]. Dunn (2018) in an article written for Tour Egypt about the White Chapel of King Senusret I (1991-1962 BC) of the 12th

Dynasty presented some of the inscriptions on the rectangular columns and on the walls of the chapel [9].

II. INSCRIPTIONS IN THE WHITE CHAPEL

The White Chapel was built by King Senusret I from the 12th Dynasty (1971-1926 BC) in recent Luxor city [10]. The ancient Egyptians were very clever in using the huge areas of their temples as writing media using symbols, texts and scenes as will be depicted in the following examples starting by the White Chapel of Senusret I:

- The first example is a wall inscription from the White Chapel carved using the hieroglyphic text in bounded rows (in the top) and inside bounded rectangular areas.



Fig.1 Wall inscription from the White Chapel [11].

- The second example is an inscription for an external wall of the White Chapel shown in Fig.2 [11]. It was inscribed using the hieroglyphic script with text written inside bounded rectangular areas looking as blocks.



Fig.2 External wall all inscription from the White Chapel [11].

- The third example is an inscription for some of the rectangular columns in the White Chapel shown in Fig.3 [12]. It was inscribed by scenes for the Pharaoh offering to Deities, Royal Cartouches, and hieroglyphic script texts fully covering the walls of the columns.

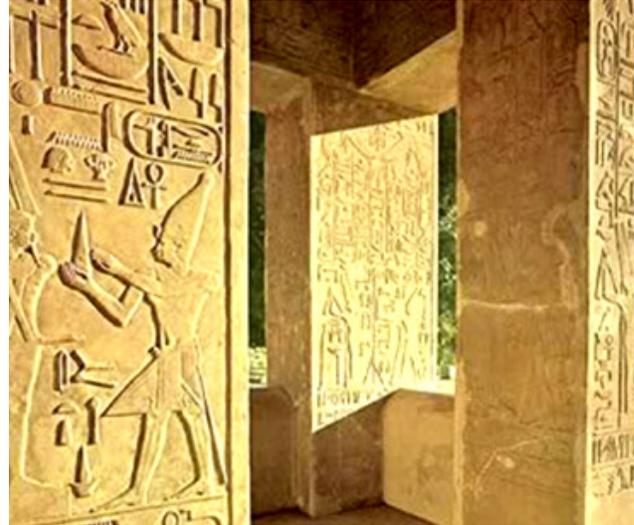


Fig.3 Columns inscription from the White Chapel [12].

III. INSCRIPTIONS IN THE TEMPLE OF AMUN RA AT KARNAK

The Temple of Amun Re at Karnak of Thebes (Luxor) was built during the New Kingdom Period (1550-1070 BC) [13]. This period was ruled by some strong Pharaohs who built huge structures for worshipping and recording their historical events as will be depicted through the following examples:

- The first example is a wall inscription for Pharaoh Seti I of the 19th Dynasty (1290-1279 BC) in the Hypostyle Hall of the Amun Ra Temple shown in Fig.4 [14]. The inscription consisted of a scene for the Pharaoh and a hieroglyphic script text written in vertical bounded columns including two Cartouches for the Pharaoh.
- The second example is a wall inscription in the Temple of Amun Ra for Pharaoh Ramses II of the 19th Dynasty (1279-1213 BC) molding bricks before Amun

Ra is shown in Fig.5 [15]. The inscription consisted of a scene for the Pharaoh and Amun Ra and a hieroglyphic script text carved in two bounded columns between the two figures and behind the Pharaoh.



Fig.4 Wall inscription for Set I from the Amun-Ra Temple [14].



Fig.5 Wall inscription for Ramses II from the Amun-Ra Temple [15].

- The third example is a column inscription showing Pharaoh Ramses II of the 19th Dynasty burning incense and pouring libation in the Temple of Anun Ra as shown in Fig.6 [5]. The inscription presented the Pharaoh in an offering position and a hieroglyphic text carved in short bounded columns above the Pharaoh including two of his Cartouches.



Fig.6 Column inscription for Ramses II from the Amun-Ra Temple [15].

IV. INSCRIPTIONS IN THE KARNAK TEMPLE

The main buildings of the Karnak temple were built by the Pharaohs of the 18th Dynasty (1543-1292 BC) [16]. Because this kingdom was great and wealthy, it is expected to have huge structures in this temple and good and rich inscriptions on its walls and columns as will be depicted from the following examples:

- The first example is an inscription in the Karnak Temple showing Pharaoh Thutmose III from the 18th Dynasty (1479-1425 BC) slaying the Canaanite captives from the battle of Megiddo and shown in Fig.7 [17]. It was inscribed using the hieroglyphic script in rows and columns with most of the area allocated for the scene of the Pharaoh slaying Egypt's enemies in the Eastern territories.
- The second example is a hieroglyphic script text in the Great Hypostyle Hall of the Karnak Temple built by Pharaoh Seti I from the 19th Dynasty (1290-1279 BC) shown in Fig.8 [18]. It was inscribed using colored scripts with text written in bounded adjacent columns. The irregularities of the external

surfaces means that it was subjected to attack from criminal artifacts robberies,



Fig.7 Wall inscription for Thutmose III from the Karnak Temple [17].



Fig.8 Wall inscription from the Great Hypostyle Hall of the Karnak Temple [18].

- The third example is a carved inscription in the south wall of the Karnak Temple shown in Fig.9 [19]. The inscription consisted of scenes for a Pharaoh offering to the Deities and hieroglyphic script text carved in bounded columns (in the top) and in un-bounded rows including two Cartouches of the Pharaoh.
- The fourth example is a wall inscription in the Great Hypostyle Hall of the Karnak Temple shown in Fig.10 [20]. The inscription was fully a hieroglyphic

text carved in adjacent columns without any scenes in between.



Fig.9 Wall inscription from the South Wall of the Karnak Temple [19].

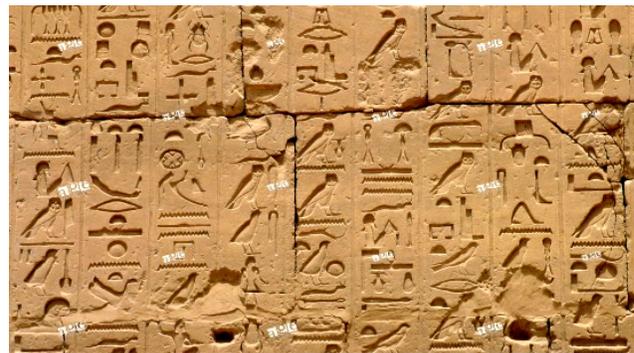


Fig.10 Wall inscription from the Great Hypostyle Hall of the Karnak Temple [20].

- The fifth example is a carved inscription on an interior wall in the Karnak Temple shown in Fig.11 [21].



Fig.11 Inscriptions on the interior walls of the Karnak Temple [21].

- The inscriptions of Fig.11 were of the prominent type. This is really a master

piece of the ancient Egyptian art during the Middle Kingdom. It comprised professionally carved figures in the praying position and hieroglyphic text carved within bounded columns and rows with two Cartouches of the Pharaoh.

- The sixth example an inscription of a column in the Great Hypostyle Hall of the Karnak Museum shown in Fig.12 [22]. This was really a Great Hall. It comprised 134 huge columns constructed by Pharaoh Seti I (1290-1279BC) and his son Pharaoh Ramses II (1279-1213 BC) of the 19th Dynasty [23]. The inscriptions were of the prominent type, covered the whole surface of the column and included a Cartouche for the Pharaoh.



Fig.12 Inscriptions on a column in the Great Hypostyle Hall of the Karnak Temple [22].

- The seventh example is a column inscription in the Karnak Temple shown in Fig.13 [23]. The whole surface was fully deeply engraved using the hieroglyphic script and a horizontal Cartouche for Pharaoh Ramses II.



Fig.13 Inscriptions on a column in the Karnak Temple [23].

V. INSCRIPTIONS IN THE AMADA TEMPLE

The Amada Temple was constructed by Pharaoh Thutmose III (1479-1425 BC) of the 18th Dynasty in Amada of Nubia. Decorations and some structure was added by Pharaohs Amenhotep II (1425-1398 BC), Thutmose IV (1398-1388 BC) of the 18th Dynasty, Seti I (1290-1279 BC) and Ramses II (1279-1213 BC) of the 19th Dynasty [24]. The style of inscribing the temple walls (and columns) was applied also to the Amada Temple as depicted by the following examples:

- The first example is a colored scene for Pharaoh Thutmose III with some of the Deities of Amada as shown in Fig.14 [24]. Besides the scene, Cartouches and hieroglyphic inscriptions was written in vertical un-bounded columns.



Fig.14 Wall inscriptions in the Amada Temple [24].

- The second example is an inscription for the interior walls and columns of the Amada Temple shown in Fig.15 [24].

The inscriptions are not clear enough, however it is clear that the whole surfaces are covered by scenes and hieroglyphic script text.

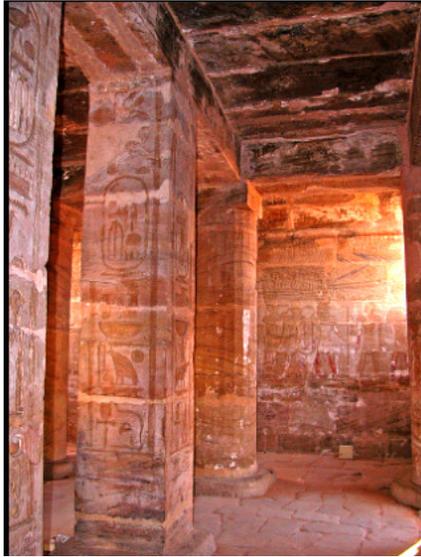


Fig.15 Wall and columns inscriptions in the interior of Amada Temple [24].

- The third example is an inscription on a column in Amada Temple shown in Fig.16 [24]. It was inscribed by symbols for Nekhbet, Uraus and Ankh and other symbols.



Fig.16 Column inscription in Amada Temple [24].

VI. INSCRIPTIONS IN THE AMENHOTEP III TEMPLE

Pharaoh Amenhotep III of the 18th Dynasty (1388-1350 BC) built his temple in the Eastern Bank of Luxor of Egypt [25]. On the other hand he built the Third Pylon of the Karnak Temple [26]. Wonderful inscriptions continued to appear in the 18th Dynasty Temples including the Amenhotep III temple as depicted by the following examples:

- The first example is a wall inscription from Amenhotep III temple in display now in the Egyptian Museum at Cairo and shown in Fig.17 [27]. The inscription depicted the Pharaoh in his military chariot with hieroglyphic text of the prominent type written within bounded short columns with Cartouches of the Pharaoh and some ancient Egyptian symbols.



Fig.17 Wall inscription in the Amenhotep III Temple [27].

- The second example is a wall inscription in the Third Pylon of Amenhotep III showing the Pharaoh manning an oar in Amun's barge shown in Fig.18 [26]. Below the barge came a hieroglyphic script carved in three un-bounded rows for Pharaoh Ramses III from the 20th Dynasty (1186-1155 BC).
- The third example is a wall inscription in the Third Pylon of Amenhotep III

showing Pharaoh Tutankhamun of the 18th Dynasty (1332-1323 BC) standing behind his grandfather Pharaoh Amenhotep III as shown in Fig.19 [26]. The scene of Tutankhamun was erased by the order of his Commander of Chief of the Army, Horemheb who became the last Pharaoh of the 18th Dynasty (1319-1292 BC) to replace Tut's image by an ankh sign with two arms holding up a large fan. Below the barge came a hieroglyphic script carved in three un-bounded rows for Pharaoh Ramses III from the 20th Dynasty (1186-1155 BC).

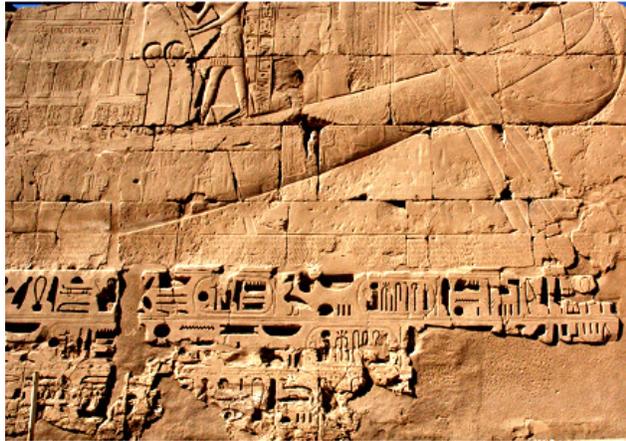


Fig.18 Wall inscription in the Amenhotep III Third Pylon [26].

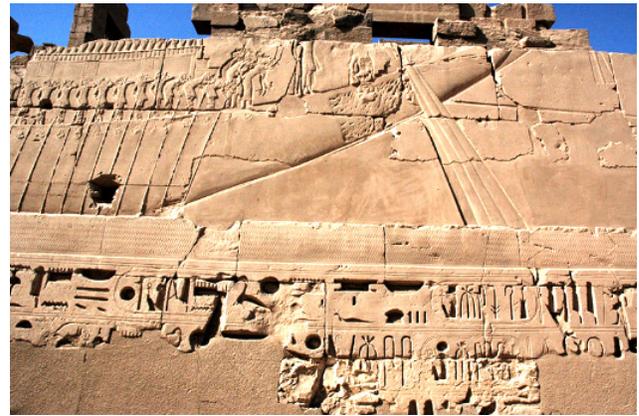


Fig.20 Wall inscription in the Amenhotep III Third Pylon [26].

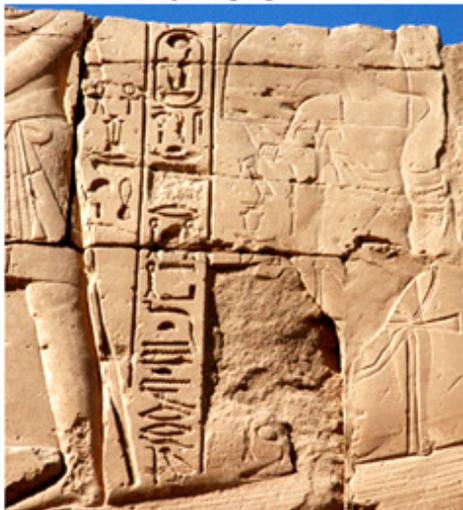


Fig.19 Wall inscription in the Amenhotep III Third Pylon [26].

- In Fig.18, the relief was inscribed by deep hieroglyphic text carved in two bounded columns between the two Pharaohs.
- The fourth example is a wall relief for the Royal ship of Pharaoh Amenhotep III shown in Fig.20 [26]. The ship was a huge one manned by a large number of rowers from both lateral sides and a number of steering oars near its front end. Below the ship came a hieroglyphic script carved in three un-bounded rows for Pharaoh Ramses III of the 20th Dynasty.

VII. INSCRIPTIONS IN SETI I TEMPLE AT ABYDOS

The second Pharaoh of the 19th Dynasty, Seti I (1292-1279 BC) founded a temple in South Abydos of Luxor finished by his son Pharaoh Ramses II [28]. They followed the same tradition of inscribing the walls of the temple by historical and religious events as depicted by the following examples:

- The first example is a wall inscription in Seti I temple shown in Fig.21 [28]. The inscription shows a scene for the Pharaoh Seti I between two of the 19th Dynasty Deities with a hieroglyphic text engraved in short columns.



Fig.21 Wall inscription in the Seti I Temple at Abydos [28].

- The second example is a colored wall relief for Pharaoh Seti I in his temple offering an incense to the sacred emblem of Osiris as shown in Fig.22 [29]. Colored hieroglyphic text was written in bounded short columns concentrated in the top part of the relief.

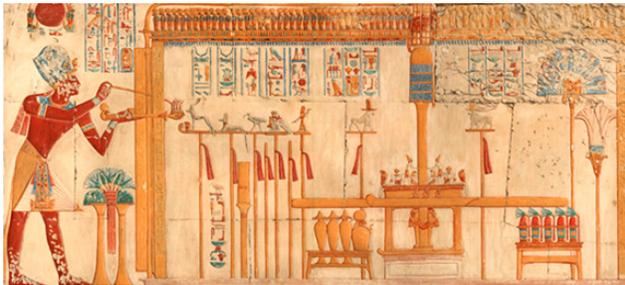


Fig.22 Wall inscription in the Seti I Temple at Abydos [29].

- The third example from the Temple of Seti I is a relief for the Pharaoh Seti I offering libations to the sacred barge of Osiris as shown in Fig.23 [29]. This is a wonderful colored scene showing the Pharaoh offering using both hands with hieroglyphic colored text written in short bounded columns. The barge was drawn with its full crew and driving tools.



Fig.23 Wall inscription in the Seti I Temple at Abydos [29].

- The fourth example is a wall inscription from the Seti I Temple shown in Fig.24 [30]. The inscription is of the deep carved type using the hieroglyphic script with text carved in bounded columns including two Cartouches of the Pharaoh.



Fig.24 Wall inscription in the Seti I Temple at Abydos [30].

- The fifth example is an inscription in the second Hypostyle Hall of Seti I temple shown in Fig.25 [31].



Fig.25 Wall inscription in the second Hypostyle Hall of Seti I Temple [30].

- The inscriptions of Fig.25 are of the prominent type where the Pharaoh was shown offering a vessel and text inscriptions were written within an un-bounded column and row.
- The sixth example is a rectangular-column inscription in Seti I temple at Abydos shown in Fig.26 [31]. The inscription comprised scenes for the Pharaohs Seti I and Ramses II and a hieroglyphic script deeply carved within un-bounded rows.



Fig.26 Column inscription in Seti I Temple [31].

- The eighth example is a colored scene for vulture 'Nekhbet' spreading its wings in the East wall of the Horus Shrine in Seti I temple at Abydos shown in Fig.27 [31]. It was shown spreading its wings over the Birth and Throne Cartouches of Pharaoh Seti I. Hieroglyphic inscription was located above the two Cartouches and below the vulture.

The Abu Simbel temples comprised two temples: the Great Temple of Ramses II and the small temple of his wife Queen Nefertari both carved in the rock during the reign of Pharaoh Ramses II of the 19th Dynasty (1279-1213 BC) [32]. This great engineering work has too many examples of using its elements as a writing media as will be illustrate by the following examples:



Fig.27 Wall inscription in the East wall of Horus Shrine in Seti I Temple [31].

- The first example is the front face of the Small Temple of Abu Simbel built by Pharaoh Ramses II and shown in Fig.28 [33]. The front walls were fully inscribed using the hieroglyphic script with text carved in un-bounded columns and rows.
- The second example is an inscription on the entrance wall of the Great Temple at Abu Simbel shown in Fig.29 [34]. The inscriptions were carved using the hieroglyphic script in text carved inside bounded short columns and a large Royal Cartouche.



Fig.28 Wall inscriptions in the Small Temple in Abu Simbel [33].

VIII. INSCRIPTIONS IN ABU SIMBEL TEMPLE



Fig.29 Wall inscription in the entrance of the Great Temple in Abu Simbel [34].

- The third example is a wall inscriptions in the Hypostyle Hall of the Great Temple in Abu Simbel shown in Fig.30 [35]. The inscriptions covered fully the walls and roof of the Hall.
- The fourth example is a relief from the battle of Kadesh against Hittites in the Inner Temple (Hypostyle Hall) of the Great Temple shown in Fig.31 [35]. The inscription was composed of a scene of captured soldiers and a bounded row of hieroglyphic text including the Cartouche of the Pharaoh.



Fig.30 Wall inscriptions in the Hypostyle Hall of the Great Temple in Abu Simbel [35].

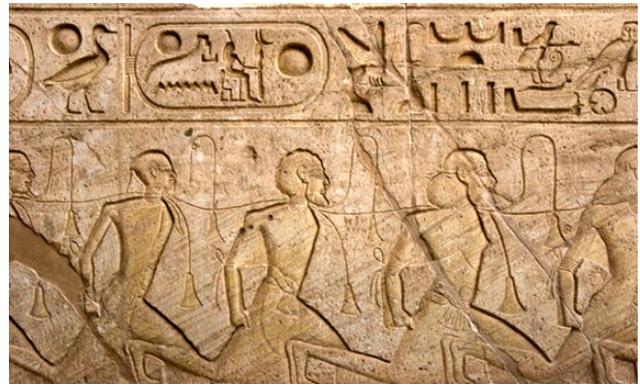


Fig.31 Wall inscription in the Hypostyle Hall of the Great Temple in Abu Simbel [35].

- The fifth example is the sanctuary (house of statues) in a deep and small dark location in the Great Temple at Abu Simbel where statues for Ramses II and three Deities of the New Kingdom are shown in Fig.32 [36]. This dark part of the temple represent the top technology in the embracing of the astronomical, mechanical and architectural sciences in the ancient Egyptian society. The four statues were set such that the sun shines only twice a year on the Pharaoh's statue. The wall behind the statues was inscribed using the hieroglyphic script identifying the four statues.



Fig.32 The sanctuary of the Great Temple in Abu Simbel [36].

IX. INSCRIPTIONS IN RAMESSEUM TEMPLE AT LUXOR

The Ramesseum Temple at Luxor was established during the reign of Pharaoh Ramses II of the 19th Dynasty (1279-1213 BC) [37]. Wonderful inscriptions were performed by the engineers and technicians of this great Pharaoh as depicted by the following examples:

- The first example is a wall-relief showing Pharaoh Ramses II receiving an Ankh symbol from one of the Deities shown in Fig.33 [37]. It was inscribed by three Cartouches for the Pharaoh carved just above the two faces using the hieroglyphic script.
- The second example is an inscription from some of the Ramesseum internal rooms shown in Fig.34 [38]. The inscription was produced by deep carving in the rock for a scene for the Ramses II receiving an Ankh from one of the New Kingdom Deities with hieroglyphic text carved in bounded columns.



Fig.33 Relief in the Ramesseum Temple in Luxor [37].

- The third example is an inscription in the Ramesseum for five of the Pharaoh Ramses II sons shown in Fig.35 [39]. The inscription presented five of the Pharaoh sons with their names within an hieroglyphic text before each of them carved inside a bounded column.



Fig.34 Inscription in the Ramesseum Temple in Luxor [38].



Fig.35 Inscription in the Ramesseum Temple for 5 of Ramses II sons [39].

X. INSCRIPTIONS IN THE RAMSES II TEMPLE AT ABYDOS

The temple of Ramses II at Abydos was cut in alabaster rock by Pharaoh Ramses II of the 19th Dynasty Northwest of his father's temple (Seti I Temple) with reliefs still keeping their colours [40]. Here are some of the inscriptions in the Ramses II Temple at Abydos:

- The first example is an inscription on the Western wall of the temple shown in

Fig.36 [41]. The inscription was composed of scenes for the Pharaoh and hieroglyphic texts carved inside bounded columns and rows.



Fig.36 Inscription on the Western wall of Ramses II Temple at Abydos [41].

- The second example is an inscription in the Northern wall of the temple shown in Fig.37 [41]. The inscription consisted of a scene for the Pharaoh with some of the New Kingdom Deities, a Royal offering Table and a hieroglyphic script carved in a bounded row under the scene.
- The third example is a colored wall inscription from the temple of Ramses II at Abydos now in display in the Louvre Museum at Paris and shown in Fig.387 [42] !!!!. The inscription depicted the Pharaoh with some of the New Kingdom Deities and inscription using the hieroglyphic text carved in bounded column and row with a number of the Pharaoh Cartouches. As a researcher, I am fully surprised about moving temple decorations from Egypt to museums. The temples are already an open-air museums. So, why criminals destroy those wonderful open-air museums by destroying their decorations ?.

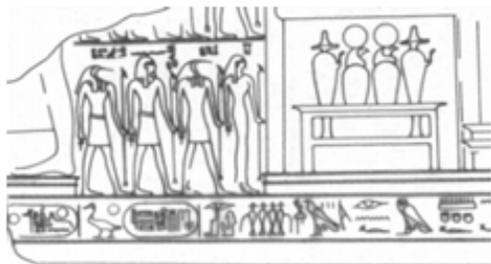


Fig.37 Inscription on the Northern wall of Ramses II Temple at Abydos [41].

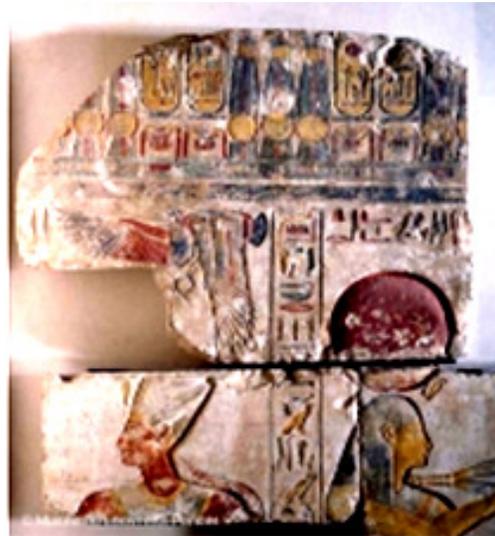


Fig.38 Colored wall inscription in Ramses II Temple at Abydos [42].

- The last example is a colored wall inscription from the temple of Ramses II at Abydos now in display in the Louvre Museum at Paris and shown in Fig.39 [42] !!!!. The inscription was a scene for the Pharaoh Ramses II welcomed by Horus Deity by offering him the Ankh and Flail Symbols.



Fig.39 Colored wall scene in Ramses II Temple at Abydos [42].

XI. INSCRIPTIONS IN THE KHONSU TEMPLE AT LUXOR

The Temple of Khonsu at Luxor was originally constructed by Pharaoh Ramses III of the 20th Dynasty (1186-1155 BC) while its Hypostyle Hall was constructed by Pharaoh Nectenebo I of the 30th Dynasty (380-362 BC)

[43]. The same approach of temples decoration was followed in the construction of Khonsu Temple as depicted in the following examples:

- The first example is an inscription for Herihor, King of South Egypt during the 20th Dynasty (1190-1075 BC) in the Court of the Temple and shown in Fig.40 [44]. The inscription was carved using the hieroglyphic script with text carved in three bounded rows.

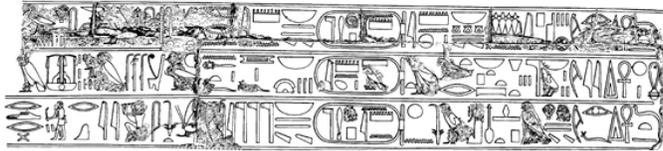


Fig.40 Wall inscription for King Herihor in Khonsu Temple [44].

- The second example is an inscription for Pharaoh Ramses XI of the 20th Dynasty (1107-1077 BC) offering flowers to Khonsu in the First Hypostyle Hall of Khonsu Temple shown in Fig.41 [44]. The inscription was composed of a scene for the Pharaoh offering flowers and a hieroglyphic text carved in columns including a number of Cartouches of the Pharaoh and some symbols.



Fig.41 Wall inscription for Pharaoh Ramses XI in Khonsu Temple [44].

- The third example is a Decree for the High Priest of Amun, Menkheperre (1045-992 BC) in the Court of the

Temple during the 21st Dynasty and shown in Fig.42 [44]. The inscription was using the hieroglyphic script carved in adjacent bounded columns with distortion in the bottom and right parts.



Fig.42 Wall inscription for Pharaoh Ramses XI in Khonsu Temple [44].

- The fourth example is a an inscription for Pharaoh Nectanebo II of the 30th Dynasty (360-343 BC) offering to Khonsu-Re in his temple as shown in Fig.43 [44]. The inscription took the form of a scene for the Pharaoh offering to Khonsu and a hieroglyphic script carved in bounded short columns in the top and without bounding in front and behind the Pharaoh.



Fig.43 Wall inscription for Pharaoh Nectanebo II in Khonsu Temple [44].

- The fifth example is a colored offering scene for (probably) Pharaoh Ramses III

offering to Khonsu as shown in Fig.44 [45]. The scene showed the Pharaoh offering incense with Horus fluttering above him. In the centre of the scene comes a hieroglyphic text and two Cartouches of the Pharaoh.



Fig.44 Wall inscription for Pharaoh Ramses III in Khonsu Temple [45].

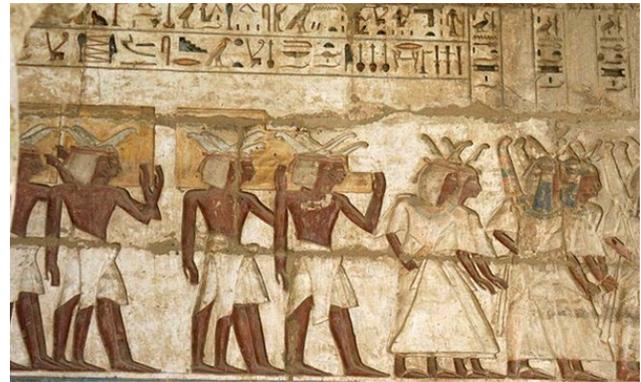


Fig.45 Wall inscription for Pharaoh Ramses III war against the Sea Peoples [46].

XII. INSCRIPTIONS IN THE MEDINET HABU TEMPLE (TEMPLE OF RAMSES III)

This temple was built for Pharaoh Ramses III of the 20th Dynasty (1186-1155 BC) in Thebes with inscriptions describing his war against the Libyans and the Sea Peoples [46]. The temple is still existing at Luxor after more than 3100 years as a witness on the glory of the Egyptian Engineers in during the New Kingdom. This will be depicted through many inscriptions on the walls and columns of the temple as illustrated by the following examples:

- The first example is a colored scene registering the victory of Pharaoh Ramses III on the Sea Peoples and taking their soldiers as prisoners as shown in Fig.45 [46]. The historical matter was described above the scene bounded rows and columns using the hieroglyphic script.

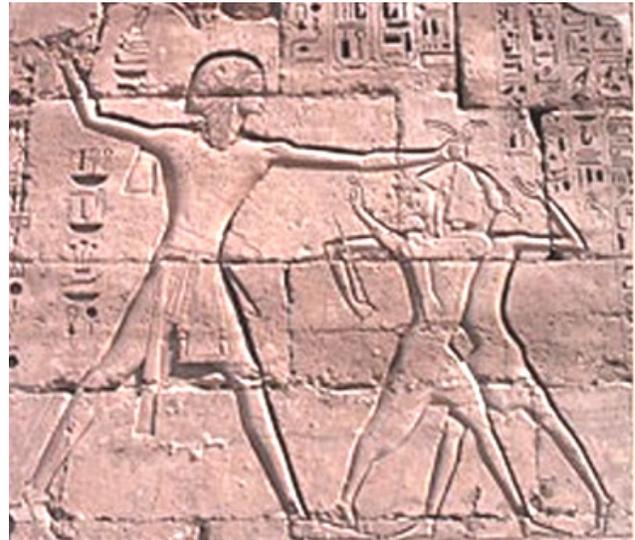


Fig.46 Wall inscription for the Pharaoh smiting his enemies heads [46].

- The third example is a professionally deeply engraved hieroglyphic text on a wall in Ramses III Temple at Medinet

Habu shown in Fig.47 [47]. It was carved within bounded parallel rows including the Cartouches of the Pharaoh.



Fig.47 Deep wall inscription in Ramses III Temple at Medinet Habu [47].

- The fourth example is a wall inscription in the Temple of Ramses III at Medinet Habu aiming at authorizing the accounting process of the hands of the enemies cut by the Pharaoh during the battle as shown in Fig.48 [48]. The scene depicted the counting process graphically using three officials while the process was authorized by a hieroglyphic text carved within bounded short columns in three sides of the scene.



Fig.48 Wall inscription for hands counting in Ramses III Temple at Medinet Habu [48].

- The fifth example is colored inscriptions on some columns, roof and walls in the Temple of Ramses III at Medinet Habu as shown in Fig.49 [48]. The

inscriptions are extensive and covering all the surfaces with scenes, hieroglyphic texts and colored patterns on the columns and the roof.



Fig.49 Wall, columns and roof inscriptions in Ramses III Temple at Medinet Habu [48].

XIII. INSCRIPTIONS IN THE PHILAE TEMPLE

The temple of Isis in the Philae complex was built by Pharaoh Nectanebo I of the 30th Dynasty (380-362 BC) [49]. Wonderful neat inscriptions of different types were a characteristic for this temple as depicted by the following examples:

- The first example is an inscription in the Philae Temple at Aswan shown in Fig.50 [50]. It was inscribed using the hieroglyphic script carved in nicely bounded columns beside each other having great accuracy and looking if they were generated using a computerized word processor.



Fig.50 Wall inscription in the Philae Temple [50].

- The second example is an inscription on a wall in Isis Temple at Philae shown in Fig.51 [51]. It was inscribed using a prominent hieroglyphic script carved in bounded short columns. It is clear that the Greek who occupied Egypt after the Late Period wrote on the same wall using the Greek script in the top and bottom surfaces.



Fig.51 Wall inscription in the Isis Temple at Philae [51].

- The third example is an inscription on a wall in Philae Temple shown in Fig.52 [52]. The inscription was composed of an offering scene and a hieroglyphic text carved inside bounded long columns.



Fig.52 Wall inscription in the Philae Temple [52].

- The fourth example is an inscription on a wall in Philae Temple shown in Fig.53

[53]. The inscription was composed of a scene for a Pharaoh offering to one of the Deities of the 30th Dynasty and a hieroglyphic text of the prominent type carved inside bounded long columns and Cartouches of the Pharaoh carved in the top near the Pharaoh's head.



Fig.53 Wall inscription in the Philae Temple [53].

- The fifth example is a wall inscription on the external wall of the Temple of Philae for a Pharaoh offering to two Deities as shown in Fig.54 [54]. Hieroglyphic text was carved in long bounded columns covering most of the wall surface beside the scenes.



Fig.54 Inscription on the external wall the Philae Temple [54].

XIV. INSCRIPTIONS IN THE DENDERA TEMPLE

The Dendera Temple called 'Mammesi' was built by Pharaoh Nectanebo II of the 30th Dynasty (360-343 BC) at Dendera, 5 km south of Qena in the West Bank of the Nile [55,56]. We have two inscription examples from the Mammesi which is different than the Temple of Hathor which was build during the Ptolemaic Period.

- The first example is a wall inscription in the Dendera Temple recording an extensive offering symphony to the temple as shown in Fig.55 [57]. The inscription presented a queue of offering officials with extensive hieroglyphic texts describing the symphony carved in a a bounded row in the top and a large number of bounded short and long columns.



Fig.55 Wall inscription in the Dendera Temple [57].

- The second example is a a wall inscription showing Hathor sucking her son Ihy as shown in Fig.56 [58]. Around the scene a text was written using the hieroglyphic script carved in bounded long rows and bounded short and long columns in a wonderful design acting also as a decoration for the wall of the temple.



Fig.56 Wall inscription in the Dendera Temple [58].

XV. CONCLUSIONS

- The paper investigated the evolution of Mechanical Engineering in ancient Egypt through the inscription of temples during the Middle Kingdom to Late Period.
- The White Chapel built by King Senusret I in the 12th Dynasty had extensive inscriptions on most of its walls and columns.
- Pharaoh Seti I of the 19th Dynasty built a temple for Amun Ra at Karnak with inscriptions for himself and for his son Ramses II on walls and columns of the temple.
- The Karnak Temple was built by the Pharaohs of the 18th Dynasty with extensive inscriptions of the deep and prominent carving types.
- The Amada Temple was built by the 18th Dynasty Pharaohs Thutmose III and Amenhotep II. The ancient Egyptian artists could inscribe its walls and columns with colored inscriptions comprising scenes and hieroglyphic texts.
- Amenhotep III of the 18th Dynasty built his temple in the Eastern Bank of Luxor. His temple was inscribed by huge scenes and texts carved using the hieroglyphic script. Pharaoh Ramses III of the 20th Dynasty added text inscribed for himself deeply carved in long rows.

- Pharaohs Seti I and Ramses II of the 19th Dynasty established the Temple of Abydos where wonderful colored inscriptions decorated its walls and columns.
 - Pharaoh Ramses II built two temples in Abu Simbel, one for himself and the other for his wife Nefertiti. As he was a great Pharaoh, temples built by him were also great in design, size, structure and inscriptions. The inscriptions registered with scenes and texts his battles against Egypt's enemies. The design of the original sanctuary room in his Great Temple was really amazing reflecting the embracement of the mechanical, architectural and astronomical sciences of the ancient Egyptians.
 - Pharaoh Ramses II built another temple in Luxor (the Ramesseum Temple) with extensive inscriptions on its walls. He built also a temple at Abydos with colored inscriptions using scenes and hieroglyphic texts.
 - The Khunso Temple at Luxor was built by Pharaohs Ramses III of the 20th Dynasty and Nectanebo I of the 30th Dynasty. It was extensively inscribed for Pharaohs from the 20th and 30th Dynasties.
 - Pharaoh Ramses III built a temple in Medinet Habu for the Khonsu Deity. He used the temple walls to register his battles against the Libyans and the Sea Peoples. Wonderful colored scenes and hieroglyphic texts were used for this purpose.
 - Pharaoh Nectanebo I of the 30th Dynasty built the Temple of Isis at Philae and inscribed it by scenes and hieroglyphic texts of different types.
 - Pharaoh Nectanebo II of the 30th Dynasty built the Mammisi Temple at Dendera with extensive wall inscriptions using the hieroglyphic script.
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