

# Mechanical Engineering in Ancient Egypt, Part VIII: Jewellery Industry (Finger-rings from the 19<sup>th</sup> Dynasty to the Late Period)

Galal Ali Hassaan

*Emeritus Professor, Department of Mechanical Design & Production,  
Faculty of Engineering, Cairo University, Giza, Egypt*

## **Abstract**

*The objective of this paper is to investigate the evolution of the finger-rings industry in ancient Egypt during the era from the 19<sup>th</sup> dynasty to the late period of the ancient Egypt history. During this historical period ancient Egyptians continued to produce finger-rings of the swivel and solid design. The characteristics and materials are studied. The paper presents actual existing models either royal of for high officials.*

**Keywords** –Mechanical engineering history, Jewellery industry in ancient Egypt, finger-rings, 19<sup>th</sup> dynasty to late period.



**Fig.1 Bronze finger-ring of Seti I [2].**

## **I. INTRODUCTION**

The ancient Egyptians knew finger-rings from more than 5000 years. They started by solid one piece finger rings and developed through years to new designs through dynasties up to the 18<sup>th</sup> dynasty. In part VII of this research papers series, the author investigated the evolution of finger-rings in ancient Egypt starting from the predynastic period up to the 18<sup>th</sup> dynasty [1]. He presented a survey for some literature related to the subject of his paper. This is the second part of this research covering the timeline from the 19<sup>th</sup> dynasty to the end of the late period.

## **II. THE 19TH DYNASTY**

The 19<sup>th</sup> dynasty was one of the strongest dynasties of ancient Egypt. This was reflected to the technology level in producing finger-rings as we will see in the following examples:

- Fig.1 shows a Bronze finger-ring of Pharaoh Seti I, the 2<sup>nd</sup> Pharaoh of the 19<sup>th</sup> dynasty [2]. It is of one solid piece with bezel carrying information about the Pharaoh. It is in display in the Metropolitan Museum of Art.

- Now we move to the rein of Pharaoh Ramses II, the 3<sup>rd</sup> Pharaoh of the 19<sup>th</sup> dynasty and the greatest Egyptian Pharaoh who established an empire extended over three continents, Africa, Asia and Europe. We have a number of finger-ring models belonging to Ramses II carrying a lot of information about the development of the finger-rings industry in the 19<sup>th</sup> dynasty:
  - Fig.2 shows a solid ring of Pharaoh Ramses II displayed in the Brooklyn Museum of New York [3]. It is manufactured from Bronze and it is a one solid piece with bezel inscribed by the name of the Pharaoh.
  - Fig.3 shows another model of Ramses II finger rings located in the West Park Museum in Macclesfield [4]. This finger ring carries the cartouche of Pharaoh Ramses II and of the swivel type appeared in the 12<sup>th</sup> dynasty [1]. The bezel takes the shape of a scarab manufactured from a semi-precious stone The hoop is a small diameter gold wire. The joint is designed and

produced from a golden wire rapped around the hoop at its ends.

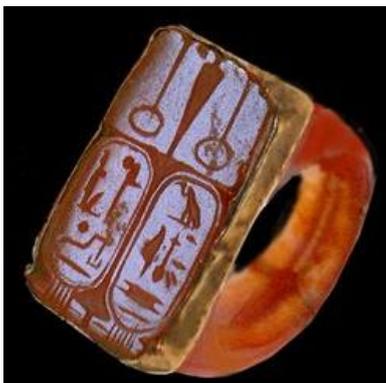


**Fig.2 Solid Bronze ring of Ramses II [3].**



**Fig.3 Swivil ring of Ramses II [4].**

- The 3<sup>rd</sup> finger-ring model is of the solid one piece type displayed in the Louvre Museum of Paris and shown in Fig.4 [5]. The whole ring is cut from a carnelian semi-precious stone and its bezel carries the cartouches of Pharaoh Ramses II and his wife Nefertiti using a silver color.



**Fig.4 Solid carnelian ring of Ramses II [5].**

- The last model of finger-rings during the era of Great Ramses II is shown in Fig.5 [6]. It shows a very sophisticated 2-horses golden

ring for Pharaoh Ramses II displayed in the Louvre Museum. The ring is of the solid one piece design. Its bezel is full of fine decorations of difficult configurations including the two horses. The hoop has a flat cross-section and decorated from inside by two parallel grooves. Its mechanical design is unique and didn't appear before.



**Fig.5 Two-horses solid ring of Ramses II [6].**

- There is one finger-ring model belonging to the 6<sup>th</sup> Pharaoh of the 19<sup>th</sup> dynasty, Amenmesse. His finger-ring is displayed in Walters Art Museum of USA and shown in Fig.6 [7]. It is of the one piece solid design casted from silver and its bezel takes the shape of the Pharaoh cartouche. The finger hole is not perfectly cylindrical but all the corners are perfectly filleted as machine design requires.



**Fig.6 Silver finger-ring of Amenmesse [7].**

- A new design of finger-rings is emerged in the 19<sup>th</sup>/20<sup>th</sup> dynasties of the new kingdom which is a sphinx finger-ring. One model of this design is shown in Fig.7 [8]. It is cut from one piece of crystal rock. This is the first time to have a finger-ring bezel carrying a sphinx. It is not known to whom does the sphinx face belong. The archaeologists have

to fill such gaps which are mainly due to the antiques robbery. All the surfaces are perfectly filleted and the finger hall perfectly circular.



**Fig.7 Sphinx finger-ring [8].**

### **III. THE 20<sup>TH</sup> DYNASTY**

This is the last dynasty of the new kingdom. We will follow the development of finger-rings during this dynasty through the available models in the different Museums in the world.

- Fig.8 shows a two ducks finger ring for Pharaoh Ramses IV, the 3<sup>rd</sup> Pharaoh of the 20<sup>th</sup> dynasty [9]. The ring is manufactured from gold and has a complex design. The bezel takes the form of two ducks. The hoop consists of 3 parallel sub-hoops with helical wires at the ends may be acting as a revolutive joint for the ducks. Another model of Ramses IV finger-rings is manufactured from silver and has a solid one piece design. It is located in Brooklyn Museum and shown in Fig.9 [10]. The bezel is inscribed by the Pharaoh data and has elliptic shape.

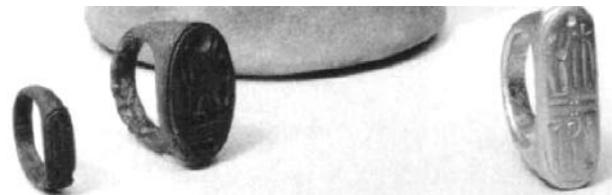


**Fig.8 Two ducks finger- ring of Ramses IV [9].**



**Fig.9 Silver finger- ring of Ramses IV [10].**

- Now, visit Pharaoh Ramses VI, the 5<sup>th</sup> Pharaoh of the 20<sup>th</sup> dynasty. We have a set of three finger-rings for Ramses VI manufactured one from gold and the other two from bronze. They are shown in Fig.10 [11]. The bezels carry the name of the Pharaoh and it seems that all of them are of the solid-one-piece type. The bezel of the ring to the right has a cartouche design, while the one in the middle has an elliptical-shape design.



**Fig.10 Finger- rings of Ramses VI [11].**

- Next we visit Pharaoh Ramses X, the 9<sup>th</sup> Pharaoh of the 20<sup>th</sup> dynasty. Fig.11 shows a gold finger-ring of Ramses X located in the Metropolitan Museum of Art [12]. It is of the solid-one-piece type and has an elliptical bezel engraved with the Pharaoh data.



**Fig.11 Finger- ring of Ramses X [12].**

- The ancient Egyptians manufactured finger rings in the 19<sup>th</sup> and 20<sup>th</sup> dynasty not only from metallic materials but also from natural and artificial materials such as faience and semi-precious materials. Fig.12 shows a set of non-metallic finger rings from the 19<sup>th</sup> and 20<sup>th</sup> dynasties [13]. They are manufactured from carnelian, feldspar, green faience and paste [13]. One of them almost has no bezel and the rest have bezels carrying the names of their owners.



**Fig.12 Non-metallic finger- rings [13].**

- A final model from the 20<sup>th</sup> dynasty is a blue faience solid finger-ring from the late period of the 20<sup>th</sup> dynasty is shown in Fig.13 [14]. It bezel takes the shape of a Pharaoh cartouche.



**Fig.13 Faience ring from late 20<sup>th</sup> dynasty [14].**

#### **IV. THE 3<sup>RD</sup> INTERMEDIATE PERIOD**

This period of ancient Egypt history covers the dynasties from the 21<sup>st</sup> to the 25<sup>th</sup> [15]. We have a number of finger-ring samples from this period as follows:

- Fig.14 shows a swivel finger-ring of Pharaoh Psusennes I, the 3<sup>rd</sup> Pharaoh of the 21<sup>st</sup> dynasty displayed in the Egyptian Museum [16]. The ring design is a typical dynasty 12 design. The bezel takes the shape of a Horus eye for protection. The eye is manufactured from lapis lazuli and all the

other parts are from gold. The helical coil around the hoop covers about 75 % of the hoop.



**Fig.14 Swivel finger-ring of Psusennes I [16].**

- Another finger-ring model of Pharaoh Psusennes I is shown in Fig.15 [13]. It is of the solid-one-piece design. The bezel carries the Pharaoh cartouche and the hoop is wide and decorated by a number of semi-precious stones over the main ring material which is gold.



**Fig.15 Solid finger-ring of Psusennes I [13].**

- Now, we visit Pharaoh Shoshenq III, the 6<sup>th</sup> Pharaoh of the 22<sup>nd</sup> dynasty. Fig.16 shows one of his finger-rings which is of the swivel design displayed in the Museum of Fine Arts at Boston [17]. It is manufactured from gold except the bezel stone which takes the form of the Pharaoh cartouche is from a semi-precious material. The helical wire on the hoop covers a small length of the hoop.



**Fig.16 Swivel finger-ring of Shoshenq III [17].**

- Another finger-ring model produced from faience and locate in the British Museum is shown in Fig.17 [18]. It is decorated from outside and it seems that it has no bezel.



**Fig.17 Faience finger ring [18].**

- A different design of faience solid-one-piece finger-rings in the 22<sup>nd</sup> dynasty is shown in Fig.18 [16]. It is displayed in the Cleveland Museum of Art. Both bezel and hoop are decorated by a Aegis of Nephthys on the bezel and flowers on the hoop. The corners are perfectly filleted not to harm the ring user.



**Fig.18 Faience finger-ring from the 22<sup>nd</sup> dynasty [16].**

- Another swivel type finger-ring from the 3<sup>rd</sup> intermediate period and located in the Metropolitan Museum of Art is shown in

Fig.19 [19]. Its bezel is manufactured from glazed steatite and the rest of the components are from gold. Its design style is from the 12<sup>th</sup> dynasty [1].



**Fig.19 Swivel ring from 3<sup>rd</sup> intermediate period [19].**

- The next model is displayed in the British Museum. It is a swivel finger-ring from the 3<sup>rd</sup> intermediate period and shown in Fig.20 [20]. The bezel is manufactured from carnelian and takes the shape of a cat setting on a base from the same material.. The hoop and journal of the revoluted joint are manufactured from gold without any helical wire around the hoop.



**Fig.20 Cat-finger-ring [20].**

## V. LATE PERIOD

The late period covers the dynasties 26 to 31 [21]. Rings continued to appear in the Egyptian society. Sample of finger-rings in this period are presented below:

- The first finger-ring model from this period is from the 26<sup>th</sup> dynasty and it belongs to Priest Sienamun. It is displayed in the Metropolitan Museum of Art and shown in Fig.21 [22]. The bezel has a rectangular shape filleted at the corners and carried the data of the Priest in three rows. The hoop

has a circular cross-section and welded to the bezel.



**Fig.21 Priest Sienamun finger-ring [22].**

- A gold solid finger ring for the Chief Steward Sheshonq in the late period is displayed in the British Museum and shown in Fig.22 [23]. The bezel takes the form of the Steward cartouche and the hoop is gradually integrated with the bezel.



**Fig.22 Sheshonq finger-ring [23].**

- Another solid finger-ring model belongs to priest of Horus Ankhwennefer during the late period. It is shown in Fig.23 [24]. It is manufactured from gold as a solid-one-piece with bezel carrying the personal data of the priest.



**Fig.23 Priest Ankhwennefer finger-ring [24].**

- Another gold finger-ring model from the late period is shown in Fig.24 [25]. The bezel has a rectangular shape with filleted corners and engraved with a cryptographic

hieroglyphic motto. It is of the solid one-piece design manufactured from gold.



**Fig.24 Priest Ankhwennefer finger-ring [25].**

## VI. CONCLUSION

- The evolution of mechanical engineering through the production of finger-rings was investigated during the time from the 19<sup>th</sup> dynasty to the late period of ancient Egypt..
- The ancient Egyptians used bronze in producing finger-rings since the rein of Set I of the 19<sup>th</sup> dynasty.
- In the rein of Ramses II of the 19<sup>th</sup> dynasty, they produced finger-rings from gold, bronze and semi-precious stones. Most of the finger-rings during this rein were of the solid-design. However, the swivel-design was also applied. A new model was designed with bezel carrying two gold horses with a highly decorated bezel.
- In the rein of Amenmesse, they used silver in producing solid-finger-rings.
- In the 19<sup>th</sup> / 20<sup>th</sup> dynasties era, they manufactured a sphinx finger-ring from crystal. Its design was amazing from mechanical engineering point of view for its accuracy, surface finish and fillets.
- A new design appeared in the rein of Ramses IV of the 20<sup>th</sup> dynasty where the bezel carried two ducks and the hoop consisted of three parallel sub-hoops. During this rein, gold and silver were used to produce solid finger-rings.
- In the era of Ramses VI of the 20<sup>th</sup> dynasty, solid finger-rings continued to appear using gold and bronze materials.
- Solid finger-rings continued to appear during the rein of Ramses X of the 20<sup>th</sup> dynasty.
- Non-metallic materials were used in the production of finger-rings during the 19<sup>th</sup> and 20<sup>th</sup> dynasties with inscriptions on their bezels.

- Swivel design of finger-rings existed in the 3<sup>rd</sup> intermediate period during the reign of Psusennes I of the 21<sup>st</sup> dynasty and Shoshenq III of the 22<sup>nd</sup> dynasty.
  - Highly decorated solid rings were designed and produced during the reign of Psusennes I (21<sup>st</sup> dynasty) and the 22<sup>nd</sup> dynasty.
  - A finger-ring design with carnelian cat-bezel took place in the 3<sup>rd</sup> intermediate period with swivel characteristics.
  - In the late period, the swivel design of finger-rings disappeared and all the models surviving were of the solid-one-piece design. The models presented during this period were not royal but for high officials. All of them were produced from gold and had bezel inscribed by wearer personal data.
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