

Treatment of Findings from the Site of the New Kingdom (the South of Saqqara) Leiden and Turin Excavation (Spring 2015)

Hassan Abdallah HASSAN*, Basma ZAGHLOL** and Ashraf Youssef EWAIS***

[Abstract]

The necropolis of Memphis, Saqqara, is a famous ancient Egyptian Heritage site that was a religious capital throughout ancient Egyptian history and has monuments dating from the First and Second Dynasties to the Coptic era. It is located to the southwest of Cairo, the current capital of Egypt, and to the south of the Giza area famous for the sphinx and great pyramids from the Fourth Dynasty. Many foreign missions have been working in Saqqara for a long time as there are many places that have tombs from the New Kingdom. The site to the south of the Unas pyramid has been excavated by an English mission and more recently by a Dutch mission. In the spring of 2015, the Leiden and Turin Excavation mission started and has discovered the remains of anonymous tombs, some limestone blocks, and a limestone statue of Horus the falcon, all of which need to be conserved. Urgent conservation work was done at the excavation site to support the flaking layers, after which the statue and limestone blocks were taken to a conservation lab where mechanical and chemical cleaning were conducted. The XRD analyses showed that the main components of the limestone statue and the limestone blocks was calcite (CaCO_3) and the red pigment was Hematite (Fe_2O_3). Injections with treated lime were used to fix and support the separated layers from the statue of Horus; however, as the surface of the statue was fragile, it was consolidated using a 1–1 mixture of Nano lime and ethyl silicate. The limestone block fragments were glued together using steel bars and Epoxy 1306.

1 Introduction

Saqqara is one of the most important heritage sites in Egypt. It is located about 28 km southwest of Cairo on latitude 29°51' North and longitude 31°51' East. (Jeffreys, D. G 1985) Saqqara

* Supervisor of Saqqara Conservation Administration, Ministry of Antiquities, Egypt

** Conservator in Saqqara Conservation Administration, Ministry of Antiquities, Egypt

*** General Director of Saqqara Conservation Administration, Ministry of Antiquities, Egypt

is also known as a large ancient funerary land in Egypt because of the religious significance of the graveyard god (Sokar), from whom the name of Saqqara is derived; however, Arabic historical tales say that the word “Saqqara” was the name of an Arab Bedouin tribe living in the area in the middle ages. (Selim Hassan, 1992) Saqqara is the necropolis of Memphis, the capital of Egypt during most of the Old Kingdom, and has been considered a historic, religious site since ancient Egypt. As several important people in ancient Egypt built their tombs in Saqqara, there are many tombs from the Old Kingdom, the most famous of which are the tombs of Mereruka, Ti and Ptahhotep. (N. Kanawati and M. Abder-Razik, 2000)

There are also many tombs from the New Kingdom. Even though the capital of Egypt was in Thebes (currently Luxor) during the New Kingdom, many great officials and nobles still chose to build their tombs in Saqqara, so there are many places in Saqqara that contain tombs from the New Kingdom such as the Bubasteion site t discovered by the French Egyptologist Alain Zivie. The most famous tombs in Bubasteion are the tomb of Mai, the step mother of the King Tutankhamen, and the tomb of Nemtymes, an ambassador at the time of king Ramses the second. There are also two sites in the south of Saqqara: the first site is the Cairo University excavation site and the second is the English and Dutch mission site, which is also the largest and the most important New Kingdom site in Saqqara because there are many tombs such as that of Horemheb, who was the leader of the army (at the time of king Tutankhamen) and later the king of Egypt and the tomb of Maya, who was the treasurer to King Tutankhamen. (H. D. Schneider, 1996) These tombs amongst others were discovered in May 2015 by a joint excavation, by the Egypt Exploration society in London and the National Museum of Antiquities in Leiden under the auspices of the Supreme Council of Antiquities of Egypt. The excavation was carried out in cooperation with the Leiden Museum of Antiquities and Leiden University and the Egyptian Museum at Turin, the excavation lasting from only May 4th to May 26th 2016. The excavations also found the remains of an anonymous tomb and some other items that required conservation.

2 The Movable Findings from the Excavation

While clearing the floor during the excavation, a large shaft was found to the west of the chapel in the tomb of Tatia, in which about 1m under the level of the limestone rim lay a gravel floor, causing speculation that it may belong to an earlier age. While cleaning the shaft many reliefs were revealed belonging to different tombs, among which was a fragment from the tomb of Meryneith that shows the owner of the tomb worshipping one of the gods in the fields of Iaru. There are other fragments, some of which form a slab from the south wall of the tomb of Tatia. A statue of a falcon was also found above

the top lying on its side in loose sand and rubble. (Preliminary report on the Leiden-Turin Excavations at Saqqara, Season 2015)

2.1 The Statue of the Falcon

As mentioned, a statue of a falcon carved from limestone was found on its side in the loose sand and rubble. There is a kneeling person in front of the falcon legs who may be depicting a king; however, in similar group statues, important individuals don't usually face the god. Even though there were few statues of sacred animals in the necropolis of the New Kingdom, examples have been found in other places, such as the statue of a bull and a person (may be Ramses II) in the tomb of Nemtyemes and the fragment of a bull statue found in the vicinity of the south chapel in the tomb of Tai, who was probably devoted to the cult of the god Apis. Unfortunately, the statue of the falcon with the person bowing to it were not in good condition and there are no inscriptions to indicate the name of the king. (Preliminary Report on the Leiden-Turin Excavations at Saqqara, Season 2015) The dimensions of the statue are about 130 cm × 120 cm × 40 cm.

2.2 A Broken Slab from the South Wall of the Tomb of Tatia

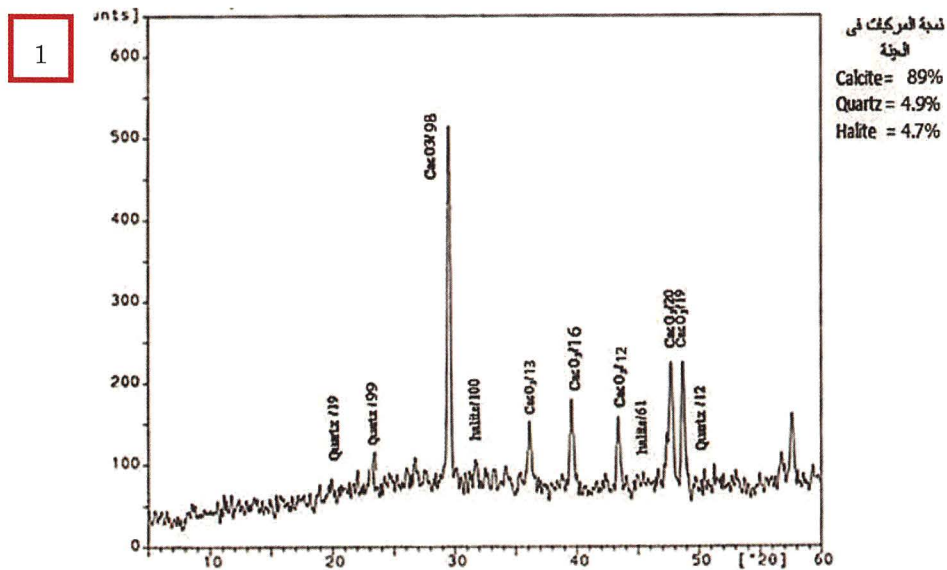
In the same shaft, a broken carved limestone slab was found which came from the south wall of the tomb of Tatia. The slab had been broken into four different-sized fragments and depicts a seated couple with a nude child standing under the chair. On the upper part, there are nine hieroglyphic lines under an inscription in which red pigment still remains. (Preliminary Report on the Leiden-Turin Excavations at Saqqara, Season 2015) The dimensions of the biggest fragment were about 80 cm × 60 cm × 18 cm.

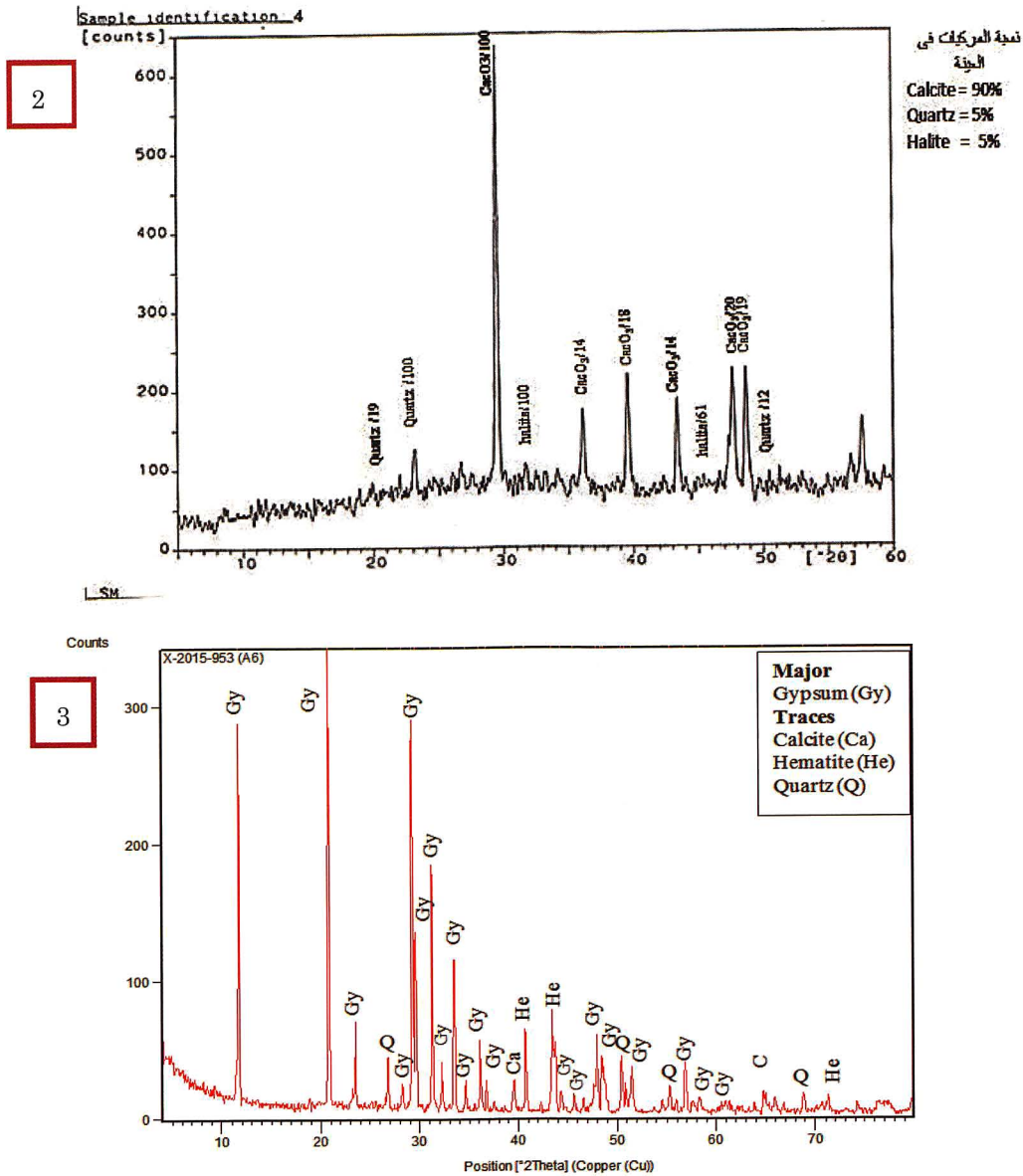
3 Methods and Materials

XRD analyses were used to identify the components of the limestone used for the falcon statue and slab and to identify the red pigment. A USB digital light optical microscope was used to examine the difference between the surface of the stone before and after the consolidation with Nano lime and to examine the red pigment before and after consolidation with Paraloid B72. Nano lime was used to consolidate the fragile surface limestone of the falcon statue and 3% Paraloid B72 and treated lime were used for the injections needed to fill the spaces between the fragments.

3.1 XRD Analyses

It was necessary to identify the components of the limestone so as to choose the best products for the consolidation. It was also important to identify the components of the pigments so as to choose the best product to consolidate the pigment to allow historical information to be recorded. The XRD of the limestone in the falcon statue identified calcite as the main component along with quartz and halite (Fig. 1). The XRD of the slab also identified calcite as the main component of the limestone with quartz and halite (Fig. 2). These two analyses showed that the limestone components were nearly the same and differed only in quantity, meaning that the limestone for both the statue and the slab may have come from the same place. The XRD of the red pigment found that it was hematite (Fe_2O_3) (Fig. 3), which was the same pigment that had been used in most ancient Egyptian monuments and antiquities.





Figs. 1, 2, and 3 The XRD sheets for the falcon statue and slab limestone and for the red pigment

4 Conservation and Restoration Work

Conservation and restoration are processes done by specialists to treat and preserve monuments and antiquities as evidence of human civilization. Restoration started in early history, with the Egyptian Khaemwaset being the first restorer. He was the son of king Ramses the second and he restored and conserved many of his ancestors in different places in Egypt. In Saqqara, on the southern façade of the Unas pyramid, he wrote down the work that he had done to restore and preserve the pyramid. Restoration and conservation work is subject to many rules from global organizations such as UNESCO and ICROM.

4.1 Conservation of the Falcon Statue

4.1.1 Forms of Deterioration

When the limestone falcon statue was discovered amidst the sand and rubble, it was obvious that the statue was in poor condition as it was covered with salt and a disfiguring crust. The surface of the statue was fragile and flaky in some parts and some of the layers had separated; therefore, it was necessary to conduct urgent restoration work at the site to fix and support the crumbling layers before transferring the statue to the conservation lab to complete the conservation work.



Figs. 4-9 The deterioration on the statue of the falcon, flaking, the sand and salt that covered the surface, and the surface erosion

4.1.2 Conservation and restoration work

As the statue had many problems because of the flaky layers, it was necessary to first fix those layers before transferring the statue to the conservation lab. A lime-based temporary mortar with a 1-

2 lime and sand mix was prepared to fix the loosened layers in places, after which the statue was transferred to the lab where the conservation work was completed. In the lab, general cleaning was the first process to remove the dust, sand, and salt. This was first done using mechanical cleaning with brushes and fine tools so as not to harm the statue surface and to maintain the patina. Then, with a mixture of 1-1 ethanol and water, the statue was chemically cleaned using cotton pads to remove the crust. The XRD analysis of the limestone in the statue indicated that the main component was calcite with small amounts of quartz and halite; therefore, a mixture of Nano lime and ethyl silicate was used to consolidate the statue because it is the best for limestone that contains quartz. (Ashraf Youssef and Mohamed Kamal 2015) The temporary mortar used on site to fix the flaky layers was removed and replaced with a lime based mortar mixed with 5% Acryl AC 33 matching the color of the statue figures from 10 to 21.



Figs. 10-21 The conservation and restoration work done on the falcon statue

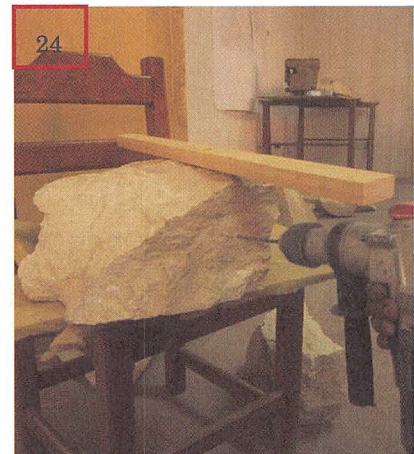
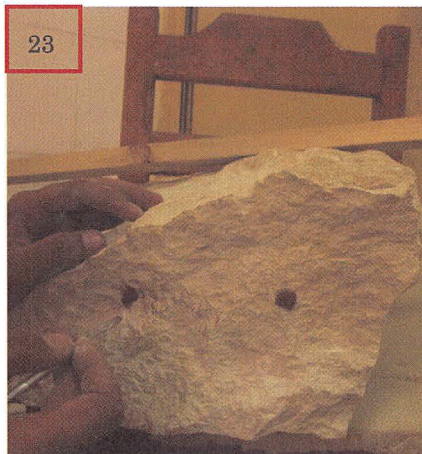
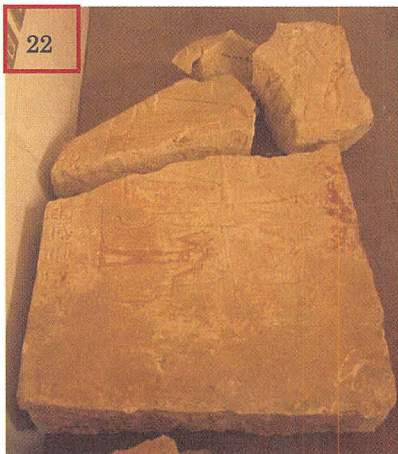
4.2 Conservation of the Limestone Slab

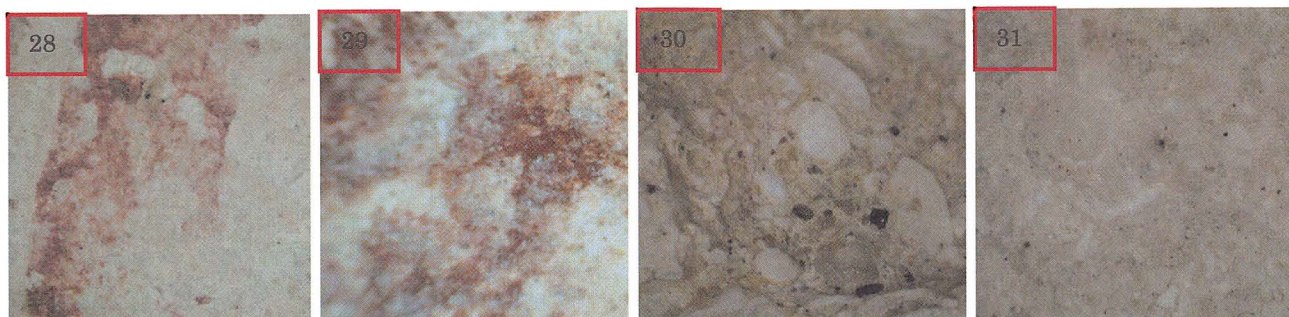
4.2.1 Deterioration

The limestone slab had been broken into four differently shaped and sized pieces, the biggest of which was about 80 cm × 60 cm × 18 cm. There were also missing parts in the red pigment and the red pigment itself needed to be consolidated as it was faded and fragile and there were missing parts on the edges.

4.2.2 Conservation Work

Mechanical and chemical cleaning was first done on all four pieces with the chemical cleaning using a 1-1 ethanol water solution. The four pieces were then glued together one by one using steel bars and Epoxy 1306, the red pigment was consolidated using Paraloid B72 3%, and the gaps and missing parts between the four pieces were filled in using a 2-1 sand lime based mortar and 5% Acryl AC33, as shown in figures 22 to 31.





Figs. 22-31 The conservation and restoration work of the slab

Figs. 28-31 The USB digital light optical microscope pictures of the red pigment before and after consolidation and the limestone of the falcon statue before and after the consolidation using Nano lime and ethyl silicate

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