

# Treatment and Conservation of the Statue of Nefer from the Czech Mission Excavations in Abusir Area

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## [Abstract]

The Czech mission in Abusir had a successful archaeological season in 2012. They discovered a tomb of Nefer, where they found more than ten limestone statues of Nefer. Nefer was a great official in the time of the king Neferirkare of the fifth dynasty.

One of the statues had a broken head. The Saqqara Administration for the conservation and Restoration Antiquities used one material for treatment and conservation of the unique statue. This material is Paraloid B72, which is usually used as a consolidant and is a reversible material used for different purposes.

## 1 Introduction

Abusir is one of the most important archaeological areas in Egypt. It is located on Latitude 29.56 north and the Longitude 31.13 east (The Survey of Memphis, 1985, p. 4). Abusir has many tombs from the fifth dynasty because Abusir was the home of the all the kings of the fifth dynasty (Verner, 2001). Abusir has also some of the tombs from the Late Period.

## 2 The Archaeological Work in 2012

### 2.1 The Activities of the Czech Mission

The Czech mission has been working in Abusir for more than three decades. In 2012, they made a important discovery of the tomb of Nefer, who was an important official and scribe of the north and the south houses in the time of king Neferirkare.

### 2.2 Statue of Nefer

A statue (reg. no. 2633, excav. No. 149c/AS68/2012) is a striding Nefer, wearing a striated wig and a pleated kilt. The statue base measures 26×46×7 cm and the statue itself is 82 cm high. The sunk inscription on the statue base reads: "Overseer of Scribes of the Crews, Well-provided before the Great God, Property Custodian of the King, Before his Lord, Nefer" (Egyptian Archaeology 43).

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### 3 Method and Materials

XRD was used to investigate the components of the stone of the statue, and to analyze its red and black colors. A digital microscope was used to choose the right solvent with the consolidant.

### 4 Mechanism of Limestone Deterioration

Limestone deterioration occurs due to four main basic groups of reaction. It is obvious that physical degradation is caused by the action of water, temperature variation and abrasion, and also physicochemical mechanisms involving recrystallization of soluble or semi soluble salts without associated chemical change. Chemical reactions are initiated by normal constituents and pollutants (Evin Caner, 2011).

Atmosphere, ground water and finally microbiological activity also causes direct physical damage on the surface of the monument. Of course, the deterioration factors that affect the limestone usually work together, and then the deterioration can be complicated and needs to be studied carefully before starting the conservation and restoration work.

### 5 Paraloid B72

Paraloid B72 is one of the most common consolidants that are used in the field of conservation and restoration. It is an ethyl-methacrylate copolymer. It is soluble in many solvents such as ethanol, acetone, xylene and toluene. It is also soluble in mixture of two or more of these solvents (Museum of Fine Arts, Boston, 2012).

The mixture of different solvents with various properties usually is used to alter the work time and to produce different characteristics such as the hardness and flexibility that may be needed in some cases (Stephen Koob, 1986).

Paraloid B72 has many advantages as consolidant. It is harder and stronger than older consolidants such as polyvinyl acetate. However, it is less brittle. As an adhesive, it is more flexible, stressable and strainable on a joint than most other adhesives. One of its drawbacks is that it cannot be used in high humidity places (A. Phenix, 1992). It should be used in low concentration and locally. It becomes darker if it is used in high concentrations.

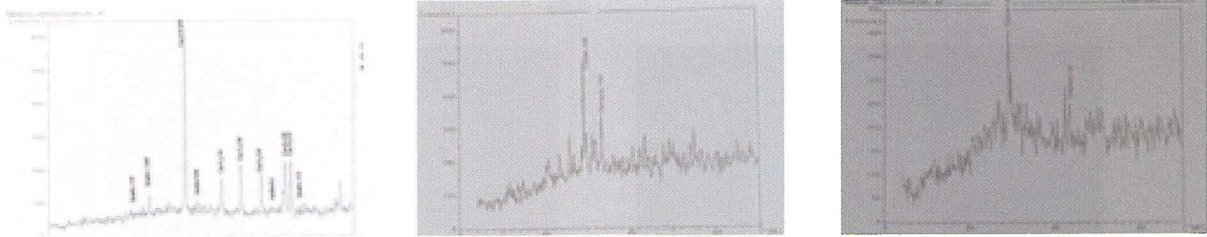
### 6 The State of the Statue before Conservation

The statue was covered in dirt: mostly sand, mud and salts. Its head was broken at the end of the neck. The wig is unique because it has two wooden parts near the ears, and both parts were separated. The statue has preserved its two main colors: black for the wig, the base and the backside of the stand, and red for the body and the face, whose colors were fragile.

## 7 Analyses

X-ray diffraction analyses were needed to know the components of the limestone and the colors. The XRD chart of the limestone shows that the main mineral in the sample is the calcite and there are quartz and halite in small quantities that show two things:

- 1- The kind of limestone of the statue is an excellent grade.
- 2- The limestone of the statue is similar to the limestone of the Naos statue at the entrance of the tomb.



Results are shown in the table below.

The limestone XRD analysis:

CaCO <sub>3</sub> 90%	Si 5%	NaCl 5%
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The XRD color analysis:

Black	Graphite
Red	Hematite

## 8 Conservation and Restoration Work

### 8.1 Cleaning

Cleaning was the first step of this conservation work because the surface of the statue was covered with much dirt (sand and mud) as it was found buried underground. Mechanical cleaning with fine brushes without scratching was necessary because the colors were so fragile.

The statue was given a chemical cleaning with water and ethanol one by one. Tests of the cleaning showed a soft touch should be used in the cleaning.

## 8.2 Consolidation of the Colors

It was necessary to consolidate the colors before working on fixing the separated parts (the head and the two wooden parts of the wig near the head) because the colors were so fragile and might be lost with much handling.

As the statue will be in storeroom or shown in a museum, the temperature and the humidity should be stable or controlled.

Samples of the red color were applied B72 2% in acetone and the surface of the color became shiny and dark. Next, B72 2% in acetone and alcohol 1-1 were used and provided a good result. Then, it was applied twice to consolidate the colors.



B72 in acetone



B72 in acetone and alcohol

## 8.3 Fixing the Separated Parts

### 8.3.1 The Head

The head weights about 3 kg and it was broken at the end of the neck. It was necessary to use a bar of fiberglass or steel. With no fiberglass bars 8 or 6 mm at that time, 8 mm steel bar was used. B72 50% was used as adhesives and the same concentration with limestone powder from drilling was used as filler.

### 8.3.2 The Two Parts of the Wig

It is unusual to find two parts of a wig made of wood near the ears on both sides of the head. There were two holes in each part, and there were two holes in the head to fix the two parts. The wooden nails that were used to fix the two parts had been lost.

Wooden nails were made to fix the two wooden parts by using B72, 50%.

### 8.3.3 The Packing

It was necessary not to leave the statue in the storeroom on metal shelves. Therefore, a wooden box was made in the same size as the statue and it was lined with blue foam. Next, silica gel was put in a cloth bag. The box has two covers; one is transparent made of polycarbonate, and the other is made of wood.

#### 8.3.4 The Conclusion

The limestone of the statue is high quality. However, it has other minerals as well. The colors are the same colors the ancient Egyptians used.

The main material that was used is Paraloid B72 in different concentrations in the consolidation of the colors as adhesive and as filler with limestone powder.

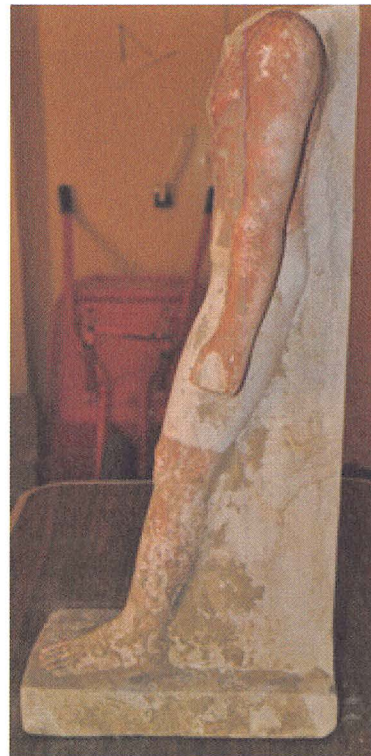
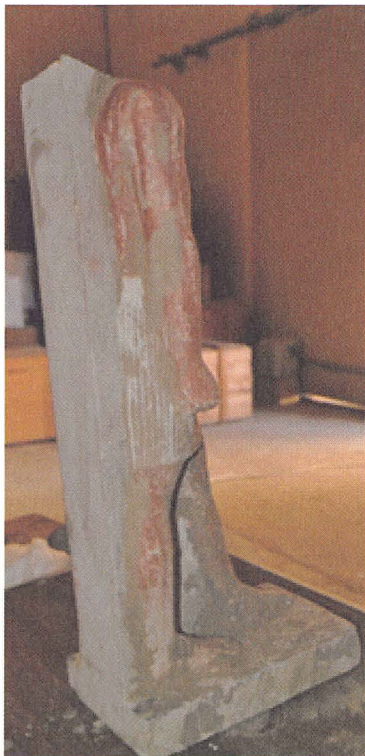
#### Acknowledgements

Thanks to the staff of Saqqara Conservation and Restoration Administration.

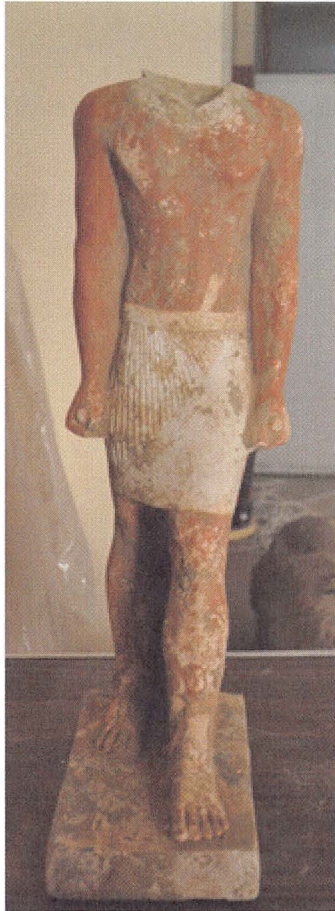
Thanks to the Czech mission in Abusir that has helped me greatly.

Thanks to the staff of the storeroom in Saqqara who has also greatly helped me.

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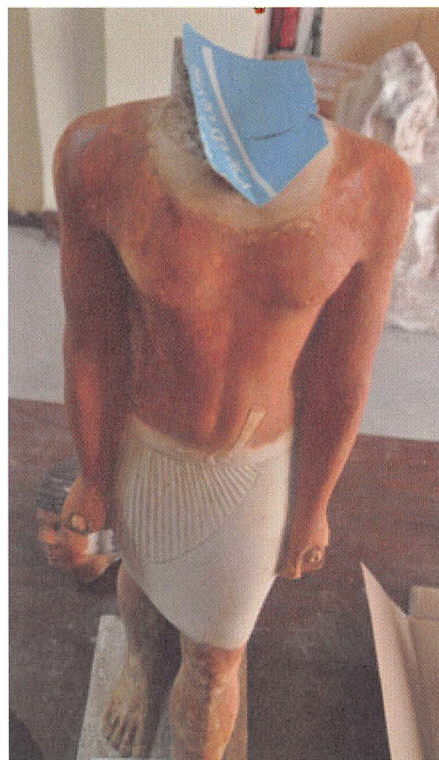
Both the left and the right sides before conservation



The front and the back before conservation

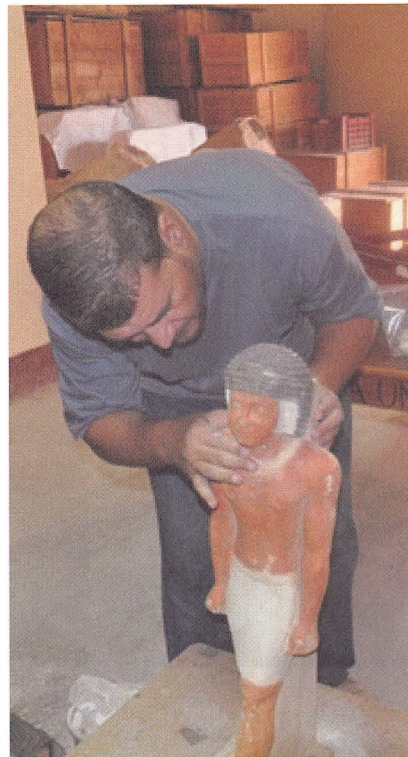
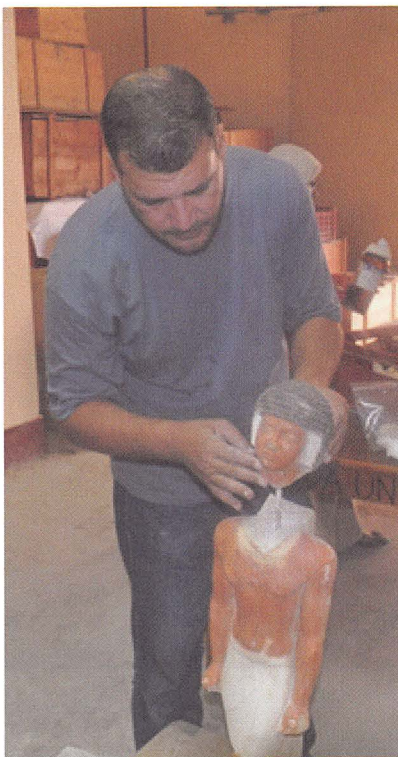


The head and the body before conservation

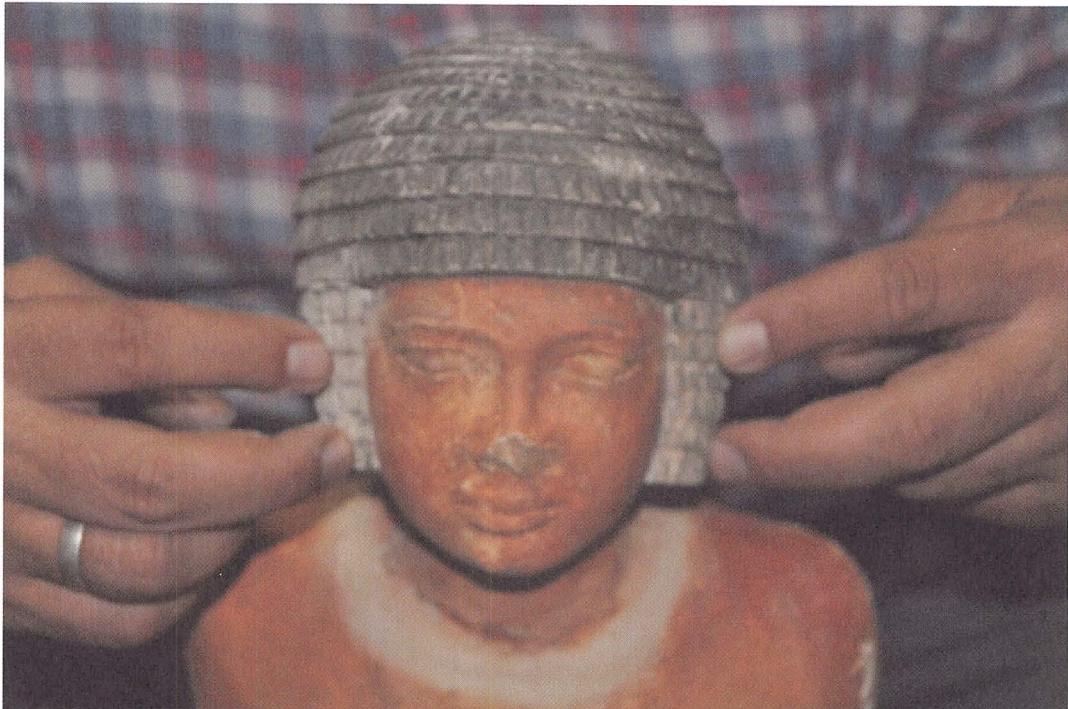
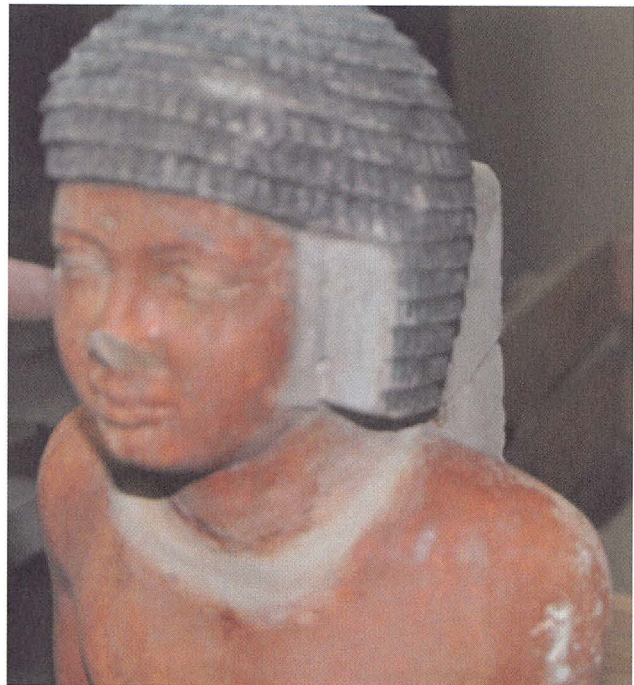
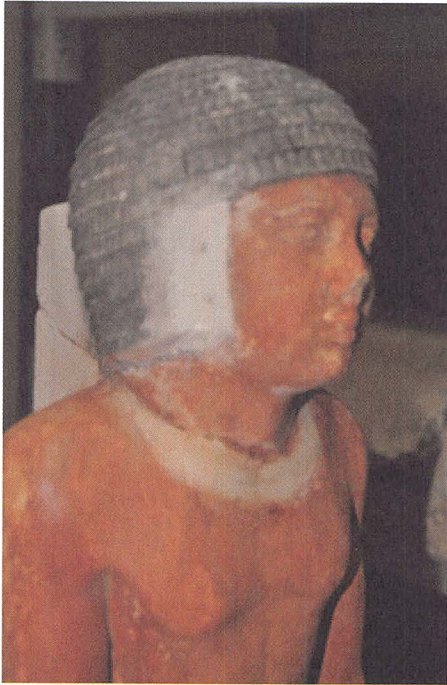


Preparing to fix the head

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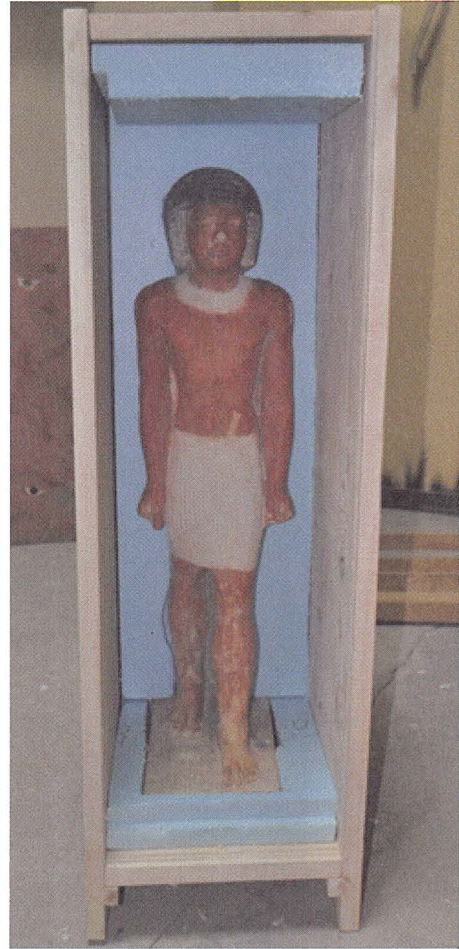
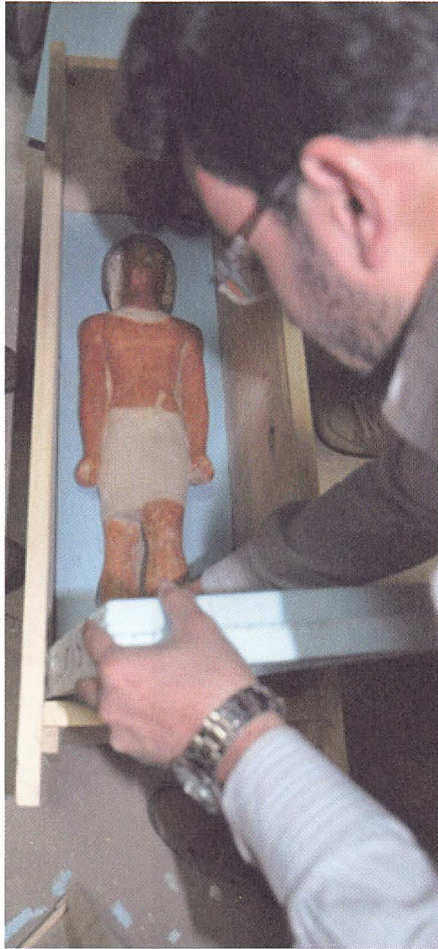
Fixing the head

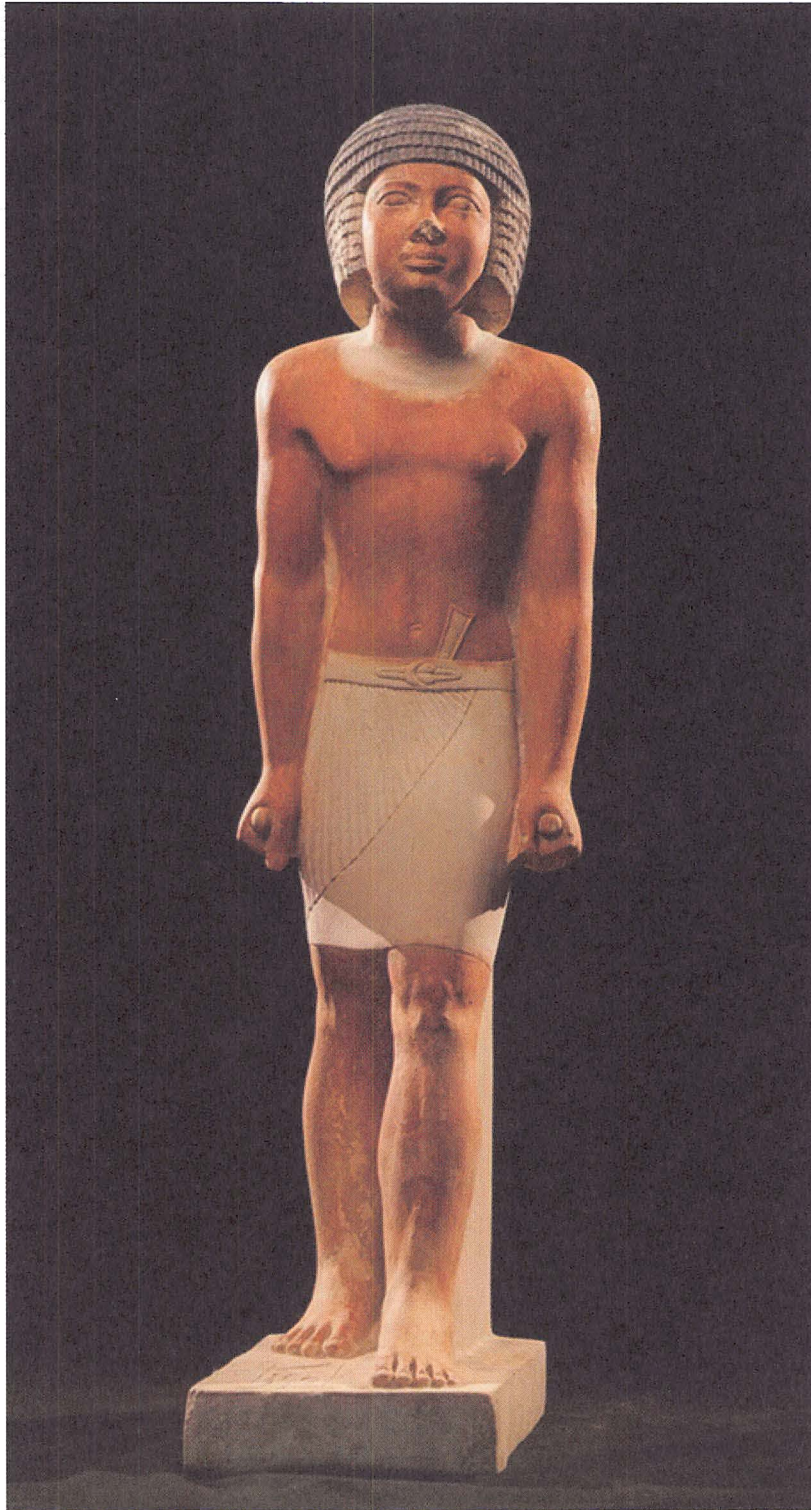


Fixing the two parts of the wig



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After conservation

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