

Egyptology at the Dawn of the Twenty-first Century

Proceedings
of the Eighth
International Congress
of Egyptologists
Cairo, 2000

• Volume 1
• Archaeology

• With a preface by Zahi Hawass

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Volume 1
Archaeology



Edited by
Zahi Hawass

In collaboration with
Lyla Pinch Brock

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Preface

Zahi Hawass

The Eighth International Congress of Egyptologists, held in Cairo in March 2000, marked the opening of the new millennium as an opportunity to evaluate and redefine the focus and goals of Egyptology in the twenty-first century. Through the Millennium Debates and the papers of other participants published here, we are made aware that now more than ever, Egyptology is facing a period of change and challenge and we must meet these challenges if our field is to remain relevant to the modern world. The Congress was attended by some 1,400 scholars, and of the 400 papers delivered, 248 were selected by our scientific review committee to be published in these volumes. It is notable that this Congress included a higher number of Egyptian Egyptologists than we have seen in many years. In fact, some 500 Egyptian Egyptologists attended the conference. Their inclusion with the more well-known names in Egyptology is an indication of one of the frequently mentioned themes in the Congress: the need for education and training of more Egyptian scholars and excavators to study and maintain their country's monuments as part of the world's heritage.

The enormous quantity of submissions to the Proceedings led to the decision to publish them in three volumes. Volume One contains all the archaeology papers; Volume Two, those dealing with history and religion; and Volume Three covers the topics of language, literature, museology, and conservation. Each volume of these Proceedings opens with the text of the corresponding Millennium Debates and their respondents, and the papers of the specific subjects follow in alphabetical order by the contributor's name.

The Millennium Debates formed a special focus for this Congress. Chaired and responded to by eminent experts in the field, the Debates covered archaeology, art, history, language, literature, museology, religion, site management, and conservation. In his paper (opening the Debates in Volume One) on "Egyptology in the Twenty-first Century," David O'Connor provides a cogent summary of the trends in field work in Egyptology in the last forty years and discusses three points crucial to the future of Egyptian archaeology: the changing attitudes of Egyptians toward

their archaeology, the need for comprehensive mapping (rather than excavation) of the national archaeological landscape, and theoretical issues and their impact on archaeology, epigraphy, and other scholarly disciplines.

Volume Two continues with keynote speakers addressing the Millennium Debate issues of history, art history, and religion. In his paper, "Writing the History of Ancient Egypt," Donald B. Redford challenges the appropriateness of new approaches to historiography such as retrospective economic theory, Egyptology as anthropology, deconstruction, and 'history from below,' as he characterizes the tendency to use anecdotal evidence to draw far-reaching conclusions about the 'common people' in Egyptian history. Edna R. Russmann, in her contribution to the Millennium Debate on the study of the art of ancient Egypt laments the failure of Egyptian art scholarship to coalesce into a recognized subdiscipline with an academic tradition of acknowledged interests and methods of its own. She goes on to give a summary of the most urgent needs facing the study of Egyptian art as well as possible solutions. In the last Millennium Debate paper in Volume Two, Herman te Velde writes on "The History of the Study of Ancient Egyptian Religion and its Future," which he considers one of the most urgent topics in Egyptology today, since the core of ancient Egyptian culture is its religion. He speculates that although Egyptologists with various special interests will contribute to the study of religion, the most progress should be expected from those willing to focus their research specifically on religion and its accompanying issues, such as polytheism versus monotheism, pharaonism versus local religions, and religion in life as well as death.

Perhaps the most challenging of Millennium Debate papers come in Volume Three. John Baines' comprehensive examination of the current and future possibilities for research on Egyptian literature is complemented by Antonio Loprieno's notes on the problems and priorities in Egyptian linguistics. Baines provides extensive analysis and definition of the Egyptian literary corpus, its relation to the wider stream of tradition and range of written forms, and the social and ideological situation and status of what was written. Loprieno concentrates on the achievements of Egyptian linguistics over the last fifteen years and considers the impact of recent developments in linguistic research on Egyptian phonology and lexicography. Regine Schulz's paper, "Museums and Marketing: A Contradiction" is a timely examination of the pressures facing museums around the world to provide "blockbuster entertainment" while maintaining their five basic mandates of collecting, preservation, research, presentation, and mediation. Finally, my own contribution to the Millennium Debates, "Site Management and Conservation," addresses some of the principal problems and threats to the conservation of Egyptian heritage sites and makes recommendations, some perhaps controversial, for improving site management methods and protection as well as giving suggestions for salvage and excavation over the next ten years.

In addition to being a forum for debate and report, the Congress honored several prominent Egyptologists for their outstanding contributions to the field, including Abdel-Aziz Saleh and Sayed Tawfik from Egypt; Harry Smith of England; William K. Simpson from the United States; Rainer Stadelmann from Germany; Jean Leclant of France; Sergio Donadoni from Italy; Kazimierz Michalowski of Poland; and the late Gamal Mokhtar, former Chairman of the Antiquities Organization of Egypt and Member of the Supreme Council of Culture.

I took great pride in the many complimentary comments I received regarding the organization and success of the Eighth International Congress of Egyptologists, but credit for this must be shared with the many people whose efforts made that success possible. I would like to thank the members of the different committees who planned and executed the many aspects involved in holding such a large conference. The Congress was held at the Mena House Oberoi Hotel in

the shadow of the Giza Pyramids and thanks to its General Manager, Rajiv Kaul, everything ran smoothly in the day-to-day operations. The Congress would also not have been possible without the financial support of many Egyptian business corporations. Another important contributor was the American University in Cairo Press. Its director, Mark Linz, and the Press's editorial staff were of great help in completing the Congress's mission by publishing the Abstracts, edited by Angela Jones, and of course these final three volumes of Proceedings edited in collaboration with Lyla Brock.

In conclusion, I would urge the International Association of Egyptologists to review and expand its activities in the future, with the aim of making itself better known to the general public and potential sponsors. This would enable it to raise the funds to undertake and complete valuable projects, many of which are discussed in these volumes. I would also urge that scientific studies and research programs should be geared less to the personal interests of the researcher, but should follow an overall action plan targeting those areas where monuments are especially endangered, such as the Delta and the great deserts of Egypt. I believe that all who participated in the Eighth International Congress of Egyptologists and all those who read these volumes of Proceedings will take wise and positive action in regard to these concerns.

Consolidation and Restoration of Monuments and Sites: Tomb No. 1703, Anch-Ib, Western Cemetery, Giza Plateau

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The aim of the work was to discover suitable techniques and materials for the consolidation and restoration of a mud-brick monument (Tomb of Anch-Ib, Western Cemetery). The experimental materials used were Befix (acid mineralic hardener for natural silicates) and Namex (complex of an organic polymer with silicate chemical-reactive groups in aqueous solution). Two methods were tried, namely surface coating and surface brushing. These gave good results for restoration and consolidation. The results showed no change in the physical and chemical properties of the treated materials.

Introduction

Consolidation is the physical addition or application of adhesive or supportive materials into the actual fabric of the monument in order to ensure its continued durability or structural integrity. Restoration is intended to revive the original concept or legibility of the object. Damage and destruction to the tomb caused by humidity, chemical agents, and all types of pests and microorganisms must be stopped in order to preserve the object or the structure. The consolidating materials that used were Namex and Befix. Namex was used in one of the most damaged parts of the tomb as consolidating material to complete the missing parts. The missing parts must integrate harmoniously with the whole but at the same time must be distinguishable from the original, so that restoration does not falsify the artistic or historic evidence. Befix has also been used for the consolidation of other parts of the tomb. Two methods have been used, namely surface coating and surface brushing. The efficiency of any material depends mainly upon the properties of the monuments and its stage of deterioration, as well as the properties and chemical composition of the consolidating materials. The consolidating materials chosen for their preservation should not change the physical and chemical properties of the treated materials.

The Experiment

Two techniques were used for the consolidation and stabilization of mud brick (adobe) namely, brushing with Befix and coating with Namex. Part of the mud brick of the tomb was brushed with diluted Befix starting with 1:5, 1:3, 1:2, and finally a 1:1 solution of Befix to limewater. The first treatment must always be preceded by thorough mechanical cleaning and drying of the surface. A mixture of Namex cement and sand was used to coat most surfaces of the tomb. The Namex mixture was prepared by thoroughly mixing sand, cement, and Namex in the proportion of (1:1:0.3) and water. The mixing of Namex with cement resulted in a new silicate material of high-quality performance.¹

The analyses carried out before and after treatment were:

- 1) Percentage of porosity was determined using Porosimeter 2000
- 2) Calculation of percentage of water absorption
- 3) Determination of pH values
- 4) Mineralogical and elemental analyses were determined using X-ray diffraction,² and the scanning electron-microscope (SEM) ³

Results and Discussion

Description of the tomb

The tomb is rectangular in plan. Its dimensions are 36 x 15 x 12 m. It is built of mud brick and has two shafts. The eastern wall of the tomb has three false doors. The first one has a small depression 26 cm wide. On the upper part of the false door there are two limestone steps. The upper step carries the name of the wife (Khentytes). The lower step is in the shape of a half-circle and carries the name of the owner (Anch-Ib). The upper part of the false door was destroyed. The third false door (south) has a step from limestone. There is an inscription indicating the name of the owner (Anch-Ib) who was an Overseer of Workmen. The tomb dates to the early Fifth Dynasty.⁴

Physical characteristics

- 1) The total porosity, measured by Porosimeter 2000, reached 37 percent before treatment and decreased to 22 percent after treatment with Befix and seven percent after treatment with Namex.
- 2) The percentage of water absorption reached 7.6 before treatment and 7.4 after treatment with Namex.

Chemical and Mineralogical Analyses

1) pH Value Analysis:

The pH value reached 12.6 before treatment and 12.7 after treatment with Namex, while in the case of Befix, there was no change in pH value.

2) X-ray Diffraction Analysis:

a. The X-ray diffraction pattern of the treated mud brick sample from the tomb of Anch-Ib is presented in figure 1a. It indicates that free quartz SiO_2 is the predominant mineral, followed by mainly calcium carbonate, traces of dolomite, and a minor amount of clay mineral, namely montmorillonite, albite, kaolinite, and illite in decreasing order.

b. This mineralogical composition did not change with treatment as detected from the X-ray diffraction pattern (fig. 1b).

3) Scanning Electron Microscope (SEM) Analysis:

The scanning electron microscope (SEM) plategraphs and analyses were carried out on sam-

ples of mudbrick before and after treatment. Different spots were tested and showed the following results:

a. Plate 1 shows the fabric of treated material before treatment. Notice the wide interconnected chambers between the unsorted subangular grains. Some pores are filled with fine material, i.e. clay. Rounded quartz grains are embedded in the clay matrix.

b. Platemicrograph of the sample after treatment with Befix in Plate 2, shows a network on the edge of the sample. The same plate shows the penetration of the treated material (Befix) through pores, binding the different grains and the blocks of the mud brick samples, leaving open passages for air and moisture. It can be noted that Befix produced a natural solid binding material without making any morphological changes in the treated materials.

c. Plate 3 is a platemicrograph of the sample after treatment with Namex showing the coating materials (Namex), consolidating and binding the grains of the mud brick sample.

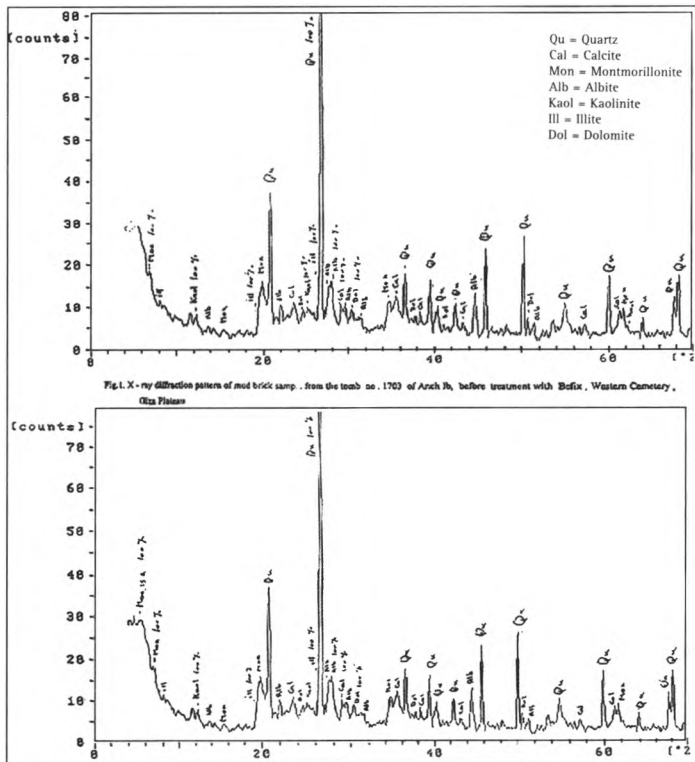


Figure 1

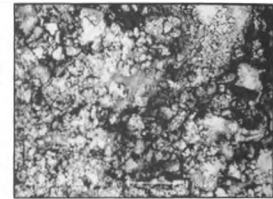


Plate 1

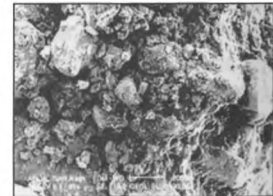


Plate 2

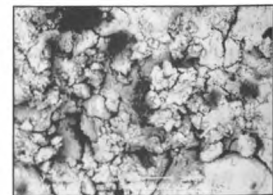


Plate 3

Conclusions

The consolidating materials selected to preserve the deteriorated mud brick of tomb no.1703, Anch-Ib, Western Cemetery, Giza Plateau, are Befix and Namex. Befix is the commercial name for an acid mineralic hardener for natural silicates, i.e. a siliceous solidifying agent, and Namex

is the commercial name of a complex of organic polymer with silicate chemical-reactive groups in aqueous solutions.

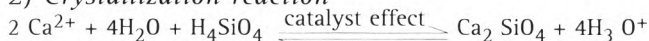
The choice of these materials for consolidation in this work was mainly based on the percentage of clay minerals, especially montmorillonite. The results obtained show that Befix is a suitable consolidating material when the composition of mud brick contains lesser amounts of montmorillonite, and vice versa in the case of Namex.

Befix creates a silicate bond with the treated materials in the presence of limewater, leading to a new stable silicate compound. At the same time the surface becomes hydrophobic (water repellent). Its action can be demonstrated theoretically in the following steps:

1) Solubility reaction

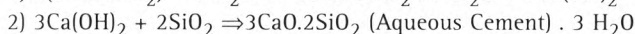
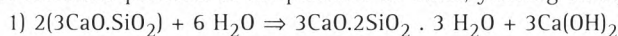


2) Crystallization reaction



An additional application of Namex mortar on the treated surface produced the desired stabilization and consolidation of the surface.

In this work, we have used cement instead of lime (used in the Roman Period), which reacts with the corrosion products in the presence of water, yielding an aqueous cement.



After the addition of the suitable silicate material (Namex) to the resultant aqueous cement, it will have poor capillary absorption, a high water vapor diffusion and a slightly higher elasticity than the treated materials, as well as an excellent adhesion to the treated surface. These applications have been tested specially on the severely deteriorated bricks, and gave excellent results.

It may be concluded that the existence of a unique preservation material or process is doubtful because many factors, such as the properties of the mud brick, causes and degree of deterioration, vary to a great extent from one structure to the other. The consolidation and restoration of each mud-brick structure should therefore be considered as an individual problem.

Notes:

- 1 Personal communications, Prof. Dr. Hugo Hubacek, Head of the Institute for Silicate Technology, Vienna, Austria.
- 2 ASTM (1968) Index (Inorganic) to the Powder Diffraction File, American Society for Testing and Materials.
- 3 SEM Model Philips XL 30 Attached with EDX Unit. Personal Communication, Egyptian Geological Survey and Mining Authority. Laboratories Sector, Cairo, Egypt.
- 4 Personal Communication, Dr. Zahi Hawass, Director General of the Giza Plateau, Supreme Council of Antiquities, Cairo, Egypt.