

THE OSTRACON

THE JOURNAL OF THE EGYPTIAN STUDY SOCIETY

PUBLICATIONS COMMITTEE

Robert Bigelow	Dena Newkirk
Patricia Cavenee	Maryanne Patterson
Susan Cottman	Frank Pettee
Ingrid Giffin	Mary Pratchett
Rhonda Hageman	Jan Stremme
Richard Harwood	

ESS STAFF LIAISON

Jeff Stephenson

The Ostrakon is published one or two times a year by members of the Egyptian Study Society. The ESS is a non-profit organization whose purpose is to study ancient Egypt. It is a cooperating organization with the Denver Museum of Nature and Science. Articles are contributed by members and scholars on a voluntary basis. Member participation is encouraged. Nothing may be reprinted in whole or part without written permission of the author.

For submission guidelines, see the ESS Web site at www.EgyptStudy.org or e-mail the Editor at Ostrakon@EgyptStudy.org.

The opinions expressed in The Ostrakon do not necessarily represent the views of the Publications Committee, the Egyptian Study Society, or the Denver Museum of Nature and Science.

©2006 Egyptian Study Society

Publication of The Ostrakon is supported by a grant from
THE PETTY FOUNDATION

Egyptian Study Society, Inc.
P.O. Box 40754
Denver, Colorado 80204-0754
UNITED STATES OF AMERICA



IN THIS ISSUE ...

THE MORTUARY TEMPLE OF HATSHEPSUT AT DEIR EL-BAHRI:
THE CONSTRUCTION AND RESTORATION OF A MASTERPIECE—PART II
Bonnie M. Sampsell

10

The Mortuary Temple of Hatshepsut at Deir el-Bahri: The Construction and Restoration of a Masterpiece—Part II

Bonnie M. Sampsell

[The following article should have been published as an integral part of Dr. Sampsell's article in the Summer 2005 issue of The Ostrakon. The Editorial Staff apologizes to Dr. Sampsell and our readers for our error. — The Editor]

SUMMARY OF PART I

The first part of this article described the history of the temple through a number of phases.¹ The earliest construction phase is now thought to have begun early in the 18th Dynasty under the reign of Tuthmosis II. It drew its inspiration from the adjacent Middle Kingdom temple of Mentuhotep II. Under Hatshepsut, “her” temple was remodeled and expanded to the dimensions we see today. The temple structure was embellished with inscribed scenes and statuary featuring Hatshepsut. After her death, Tuthmosis III ordered Hatshepsut's statues destroyed, her inscribed figures obliterated, and her cartouches changed to those of his father or grandfather.

Although eclipsed in importance by later West Bank temples, Hatshepsut's monument continued to function through the Ptolemaic era, before being gradually covered by rocks falling from the cliffs. For several hundred years, a Coptic monastery occupied the site. In the 1800s, travelers and scholars began to uncover the ancient ruins and to unravel their story. This process of excavation and partial restoration continued under various expeditions in the first decades of the twentieth century.

WORK OF THE POLISH-EGYPTIAN MISSION

In the early 1960s, Egyptian authorities authorized a complete restoration of the Upper Terrace of the temple. President Nasser wanted a team from a Socialist (non-Western) country, and the Polish experts had a lot of experience in restoring their own historical monuments destroyed during World War II. Kazimierz Michalowski, the first director, was a highly reputed Egyptologist. He and other Polish specialists supervised Egyptian restorers for what became an extended joint mission.²

Over the years, excavations by a number of people had unearthed a vast array of architectural and inscribed pieces. Fragments from all three temples (those of Mentuhotep II, Tuthmosis III and Hatshepsut) had been discovered almost everywhere within the huge field of ruins at Deir el-Bahri.³ Although some of these had been replaced, the Polish team found more than 10,000 pieces laid out in rows on the Lower and Middle Terraces of Hatshepsut's temple like parts of a gigantic jigsaw puzzle.⁴ Years of careful research were necessary before any attempt could be made to reassemble the puzzle to its original

condition. The first priority was to clear all areas, record and sort the fragments, and clean and consolidate pieces as needed.

Architectural engineers were employed to plan the restoration of the temple fabric with the goal of restoring the complete exterior of the temple. They were aided in their studies by archaeological evidence of the original ground plan and the architectural elements themselves. Comparisons with the structure and decorative motifs of other temples were also helpful.

The general approach has been to reincorporate as many of the original fragments of the temple as possible into reconstructed features. The shapes and dimensions of retrieved remains have allowed the architects to faithfully reconstruct walls, cornices and columns. The original temple walls were built with two outer faces of fine-grained limestone blocks joined with wooden cramps. The cavity between the two facing walls was filled with rubble into which the backs of some facing blocks extended to improve the bonding.⁵ The reconstructed walls have a solid fired-brick core against which original inscribed facing blocks have been set. Missing facing blocks have been replaced with brick and overlain with a thin, artificial limestone facing (essentially a “tile” rather than a block).⁶ These substitutes can be replaced with ancient stone fragments when they are identified. The distinction between new and old material is clear,



Fig. 1. Upper Courtyard looking towards southeast corner. Polygonal columns have been restored to various heights depending on the number of ancient fragments they contain. Some fragments of architraves are set on plinths (left front).



Fig. 2. Hatshepsut's Mortuary Temple at Deir el-Bahri lies beneath unstable cliffs of shale topped by massive limestone.

but subtle. Reinforced concrete has been used in invisible locations where extra strength is needed.

Before inscribed walls can be reconstructed, Egyptologists must study the fragments, find ones that match, and determine their position within the temple. It is like doing several gigantic jigsaw puzzles simultaneously without any pictures on the box! Fortunately, the restorers can draw on parallel scenes and texts located in other temples, including some dating to Hatshepsut's reign. Each year they make additional finds of matching pieces in the storerooms, and at the same time correct mistakes that earlier restorers made in their reconstructions.⁷ Unfortunately, since the temples were used as quarries for over 3000 years, many pieces will never be found while some extant fragments cannot yet be linked to any other.

Some sections of Hatshepsut's temple have been rather fully restored, while in others—where only a small number of original fragments have been recovered—only a partial restoration has occurred. For example, only a handful of Osiride statues were reconstructed in the Upper Portico, and most columns in the Upper Courtyard are only a few feet tall—reaching only as high as the ancient fragment they contain (Fig. 1).⁸ Some original fragments have been judged too fragile or too valuable to remain in the temple and have been placed in museums. At the same time, replicas of some of the original material that has been removed to museums have been used in the restoration.⁹

During all periods, ancient builders, excavators, and restorers at Deir el-Bahri have faced a major geological problem: the unstable nature of the rock in the cliffs behind and above the temples (Fig. 2).¹⁰ Weathered limestone falls in chips and chunks. Ancient rockfalls buried the temple ruins under many

feet of debris and perhaps thereby helped preserve them. Now that the temples have been cleared, these inevitable rockfalls could do considerable damage.

Wysocki described a terrifying experience that occurred on March 31, 1969, while masons were preparing to work on the West Wall of Hatshepsut's Upper Courtyard. A slight earthquake shook loose nearly 40 tons of rock, which cascaded down about 125 feet onto the Upper Terrace.¹¹ Fortunately no one was injured and damage to the temple was slight. The Polish mission spent a great deal of time studying this rockfall hazard and considering alternative solutions. Removing loose chunks from the cliff before they could fall would have been expensive, and it still would have been necessary to protect the temple during removal. Methods to anchor loose pieces to the cliff face or cover the cliff face with netting to catch rockfalls were deemed unworkable and

unsightly. Instead, the archaeologists discovered the method used by the ancient builders and copied it!

When work began in 1968, only a few remnants of the facing wall above the West Wall of the Upper Courtyard remained intact. Rock debris formed a talus slope above and behind the wall. As the restorers removed this loose material, they discovered that the Esna Shale bedrock of the cliff had been excavated to form a platform or

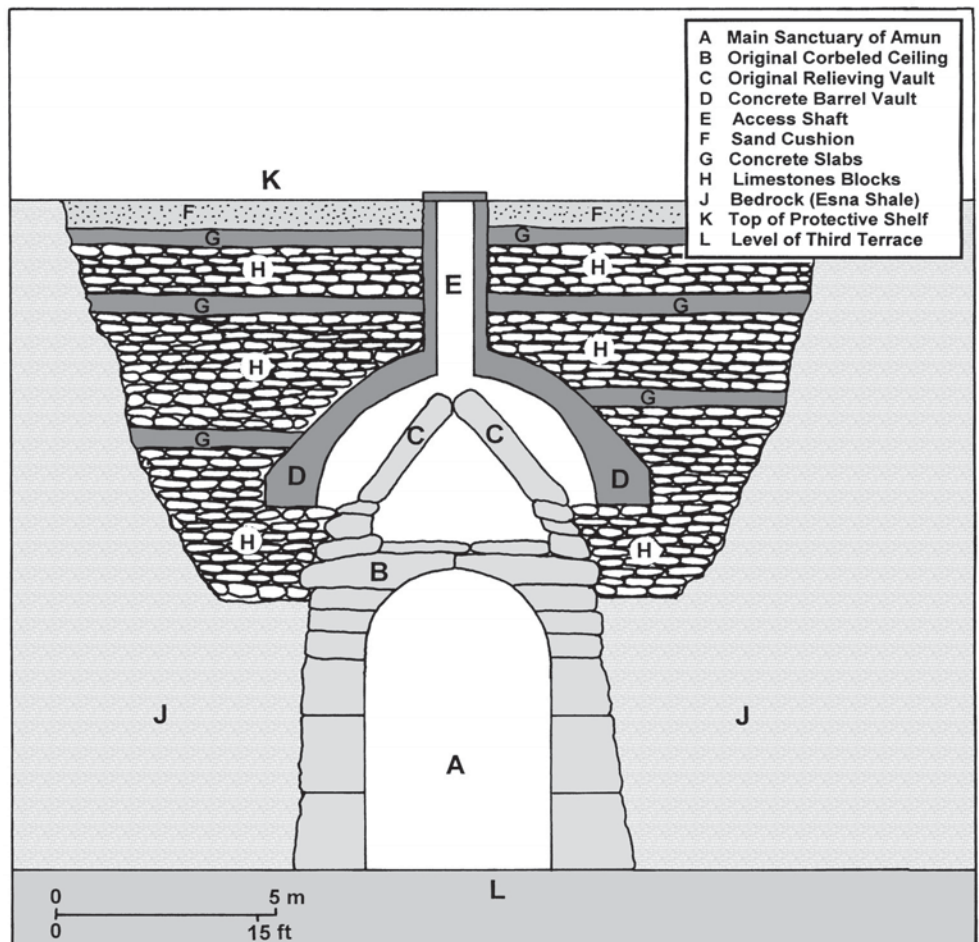


Fig. 3. Cross-section through Amun sanctuary (on Upper Terrace) showing ancient vault and modern reconstruction. (Based on Wysocki 1983.)

“shelf” 46 feet above the top of the West Wall and running the entire length of the temple.¹² The platform was originally 31 feet deep, but the outer (eastern) half had been pulverized by repeated falls of limestone from high on the cliff. The expansion of this shattered shale, when wetted by the infrequent rainstorms, had pushed out the West Wall and toppled the upper facing wall. Once the debris had been cleared back to sound bedrock, it was necessary to fill the gap so that the West Wall and facing wall above it could be rebuilt. The gap was filled with layers of crushed limestone covered with lime mortar. Horizontal, reinforced-concrete pads were placed at intervals in the rising fill to prevent a large falling rock from cracking the fill. Finally, a sand cushion was placed on the top of the rock fill. The platform was completed in 1982, and its effectiveness was demonstrated in 1985 when another avalanche of 50 tons of rock fell harmlessly onto the reconstructed platform from which it was safely removed.¹³

During the work on the platform an additional aspect of the original construction was revealed. The Amun sanctuary, which has the appearance of rock-cut chambers lined with fine limestone slabs, had in fact been built in a trench that was cut into the cliff. This trench extended from the top of the platform to the floor of the Upper Courtyard (Fig. 3, previous page). The sanctuary’s first chamber (the high-ceilinged barque chamber) was built of limestone blocks within this trench. Its ceiling was corbeled with more limestone blocks and then cut out from below to give the impression of a curved vault.¹⁴ Above this ceiling, a relieving vault was created by pairs of leaning gable blocks. Then the trench was refilled to the level of the platform. Wysocki found evidence that this was actually a remodeling of Tuthmosis II’s original rock-cut sanctuary ordered by Hatshepsut.¹⁵

The original ceiling blocks and relieving vault blocks were in excellent condition. But to protect them, Wysocki obtained permission from the Egyptian authorities to erect a reinforced-concrete barrel vault above the ancient relieving vault before refilling the trench. A shaft was built to provide access to the interior of the barrel vault from the restored platform above so that the ancient construction can be examined in the future.

The West Wall of the Upper Courtyard was not the only one threatened by disintegration of the Esna Shale formation on which the temple sits. In fact many of the porticos’ western walls that had been built directly against the bedrock were affected. Modern excavators found that these walls were either bowed outwards or had buckled and spilled their blocks onto the ground.¹⁶ The only solution was to excavate the shale debris down to sound bedrock. To prevent further disintegration, the shale was then isolated from the atmosphere by a layer of bitumen. The space between the bedrock and the wall was then filled with limestone chunks and mortar. Reinforcing bars were placed into forms to pour concrete vertical backing walls or horizontal pads.¹⁷ Continued surveillance and repairs will be required in the future to combat the geological hazards.

THE VALUE OF RESTORATION

Anyone visiting the restored Hatshepsut Temple will be very impressed by the current state of the monument compared to its condition in the 1800s. But has the goal been simply to create a tourist attraction, a sort of ancient Egyptian Disney World? Absolutely not! Although tourists may be the most numerous beneficiaries, the real value of the restoration has been the new knowledge in a number of fields that will be studied by scholars for years to come.

In fact, restoration requires research and produces data that cannot be achieved by simple excavations, or by the study of fragments in storerooms scattered in museums across the world. Every restoration decision is based on the most meticulous consideration of available architectural and epigraphic evidence. Rebuilding has given architects an appreciation for ancient construction methods including the realization that the Egyptians recognized the dangers inherent in the Deir el-Bahri site. We now have a better understanding of the building phases and which king was probably responsible for each stage. The restored Temple of Hatshepsut can be studied to determine its place in the evolution of temple architecture, noting where archaism was employed and where new features were introduced.

In general, restoration provides better conservation of fragments than leaving them lying in the ruins, especially given the dangers from ground water, rain storms and rockfalls. The storage and conservation of thousands of loose fragments creates a huge burden for monument site managers. Furthermore, viewing reassembled inscriptions in context is more valuable than in a jumble of separate fragments. Reassembled scenes have provided Egyptologists with new information about religious rituals and the events of an important period of Pharaonic history.

Perhaps the most interesting consequence of restoration is the insight it gives us into ancient esthetics. Who can visit this masterpiece without feeling a direct human link with the remarkable woman who inspired it?

ENDNOTES

1. Sampsell 2005. “The Mortuary Temple of Hatshepsut at Deir el-Bahri: The Construction and Restoration of a Masterpiece.” *The Ostrakon* 16 (2): 13–20.
2. It is impossible in this brief report to acknowledge the dozens of Polish experts who have worked at Deir el-Bahri over the years. Their names are listed in Szafranski 2001.
3. Lipinska 1977, 11.
4. Szafranski 2001, 63.
5. “Vertical” walls built against the natural rock of the cliff actually had batter of 5%, that is, their tops leaned slightly back against the bedrock. A similar batter was seen on outer faces of some of the freestanding walls of the temple. Wysocki (1992a, 242) postulates that all battered walls were built this way to improve their ability to withstand the pressure of the enclosed rubble. Such construction was not required for shorter, thinner walls, and they were vertical.
6. Wysocki 1992b.
7. Karkowski 1990; Kwasnica 2001.
8. Dabrowski (1996) said that in 1960 none of the pillars or Osiride statues of the Upper Portico remained intact. Many fragments of the pillars were found, but they had been viciously damaged and then recut.
9. The best example of this is the block with the picture of the fat Queen of Punt. This block was stolen from the site shortly after it was uncovered. The block was recovered, however, and placed in the Cairo Museum where it remains. A replica is located in the temple.
10. Wysocki 1983; 1992c.
11. Wysocki 1983, 245.
12. Knowing that many aspects of Hatshepsut’s temple used Mentuhotep’s adjacent temple as a model, Wysocki explored the Mentuhotep temple and discovered it had a similar platform

cut into the cliff above it (Wysocki 1983, 251). Unfortunately the thin layers of shale in the Esna Formation were not strong enough to resist the impacts of the falling chunks of limestone. (Wysocki 1983, 246, 249).

13. Wysocki (1992c, 465). So far the rockfalls have not involved any of the “towers” at the very top edge of the limestone cliff. These weigh thousands of tons, and if one fell, it would surely destroy the temple.
14. Several other chambers at the temple have an apparently-vaulted ceiling cut into a corbeled roof, but they do not have relieving vaults over them. These vaulted ceilings occur in Hatshepsut’s offering chapel and the Anubis chapel on the Upper Terrace, and in the Hathor chapel and Anubis chapel on the Middle Terrace.
15. Wysocki 1992a, 243, 5. One piece of evidence is the fact that the north and south walls of the barque chamber are not bonded to its east wall, which still retains an original limestone doorway inside Hatshepsut’s granite portal.
16. Baraize 1906; Wysocki 1983, 245; 1984, 347-8; 1992c, 467.
17. Wysocki 1992c.

BIBLIOGRAPHY

Arnold, Dieter. 1974. *Der Tempel des Königs Mentuhotep von Deir el-Bahari, Band I: Architektur und Deutung*. Mainz am Rhein: Verlag Philipp von Zabern.

Baines, John and Jaromir Malek. 1980. *Atlas of Ancient Egypt*. New York: Facts on File, Inc.

Baraize, Émile. 1906. “Sur quelques travaux de consolidation exécutés en février et mars 1906.” *Annales du Service des Antiquités de l’Égypte* 7: 150–154

Carter, Howard. 1912. “The ‘Valley’-Temple of Queen Hatshepsut.” In *Five Years Excavating in Thebes* by The Earl of Carnarvon and Howard Carter. London: Oxford University Press. 38–41

Clayton, Peter. 1994. *Chronicle of the Pharaohs*. New York: Thames and Hudson.

Dabrowski, Leszek. 1966. “On the problems of reconstruction of the upper portico of Hatshepsut Temple at Deir el-Bahari.” In *Mélanges offerts à Kazimierz Michalowski*. Marie-Louise Bernhard (ed.). Warsaw: Państwowe Wydawnictwo Naukowe. 67–70

Freed, Rita A. 2002. “Catalog Entry #4 – Tuthmosis III.” Catalog entry in *The Quest for Immortality: Treasures of Ancient Egypt*. Edited by Erick Hornung and Betsy M. Bryan. Washington, D.C.: National Gallery of Art. 83.

Harwood, Richard. 1995. “Mentuhotep II: Founder of the Middle Kingdom—Part 2: The Pharaoh.” *The Ostrakon* 6 (2).

James, Thomas G. H. “British activity on the Hatshepsut Temple.” In Szafranski 2001. 39–55.

Karkowski, Janusz. 1990. “Deir el-Bahari, Temple of Hatshepsut: Egyptological Studies 1977–1980.” *Études et Travaux* 14: 349–363.

Kwasnica, Andrezej. “Reconstructing the Architectural Layout of the Upper Courtyard.” In Szafranski 2001. 81–97

Lipinska, Jadwiga. 1977. *Deir el-Bahari, II. The Temple of Tuthmosis III: Architecture*. Warsaw: Państwowe Wydawnictwo Naukowe.

Lipinska, Jadwiga. 1992. “The Polish Archaeology Missions at Deir el-Bahari,” *KMT* 3 (2): 46–51.

Miller, Nicholas B. 1962. “A Fragment of the Hatshepsut Punt Relief.” *Journal of the American Research Center in Egypt* 1: 55–57.

Naville, Édouard. 1894–1898. *The Temple of Deir el Bahari*. 7 volumes. London: Egyptian Exploration Fund (*EEF volumes* 12–14, 16, 19, 27, 29.)

Pawlicki, Franciszek. 2000. *The Temple of Queen Hatshepsut at Deir el-Bahari*. Cairo: The Supreme Council of Antiquities Press.

Phillips, J. Peter. 2002. *The Columns of Egypt*. Manchester, UK: Peartree Publishing.

Porter, Bertha and Rosalind L.B. Moss. 1972. *Topographical Bibliography of Ancient Egyptian Hieroglyphic Texts, Reliefs, and Paintings. II: Theban Temples*. Oxford: Clarendon Press.

Sampsell, Bonnie M. 2003. *A Traveler’s Guide to the Geology of Egypt*. Cairo: American University in Cairo Press.

Sampsell, Bonnie M. 2004a. “The Statuary of Tuthmosis III.” *The Ostrakon* 15 (2): 8–13.

Sampsell, Bonnie M. 2004b. “The Theban Temples of Tuthmosis III.” *The Ostrakon* 15 (2): 16–25.

Sampsell, Bonnie M. 2005. “The Mortuary Temple of Hatshepsut at Deir el-Bahari: The Construction and Restoration of a Masterpiece.” *The Ostrakon* 16 (2):13-20.

Szafranski, Zbigniew (ed). 2001. *Queen Hatshepsut and her temple 3500 years later*. Stare Babice, Poland: Agencja Reklamowo-Wydawnicza A. Grzegorzczuk

Wilkinson, Richard H. 2000. *The Complete Temples of Ancient Egypt*. New York: Thames and Hudson.

Winlock, H.E. 1942. *Excavations at Deir el Bahari: 1911–1931*. New York: The MacMillan Company.

Wysocki, Zygmunt. 1983. “The discoveries, research and the results of the reconstruction made at the rock platform and the protective wall over the Upper Terrace in the Temple of Queen Hatshepsut at Deir el Bahri.” *MDAIK (Mitteilungen des Deutschen Archäologischen Instituts Abteilung Kairo)* 39: 243–253.

——— 1984. “The results of research, architectonic studies and of protective work over the Northern Portico of the Middle Courtyard in the Hatshepsut Temple at Deir el Bahari.” *MDAIK* 40: 329–349.

——— 1985. “The Temple of Queen Hatshepsut at Deir el-Bahari.” *MDAIK* 41: 293–207.

——— 1986. “The Temple of Queen Hatshepsut at Deir el Bahari: Its Original Form.” *MDAIK* 42: 213–228.

——— 1987. “The Temple of Queen Hatshepsut at Deir El Bahari—The Results of Architectural Research over the North Part of the Upper Terrace.” *MDAIK* 43: 267–276.

——— 1990. “Deir el-Bahari 1977–1982.” *Études et Travaux* 14: 321–347.

——— 1992a. “The Temple of Queen Hatshepsut at Deir el Bahari: The Raising of the Structure in View of Architectural Studies.” *MDAIK* 48: 233–254.

——— 1992b. “Deir el-Bahari, saisons 1982–1985.” *Études et Travaux* 16: 435–463.

Dr. Bonnie M. Sampsell is a long-time member of the ESS and a frequent contributor to The Ostrakon. Her book, A Traveler’s Guide to the Geology of Egypt, was published by the American University in Cairo Press in 2003. A retired professor and frequent traveler to Egypt, Dr. Sampsell lives in North Carolina.