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WROCLAW SCHOOL OF RESEARCH AND CONSERVATION OF ARCHITECTURE – SELECTED RESEARCH AND CONSERVATION PROJECTS CARRIED OUT IN THE TEMPLE OF HATSHEPSUT AT DEIR EL-BAHARI BETWEEN 2000-2020

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Abstract

The activities of the Wrocław School of Research and Conservation of Architecture in the Temple of Hatshepsut in Deir el-Bahari in Egypt between the years 2000 and 2020 are presented herein. These activities are based on a selection of research and conservation projects carried out by specialists from the Wrocław University of Science and Technology in cooperation with the Centre of Mediterranean Archaeology of the University of Warsaw. During the period under review, the author of the article served as the architect of the mission, with the presented projects being executed as original initiatives or under her supervision. The emphasis placed on the interdisciplinary nature of the work, incorporating archaeological, architectural, conservation, and engineering research, is noteworthy. The significance of these research endeavors for the preservation of cultural heritage and the education of future architects and conservators is also highlighted.

Keywords*: Ancient Egypt; Ancient structure; Site protection; Hatshepsut temple; Conservation of architecture; Wroclaw School of Architecture*

Introduction

The term "Wrocław School of Research and Conservation of Ancient Architecture in the Mediterranean Basin" was created in 2008 for the needs of a scientific conference organized for the 40th anniversary of the professional work of Professor Stanisław Medeksza. The research on ancient architecture of the Mediterranean Basin initiated by Professor Medeksza and continued by other employees of the Institute of the History of Architecture, Art, and Technology gave rise to the implementation of many architectural and conservation projects. Since its establishment in 1968, the Institute has brought together experts from various disciplines—archaeologists, historians, art historians, and specialists in the history of technology, as well as architects dealing with the conservation of architecture and urban planning. Numerous field studies and conservation works on relics of ancient architecture by members of the department have been recognized by researchers of Mediterranean archaeology, and for almost half a century almost all Polish missions operating in the Mediterranean Basin have tried to recruit architects from the Wrocław community to cooperate.

Research and conservation work at Deir el-Bahari in ancient Thebes in Egypt was initiated by the founder of the Wrocław school, Professor Stanisław Medeksza, who began cooperation with Professor Jadwiga Lipińska in 1985 on the premises of the temple of Tuthmosis III. At that time,

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the Polish-Egyptian Conservation Mission began its operations in the temple of Tuthmosis III, and its first project was to develop an in situ exhibition of the temple ruins. The project was presented and accepted for implementation by Professor Ahmed Kadri—the then Secretary General of the Egyptian Department of Antiquities [1]. Research and conservation work at the temple of Tuthmosis III was continued for several years by Professor Rafał Czerner.

Wrocław specialists have expanded their research and conservation activities to the Temple of Hatshepsut by joining the mission team of the Centre of Mediterranean Archaeology of the University of Warsaw—the Polish-Egyptian Archaeological and Conservation Mission of the Temple of Hatshepsut at Deir el-Bahari. The Polish project was initiated in 1961, first organized by the Polish Station of Mediterranean Archaeology of the University of Warsaw under the leadership of Kazimierz Michałowski, and then in 1968 it was entrusted to the conservation team led by Zygmunt Wysocki from the State Workshops for the Conservation of Cultural Heritage. In 1993, the mission of the Centre of Mediterranean Archaeology of the University of Warsaw returned to work in the Temple of Hatshepsut under the leadership of Dr. Franciszek Pawlicki, and from 1999 to 2019, the mission was led by Dr. Zbigniew Szafrański, Currently, the mission is led by Dr. Patryk Chudzik. This article presents selected research and conservation projects carried out by Wrocław specialists between 2000 and 2020.

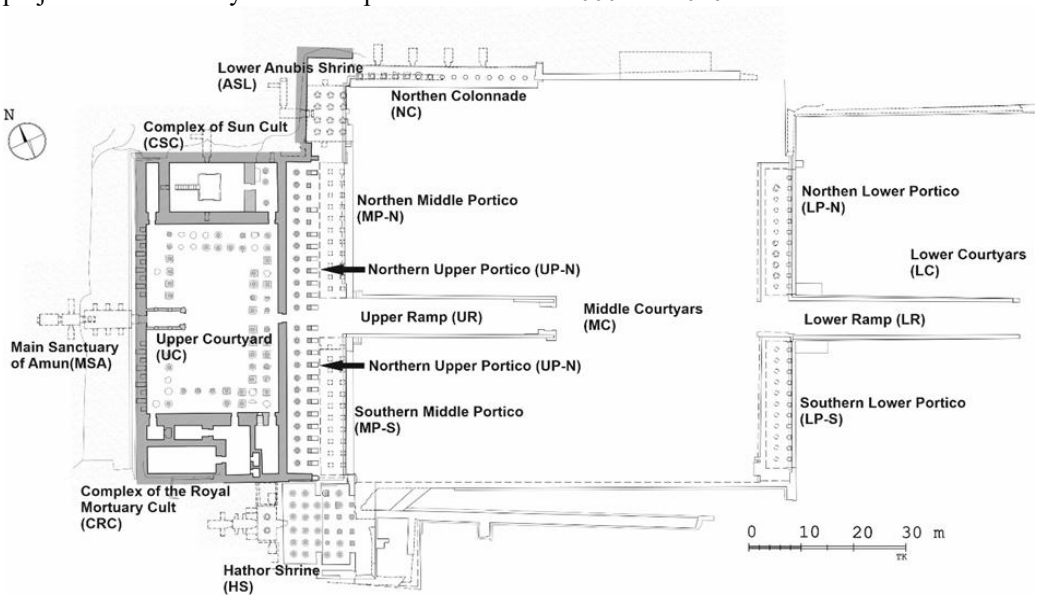

Fig. 1. Plan of the Temple of Hatshepsut.

The Temple of Hatshepsut at Deir el-Bahari is located on the western bank of the Nile, near Luxor in Egypt. During the time of Queen Hatshepsut, during the New Kingdom (15th century BC), Thebes was the capital of the empire. When Queen Hatshepsut took over the power and privileges of the pharaoh, she built a temple for her cult. For the Temple of Millions of Years, she chose a very special place at the foot of Mount el-Kurn, which limits the western part of the desert valley of Asasit. There was already a tomb and temple of Mentuhotep Nebhepetre from the 11th dynasty there. The Temple of Hatshepsut was designed on three terraces, with the highest upper platform serving a protective function. The Lower Terrace is situated at an elevation of 102.13 m, with the Middle Terrace at 111.75 m. The Upper Terrace is situated at an elevation of 119.9 m. The highest element of the temple – the reconstructed platform – reaches an elevation of 133.87 m [2]. The complex is oriented on the east-west axis. The main axis of the temple starts in the sanctuary of Amun (in the west), then passes through two granite portals of the Upper Terrace, runs further through the ramps of the Middle and Lower Terraces, dividing the complex

into two almost symmetrical parts. The individual fragments of the building are planned based on a modular grid parallel to the axis of the temple. The basic module of the grid is contained in a square of 1.5×1.5 royal cubits (a cubit is about 52 cm), which gives an approximate dimension of 80×80 cm [3]. The Lowest Terrace of the temple is a courtyard closed on the west side by porticoes, between which there is a ramp leading to the Middle Terrace, which, like the lower one, is closed on the west by two porticoes. On both sides of these porticoes there are chapels of deities worshipped in the temple: the chapel of Hathor on the south and the Anubis Chapel on the north. On the third level there are the main rooms of the temple. The entrance to this level, like the previous one, is a ramp. On both sides of it there are pillared porticoes equipped with Osiriacs. The entrance on the axis leads through a portal to the courtyard, where the Sanctuary of Amun, partially carved in the rock, is located. On both sides of the inner courtyard there are additional chapels: on the north an open courtyard with an altar of the solar cult - the Complex of the Solar Cult—and on the south a hall of offerings for Hatshepsut and Tuthmosis I, i.e., the Complex of the Royal Cult (Fig. 1).

Experimental part

Nowadays, the execution of historical architecture projects requires the involvement of a large interdisciplinary research and implementation team. Historic buildings from any period subjected to scientific or conservation research usually do not look like they did in their glory days. Most often, they present themselves as heterogeneous layers hiding elements of past culture and are implemented in accordance with the logic of their times [4]. Therefore, during the implementation of a conservation project (restoration, anastylosis, or exhibition), it is important to use such methods in an interdisciplinary team so that the pre-design analyses show every trace, material, nature of the structure, and beauty of the preserved elements of detail or decoration.

In the case of the temple of Queen Hatshepsut from Deir el-Bahari, dating back to the 15th century BC, general scientific research methods were adopted, starting from historical analysis (examination of archives and historical documentation) together with Egyptological research (examination of ancient source texts, history, literature, religion, and art) through field research (archaeology and architectural research) to comparative analyses and syntheses. In archaeological research, the participation of not only archaeologists but also architects, documentalists, and architecture researchers was important. Archaeological and architectural documentation made it possible to perform stratigraphic studies of preserved *in situ* building elements, as well as analysis of conservation works that took place in the Temple of Hatshepsut both in ancient times and today. Finally, the use of the comparative analysis method allowed us to make a project decision. However, such a project could not have been implemented without conservation or material or construction research. Conservation research was conducted using field or instrumental methods in research laboratories. Taking the above into account, the synthesis method was used to present the results of individual studies used in the development and implementation of the projects. Architectural plans and drawings (3D scanning and photo scanning) made it possible to create a concept for an architectural and conservation project. Almost every implemented project involved stone, painting, and construction conservators, as well as geologists.

Results and discussion

Selected completed projects

The projects implemented by Wrocław architects in the Temple of Queen Hatshepsut can be divided into research projects (architectural and conservation research) as well as architectural and conservation projects. Almost all of them were focused on the area of the Upper Terrace of the temple. Only one research project, implemented as an intervention, involved the Lower Terrace of the temple.

The research projects were closely related to the implementation, first of all, of a theoretical project for the reconstruction of a given part of the temple so that in the next stage an architectural and conservation project could be implemented for the revitalization and, ultimately, making a given part of the temple available to tourists.

In 1999/2000, the Polish-Egyptian Archaeological and Conservation Mission, led by Dr. Zbigniew Szafrański, implemented a previously started project for the conservation and exhibition of the Jubilee Courtyard and the Main Sanctuary of Amun on the Upper Terrace of the temple. This was related to the obligation resulting from the cooperation with the Egyptian Department of Antiquities to make this part of the temple available for tourism. The Egyptological, architectural, and conservation studies resulted in the completion of the reconstruction of the Upper Festival Courtyard – this complex was opened to visitors in 2000. Professor Rafał Czerner from the Wrocław University of Science and Technology participated in this project, realizing the arrangement of the courtyard and securing the valuable architectural details exhibited [5].

The next major project, which was completed and made available to tourists, was the project of conservation and exhibition of the Solar Cult Complex. Archaeological and Egyptological research carried out since the 1980s and 1990s provided the basis for architectural research. The work was carried out by a team of specialists from PP Pracownia Konserwacji Zabytków (State Enterprise of Monument Conservation Workshops) until the end of 1989, and in 1993 the work was continued by the Centre of Mediterranean Archaeology of the University of Warsaw. In 2001, the author of the article joined the group of researchers, focusing her work on the Solar Cult Complex. As the chief architect of the mission, I was responsible for architectural research, preparation, and supervision of the conservation and exhibition project for this part of the temple. The implementation of this comprehensive task began with familiarization with the previous archaeological, Egyptological, and architectural research. Analyses, summaries, and conclusions were published in the article: Historia badań i konserwacji architektury w świątyni Hatszepsut w Deir el-Bahari [History of research and conservation of architecture in the Temple of Hatshepsut at Deir el-Bahari] [6]. The Egyptological studies developed and published by Professor Janusz Karkowski, which were the basis for the implementation of the project of reconstructing part of the Solar Cult Complex, were significant for the entire project. The conservation conclusions and postulates included a general concept of the exhibition as well as functional and spatial clarity of the entire undertaking. Detailed guidelines were developed for individual fragments of the complex, starting with the reconstruction of the courtyard walls and securing the Anubis Chapel with the exhibition of the passage from the Re-Horachte vestibule to the open courtyard. This exhibition was prepared by the author based on the Egyptological research of J. Karkowski and the initial concept of the architect Andrzej Kwaśnica from PP Pracownia Konserwacji Zabytków. The most significant undertaking was the preparation of a project for the protection and conservation of the Anubis Chapel. The project assumed the execution of the protection of the chapel with a reinforced concrete structure hidden behind the northern wall of the complex, preparation of design documentation for glass and steel doors securing the interior of the chapel, and a project for the conservation of polychromes. The project of the exhibition of the entire complex was prepared by the author of the article, and in the case of the protection of the Anubis Chapel, the design assumptions and the structural design were prepared by Eng. Mieczysław Michiewicz. The project included the implementation of a steel-reinforced concrete structure located above the upper surface of the chapel vault. The basis of the supporting structure was trapezoidal frames made of I-beam sections, supported on foundations made of steel beams. The foundations were based on sockets carved in the rock wall on the north side and on the south side in the reconstructed stone wall of the courtyard. The steel structure was covered with an anti-corrosion paint coating. Concreting of the slabs was carried out using the so-called traditional formwork made of galvanized steel sheets, which also served as protection for the upper surface of the vault from contamination with wet concrete mass. The upper surface of the roof structure was covered with two layers of bituminous mass, which

provided additional waterproof and moisture protection. The entire structure was covered with rock rubble, which also served as a cushioning layer (Fig. 2).

Fig. 2. The Sun Cult Complex. Shrine of Anubis and the northern wall of the courtyard during the project. State during conservation work in 2005.

The conservation program and conservation of the chapel interior polychrome were carried out by Maria Lulkiewicz-Podkowińska, a conservator of works of art in the field of painting. The last important element of the exhibition project of the Solar Cult Complex was the conservation of the free-standing solar altar. The conservation program was developed by Izabela Uchman, a conservator of works of art. The description of the entire project implementation was published in the article [7]. The last stage of the Solar Cult Complex restoration project was the implementation of the exhibition of the courtyard wall finials and securing the polychrome in the entrance to the complex with glass screens. The projects were implemented in the years 2008-2010 (Fig. 3).

Fig. 3. Solar Cult Complex. General view toward the west and north. State during conservation work in 2005 (Photo M. Jawornicki)

The project of the wall crowning was connected with the exposure of the preserved original fragments of cornices and balustrades. When undertaking this task, a decision was made to simultaneously construct a roof with drainage over the Northern Chapel of Amun, which is adjacent to the complex. This roof was intended to protect the interior of the chapel from precipitation, which occurs every few years. The roof designed by the author and Eng. M. Michiewicz, has a minimal fall so that it is not visible from behind the original cornice and balustrade elements. Water from the drainage trough was directed north to the back of the northern wall of the temple. The roof structure was made of wood with a covering of light sandwich panels protecting the ceiling of the chapel not only from rain but also from overheating. The official opening of the Solar Cult Complex took place on 23 February 2015 in the presence of the Minister of Antiquities of Egypt, Dr. Mahmud Eldamta, Prime Minister of the Government of Egypt, Minister of Tourism and the Governor of Luxor. The Polish side was represented by the then Ambassador of the Republic of Poland, Michał Murkociński; the director of PCMA, Dr. Hab. Tomasz Waliszewski; and the director of the Station in Cairo, Dr. Zbigniew Szafrański.

Architectural research on the theoretical reconstruction of the solar altar was carried out in parallel with conservation work. The results of this research were published by the author in two articles [8, 9]. Proposing a theoretical reconstruction of the arrangement of the solar altar in the Solar Cult Complex seemed to be a difficult task, because similar objects have not been preserved anywhere. An attempt was made to analyze the preserved sketches on the surface of the preserved platform, and a simulation was carried out using the combination of Egyptian triangles. Finally, three possibilities of the altar arrangement were proposed. The next step, elaborated in the next article, was to present the chronology of changes in the dimensions of the altar and the possibilities of transporting and assembling the two obelisks. Their dead weight was calculated, and the method of assembly and possible shifting was presented.

Subsequent architectural and conservation projects were carried out in the southern part of the Upper Terrace of the Temple of Queen Hatshepsut. The project was related to the reinforcement and securing of the ceiling of the Hathor Chapel. The concept of the protection and supervision of the implementation was to be carried out by Eng. M. Michiewicz, and Dr. Eng. Arch. Aleksandra Brzozowska-Jawornicka, from the Wrocław University of Science and Technology. The state of preservation of the ceiling above the vestibule of the Hathor Chapel raised doubts and the resulting threats for many years. The external surface of the ceiling slabs had flaked off, and their surface was covered with a network of cracks, some of which went through the entire thickness of the slabs. The cracks and markings of the ceiling slabs caused the destruction of the paint coatings from the inside of the chapel. The flaking and cracks of the ceiling slabs were caused by atmospheric factors and the significant exposure of the surfaces to the sun. For many years, the interior of the vestibule of the Hathor Chapel and the adjacent niches were secured with temporary wooden and steel structures. Over time, however, it became justified to properly secure the vestibule ceiling. In 2009, a decision was made to implement a project to secure the vestibule ceiling of the Hathor Chapel. After completing the architectural and conservation documentation, actions were taken to strengthen the ceiling (Fig. 4). The most difficult stage of the project was the construction of a steel structure to take the load from the damaged stone slabs and transfer it to the solid and stable surfaces of the external walls and columns. The stone slabs were anchored to the steel structure with injection resin using stainless steel rods. A decision was made to preserve the paintwork on the underside of the slabs. In this way, eight slabs were reinforced above the vestibule of the Hathor Chapel, and then a roof was made of light sandwich panels placed on a wooden structure to protect the whole from overheating and precipitation (Fig. 5). The angle of the roof was selected so that visitors to the temple could not see the roof from the level of the Hathor Chapel. Similarly, to the roof over the North Chapel of Amun, a drainage channel was also made hidden in the wall with a slope towards the south, leading the water out of the temple [10].

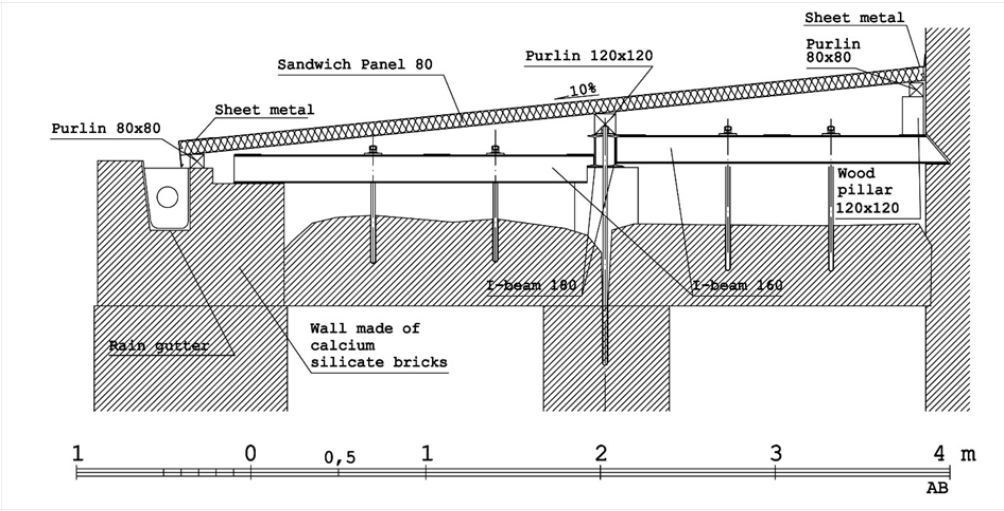

Fig. 4. Project of the strengthening and roofing of the Vestibule of the Hathor Chapel ceiling section. (Drawing by A. Brzozowska-Jawornicka)

Fig. 5. Strengthening and roofing the vestibule of the Hathor Chapel.

In recent years, research has been concentrated in the Royal Cult Complex in the southern part of the Upper Terrace of the temple. Egyptological, archaeological, architectural, and conservation studies are aimed at making a theoretical reconstruction of the entire complex so that on this basis it would be possible to prepare a project for the reconstruction and exhibition of this part of the temple. The basis for the architectural documentation was the performance of a 3D scan of the entire Royal Cult Complex. This documentation was developed in 2009-2010 and

covered the Upper Terrace of the Temple of Hatshepsut. At the invitation of the Centre of Mediterranean Archaeology of the University of Warsaw, the team of the 3D Scanning and Modelling Laboratory (Lab-Scan3D) and Leica Geosystems Polska took part in the Polish-Egyptian Archaeological and Conservation Mission in the Temple of Hatshepsut at Deir el-Baharii in March 2009 and started a pilot 3D scanning project. The team working on-site included Waldemar Kubisz from Leica Geosystems Polska and Professor Jacek Kościuk from LabScan3D at Wrocław University of Science and Technology. The team received support and assistance from representatives of Leica Geosystems in Egypt and Łukasz Żak from the Institute of Geodesy and Cartography, who prepared a geodetic network consisting of 31 reference points [11]. The entire scanning project was carried out in two phases – scanning and documentation of previously scanned areas using high-resolution digital photos. Based on the documentation from 3D scanning and orthophotos, maps of damage to the walls of the Chapel of Hatshepsut were prepared in 2013, which will be the basis for preparing conservation guidelines. The architect Aleksandra Brzozowska-Jawornicka from the Wrocław University of Science and Technology; art conservators Rajmund Gazda from Warsaw and Maria Gąsior from the Academy of Fine Arts in Wrocław; and inż. Mieczysław Michiewicz, Eng. (Fig. 6) participated in the preparation of the documentation [12].

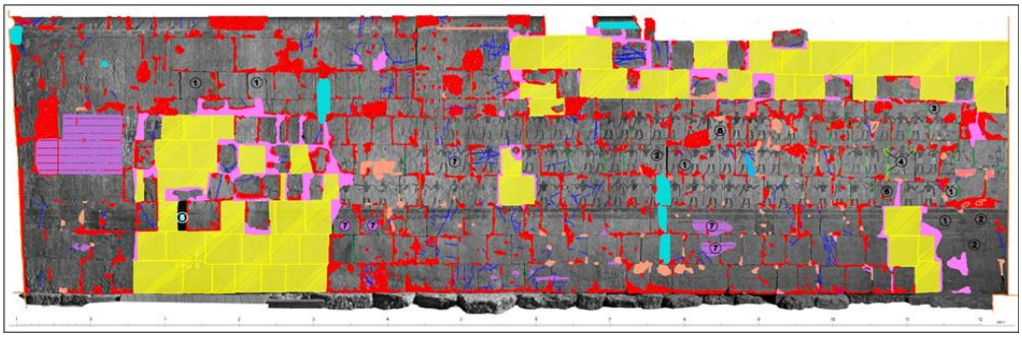

Fig. 6. Damage map - fragment, north wall of Hatshepsut Chapel. Archive of the Centre for Mediterranean Archaeology, University of Warsaw. (Drawing by A. Brzozowska-Jawornicka)

The results of the prepared damage map showed numerous cracks and gaps in stone blocks, their separation and dislocation, and damage in the form of flaking of the face. Biological layers, near-surface discoloration of stones, and stains were noted on the surface of the walls. Important elements located on the walls were preserved fragments of early Christian mud mortars and supplements to the form of blocks in ancient mortar. During macroscopic examinations, the occurrence of several types of ancient mortars was observed, which may indicate that repairs were already being carried out in the Chapel of Hatshepsut at that time. The conservation studies also included analyses of several samples: mortar from the vestibule (southern wall) and whitewash taken from the chapel vault. These samples were taken in the 1990s and were kept in the archives of the Archaeology Centre at the University of Warsaw in Warsaw. The studies were conducted by a team from the Laboratory of Technology and Conservation at the Faculty of Architecture of the Wrocław University of Science and Technology and Dr. Wojciech Bartz, from the University of Wrocław, and the results were published in the article "Mineralogical characteristics of mortars from the Temple of Hatshepsut at Deir el-Bahari: Preliminary report." The research was preliminary due to the insufficient amount of material [13]. Conservation and material research also included testing the tensile strength of limestone in bending, carried out

during the mission in 2014 and published in 2018. For field research at Deir el-Bahari, four samples of limestone, approximately 20 cm long and with a cross-section of 2.5×2.0 cm, were cut from partially damaged blocks of the temple walls. The differences in strength of the tested samples turned out to be minor, and therefore, it was recommended to extend the research and increase the amount of tested material to at least 10 pieces of larger sizes. The research should be carried out in a professional-strength laboratory [14]. The research results allowed for the verification of the assumed spans and cross-sections of the architraves, theoretically reconstructed in the vestibule of the Chapel of Hatshepsut in the Royal Cult Complex. Architectural research was conducted in parallel with Egyptological studies and considering the results of archaeological research and is still being continued.

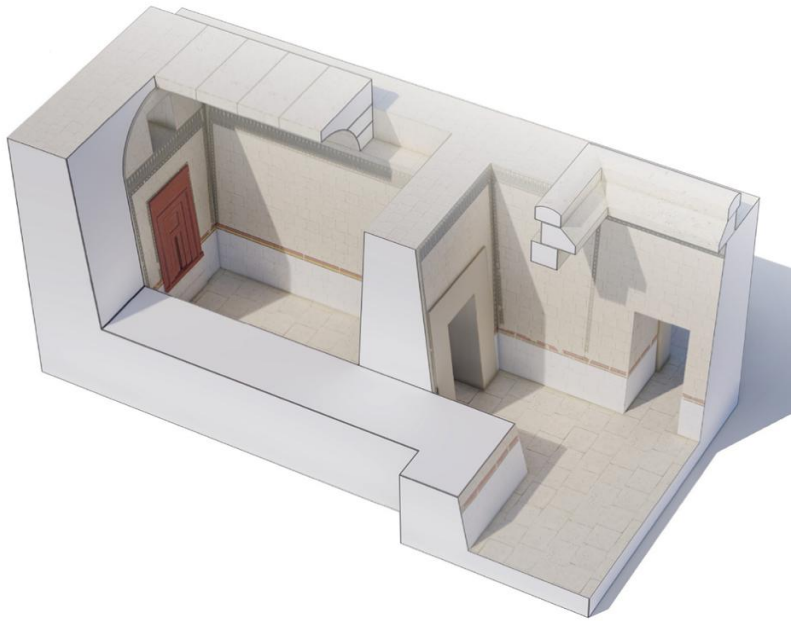

Fig. 7. Axonometric reconstruction of the chapel of Thutmose I: view from the southeast.

The first component of the Royal Cult Complex to be comprehensively studied was the Chapel of Thutmose I (Fig. 7). A monograph on its architecture, authored by the present writer, was published in 2020 [15]. In 2021, a complete study of the chapel was published jointly with the Egyptologist Mirosław Barwik and with the contribution of Teresa Dziedzic [16]. Both publications focus on the results of research conducted within one of the chapels of the Royal Cult Complex. Both publications focus on the results of research in the area of one of the chapels in the Royal Cult Complex. The books are one of only a few international studies showing the architecture of the Temple of Hatshepsut at Deir el-Bahari along with an analysis of the construction techniques and processes of ancient Egypt. The first of the publications has been enriched with a detailed analysis of the proportions and module adopted during the construction process and changes in the concept of the arrangement of the southern part of the Upper Terrace in the Temple of Hatshepsut. The next parts of the Royal Cult Complex currently under development are the Chapel of Queen Hatshepsut with the vestibule. The theoretical study prepared by Egyptologists and the author of the article will be the basis for the development of a project for the reconstruction and exhibition of the relics of the Royal Cult Complex. Design and

implementation work will also be carried out based on research and conservation programs, both in the field of stone conservation and polychrome conservation.

The scope of architectural research, which was the basis for the project and the repeated reconstruction, included the study carried out with Mariusz Caban from the Wrocław University of Science and Technology concerning the colossus of the Osirian figure located on the northern side of the Lower Terrace of the temple. This study was undertaken due to noticeable errors in the reconstruction made at the beginning of the 20th century. In 1911, an American mission led by Herbert E. Winlock from the Metropolitan Museum of Art in New York began its work in the Hatshepsut temple. Over the following years, the mission under his direction made many discoveries, starting from foundation deposit pits, sarcophagi, and mummies to a large number of temple sculptures. In the 1927-1928 season, the American mission discovered, among others, a large group of fragments of figures of the god Osiris with the face of the queen. An important group turned out to be blocks of colossal statues of the queen as Osiris. It was determined that the statues were about 7.25 m high. Winlock's significant discovery was the recognition that on the north side of the Hunting Portico, within the smoother, sloping wall at the top, there is a limestone pedestal on a sandstone floor. During research, scratches were identified and documented on the south wall at the top of the Obelisk Portico. The Obelisk Portico was reconstructed at the end of the 19th century, when a mission led by Edouard Naville was working in the Hatshepsut Temple, and Somers Clarke was responsible for the restoration. By interpreting the scratches and discovering fragments of the queen's statues, Winlock's team determined the function of the chipped stone block protruding from the wall. It was assumed that it was a block connecting the figure of the colossus to the wall [17]. From Winlock's notes we could learn that a decision was made to reconstruct the northern colossus of the queen's figure. In April 1928, Emile Baraize was to perform the reconstruction on the preserved pedestal in the northern portico [18]. In the years 2005-2016, documentation was carried out, and research was undertaken on the porticoes of the lower terrace in order to verify the achievements of H. Winlock's mission regarding the figures of the queen as Osiris. Students from the Wrocław University of Science and Technology, Sara Arbter and Paweł Srokowski, participated in the development of the inventory. Based on this documentation and research on proportions and modules, a second reconstruction of the Osirian figure was developed (Fig. 8). The main executor of this reconstruction was the sculptor and artist Wojciech Myjak. The research was published in the article [19].

In addition to the planned research or conservation work, tasks are being carried out in the Temple of Hatshepsut that require immediate design and implementation. Such a situation occurred in 2016, when small cracks were observed on the decorated ceiling of the Lower Anubis vestibule on the Temple's Middle Terrace. They were caused by the movements of the mountains surrounding the temple and corrosion of the concrete filling covering the stone slabs of the hall. In 2016 and 2017, the vulnerable parts of the decorated ceiling were consolidated using conservation methods. In February 2019, the general condition of the monument was assessed. Due to the fact that the condition of the decorated ceiling had not changed, a decision was made to replace the concrete waterproofing filling when works were carried out on the exposed stone roof slabs from the New Kingdom period. It was also noted that the upper surfaces of the stone slabs had been subjected to hydrophobization. The effects of hydrophobization combined with the concrete filling have been maintained since 1993/1994. In local conditions at Deir el-Bahari, the hydrophobization effect on the exposed surface lasts for about 15 years. After the development of the conservation project by conservator Rajmund Gazda from Warsaw, architects Urszula Kraśniewska and the author of the article from the Wrocław University of Science and Technology, the implementation of the task to prevent further destruction of the decorated ceiling of the Lower Anubis Chapel was commenced. The project provided for cleaning the embankment debris from the eastern side in the area of ancient balustrades, identifying the original ceiling slabs and establishing their thickness at 52 cm (Fig. 9).

Fig. 8. 3D documentation of the reconstruction of Queen Hatshepsut's Osiride statue from the northern colossus. (Drawing by M. Caban)

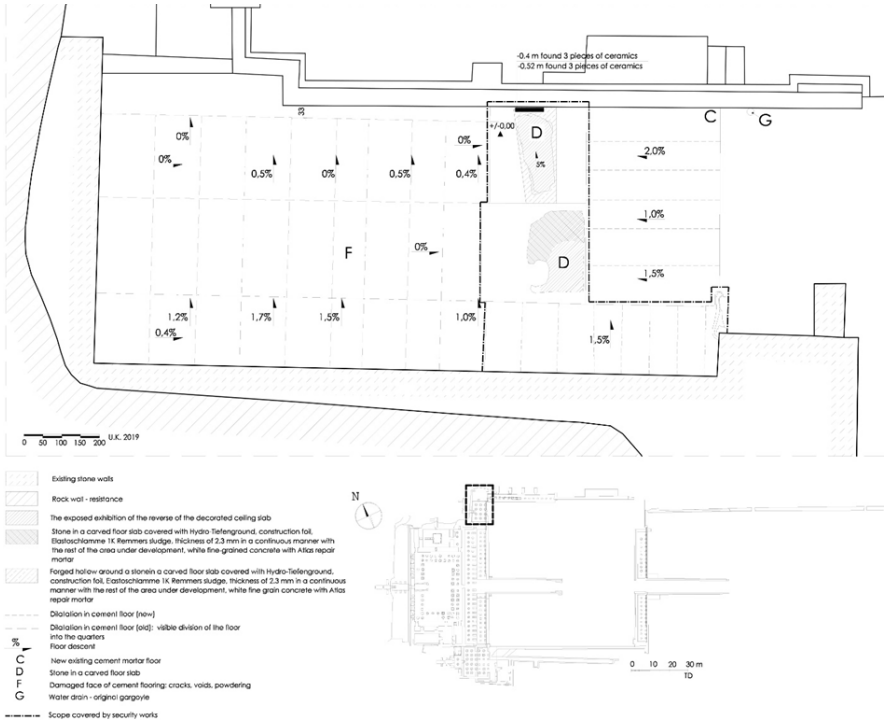

Fig. 9. The general view of the conservation proceedings with a ceiling stone above the lower Anubis Shrine. (Drawing by U. Kraśniewska, T. Dziedzic 2019)

During the research of the area covered by the study, a layer of cement mortar was identified 10 cm below the contemporary screed, most likely from the times of Emile Baraize's conservation work in the 1930s. It was decided that all secondary mortar layers would be removed and the surface of the original stone ceiling slabs would be treated with a strengthening and hydrophobic preservative and then covered with a layer of elastic slurry, and the whole thing would be covered with a new screed protecting the ceiling slabs [20].

Conclusions

The long-standing tradition of research on the architecture of the Hatshepsut Temple and the development and implementation of conservation projects by specialists from the Faculty of Architecture of the Wrocław University of Science and Technology constitute a unique activity on a national level. Employees of the Faculty of Architecture, and especially the Department of the History of Architecture, Art, and Technology, carry out their projects in cooperation with the Centre of Mediterranean Archaeology of the University of Warsaw. The diversity of research and implementation of architectural and conservation projects of the ancient architecture of the Mediterranean Basin gave the staff of our university the opportunity to educate a new generation of architects in the field of monument conservation. In 2024, the university celebrated the 25th anniversary of education in the specialization of Architecture and Monument Protection. Many years of research and design work and experience in education have allowed us to notice that this is an essential element of education for the next generation of architects sensitive to the protection of world cultural heritage. Therefore, activities related to research and conservation of ancient architecture, including the Hatshepsut Temple, have a broader impact on shaping the awareness and competencies of future generations of architects who will be responsible for the heritage protection around the world.

In conclusion, the significance of the activities of the Department of History of Architecture, Art, and Technology of the Wrocław University of Science and Technology in the context of research and conservation of the architecture of the Hatshepsut Temple goes beyond the research and conservation work itself. It is an important element in educating specialists in this field and strengthening international cooperation for the protection of cultural heritage.

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