



**FRENCH-EGYPTIAN
CENTRE FOR THE STUDY OF THE TEMPLES OF
KARNAK**

ACTIVITY REPORT 2018



Luxor, 2019



Ministry of Antiquities of Egypt
Centre National de la Recherche Scientifique
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FOREWORD

Work of the French-Egyptian Centre for the Study of the Temples of Karnak in 2017-2018 mostly took place on schedule, in accordance with the decisions of the Scientific Committee which took place in March 2016

Inside the temple, the activity of the Centre was mainly involved in three programmes, as an extension of the work of the previous seasons.

The first concerns the archaeological investigations of the eastern area of the Ptah temple. For the researches implemented in 2017, the Roman-Byzantine period settlement provided very interesting data and artefacts about the people who were living at Karnak at the end of the 4th century – beginning of the 5th century AD. The campaign of 2018 resulted in completing the general plan of this settlement, adding new data on the daily life of the inhabitants.

The second programme concerned the reconstruction of the east wall of the Cachette courtyard, allowing to rebuild a large part of this wall. This work, started in 2016, was also the opportunity to discover the presence of a niche on the east side of the wall, decorated in the name of king Tutankhamun. The eastern wall was completed in the 2018 season.

The third programme was devoted to the conservation and restoration work in the *Akb-menu*. Following the conservation of the Alexander the Great's chapel and its vestibule, the programme of 2017 concerned the "axial sanctuaries", the "funeral rooms" (now opened for visitors), and the "Sokarian rooms" which restoration was pursued in 2018, together with that of the Sokarian hypostyle hall.

The epigraphic work and graffiti studies continued on different parts of the temple throughout 2017-2018. Three new epigraphic studies had been launched in 2017, which were pursued in 2018: the blocks of the western façade of the 2nd Pylon; the blocks of the Edifice of Taharqo by the Sacred Lake, and the 7th Pylon.

The online edition of all the hieroglyphic texts from Karnak (the *Karnak project*: <http://sith.humanum.fr/karnak>) started in January 2013; it was funded by LabEx Archimede (CNRS UMR 5140-Univ. of Montpellier 3-Univ. of Perpignan). The *Karnak project* provided 5,000 hieroglyphic inscriptions of the temple of Karnak available online in 2017 and 6,000 in 2018. The scientific archives of the Centre, opened online in 2017, have provided the scholars with more than 33,500 high resolution photographs equally available online through the scientific archive site of the Centre. The photographic and topographical departments of the Centre provided a large number of orthoimages from different monuments which are used for the *Karnak project* and the archives.

Constant work has concerned the documentary database of Karnak, which was enhanced by the addition of photographs and new scans. The CFEETK website (<http://www.cfeetk.cnrs.fr/>) and social networks (Facebook and Twitter) ensure visibility the activities and work carried out by the center.

On the occasion of the 50 years of the foundation of the CFEETK, a book celebrating 50 years of French-Egyptian cooperation in Karnak was published in partnership with the French Institute of Egypt, complemented by a photographic exhibition in the temple. The *Cahiers de Karnak* 16 (28 articles), printed on the MoA press were issued in 2018.

The manuscript of volume III of the *Temple of Ptah*, devoted to the *favissa* discovered in 2014-2015, was in print at the IFAO press, to be issued in early 2019. The final proofs for the publication of the calcite chapel of Amenhotep I were returned to the IFAO for a scheduled issue end of 2019.

In 2018, different kinds of material were prepared for publication: epigraphic survey of the sphinx of Pinedjem, the Ptolemaic gate of the 2nd Pylon, the bark-shrine of Philip Arrhidaeus, the "Northern Storerooms". The volumes will be submitted in 2019.

All the work carried out at Karnak has benefited from the constant help of Dr. Mohamed Abdel Aziz, General Director of Luxor and Upper Egypt Antiquities, Amin Ammar and Mustafa el-Saghir, General Directors of the Karnak temples, Abder Raheem Khazafi, Director of Karnak Temples, Mona Fathi and Fawzy Helmi, Directors of Karnak Temples, Ghada Ibrahim, Director of scientific missions, Tayeb Gharib, chief inspector, Abdel Nasser Ahmed and Abder Radi Abdel Monem Mohamed, Chiefs conservator, Tarek Milad Zikri, Chief architect of Upper Egypt, all the inspectors, the Raïs Mahmud Faruk and the workers of the MoA. It is a pleasure to thank all of them for their kind and constant support.

We would like to extend our grateful thanks to the French authorities of the *Centre National de la Recherche Scientifique* and of the *Ministère de l'Europe et des Affaires Étrangères* for their constant financial support and interest on the programmes led by the CFEETK.

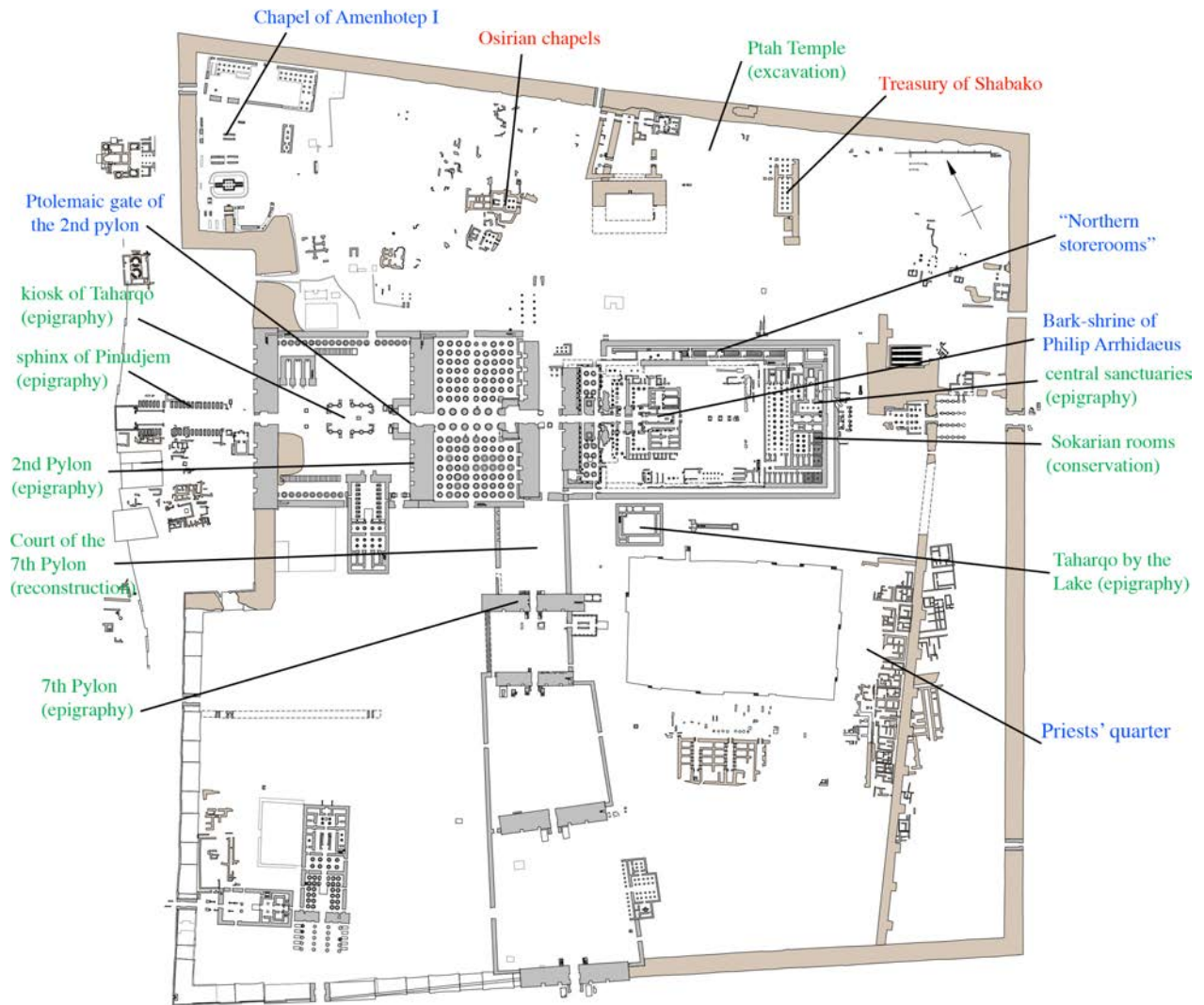
We are always delighted with the excellent relationships between the French-Egyptian Centre for the Study of the Temples of Karnak and the *Ministry of Antiquities of Egypt* led by H.E. Minister of Antiquities, Khaled el-Enany, and the Secretary General of the Supreme Council of Antiquities, Mustafa Waziri.

Christophe Thiers ended his mandate at the head of the USR 3172 of the CNRS and at the co-direction of the CFEETK on the 31/12/2018 and was succeeded at this position on the 1/1/2019 by Luc Gabolde.

Badri Abd el-Sattar

Christophe Thiers

Amun-Re Temple, main fieldwork in 2018



Temple of Ptah : main CFEETK projects
 Osirian chapels : projects hosted by CFEETK
 Priests' quarter : projects currently in publication

1. SCIENTIFIC PROGRAMMES

1.1. POWER AND MARKS OF POWER AT KARNAK

1.1.1. The Sphinxes of Pinudjem (G. Dembitz)¹

A three-week study season had been conducted between the 22th of April and the 7th of May 2018. Its aim was to double-check all the previously digitized drawings and photographs documented between February 2014 and December 2017, and to prepare the existing material for publication (*Les inscriptions de Pinudjem I^{er} sur l'allée des sphinx de Karnak-ouest*, TravCFEETK, IFAO, due in July 2019).

The missing photographic documentation of the inscriptions related to the western processional avenue of the Temple of Amun at Karnak under Pinudjem I was completed by Émilie Saubestre in April-May 2018. During the verification process seven new loose blocks originally belonging to the bases of the sphinxes were identified in the southern block yard located between the Temple of Ramesses III and the Temple of Khonsu, and in the archives of the CFEETK. The blocks were found laying in front of the northern wing of the First Pylon and were later moved to the southern block yard between 1983-1985 by the CFEETK. These blocks will be digitized by Florie Pirou in due course.

Bibliography:

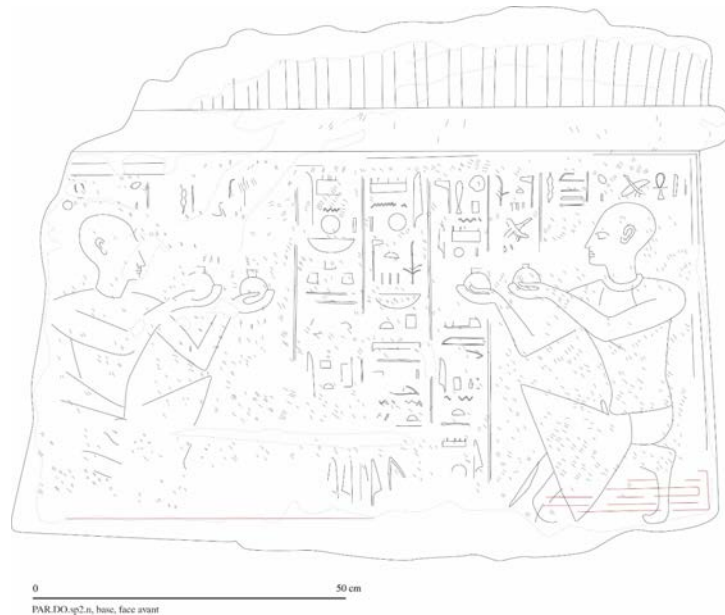
- G. Dembitz, "The building activity of Pinudjem I at Thebes", in G. Rosati, M.C. Guidotti (eds.), *Proceedings of the XI International Congress of Egyptologists, Florence, Italy 23-30 August 2015, Florence Egyptian Museum, Archeopress Egyptology 19*, Oxford, 2017, p. 172-176.



Loose block No. 1839 with the inscription of Pinudjem I, later reused by Shesonq I. © CNRS-CFEETK 128157.

¹ With Mamduh Abd el-Ghassul (MoA-CFEETK) and Fl. Pirou (LabEx Archimede–USR 3172-CFEETK).

Facsimile of the frontal part of a loose block originally belonging to a sphinx base of Pinudjem I built into the foundations of the actual undecorated bases in front of PAR.DO.sp2.n on the dromos.
© CNRS-CFEETK/Fl. Pirou.



1.1.2. The Ptolemaic gate of the 2nd Pylon and the kiosk of Taharqo (R. Preys, M. Minas)²

In 2018, the work was concentrated on the Ptolemaic inscriptions of the Taharqo kiosk in front of the Second Pylon of the temple of Amun at Karnak. They date to the reign of Ptolemy IV Philopator and are located on the intercolumnal walls of the kiosk. On the northern side, three walls are preserved to a height of approximately 1.4 m. On the southern side, only one of the three original walls is preserved to a present height of 0.6 m.

We had prepared the epigraphic drawings based on the photographs taken earlier, so that our main task consisted of checking these drawings. This included the use of artificial light and of a mirror. The *soubassement* (base) comprises processions of nome gods and goddesses, entering on the northern side the presence of the Waset, the goddess of Thebes. The walls originally also comprised a register above the *soubassement*, depicting ritual scenes, of which only the feet are preserved in some cases.

During the mission, two graffiti were discovered. Both are on the northern side of the kiosk, firstly a bark of Amun on the inner face of the second wall, secondly a horse with a horseman on the external face of the first (*i.e.* the most eastern) wall.

The work completed in this season will enable us to review the preliminary drawings back in Europe and to produce an advanced set of drawings, which will need to be checked in a further season.

The manuscript of the Ptolemaic gate of the 2nd Pylon was submitted for publication at the IFAO.

² The mission comprised two team members, René Preys (University of Namur, Belgium) and Martina Minas-Nerpel (University of Trier, Germany). Supported by Ms Warda Elnagar, MoA inspector, we commenced our work on 23 September 2018 and concluded the mission on 3 October 2018. We are grateful for the support we received from the management of Karnak temple and the Centre, especially from Mr Mustafa el-Saghir, Mr Abder Rahim Kazafi, Mrs Ghada Ibrahim, and Christophe Thiers.



Ptolemaic intercolumnar wall of the Taharqo's kiosk. © R. Preys.

Bibliography:

- HOURDIN J., "The Kushite Kiosks of Karnak and Luxor: A Cross-over Study," in E. Pischikova, J. Budka, K. Griffin (eds.), *Thebes in the First Millennium BC: Art and Archaeology of the Kushite Period and Beyond*, *GHP Egyptology* 27, London, 2018, p. 255-270.

1.1.3. The façade of the 2nd Pylon (Cl. Audouit, E. Panaite)³

The second mission of study of the sparse blocks of the 2nd pylon's façade took place from the 4th of March to the 5th of April 2018. The inventory work of the scattered blocks lying upon benches in the southern storage area of the site was continued, using the same protocol as in the previous mission: a template file with an individual numbering system is created for every block and records the basic information (location, dimensions, description, state of conservation). To date, 500 blocks were found and recorded from the 2nd to the 8th benches. At this initial stage, all of them were photographed, although high-resolution photographs will be required for the final study.

Moreover, more than 250 additional loose blocks were identified all over the nine benches but especially on the 1st and the 9th one. Raïs Mahmud and his team removed the vegetation growing among the blocks, giving access to benches 3 and 4. However some of them remain still hardly accessible due to the large amount of camelthorn (*Albagi graecorum*) which covers the aisles between benches 1 and 3. They will be studied during the upcoming mission, in the fall. Thus, one can assume that almost all of the blocks from the southern benches are now acknowledged. Blocks from the 2nd pylon are also stored on benches in the northern storage area: more than 150 blocks have been identified, but some of them are unreachabe because of the camelthorn, or because the decorated surfaces are close to the ground or actually facing down. Indeed, contrary to the southern benches, here, some of the blocks lie directly onto the ground. They should be all recorded during the upcoming missions, so that the initial phase of recording should be finished by the end of this year or the very beginning of the next year.

This preliminary study allowed a better understanding of the pylon's architecture. It is now possible to identify the main elements as the torus, the drip, the soffit and the cornice. The pylon has, up and down of the

³ This programme operates with the support of the LabEx Archimede, "Investissement d'Avenir" programme ANR-11-LABX-0032-01.

structure, several text friezes and also two horizontal cartouche friezes with the name of Ramses II engraved over those of his grandfather, Ramses I. Only these two kings are recorded so far. Vertical large inscriptions surrounded the narrow grooves set to hold the wooden flagpoles.

Furthermore, the western face of the pylon was decorated with offering scenes. The type of decoration is thus different from the one usually chosen by kings during the New Kingdom. Indeed, Ramses I or Ramses II do not seem to have opted for the usual theme of enemies' slaughter but for religious scenes. At the present time, several blocks give information about these kinds of representations. Their organization follows a recurrent pattern. The king stands in front of male and/or female deities like Amun and Mut, Horus or Isis. The Egyptian gods are standing or sitting on a throne. The king wears various crowns, mainly the *pschent*, the *atef* or the *kehepresh* crown. The legend of each offering scene indicates the kind of ritual, the official names and titles of the Pharaoh, of the present gods and some classical protection formulas. We identified so far offering scenes as: the *nemset*-vase, plants and flowers, incense, pieces of meat, wine and other liquids, jubilee celebrations.

The next mission will take place next autumn (October or November 2018). The aim will be to finish the inventory of all the benches, to realize a total photographical survey, and to will try to start the iconographic and historic analyses of all scenes.



Part of an offering scene. © Cl. Audouit, E. Panaite.



Blocks that may fit together. © Cl. Audouit, E. Panaite.



General view of blocks lying on the ground in the northern storage area. © Cl. Audouit, E. Panaite.

1.1.4. The 7th Pylon (Ch. Labarta)⁴

In 2018, works of photographic coverage, drawings and inventory of loose blocks continued. Orthophotographs of each side of the pylon were realised, and a first 3D model of the whole area was produced in collaboration with Vincent Tournadre.

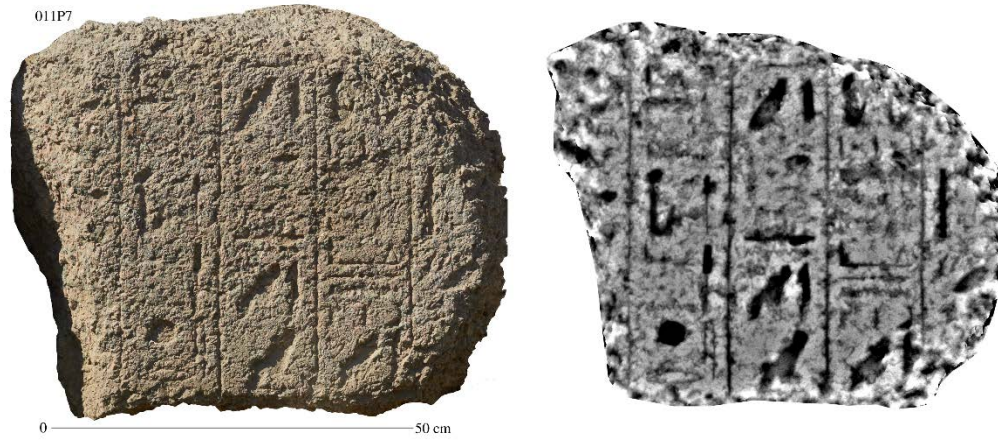
The documentation of the loose blocks lying upon the southern benches was carried on, allowing the first digital reassembly of the scenes of the granite gate, including wine and incense offerings or royal run. Facsimiles were continued by Florie Pirou (LabEx Archimede) and Mamduh Abd El Ghassul (MoA-CFEETK) from orthophotographs of the engraved faces. Research inside the archive also continued in order to get a better understanding of the monument's modern history.



View of the North face, Pillet's Archive / Boite B077-07-1924. © mom.fr.

The depth maps have been particularly useful to identify the blocks belonging to the inscription engraved on the west wall of the passage. Ten loose blocks were recorded, some in a bad state of conservation, and attributed to the wall thanks to this technic which optimizes the reading of the signs.

⁴ LabEx Archimede–USR 3172-CFEETK.



Loose block 011P7, orthophotograph and depth map. © CNRS-CFEETK/Ch. Labarta.

1.1.5. The 8th Pylon (S. Biston-Moulin, E. Froid)⁵

The 2017 field mission was postponed. In September 2018, a two weeks season was held to begin to collate the digital drawings of the graffiti at the temple of Ptah. Work focused on the gates and some of the graffiti on the south side of the temple proper. Ellen Jones also undertook photogrammetry for the purpose of creating 3-D models and orthophotographs of graffiti for which readings are still uncertain. Christoph Bachhuber took total station points of graffiti on the gates in order to locate position with more precision. We hope these will be keyed into the elevations produced by the CFEETK.

At the 8th Pylon we conducted a preliminary survey to assess what has been drawn and what remains to be recorded. Ellen Jones undertook similar photogrammetry of the inked and painted graffiti in the staircase. In the course of checking these photographs in D-stretch she found more yellow painted graffiti on the ceiling. As a result of this we undertook a new survey inside the staircase and found a further three yellow painted graffiti. These have been photographed.

⁵ With Ch. Salvador (univ. Oxford).

1.2. PERIPHERAL AREAS

1.2.1. Temple of Ptah: The Roman-Byzantine quarter (B. Durand, M. Ali al-Abady, A. Nasseh)⁶

2017-2018 Season.

The main goal of the autumn season was to finish the excavation of the Byzantine level on sector 8. From September 2107 to December 2018, a total surface of about 500 m² was cleaned, and led to the excavation of 3 new buildings. On the western part of the sector, a former structure (UB8906) linked with the Ptolemaic gate (C) was dug out. Its function is, as usual, difficult to assess.



General map of the recent excavation, together with the area excavated by G. Legrain. © CNRS-CFEETK.

⁶ With Paul Mégard (VI MEAE-CFEETK), Antonin Durand, Amandine Madelpech, Louis Dautais, Rim Saleh (CNRS trainees), Florie Pirou (CFEETK-LabEx Archimede). This programme operates with the support of the LabEx Archimede, “Investissement d’Avenir” programme ANR-11-LABX-0032-01, in the framework of the programme “Expressions du pouvoir royal à Karnak : entre édification de l’espace sacré et construction du territoire urbain, le temple de Ptah à l’étude.”



General view of the Gate C, and of the entrance of the building 8906, looking South. © CNRS-CFEETK/B. Durand.

Maybe connected to this building during the Ptolemaic period, what is interpreted as the bakery of the temple was also found next to it. Abandoned after the Ptolemaic occupation, it appeared to have been destroyed during the Byzantine period. It contains four bread kilns sub earthed, filled with ashes, charcoal and some pottery dating from the first century BC.



Example of kiln found in the bakery dating from the Ptolemaic period.
The same kiln before and after excavation of its filling. © CNRS-CFEETK/B. Durand.

In the central part of the sector, and facing the houses found during the previous season, a new house was excavated. It contains 6 main rooms and a side court. A stairway was leading to a second level, but as elsewhere, is it difficult to know exactly which part of the house was really roofed. In one of the main rooms was found a jar stand, a grain mill and 6 small stela dating from the New Kingdom. These objects are helpful on one hand to understand the kind of activities carried on in the room, and on the other hand, to give some ideas about religious practises.



The jar stand 179.8903-01 with Christian, classic and pharaonic symbols. © CNRS-CFEETK/B. Durand.



The jar stand and the grain mill *in situ*. © CNRS-CFEETK/É. Saubestre.

In the court, two bread kilns and a red granite mortar were found. If the size of this court is quite large, the important dipping of the floor is limiting the use of the space.



In the front corner, the two bread kilns. The dipping of the floor can be observed by looking at the level of the rough pavement in the opposite angle. © CNRS-CFEETK/B. Durand.

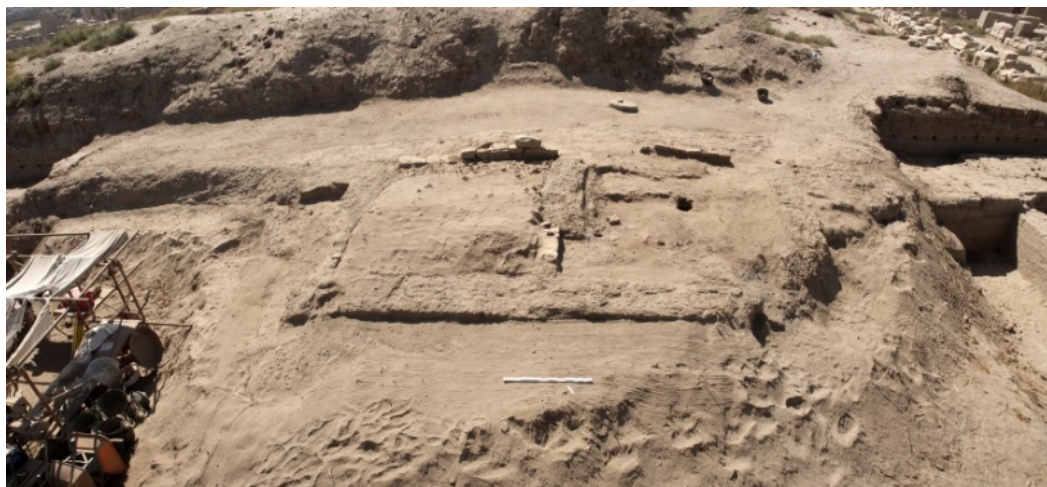
The third building is very damaged. Built with thicker walls than the others building, it consists in three rooms. One of them is quite difficult to interpret as there is no floor, the two others having provided two silos and some pottery. No doorway is preserved, and the spatial organization and the function is barely impossible to clarify.



One of the two silos with red bricks use as foundation. © CNRS-CFEETK/B. Durand.

A large area was also partly cleaned on the southern limit of the excavation, and seems to be a garbage deposit. The very fragmentary pottery spread out all over the area and the absence of any building are leading to this interpretation.

In the sector 12, it is a small area backing the Ptolemaic enclosure wall and dating also from the Byzantine period that was excavated. Only two connected rooms are here preserved. The area was much damaged by the work of George Legrain when he filled up the northern part of the hypostyle hall. If this two rooms can be interpreted as part of a house, it is however difficult to have any certainty (see below the last report).



The two rooms after the surface cleaning; looking South (sector 12). © CNRS-CFEETK/B. Durand.

In order to complete the excavation of the Byzantine remains in the sector of Ptah, a last campaign was carried on on the kôm standing between the gates B and A' (Kushite wall). As the western part of the sector was first excavated in 2008-2009, it was an opportunity to complete the data that were gathered at that time. Priority was given to the drawing of the map, and no layer was excavated, the pottery of the western part being already published. Despite de scarcity and the isolation of the remains, it is possible to interpret them as houses, even if only part of walls were found, and that their complete map is not available anymore.



The eastern part of the sector 2, between the gate B (on top) and the gate A' (down); looking North.
© CNRS-CFEETK/B. Durand.

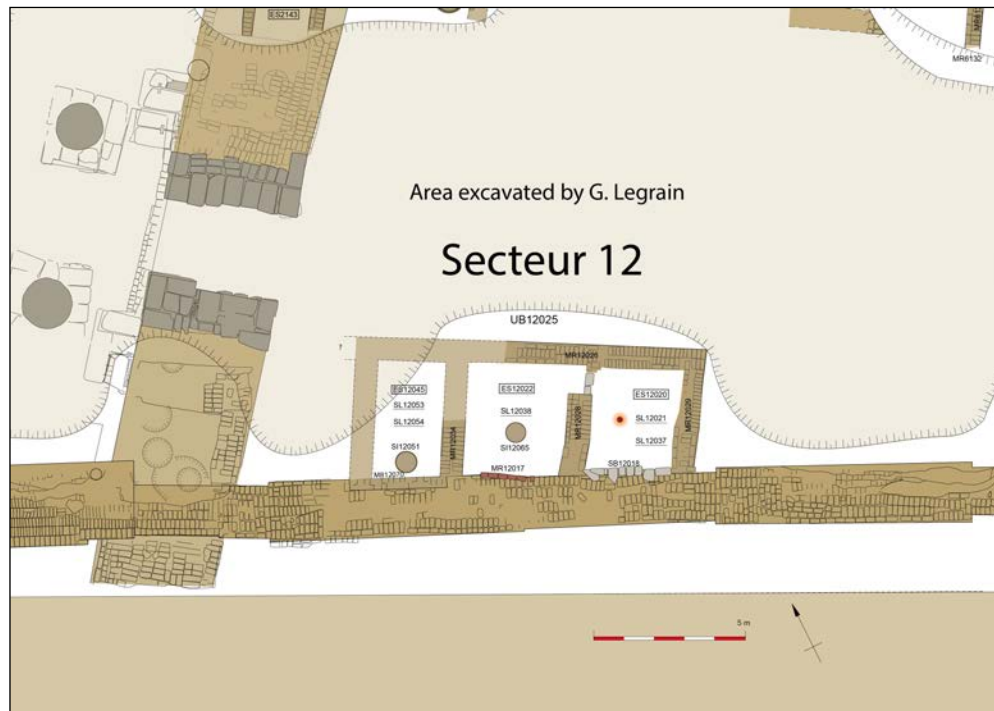


An isolated room on the northern limit of Kushite enclosure wall; looking West. © CNRS-CFEETK/B. Durand.

After the Fall mission, the work focused on writing reports, articles, and the final publication of the existing material from the Roman-Byzantine quarter, which will be submitted to the editor at the beginning of 2019 (IFAO press).

Final excavation on the sector 12, October-December 2018 (B. Durand, Y. Bourhim)

In order to complete the archaeological program around Ptah temple before its end, we decided to excavate the last sector left untouched (sector 12). It stands south of the temple itself, flanking the enclosure wall of the Ptolemaic period (see above).



The remains of the Byzantine period in the sector 12. © CNRS-CFEETK/B. Durand, Y. Bourhim.

The important elevation of the stratigraphy here is due to the fact that G. Legrain did not touch this part of the sector. That led to the conservation of a mound of about 12 m long, 5 m wide, and 2 m high.



The excavation areas in the sector 12. © CNRS-CFEETK/B. Durand.

The main results are the discovery of Byzantine rooms and of some associated artefacts (coins, oil lamps, ceramics...). Unfortunately, totally disconnected with the eastern sector, and very patchy, the information gathered here are difficult to use for a better understanding of the general occupation during that period.



Storage jar and coin found in the Byzantine layers. © CNRS-CFEETK/Y. Bourhim, É. Saubestre.

Under this level, and without surprise, some Ptolemaic period remains were found. Last to be built, an enigmatic structure made of mud bricks stands along the Ptolemaic enclosure wall, following it on around 5 m. So far, no hypothesis can be proposed. It could have intended to double the enclosure wall on few meters.



Mud bricks structure non-interpreted. © CNRS-CFEETK/B. Durand.

It for sure was built during the last period of Ptolemaic occupation as it covers some remains also dated to the Ptolemaic period. Indeed, 4 silos that were covered by it were found. The pottery uncovered in these silos dates clearly to the Ptolemaic period. The area was then facing some changes in the spatial organization of the sector between the reign of Ptolemy III, who built the enclosure wall from the gate of Shabako (A'), and the reign of Ptolemy VI, who extended the enclosure wall from the first gate (A) to the gate of Shabako (A').



Two silos before and after the archaeological dig. © CNRS-CFEETK/B. Durand.

Even if the pottery remains so far unstudied, it is supposed that, under the Ptolemaic level, one could have found some layers dating back to the end of the New Kingdom and the beginning of the TIP. No specific structure can be linked to this period in the excavated sector, and we can only record layers rich in pottery. As the layers themselves extend on a large area, we decided to delineate a limited sounding in order to have a representative sample of them.



Before and after the sounding. © CNRS-CFEETK/B. Durand.

The study of the pottery will give a more precise idea of the dating of the several levels that were discovered during this last season.

The final work on the Ptah temple area was devoted to a complete cleaning and a reconstruction of the mud bricks enclosure walls linked to Kushite and Ptolemaic gates.



Final site management programme: reconstruction of mud bricks enclosure walls. © CNRS-CFEETK/Chr. Thiers.

1.2.2. Ceramic studies (S. Marchand)

The mission took place from February 25th till March 22nd 2018. The analysis of the ceramic of the sector 6 of the temple of Ptah excavated by Guillaume Charloux is now finished. This study offers a complete chronotypological catalog of ceramics from the 11th Dynasty to the end of the 20th Dynasty for this area of the Amun precinct. It is accompanied by ceramic assemblages organized by archaeological layer which follow the stratigraphical diagram of the excavation.

There was this season some archaeological layers to be studied with the last assemblages of ceramic dated from New Kingdom till the end of the Ramesside Period. The collaboration with Florie Pirou continued this season with the realization of new drawings and the systematic corrections of the former drawings of ceramic realized for the set of the archaeological levels included for our study. The finished drawings of ceramic with the realization of the last version of the chrono-typological catalog of ceramics will be realized by Florie Pirou after the mission of study during 2018.

The archaeological layers which contained ceramic dated from the Third Intermediate Period, and brought to light in the same sectors during the excavation in Ptah temple sector will be treated by other ceramologists, Stéphanie Boulet and Romain David.

Documentary mission (G. Charloux)⁷

The documentary mission was held in Karnak from 17 February to 2 March 2018, corresponding to two weeks of field presence. The mission was supported by LabEx Archimède. Its purpose was to prepare, together with the specialists present at that time at Karnak, all the documentation for the final publication of the excavations of the Temple of Ptah (2009-2017). It was also our goal to complete some works in connection with the project of publication of the ancient excavations by Michel Azim and of a recent sounding in the courtyard of the 10th Pylon (project PCSX, G. Charloux and R. Angevin).

• *Geomorphological analysis*

A contact in the field with the team of Angus Graham (Uppsala University), who has been studying the geomorphology of the Theban region for a dozen years, has enabled the establishment of a new scientific collaboration between our teams.

The sediments collected on February 17, 2016 in a manual auger at the bottom of a deep trench located south of the temple, were analyzed by Benjamin Pennington (University of Southampton). This new material is particularly interesting since it can be replaced in a precise geoarchaeological context, under the stratigraphy of anthropic occupations. The results will be published by those researchers as part of the archaeological synthesis of the temple of Ptah.

• *Ceramic examination*

Together with S. Marchand and Fl. Pirou, in charge of the study of ceramics prior to 1st mill. BC., we have taken over the whole stratigraphy of the deep sounding and tried to clarify the contexts of discoveries of the pottery assemblage as well as the archaeological interpretations.

This indispensable work, carried out in collaboration with ceramologists, led us to review material in the boxes, to reassess several details of the stratigraphic analysis (sections, plans, etc.), and to prepare a calendar and a division of tasks.

• *Photographs*

This mission in Karnak was also an occasion to take up the photographic documentation of the archaeological material, to fill in the gaps and replace the bad clichés in the database of the excavations of the temple of Ptah and PCSX. New photographs of objects (seal prints, blocks, lithic tools, etc.) were taken thanks to the logistical support of the team of photographers under the responsibility of Émilie Saubestre.

⁷ CNRS, UMR 8167-OM.

• *Sample preparation*

Another important operation consisted in preparing, with B. Durand and Chr. Thiers, the samples destined to the IFAO. Listings have been prepared for Ptah material as well as for the courtyard of the 10th Pylon. The material was sent to IFAO on April 4, 2018. It includes the C14 samples (fauna and charcoal), as well as the results of the sieving and flotation operations of the macrovegetal samples for Charlene Bouchaud. She will carry out the archeobotanical examination at the IFAO in Cairo, in optimal and comfortable conditions.

• *Preparation of the publication of the excavations*

The preparation of the publications consisted in dividing the material and the results obtained during the excavations of the temple of Ptah among the researchers.

B. Durand will be responsible for the study of all the Byzantine levels, while G. Charloux will propose a synthesis of archaeological levels, all periods combined. An overall plan of excavations has been drawn up and updated for this purpose on Autocad and then on Illustrator. A calendar for the scheduled publications was also envisioned for the preparation of the final publications in the second half of 2018 and in the course of 2019.

Many contributions will be proposed by the specialists in charge of the collected material during the excavations: R. Angevin (lithic industry), Ch. Bouchaud (archaeobotany, study to come), St. Boulet (ceramic 25th-26th Dynasties, study completed), R. David (Ptolemaic to Byzantine pottery, almost completed study), Th. Herbich and his team (geophysics, almost completed study), H. Monchot (archaeobotany, study almost completed), S. Marchand and Fl. Pirou (MK and NK pottery, study in progress), B. Pennington and A. Graham (geomorphology, study completed), J. Roberson (print sealings, study almost completed), Th. Faucher (coins, study almost completed), to which will be added C14 datings (A. Quilès, in progress). This publication will be, of course, based on the work of many technicians, land surveyors, photographers, etc.

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1.2.3. Conservation of archaeological artefacts (L. Antoine, L. Bontemps)⁸

The coins and one Osirian statuette

149 coins have been found between September 2016 and February 2018. The treatment of conservation began during one month last year; the interventions have been finished during this season.

All the coins, from copper alloy, present the same damage but with different levels of corrosion. All of them were cleaned mechanically with scalpel and brush to remove the soil residue and powdered products of corrosion. As to the chemical cleaning, about sixty coins which presented the best state of conservation were selected to undergo an intervention.

• Treatment

According to the nature and to the thickness of the corrosion, different chemical baths were made, and repeated several times.

For the dissolution of the sediments and the thin layer of corrosion, we used a solution of sodium hexametaphosphate up to 5 and 10% concentration in demineralized water. To remove the hard corrosion layers, we dipped the coins in a chemical bath of Edta up to 5 and/or 10% concentration in demineralized water. Alternating immersion in Edta tetrasodium and disodium was sometime necessary. Some coins react better with the carbonate, others with the oxide. We used these solutions in gel when we were close to the surface of the metal or for the treatment of localized areas.

After each bath, the dissolved corrosion was removed by mechanical treatment with scalpel and micromotor. The chemical process requires necessarily the use of demineralized water rinsing during 10 min. At the end of the treatment, when all the corrosion products have been eliminated, the coins are covered with the resin Paraloid B72 up to 5 % to create a protective film.

The same treatment has been done for the Osirian statuette.

⁸ International volunteers (MEAE-CFEETK); with Ashraf Mostafa Ali, Nagwa Abd El-Ghafour, Mahmoud Said Ahmed.



States of cleaning for the Osirian statuette. © CNRS-CFEETK/É. Saubestre.

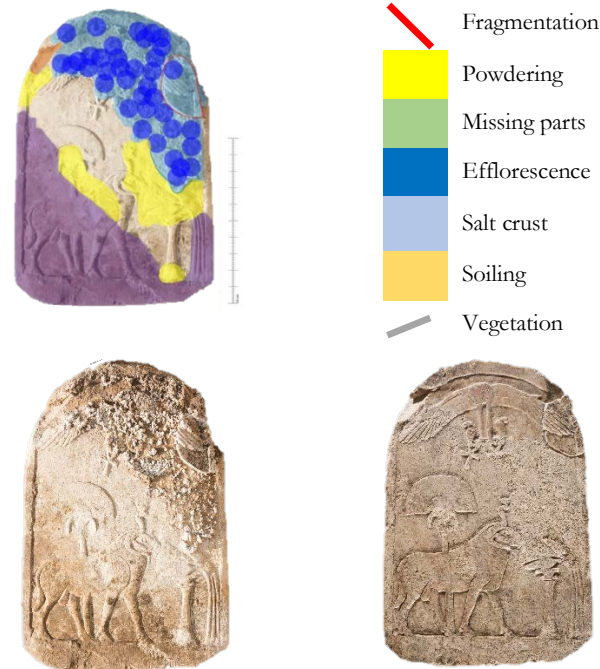


Coin during and after cleaning. © CNRS-CFEETK/É. Saubestre.

The steles

During the excavation of Ptah, seven steles have been discovered: six made of limestone and one of sandstone. This last one presents a good state of conservation; some remains of pigments were still visible. All the steles in limestone have been contaminated by the salts, and the result of this contamination is visible through the presence of efflorescences, salt crust, and powdering. The burial conditions in a damp environment with salts are the main causes of the decay.

Some of them were broken, or had missing parts. The surfaces presented staining and soiling but some remains of red pigment were still present.



Location of the damages. Stele before and after treatment. © CNRS-CFEETK/É.Saubestre.

• Treatment

It was necessary to remove the efflorescence of salts on the surface and consolidate the powdery areas. The surface needs to be cleaned and the pigments to be consolidated. The steles present a good quality of execution; the treatments should therefore enhance their aesthetic values.

The withdrawal of the salt crust has been done with several applications of Mora paste compresses⁹ with cellulose powder. Because of the powdering state of the limestone below the salt crust, this one was only reduced enough to have a better readability of the relief. Removing it completely would have been too hazardous.

The consolidation of the powdering area was made by using several compresses of ammonium oxalate up to 5% concentration in demineralized water.

The soiling and staining have been reduced first, by absorption with compresses of clay. Thereafter, we cleaned with several compresses made with ammonium bicarbonate, EDTA, CMC and demineralized water, and charged with cellulose powder.

The remains of pigments were consolidated with a cellulosic adhesive, Klucel G, up to 5% concentration. After the consolidation of the pigments we could have a better view of the detail and uncovered the representation of four rams, two of which wearing a crown, emblem of the god Amon.

The reassembly of the fragments has been done with an epoxy adhesive. To ensure the reversibility of the treatment, the bonding surfaces have been isolated with a protective film of Paraloid B72 up to 5% concentration.

Treatment of conservation for the sandstone blocks

Some reused blocks uncovered during the excavation were in a bad state of conservation. Three have been consolidated¹⁰ because their general state threatened them of granular disintegration. Two of them (one

⁹ The Mora paste is compound of EDTA, ammonium bicarbonate, sodium bicarbonate, CMC and demineralized water.

¹⁰ Ethyl silicat Wacker Silres BS OH 100 up to 50% in ethanol.

broken in two parts, the other with important scaling), have been dowelled with fiberglass stems and epoxy resin. The block from the top of eastern doorjamb of Gate C' has been found in good state of conservation with remains of polychromy. A small area on the upper part was consolidated; the rest of the sandstone did not present damages. The soiling was cleaned with a brush prior to the consolidation of the antique preparation layer with a solution of ammonium oxalate up to 5 %, and for the paint layer with a synthetic resin.¹¹



Reused block from Gate C'. Detail of the remains of polychromy under the soiling and salts.

© CNRS-CFEETK/L. Antoine.

Restoration of ceramics

Two different stands in terra cotta uncovered during this campaign have been restored. The first one was broken in 21 fragments with missing parts (lower part), areas of exfoliation and powdering. The second one was a jar stand covered with an engobe; despite his well-preserved state we observed some damages like blistering, powdering, peeling and cracks.

The main cause of these deteriorations is the burial environment which is humid and contaminated by salts.

• Treatment

The fragments have been fixed with an epoxy resin.¹² Prior to that treatment, a thin layer of thermoplastic acryl resin¹³ has been applied on the sticking areas in order to make a superficial consolidation and to help the possible reversibility of this intervention.

The powdering area was consolidated with this same resin, Paraloid B72 up to 2% concentration. The cracks and the peeling were consolidated by injections with an acrylic adhesive¹⁴ diluted with demineralized water or charged with a fine mortar¹⁵ depending of the space.

The missing parts and the cracks were closed with pluggings made with the same mortar (with crushed ceramic for the first support) bonded with the same acrylic adhesive. To integrate the intervention, a retouch was done with watercolour.

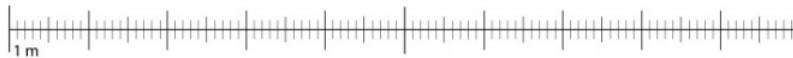
¹¹ Klucel G up to 5 % with ethanol.

¹² Araldite 2015.

¹³ Paraloid B72 up to 5 % in acetone.

¹⁴ Primal E330 S.

¹⁵ PLM-M.



Jar support before treatment. © CNRS-CFEETK/É.Saubestre.

Details of detachment of the engobe and efflorescence. © CNRS-CFEETK/L. Antoine.

Small finds

Again, a lot of small objects and fragments have been uncovered during the excavation of Ptah area. They were cleaned mechanically with soft brushes to remove the dirt. The repeated interventions on these various materials were fixing and consolidations.

1.2.4. The Treasury of Shabako (N. Licitra)¹⁶

In order to prepare the recovery of excavations in the Treasury of Shabako, an expert assessment has been requested to CRAterre Laboratory of the *École Nationale Supérieure d'Architecture* of Grenoble. For several years, the “Archaeology and Conservation” section of this laboratory specialized in research on earthen architecture since the late 1970s, works in collaboration with numerous archaeological missions world-wide to advise and assist them in setting up restoration projects of archaeological remains. For this purpose, from April 7th to 13th, 2018 Nadia Licitra and Thierry Joffroy carried out a study mission in Karnak. The objective of the mission was twofold.

First, the expertise of Th. Joffroy had to assess the state and the conservation conditions of the Treasury and allow to formulate advises and recommendations for the future work programme linking the recovery of excavations to the conservation of the earthen remains uncovered from 2008 to 2015.

Secondly, the observations made during the mission had to start a wider reflection on the conservation of mud brick buildings on the Karnak site and, more generally, in Egypt.

During this week, direct observations have been made not only in the Treasury, but also in other monuments of the precinct of Amun. In particular, attention has been paid to the mud brick monuments which have already been restored such as, for example, the Roman chapel in front of the first pylon and the chapel of Osiris Neb Djefau. In order to have more elements of comparison, it has also been possible to organize visits at South Karnak, Kom el-Ahmar and Medamud, as well as at Medinet Habou, at the Ramesseum and at the Merenptah temple. The aim of these surveys was to draw up a list of possible circumstances and degradation processes of the mud brick constructions, and to check the effectiveness of practices of restoration in progress or already carried out.

At the end of these surveys, it appeared that, as expected, the main problem for future restorations in the Treasury of Shabako, as well as, more generally, in Karnak, is the management of the plants growing on – and in some cases covering completely – the archaeological remains. The roots of these plants penetrate deep into the walls weakening the masonries, and piercing the earthen floors as well as the plastered walls. This circumstance is not specific to the Treasury since the phenomenon can be observed all over the other buildings in Karnak and in the Theban region, including those built of stone, even if the latter do not suffer in the same way. In all the observed cases, it was possible to ascertain that the plants grow again fairly quickly after the restoration work has been completed. A long-term solution therefore does not yet exist.

During the mission, the species have been identified and information concerning their different cycles of life has been collected. On several occasions, exchanges took place with workers of the different sites. Their good knowledge of the environment and their experience helped to understand some aspects of the plants' behaviour that are not always easy to detect by simple observation. At the same time, climatological research has also been started.

The aim of the partnership being established with the CRAterre laboratory is to go beyond the specific case of the Treasury of Shabako and to extend the reflection on the conservation of mud brick monuments to other Egyptian sites facing similar problems. The Treasury will be used as a case study where to conduct preliminary observations and initial tests of restoration. The objective is the establishment of one or more intervention protocols that could be used by any archaeological mission working in Egypt.

Furthermore, it is also envisaged to organize and animate periodically, in the years to come, workshops and meetings to bring together the archaeological missions working in Egypt: the aim is to promote research and debates about techniques of restoration of mud brick monuments adapted to the different environments in which these missions work.

¹⁶ Post-doc, Sorbonne University, UMR 8167. With Thierry Joffroy, CRAterre Laboratory.



The Treasury of Shabako in February 2018. © R. Séguier.

1.3. CULTS AND PLACES OF WORSHIP

1.3.1. The bark-shrine of Philipp Arrhidaeus (Chr. Thiers, A. Tillier)¹⁷

The work focuses on the final publication of this monument, including facsimiles, hieroglyphic font (JSesh), and photographs. Several loose blocks belonging to the monument were recorded. The volume including fac-similes, JSesh texts and color photographs was submitted to IFAO in November 2018.

1.3.2. The Central sanctuaries of the *Akh-menu* and “Northern Storerooms” (Chr. Thiers, Chr. Leitz, S. Biston-Moulin)¹⁸

The work in this season (from Devenber 11 to 20) was focused on the main sanctuary JB2, the series of rooms to the east of it (JB3-5) and a closed group of rooms to the southwest (SW1-4). The drawings of the wall decoration of those rooms had been finished in Tübingen between December 2017 and November 2018 to be collated during our stay in Karnak.

To check the drawings of the architraves and the columns in SW1, a scaffold was needed. It was built with the support of the CFEETK and the Rais Mahmud Faruk, giving a perfect access to the inscriptions. Furthermore, the drawings of the texts on the columns in JB1 were also checked. The work also focused on some blocks probably belonging to the rooms SW1, SW2 and JB3. In the room SW4, we were surprised by the discovery of paint residues (red and yellow) in the lower part of the scenes.

Additionally, the work concerned the objects (offering tables, statues or parts of them) placed in the rooms SX1-2, JB1-2 and SW1. By means of a mirror, an earlier copy of the inscriptions and depictions on the big offering altar in the main sanctuary, published by Nathalie Beaux in 1990, could be improved. Due to good lighting conditions, traces of decoration under two cavettos in room JB4 –which were never noticed before– were found.

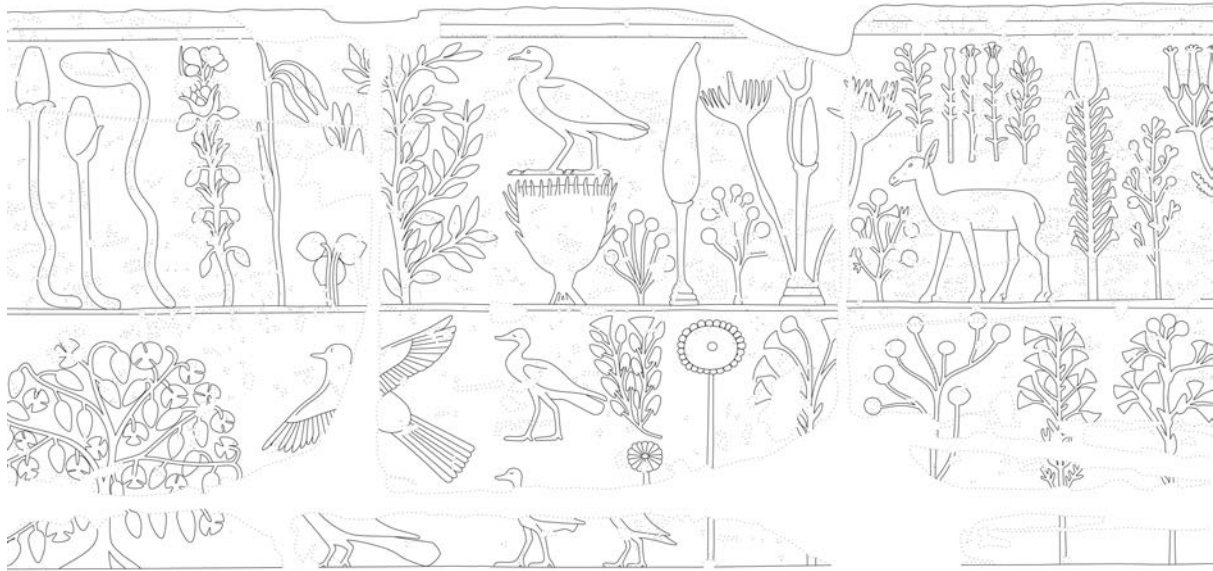
Apart from those details, the work in the Sanctuary of Alexander and its surroundings (rooms SX1-4, JB1-5, SW1-4) could be finished during this campaign. The next step will be the preparation of the edition of texts and drawings.



Traces of decoration under the cavetto of a pedestal in JB4. © A. Rickert, D. Mendel.

¹⁷ With Fl. Pirou (LabEx Archimède–USR 3172-CFEETK) and Mamduh Abd el-Ghassul (MoA-CFEETK).

¹⁸ With Fl. Pirou (LabEx Archimède–USR 3172-CFEETK), M. Abd el-Ghassul (MoA-CFEETK), D. Mendel, A. Rickert (univ. Tübingen).



Drawing of a wall in AKM.JB.1. © D. Mendel, A. Rickert.

Photographs and checkings of facsimiles are in progress for the areas SF.13, SL, and the Eastern Temple of Thutmosis III. The volume dedicated to the “Northern Storerooms” will be submitted for publication by S. Biston-Moulin in 2019.

The drawings of the “Northern storerooms” are now completed, and the publication is in preparation.

1.3.3. The Edifice of Taharqo by the Sacred Lake (J. Hourdin)¹⁹

During the season 2018, the epigraphic work of Taharqo’s edifice by the Sacred Lake focused on the continuation of the loose blocks’ inventory. A part of the blocks lying upon the benches of the south-west block yard as well as all the blocks stored to the east the Kushite monument were photographed in order to begin the drawing of facsimiles.²⁰ The identification of ancient photos taken by Henri Chevrier allows to compare the conservation state of some blocks that are now damaged. Surveys in Taharqo’s monument were also undertaken to check the small blocks still stored inside it and the reused elements of Shabako.

It is now possible to make a series of suggestions for the restitution of Taharqo’s decorative program of the upper part of the monument and its architectural organization. Some blocks belong to a set of doors integrated into decorated walls. Two large lintels (around 3 meters long) could even belong to the main eastern door of the building. The inscriptions of these gates which mention solar gods (Amun-Ra, Ra-Horakhty and Atum), along with two blocks depicting baboons adoring the sun, and another one with a solar bark, confirm also the solar purpose of the upper parts of Taharqo’s temple. Most of its walls have been decorated with a single register of scenes and, in some parts, a horizontal inscription with royal dedication was engraved above it. The Kushite king was generally depicted in front of a single deity, and sometimes in front of the Theban triad, as for the outer walls of the monument.

The first results of this study were presented during the 14th International Conference for Nubian Studies in Paris (September 2018).

¹⁹ LabEx Archimède–USR 3172-CFEETK.

²⁰ With Ch. Wolff and P. Megard (VI MEAE) for the photographs; Fl. Pirou (LabEx Archimède USR 3172-CFEETK) and M. Abd el-Ghassul (MAE-CFEETK) for the drawings.



Lintel fragments of the Edifice of Taharqo. © CNRS-CFEETK/Ch. Wolff, P. Megard.



Reused blocks of Shabako inside the Edifice of Taharqo. © CNRS-CFEETK/J. Hourdin.



Loose block from Taharqo's Edifice. © CNRS-CFEETK/Ch. Wolff.

1.3.4. Demotic graffiti (D. Devauchelle, G. Widmer)²¹

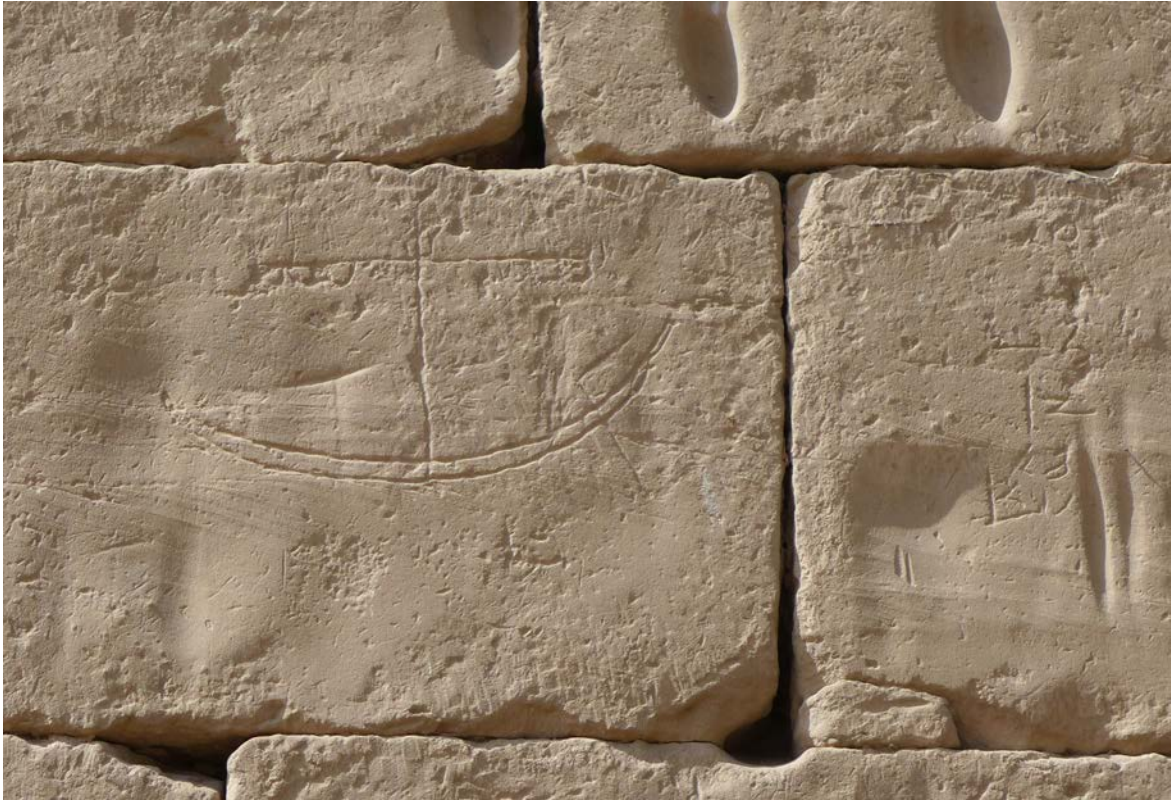
The purpose of this mission (March 29 to April 5, 2018) was the continuation of the previous study.

During this short mission, our attention was particularly drawn to a series of texts engraved on the external side of the North wall of the Great Court (Bubastite wall). This enclosure, which was left undecorated, appears to bear traces of quite a few graffiti mainly figural and therefore difficult to date. A group of five demotic inscriptions (possibly from the Ptolemaic period) is particularly interesting as it consists of a list of numbers which have been summed up. These texts are nowadays difficult to study since they were engraved 7 meters above the ground. Thanks to the help of members of the CFEETK staff we managed to get a closer view to them. It will be interesting to try to understand when and how these graffiti were made: possibly during a period when scaffoldings or hills of earth stood in front of the wall.

Outside this area, we also had the opportunity, thanks to the perfect light of April, to improve some former readings and discover a few new graffiti, in particular on the enclosure wall of Thutmose III.

Finally, we checked ancient photographs in the CFEETK database showing the two postern-gates situated in the Southwest sector of the main temple of Amun in order to prepare our project of clearing them so as to study their demotic inscriptions. Thus one aerial image taken between 1924 and 1927 shows that the area had been cleared in the past.

²¹ UMR 8164 HALMA (Lille 3, CNRS, MCC).



Graffiti engraved on the external side of the Bubastite wall.

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1.3.5. The Osirian Sanctuaries (L. Coulon, C. Giorgi)

The seventeenth campaign of excavation and restoration of the chapels of Osiris to the north of the Great Hypostyle Hall was undertaken with the support of the CFEETK, the IFAO, EPHE, INRAP, Orient & Méditerranée - Mondes pharaoniques (Paris-Sorbonne) and HiSoMA (Maison de l'Orient et de la Méditerranée, Lyon), between January, 30th and March, 1st 2018, for the main part of the mission.²²

Archaeological studies and excavations (Cyril Giorgi)

The studies were conducted in the frame of the project “Osirian chapels at Karnak”, directed by Laurent Coulon and Cyril Giorgi. Located to the north-west of the great temple of Amon of Karnak, between the great hypostyle hall and the temple of Ptah, the chapel of Osiris Wennefer Neb Djefau was erected during the 26th Dynasty under the pontificate of the god's wife Ankhnesneferibre. As part of a project devoted to the development of the Osirian cult in Karnak, this chapel has been excavated and studied since 2000 by an epigraphic and archaeological mission. This year, the work has focused on the preparation of the archaeological publication, the study of the artefacts collected during the previous seasons and the restoration of the chapel and objects. Only a few additional soundings were undertaken.

• *Inside the chapel*

At the north-western corner of the chapel, a part of the secondary enclosure wall is founded on a stone pavement which belongs to an older building. This pavement found in 2013 was made of mixed sandstone and limestone paving stones. On the pavement, several objects were found, including an inlay cobra head (to be set in an architectural frieze of uraei), a finely incised pottery made of faience, a flint blade and fragments of gold leaves.

This year we focused on identifying and documenting the mudbrick walls and foundations surrounding this pavement, which appears to be related to a ramp-type access system. Those remains may be tentatively assigned to a previous Osirian sanctuary of the first half of the 26th Dynasty. Previous work has shown that several elements from a chapel of Nekao II were reused in the area, which may belong to that building. The preliminary studies of the ceramic remains allowed to locate this construction between the 25th and the 26th Dynasty.

All the layers below these architectural elements of mudbricks were dated between the 22nd and 25th Dynasty. In addition, some elements dated from the 21st Dynasty could also be collected, such as a fragment of cooked brick stamped in the name of the of the High Priest of Amun Menkheperre (son of the Theban king Pinedjem 1st, High Priest at Thebes around 1039-990), in secondary position.

²² The members of the team were Laurent Coulon (egyptologist, EPHE, director of the mission), Cyril Giorgi (archaeologist, INRAP, co-director of the mission), Frédéric Payraudeau (egyptologist, University of Paris IV), Catherine Defernez (ceramologist, CNRS UMR 8167), Sylvie Marchand (ceramologist, IFAO), Hassan El-Amir (conservator, IFAO), Ayman Hussein (artist, IFAO), Thomas Faucher (numismat, CNRS, IRAMAT-CEB), Anna Guillou (archaeologist and egyptologist), Aleksandra Hallmann (egyptologist, Chicago Oriental Institute, Polish Academy of Science), Laurent Vallières (topographer, INRAP), Florence Gombert-Meurice (egyptologist, Louvre museum), Raphaëlle Meffre (egyptologist, University of Paris IV - Louvre museum). Nicolas Souchon (PhD student, EPHE, PSL) has attended a training session in archaeology from February 5th to 28th, 2018.

Charlotte Wolff (topograph, MEAE-CFEETK) has provided her assistance for the topographical survey. The objects were photographed by Emilie Saubestre (CNRS, USR 3172 CFEETK) and her team (Guillaume Muller, Karima Dowi abd al-Radi). The restoration and conservation of the artefacts as well of the site was undertaken by Hassan el-amir (conservator, IFAO) and his colleague Fatma Mohamed abd el-Hakm (conservator, MoA, Karnak).

Mrs Mona Abadi (excavations), Mr Mustafa Alaa ed-Din Hajaj (Evergete storeroom) were representing the Ministry of Antiquities under the supervision of, Mr Mustafa el-Saghir, Mr Badri Abd al-Sattar, Mr Abder Rahim Kazafi and Mrs Ghada Ibrahim.



Stone pavement in the northern part of the chapel. © C. Giorgi.

- *Northern part of the pylon*

During the seasons 2016 and 2017, on each side of the northern part of the pylon (MR 505), inside and outside the chapel, we had found different phases of restoration and reoccupation, which had destroyed a great part of this one. Inside the chapel we had discovered several ceramic deposits and many spaces restructured and reconstructed, included in a larger project.

Outside the chapel, a large platform is composed of mud, floor levels of mud bricks, and some walls forming small spaces. This area dated from the 3rd and 2nd cent. B.C. was directly connected with the north-eastern corner of the pylon, making it difficult to understand the initial architecture of the pylon.

This year a complementary excavation allowed us to verify the data collected last year²³ and confirm all the components of the northern part of the pylon. Moreover, these verifications enabled us to record and draw all the brick architecture, and to prepare in a second step the restoration of the monument.

²³ See report 2017.



View of the northern part of the pylon (MR 505) with his foundation. © C. Giorgi.

- *The connection with the chapel of Osiris Neb ankh*

During the last seasons (2015 to 2017), we undertook several soundings to distinguish 26th dynasty and Ptolemaic phases of constructions. In many cases the partition mudbrick walls and enclosure walls have been restructured several times, which radically changed the initial aspect of the first building. As a reminder the study of the different artefacts enabled us to reconsider the datation of this mudbrick wall (4th and 3rd cent. B.C.). During this work, we understood that the modification of the enclosure of the chapel during the first part of the Ptolemaic period was intrinsically linked to a larger project including not only the chapel of Osiris Wennefer Neb Djefau, but also the chapel of Osiris Neb ankh / Pa wesheb iad. A Ptolemaic mudbrick wall included in the masonry of the northern part of the pylon was connected to the enclosure wall of the chapel of Osiris Neb ankh / Pa wesheb iad.

This year we undertook a new excavation in the center of this wall, and in the southern part to confirm all these components and verify his foundation, before the restauration program. As during the last season, the various ceramic artefacts that we found in this wall confirm the reoccupation and rebuilding of a part of the chapel during the Ptolemaic period and probably also during a short phase of the Persian period. Furthermore, the excavations confirmed the hypothesis that the chapel of Osiris Wennefer Neb Djefau was already connected to the chapel Osiris Neb ankh / Pa wesheb iad during the 26th Dynasty.

- *The alley of Ptah*

During the previous season of excavation, we removed 4 blocks of the pavement of the alley of Ptah (near a Roman water well) to compare the data to those collected in the 2016 season.

This year, to collect additional information and artefacts (ceramic) we removed various layers of mudbrick on the western side of the alley.

Furthermore, we undertook a cleaning of the platform of mudbrick overhanging the alley, to the west, to realize a photogrammetric survey and to record more precisely the Ptolemaic construction. The ceramological study is currently in progress.

Conservation and restoration

This year, the restoration of the mudbrick wall of the chapels has been completed, including the northern part of the first pylon and the wall connecting the chapel of Osiris Wennefer Neb Djefau and the chapel of Osiris neb ankh. The missing part of the pavement has also been replaced in the east-northern part of the hypostyle hall. After cleaning of the first gate, a protective device against birds has been settled on the walls of the chapels.

The conservation of objects (coins, statuary, metal objects) has been continued in the Evergete storeroom (see also the report of H. el-Amir).



Restoration of the mudbrick walls in the northern part of the chapel. © C. Giorgi.
The chapel after restoration at the end of the season 2018. © C. Giorgi.

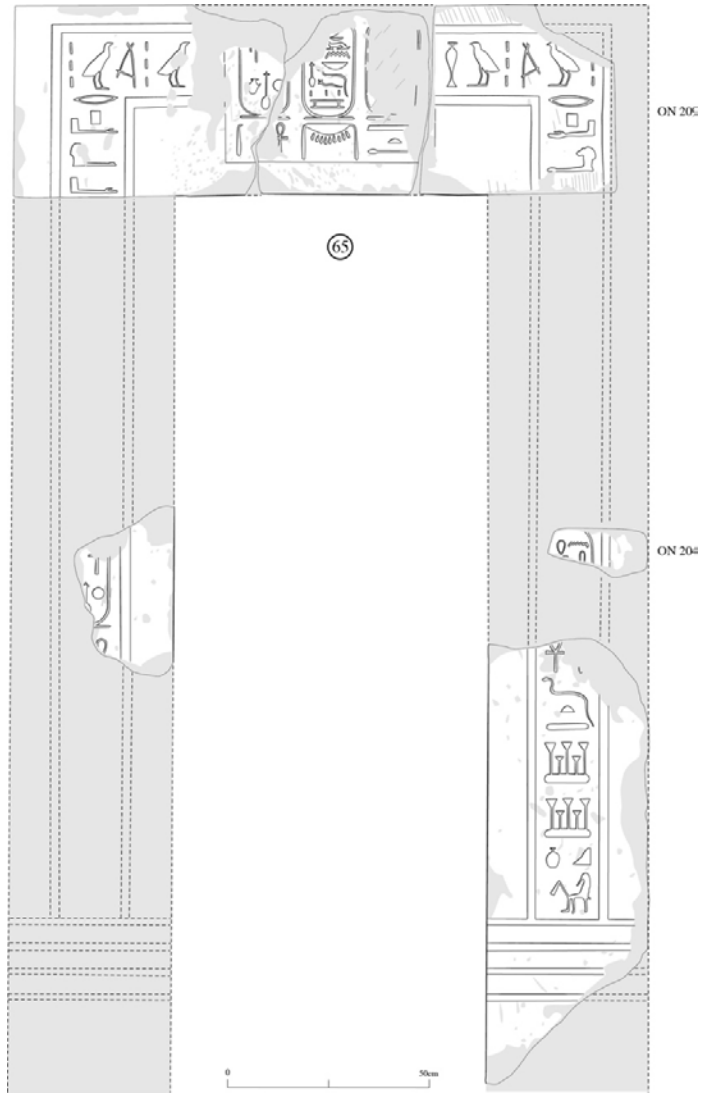


Cleaning of the first gate and installation of bird deterrent devices. © C. Giorgi, L. Coulon.

- *Reconstruction and restoration of the lintel of a secondary gate of the chapel*

The epigraphic study of several blocks found on the site during our excavations or previously (one of which discovered by Legrain and kept until now in the Sheikh Labib storeroom) has led to the reconstitution of a secondary gate of the chapel, inscribed with the names of Osiris Wennefer Neb Djefau, Ankhnesneferibra, Psamtik II, and the majordom Sheshonq. Its original location is dubious, although it could have been the gate of the southern annex of the naos.

The preparatory work for a reconstruction of this gate has been made this season, in order to rebuild it next year. The three fragments of the lintel have been stuck together by H. el-Amir. A foundation platform has been built in the northern part of the site, to the north of the naos, an area which has been excavated during the previous campaigns. The platform measures 3,30 m by 1,50 m and is made of three layers of red bricks built on a layer of sand and a plastic sheeting. On this construction, three stone slabs were disposed to support the construction of the gate.



Reconstruction of a secondary gate of the chapel of Osiris Wennefer Neb Djefau
 © L. Coulon, drawing A. Guillou.

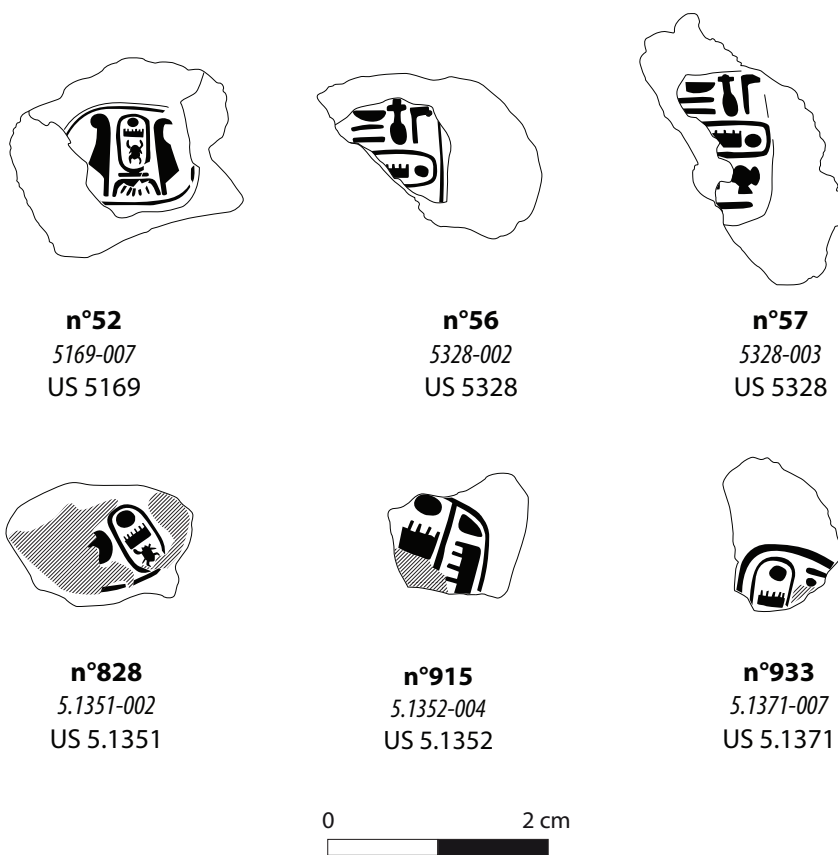


The lintel of the secondary gate after restoration. © C. Giorgi.

Objects documentation and study (Fr. Payraudeau, Fl. Gombert, R. Meffre, Th. Faucher)

The objects have been studied in the Evergete storeroom by Fr. Payraudeau, Fl. Gombert, R. Meffre and Thomas Faucher under the supervision of Mr Mustafa Alaa ed-Din Hagag, MoA Inspector. As there was no extensive digging this season, only eight new objects have been transferred to the Evergete storeroom, the more important one being a fragmentary burnt mudbrick bearing the cartouches of the High Priest of Amun Menkheperra of the 21st dynasty. 89 objects from previous seasons, specially 2017, have been documented, photographed and inputted in the database. A more thorough study of some the artefacts has been pursued in preparation for the archaeological publication.

The bronze Osiris figures, faience amulets and some scarabs have been drawn by Ayman Hussein (IFAO). The photographs have been made by E. Saubestre and her team.



Sealings of the 'Menkheperra' style. © F. Payraudeau.

• *Sealing and scarabs (Fr. Payraudeau)*

Frédéric Payraudeau (Sorbonne University) has begun the study of the sealings and scarabs, around 137 objects. 60 mud sealings with readable stamp have been drawn and classified. Several levels prior to the building of the chapel contained sealings of the 'Menkheperra' style. Their date reveals still problematic as their use lasts very long after the reign of Menkheperra Thutmosis III and such objects can easily move from a strata to a later one. Our sealings from Osiris Neb Djefau's chapel seems to run from the reign of Merenptah up to the end of the Third Intermediate Period.

• *Amulets (R. Meffre)*

Raphael Meffre (Louvre Museum) has studied the amulets of faience, especially the wedjat-eyes and Gods figurations. The 2018 season was dedicated to the documentation and study of the amulets and shabti statuettes unearthed during the preceding seasons. All this material dates back to the 1st Millennium BC, the oldest objects belonging to the Third Intermediate Period and the newest to the Greco-Roman time.

138 amulets, including complete and fragmentary statuettes, were identified and grouped by types. The most important group is the one of the wedjat-eyes, with 59 specimens (including 3 multiple eyes and 3 beads showing multiple eyes). The second group, in term of number of statuettes, is the goddesses, with 17 amulets (including 6 *Isis lactans* and 1 lion-headed goddess). Other important groups of amulets are the wadj-columns (9), the Bes and Pateque gods (respectively 8 and 6 specimens), amulets showing a god (7, including 1 ram-headed god, 1 falcon-headed god and 1 mummyform god) and child-gods (3). Other types of amulets are attested only once or twice (e.g. prisoner, sphinx, scorpion, jackal etc). Curiously, the archaeological context of an Osirian chapel did not lead to the discovery of a great number of amulets showing Osiris.



Wedjat-eyes from the excavations of the Northern Osiris chapels. © R. Meffre.

7 moulds for amulets were also studied; they were intended to make amulets of grape bunches, *Isis lactans*, Thoueris, Bes, Ptah Pateque, a bee and a Hathoric head on a column. All the amulets found during the excavations of the chapel were made from one of these moulds. The shape of the amulets was compared to other moulds. This shows continuity in forms of the grape bunches and Thoueris goddess with examples dated to the New Kingdom.

3 shabtis were identified and their study led to ascribe them to the 25th Dynasty (no. 1873), the 26th Dynasty (no. 1874) and the middle of the 26th Dynasty (no. 132) thanks to comparisons with the objects found in the Theban necropolis and especially in the Assasif tombs.

Other objects were also studied: 1 foundation deposit plaquette bearing the name of Amenirdis I (no. 559), which was compared to other examples of such objects kept in museums, a head of a uraeus cobra coming perhaps from a chapel (no. 875) and a small limestone stele showing Khonsu and Nefertum (no. 293).

- *Bronze statues of the Osirian chapels (Fl. Gombert)*

Florence Gombert (Louvre Museum) has continued the study of the bronze statuary and of the cultic material. In 2018, the study of the bronze statues of the Osirian chapels focused on the archeological contexts. Some additional fragments of statues were also identified: the feet of a statue of Osiris in hollow cast, a falcon's amulet crowned with a pschent, the legs of a divinity once placed in inlay and fragments of large statues as well as the lower parts of two statuettes of Osiris.

A study of the contexts of discovery provisionally allows to distinguish six sets of statues in the chapel of Osiris Neb Djefau. Two groups can be considered as enclosed ones buried in the chapel at the beginning of the 26th Dynasty. They consist in the content of a closed jar and in the assemblage placed under the southeast corner of the naos of the chapel and at the threshold level, closed with a reused door jamb from the time of Necho II.



Bronze artefacts found with the reused doorjamb of Necho II.

Other statuettes have been discovered buried in the chapel or in direct connection with it, such as fragments of statuette of Osiris excavated in the northwestern corner of the foundation platform of the naos, a statuette of Khonsu discovered under one of the slabs composing the ramp to a chapel, north of the Naos, or an *atef* crown feather uncovered between two column bases of the hypostyle hall, whereas the soil seems to have been very disturbed there, as exemplified by the presence of Ptolemaic coins.

Other objects were probably related to the function of the chapel, but were found without any specific connection with it, especially the statuettes discovered on the surface area.

Finally, two groups of statuettes were mixed with Roman artefacts. One of them, south-east of the chapel, consists of fragments of statuettes of Osiris and fragments of a large bronze statue, which can compose a waste dedicated to later use. The other group of objects gathered in Roman times, east of the chapel, at the edge of the path leading to the temple of Ptah, inversely contains well-preserved pieces of which a statuette of Nephthys winged of earlier period, directly found on the circulation ground associated with many complete ceramics, including miniature vases, and various objects like a scarabeus, amulets or coins. Not far, a statuette of Khonsu-Thot in bronze of fat proportions was found under a Roman period assemblage, within the terminal filling of a Ptolemaic period silo where was also discovered a small wooden figurine representing a sistrum goddess. A duck's head which was the end of a *simpulum* handle was uncovered in the same area, in a mud brick wall connected to the ground of the Roman period.

In addition, three objects in copper alloy were discovered during the excavations of the building behind the chapel. The first one is a seal inscribed with the name of Amon (?) discovered in the last level occupation of a small room (4th c. B.C.) where a fragment of an amphora and a lot of bread moulds were also discovered. The second one consists in two feathers of Amon with a solar disc discovered in a large room dated from the end of the Vth to the 4th B.C. Finally, an inlay plaque was discovered in a pit of very heterogeneous material dated from the Late Period to the Byzantine period. This plate is decorated with a naos topped by a frieze of uraei, divided in two registers, one with a scene of two deities seated on either side of an emblem perhaps the Abydenian fetish.

The study of the bronze statues also focused on the statuettes found in the chapel of Osiris Neb-Neheh in 2007, in three areas, in the four-column hall in front of the naos, in the axial chapel of the naos and in the lateral chapel of the naos. They can be studied as a whole as their contexts of discovery seem similar: all the statuettes were placed between the pavement stones, concentrated in the most sacred spaces of the chapel. These are sixteen statuettes or fragments of statuettes of Osiris, eight of which are the result of a simple fabrication by printing the wax on one side, four were moulded face and back, four other were in hollow cast. Various fragments of scepter and uraei of *atef* crown of Osiris statues were also found there. To this set of statuettes or fragment of statuettes of Osiris is added an hathoric crown, a statue of nursing Isis and the curl of hair of a child divinity. Their description in a catalog will take on the criteria defined in the study of the statuettes of Osiris in bronze discovered at Ayn Manawîr, a small temple of the oasis of Kharga, dedicated to Osiris *im*. Their study made it possible to distinguish what belongs to the technique, function, style or iconography and thus to define types.

- *Coins (Thomas Faucher)*

The work accomplished on coins this season was done during a stay between 22nd and 28th of February. The aim of this study season was two-fold. The first one was to complete the study of coins found last year during excavations and that have been cleaned at the beginning of this season. The second one was to check, complete the registration and take all the pictures of the coins found since the beginning of the mission. Since no excavations took place this year, and consequently that no coins were found, it was possible to have a complete overview of the coins found by the team in the past 20 years or so.

Last year, a large group of coins was found scattered in different soundings southeast of the entrance of the chapel. More than 40 coins were found overall. Even if the largest amount of them was found scattered over the site, it appears that there are three groups of coins, dated from the same period, but with different metallurgical features. Found in a lower level, there was also few very large Ptolemaic coins. Within the large groups, all struck between the end of the 2nd cent. BC and the first half of the first cent. BC, three distinctive metallurgical groups arose. The first one is a "classical" example of molded coins, produced with a bad copper alloy (content of tin can rise up to 30 or 40% of lead). The second group consists of coins somehow smaller

in size, of grey, color, composed mostly with lead. The types of the coins, only visible on one coin, show the same characteristics than the coins of the previous group (head of Zeus Ammon/ two eagles on a thunderbolt). The third group show coins of the same size but with different color, dark red, and characteristic of high content copper alloy. The other difference of these coins is also that they present a surface with tiny blisters of the same color on the surface. It looks like corrosion beforehand, but the cleaning of the coins has proved that there are bits of metal attached to the coins. These features must be connected with the smelting process during the production of coins.

These three groups, with very special features, are unofficial productions. Their very bad manufacture characteristics could be the sign of a very local production, even a production made in the same area. Most of these coins indeed show traces of bad control of the metallurgy process and could represent the default coins of a local production. The absence of molds and furnaces connected to their discovery do not allow to be more specific nor to ascertain its exact location.

The other coins found last year, in deeper levels, are all Ptolemaic coins of the third century BC. Some of them are in very good state of preservation and there is one example of the largest coin ever struck during the antiquity. This coin was worth an octobol and weights 80.6 g. It shows on the obverse a head of Zeus Ammon the right and on the reverse, an eagle facing left, the head reverted, with the letter Epsilon between legs and, around the eagle, the legend ΒΑΣΙΛΕΩΣ ΠΤΟΛΕΜΑΙΟΥ. This coin belongs to the 4th series of the Ptolemaic bronze coins, struck between 240-220. In the same layer (71.010), another coin was found, from a later series (5, 220-197), which is not surprising since they are circulating together. Together with those two coins, a large iron key was also found. This makes a very interesting group and discard, somehow, the possibility of a random loss. It better looks like the coins were left there and that the owner never came back. It could be related to the phase of hoarding that is contemporary of the local revolt at the very end of the 3rd cent. BC.

The number of coins found since the beginning of the mission reaches now 132. Even if the general state of conservation is of bad quality; this sample provide an interesting counterpart of the coins found elsewhere in the temple, especially in front of the first pylon. The vast majority of the coins are from the Ptolemaic period (108), followed by a small lot of early roman coins (10) and late roman coins (4). Only 10 coins were impossible to date to any period at all.



Bronze octobol of the series 3 (240-220).

Ceramological studies

Under the co-direction of Catherine Defernez (CNRS, UMR 8167) and Sylvie Marchand (IFAO), and with the collaboration of Ayman Hussein (artist, IFAO), ceramological studies took place from February 12th to March 22th, 2018.

As mentioned in the initial program, the aims of the mission were, firstly, to review (or record) the material uncovered during the last season at several points of the Chapel of Osiris Wennefer Neb Djefau), and, secondly, to continue a further analysis of the pottery uncovered in the area of the Chapel during the previous excavations, and actually stored in the sound and light magazine.

- *C. Defernez*

Several goals were pursued:

- Following study of the material uncovered during previous excavations of the large mud-brick building located behind the naos of the Chapel – sector 3;
 - Preliminary analysis of the ceramic-sets collected during the last season, either in the northern part of the Chapel, or along the enclosure wall;
 - Following study of the material uncovered during previous excavations inside the Chapel – sector 5;
 - Sampling of ceramics sherds for archaeometric studies in IFAO laboratory (through CFEETK application).
- Following study of the material from the mud-brick building to the western part of the Saitic Chapel (sector 3)

A further analysis of the material collected from the building located behind the Chapel was also established (sector 3). This area has provided a large amount of pottery dated from 25th to 31st Dynasties. This season focused on the study of the material found in the large pits dug in the middle of walls of this building. Despite their heterogeneous character, the sets which were studied²⁴ have revealed a few essential data, such as more complete profiles of several shapes not well-preserved in the stratigraphical units (or closed deposits). These pieces complete the corpus initially established. Among the major pieces recorded (or collected), let us mention fine vessels in Marl clay (Fig. A)²⁵ characteristic of the Persian period and contemporary to the last occupational phases of the building (4th cent. BC),²⁶ local copies of Cypriot mortars of the Late Classical period (Fig. B-C), fragments of a few Aegean amphoras²⁷, Phoenician jars and Attic vessels (such as a base of black-glazed kantharos), fragments of imitations of Cypriot basket-handles amphoras in local Marl clay (Fig. D) and numerous pot-stands (Fig. E). Further information on the chronology of these structures was also provided. Among the finds, if the Late Period pottery is well-attested, fragments of the Ptolemaic and Coptic periods have been identified: fine vessels of the Hellenistic tradition (*echinus* bowls/or cups, cooking pots such as *caccabai*, *lopades*, etc.), jars, mugs and bottles with geometrical and floral patterns (painted in red, brown or black), typical of the beginning of the Ptolemaic period (3rd cent. BC), pieces from Rhodian amphoras (rims, handles, bases), and then, rims, necks, bases and handles of the Coptic amphoras called Late Roman 7, dated to the 4th century BC, and later. Alongside with these

²⁴ Mainly US 5153, US 5154, US 5176, US 5177, US 5179, US 5180, US 5420/5005, and US 5159 (excavated pit in unit P4 – see US 5068).

²⁵ Fabric Marl A4, variant 2, in Vienna System.

²⁶ Such as large storage-jars with S-profiled rims, carinated cups and plates with direct or everted rims, shallow dishes with slanted sides and a ring-base, basins, mixing-bowls, pot-stands and *dokkas*.

²⁷ Mainly rims and handles from Solocha amphora type, well-dated to the middle-second part of the 4th cent. BC.

significant vessels, several fragments of local copies of Aegean transport amphoras in Marl clay (Rhodian, Cnidian and Coan amphoras), dated from the late 4th to the late 3rd century BC, were recorded.²⁸

At the end of this preliminary analysis, it is curious to note that only a few rare pieces of Roman pottery were identified. For the 7 excavated pits, only few of them contained artefacts dating back from the Roman period, and more specifically to the beginning of the Roman period (from imperial times). Thus, all data gathered from this season let us to think that a large part of the mud-brick building (sector 3) – particularly the southern part – was probably dismantled in the course of the first part of the Ptolemaic period.

- Preliminary analysis of the ceramic-sets collected during the last season, either in the northern part of the Chapel, or along the enclosure wall (sector 5)

Focused on the conservation and anastylosis of the main structures of the Chapel dedicated to Osiris Wennefer Neb Djefau, this season has not provided a large amount of pottery, contrary to the previous seasons. Thus, the material collected was extracted from various soundings made inside the Chapel, to the northern part of the area (SD 86 and SD 90). From this sector, only pottery-sherds, in a bad state of conservation, were found. Despite their small size, a relative date may be proposed (only for a few sequences excavated in the northern part of the Chapel where an older platform was uncovered - access ramp or Chapel).²⁹ Most of the collected pieces could be not later than the 25th Dynasty, which means that the pavement cleared must date back to this period: specific shapes, such as meat-jars, everted conical cups or plates in Nile clay, chalices, storage S-profiled necked jars in Marl A4 (Fig. A), kegs from Baharya Oasis are closed to the 25th Dynasty, and well-documented on various sites of this period; these elements were connected to the intrusive pieces dating back to the TIP and Ramesside period: body-sherds from Ramesside amphoras in Marl F, Marl D and in Marl B, were clearly identified, also a few rims from Canaanian jars and local vessels in Nile E or Nile D.³⁰ Sets from this area should be dated to the transitional phase between TIP and 25th Dynasty or early 25th Dynasty (SD 90, US 90.001, US 90.002, US 90.003 and US 90.004). Moreover, rare layers around this structure which have provided material seem to be occupied at the same period – first part of the 25th Dynasty (SD 86, US 86.001, US 86.002, US 86.003; SD 99, US 99.001). This chronological range should also be the same for the layers which were excavated at the immediate proximity.

In the area where other field verifications have been carried out, at the entrance of the Chapel, for example, or along the enclosure wall protected by several « orthostates », sets of pottery uncovered belong to the last occupational phases of the Late Period (late 5th to early 3rd cent. BC): such is the case, for example, of the material coming from ORTHO 1 (US 5.1053), ORTHO 2 (US 2), and MR 501, N.1;³¹ of course, as in many other contexts, sherds from various periods were also identified (from Ramesside, TIP, 25th and 26th Dynasties).

Concerning other levels, numbered SD 91 (US 91.002, US 91.003), SD 95 (US 95.001), SD 15, US 82.010 and MR 505, it is difficult to propose a more accurate datation than “Late Period” with a small portion of data. It is important to note that a small piece of a Ptolemaic cup (named *echinus bowl*) was found in layer of bricks 1 of MR 515.

- Following study of the material uncovered during previous excavations inside the Chapel (sector 5)

At the end of the last season, a brief examination of the material from previous excavations in area 5 was also done. The material relating to the following levels – US 5130, US 5081, US 5140, US 5078 and US 5267 –

²⁸ Mainly in each pit (US 5179, US 5180, US 5153, US 5177).

²⁹ Mainly US 90.001, US 90.002, US 90.003A-B, US 90.004, US 90.004, under greyish level.

³⁰ Vienna System fabrics very well-attested during Ramesside and early TIP times.

³¹ It is noteworthy to quote that a base of a burning-incense cup dating to the 4th cent BC (and later, early 3rd) was found in MR 501, N.1.

is marked by a great disparity: pottery-sherds from Ramesside period to late Coptic period were identified. It is however important to note that no piece later than early 3rd cent. BC was identified in levels US 5231 and US 5233. Furthermore, most of the material coming from US 5271, 5273, 5275, and US 5190 (under the way to the Ptah Temple), should be dated to the late 25th/early 26th Dynasty.

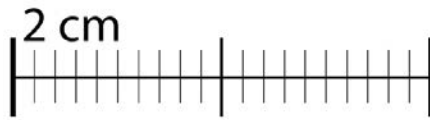


Fig. A: Marl clay fabric (Marl A4, Var. 2). © CNRS-CFEETK.



Fig. B: Mortar in Marl clay fabric (Marl A4, Var. 2).



Fig. C: Mortar in Marl clay fabric (Marl A4, Var. 2).
© CNRS-CFEETK.



Fig. D: "Basket-handle amphora" in Marl clay fabric (Marl A4, Var. 2). © CNRS-CFEETK.



Fig. E: Pot-stand in Nile clay. © CNRS-CFEETK.

• *S. Marchand*

The study mission conducted on the material from Ptolemaic and Roman layers was divided between the analysis of the ceramics from the excavation of the 2018 season and the preparation of the drawings of individual pieces for the catalog and assemblages. The chrono-typological catalog and the study of ceramic assemblages of the Ptolemaic and Roman eras have been completed at the end of this mission and prepared for publication. This corpus includes the ceramic material of the excavations from 2013 (including the sector 5 for years 2004, 2008-2009). All drawings were made by Ayman Hussein. Complements of photos were made this season by Émilie Saubestre (USR 3172-CFEETK) including that of the Roman ceramic assemblage discovered in 2017 dated of the 2nd century. AD. 16 ceramic samples from the ON excavations were taken by C. Defernez and S. Marchand in March 2018, for study (thin section and macro photos) at Ifao's materials study laboratory. An inventory of stone vases (NMI = 37) and animal and human figurines (NMI = 122) that have been uncovered in the Wennefer Neb Djefau area was provided by Frédéric Payraudeau. A very quick review of this furniture allowed us to evaluate the time that will be required for its study next season, in February 2019.

The iconographic study of the osirian chapels (A. Hallmann)

During the 2018 season, A. Hallmann continued the iconographical study of the Osirian chapels, which is a part of the project: *Les sanctuaires osiriens de Karnak*. The work that started on March 11th and finished on March 20th was supervised by the MoA inspector Mr Abd el-Meneim Ahmed Abd el-Azim.

The work concentrated on the Kushite chapel of Osiris Neb-anekh / Pa-wesheb-iad situated on the alley of Ptah, to the north from the chapel of Osiris Wennefer Neb-anekh. The chapel was built during the tenure of Shepenwepet II, and the reign of Taharqo, who are both represented in the chapel's decoration. Additionally, there is a portrayal of deceased Amenirdis I. The iconographical analysis of the chapel focused on the style of portrayals of human figures as well as gods. It encompassed analysis of anatomical features of rendered figures, their costume and attributes, as well as the relations between figures. In these regards, the special attention was also paid to the scale of represented figures and the architectural elements on which they were carved.

The work also focused on preserved colors in the chapel decoration. The colors were possible to be traced on some figures, on the background area, as well as on some glyphs. The color analysis reveals that some elements of chapel decoration were only painted and not carved. The tracing of colors' distribution and their preservation was done in order to supplement the visual analysis by archaeometry in the future. The goal of this research is to examine the different stages of chapel decoration from the preparation of the wall to the last stage of painting's application, as well as techniques used by the artists. The visual analysis allows for distinguishing yellow, blue, white and possibly two shades of red color.



Remaining colors on the crown of Amun. Chapel of Osiris Neb-anh/Pa-wesheb-ia. © A. Hallmann.



Remaining colors on the portrayal of the God's Wife. Chapel of Osiris Neb-anh/Pa-wesheb-ia. © A. Hallmann.



Remaining colors on the portrayal of the God's Wife. Chapel of Osiris Neb-anh/Pa-wesheb-ia. © A. Hallmann.

1.4. THE *KARNAK* PROJECT (S. Biston-Moulin³², Chr. Thiers)³³

Started in January 2013, the *Karnak project* (CNRS, USR 3172 - CFEETK / UMR 5140 - ASM, Team ENiM - Programme “Investissement d’Avenir” ANR-11-LABX-0032-01 LabEx Archimede) aims to collect, organize and make accessible all textual documentation both present and originating from the temples of Karnak.

The website: www.sith.huma-num.fr/karnak

The new interface was opened to the public on June 12, 2017 after a presentation in Montpellier. In 2018 almost 5,000,000 visitors had viewed the project records online during the first four years of its existence.

In 2018, the *Karnak project* reached 6500 hieroglyphic inscriptions of the Karnak temple accessible online with a permalink system giving access to complete records of documents (hieroglyphic texts, high-resolution photographs, facsimiles, bibliographies, etc.). Just over 10,000 hieroglyphic inscriptions have been integrated into the project to date. These documents are progressively published online after review and validation by project members.

The work of indexing the corpus of Karnak’s inscriptions, which is still in the process of being assembled, has led to the publication in June 2017 of a first version of the Glossary of Karnak’s inscriptions devoted to vocabulary. This first volume contains just over 1,600 terms representing about 100,000 attestations in the inscriptions processed at this stage. It complements the inventory of monuments, objects, scenes and inscriptions of the Karnak temples published in 2016 and will be regularly enriched as the work of indexing and lexical analysis of the corpus progresses.

This volume is accessible in Pdf format from the websites of the French-Egyptian Centre for the Study of Temples of Karnak (MoA/USR 3172 of the CNRS) and the Egyptology team of the University of Montpellier (CNRS, UMR 5140-ASM).

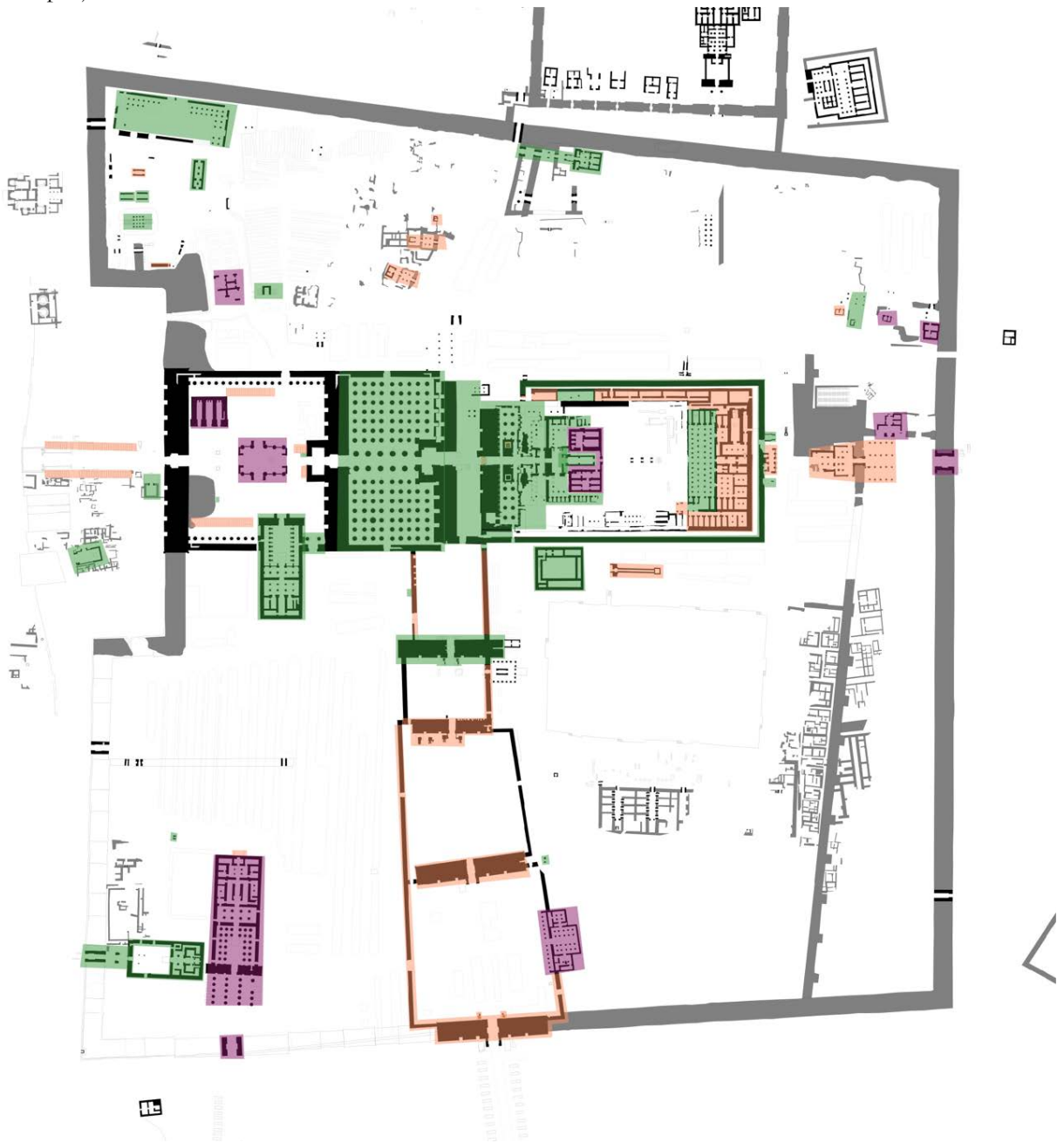
Several articles related to the work of gathering and publishing Karnak’s inscriptions in the project were published in Volume 16 of *Cahiers de Karnak* (see below).

The work carried out on the *Karnak project* has also made it possible again this year to identify gaps in the photographic documentation kept at the CFEETK. A photographic survey programme based on the *Karnak project* inventory was established with the CFEETK photographic service. The orthophotographic technique (AgiSoft PhotoScan) allowing in a reasonable time to make the large number of photographs necessary for the advancement of the project and the regular addition of new documents online.

³² CNRS, UMR 5140-ASM.

³³ This project is supported by LabEx Archimede from “Investissement d’Avenir” programme ANR-11-LABX-0032-01; <http://sith.huma-num.fr/karnak>, <https://karnak.hypotheses.org/>; with G. Dembitz, J. Hourdin, Ch. Labarta, A. Fernandez Pichel, Fl. Pirou (LabEx Archimede–USR 3172-CFEETK), T. Fignon, M. Gervason, M. Louys, M. Habachy (CNRS trainees).

Status of the project in 2017:



green: online or partially online;
orange: completed data entry, documents being finalized for online publication;
purple: current data entry.

Bibliography:

- BISTON-MOULIN S., THIERS Chr., “The Karnak Project: A Comprehensive Edition of the Largest Ancient Egyptian Temple”, in A. De Santis, I. Rossi (eds.), *Crossing Experiences in Digital Epigraphy. From Practice to Discipline*, Berlin, 2019, p. 153-162.

2. RECONSTRUCTION PROGRAMMES (A. Garric)³⁴

2.1. The walls of the “Cachette Courtyard”

The walls of the “Cachette Courtyard”

The reconstruction project has started in September 2016 in Karnak Temple: the reassembly of 250 blocks onto the Cachette Courtyard walls, built by Thutmose III and especially decorated by Ramesses II and Tutankhamun. Partially rebuilt following the study of (F. Le Saout, 1982), this anastylosis is based on a research done by G. Dembitz who produced, from epigraphic survey and old photographs, some views of the reassembled stones. These studies were done to document the meaning of the decorated scenes and the hieroglyphic texts.



Orthophotograph of the west side of East Wall before anastylosis. © CNRS-CFEETK/A. Garric.



Orthophotograph of the west side of East Wall after anastylosis. © CNRS-CFEETK/A. Garric.

One of the main difficulties of anastylosis, especially when the monument is incomplete, is the first laid courses cannot be readjusted during the laying of the next ones, and these not only have to connect with the part already assembled but also, at the end, with those of the existing building. Note that each stone weights about 2.5 tons.

The reassembly of all the blocks to their original position on the structures still in place requires a millimetric accuracy.

Each one needs to be carefully surveyed with these specifications to know the dimensions and the precise architectural characteristics as to the course heights, block lengths, and distance between the decorative elements and joints.

As traditional survey techniques are long and tedious (in this case, it would require scaffolding, plumb level, drawing board, etc.), while an image-based approach is an opportunity to accelerate this process.

Therefore, orthophotographs on both sides of each wall have been made with a resolution adapted to the direct needs of the reconstruction work: sufficient enough to record all necessary information, allowing the reading of hieroglyphs, the measurement of decor elements and joint positions, without being overly cumbersome.

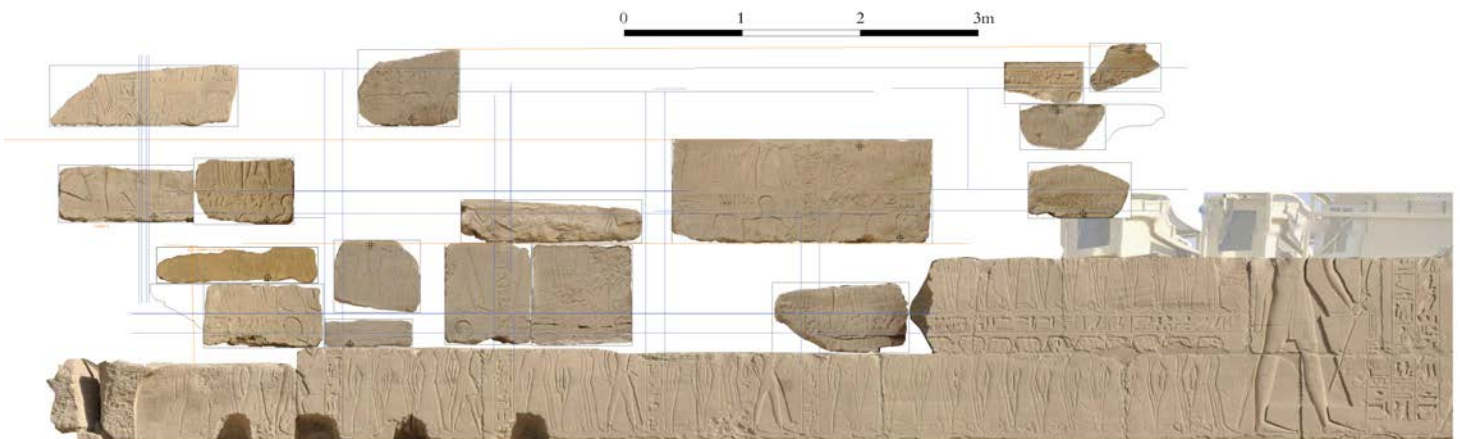
Unlike the epigraphic use-case, the visual information derived from the image reconstruction are not as important as their geometric quality. On a 60m long and 8m high east wall, about a hundred images were

³⁴ With Ramadan Yassin, Jamal Salem, Hashem Abd El Hamid, Ahmed Youssef, Hamdi Adli, Ashraf Jamal, Samir Ahmed, Mohamed Abd El Sid, Girgis Ernest, Saadi Saadek, Mohamed Khalil, Walid Mohamed, Mohamed Abbadi, Salah Fahim (MoA-CFEETK).

taken from 3m (Nikon D90). To guarantee this geometric quality, 6 to 10 GCP are set on the wall, associated with close-up pictures indicating their positions (defined on easily identifiable elements such as the end of a line of decoration, the tip of a particular crack, etc.). A 3D model is created, allowing to compute orthophotographs on the vertical side. Inserted into a CAD software, the next step is to integrate all the blocks into the complete orthophotograph of the wall. Two solutions are possible:

- Using historical images if the quality is good enough, although this may not be the best solution.
- Making orthophotographs of each block (limited to 5/6 shots)

In both cases, the distance between two details on each decorated face are measured, and thus all blocks can easily be imported and scaled in the CAD file.



Recently discovered blocks to be reassembled onto the Cachette Court North-West Wall. Ortho-images of all the blocks to be rebuilt have been scaled and accurately preassembled on CAD software (ongoing reconstruction hypothesis).

© CNRS-CFEETK/G. Dembitz, A. Garric.

Therefore, it is no longer necessary to make measurements either on the wall or on the blocks as the measurements are all easily accessible in the ortho-image CAD file: widths of the different scenes, height of the text lines, distance between a line and a joint, etc. all within millimetric accuracy.

With this kind of information, the reconstruction work can easily be done "virtually" and then on the field. For the North Wall top part, which is 12m high and difficult to survey, the position of 16 recently discovered blocks has been confirmed by using this photogrammetric process without even moving them, which is rather practical because some stones weigh more than 4 tons.



The recently discovered niche decorated in the name of Tutankhamun being reconstructed. © CNRS-CFEETK/A. Garric.

Finally, the realization of this anastylosis will soon lead to a publication (in collaboration with G. Dembitz) on a recent discovery: during the reassembly of the first scenes of Tutankhamun (east side of the East wall), we have discovered the existence a niche decorated in his name and till now totally unknown.

This niche is now fully reconstructed as well as all the scenes of Tutankhamun. The rebuilding of the west side of this wall was completed in May of this year. All the lacunary parts of the walls are built with new stones cut on the site by our team and have been rendered at the end with the laying of a coloured coating approaching the appearance and colour of sandstone.

All ancient stone facings received a final cleaning (desalting, surface consolidation on the remains of polychrome, etc.). All the scaffoldings have been taken down.

The programme is now focusing on the West Wall reconstruction.



The last block of Tutankhamun scenes being set in place. © CNRS-CFEETK/A. Garric.



Reconstructed part of the west side of East wall. © CNRS-CFEETK/A. Garric.



Reconstructed part of the west side of East wall. © CNRS-CFEETK/A. Garric.

3. CONSERVATION-RESTORATION PROGRAMMES (L. Antoine and then Laura Bontemps)³⁵

3.1. The so-called “funeral rooms” of the *Akh-Menu*

This work concerned the conservation of the so-called “funeral rooms” (AKM.CF.1-3) built under the reign of Thutmosis III in the *Akh-menu*. They consist in a vestibule and two chapels dedicated to the cult of the (statue of) king.

Report on the present state of conservation

Structural alterations

- Granular disintegration especially on the lower part of the monument
- Granular disintegration located in the bed of sedimentation on the upper blocks
- Salt-subflorescence of bedrocks
- Stone fragments separated and movable
- Fractures and cracks
- Old mortar with cement

Surface alterations

- Generalized dusting
- Cement mortar overflowing
- Thin layer of cement on bedrocks
- Powdery paint layer
- Ring

Diagnosis

The sandstone is contaminated by salts coming from the ground. Their migration into the stone can be caused by multiple factors. One of the origins can be the recurring floods of Nile previous to the construction of the Aswan dam in 1965. Besides, the former level of burying, knowing that the actual ground level is 2 to 3 meters lower, is a condition that broadly favored the motion of salts high into the stone. Moreover, the actual level of the water table, though significantly lowered, also causes salts migration due to the capillary lift.

The previous interventions carried out with cement coating cause even more deterioration of the sandstone. This material is forming a waterproof layer and therefore confines the salts into the stone. We can also notice that, within time, this coating became unsightly.

Treatment proposal

The work carried on in the funeral rooms of *Akh-menu* aims at ensuring the conservation of the architectural ensemble through the stabilization of the structural degradations of the stone. Our intervention should also improve the aesthetic value of the site thanks to various interventions such as polychromy consolidation, applying of new coatings and cleaning of the surface of the walls.

³⁵ The work was supervised by L. Antoine (International volunteer, MEAE-CFEETK) and Abdel Nasser Ahmed, Chief of conservation. Members of the team: Ashraf Mostafa Ali, Nagwa Abd El-Ghafour, Abdelnasser Mahmoud, Mahmoud Said Ahmed, Ghaad Nubi Hussein, Tarek Mohamed Gharib, Mustafa Abdou Mahmoud Qoraïm, Manon Lefèvre (conservator), Corentin Luneau and Clémence Poirier (CNRS trainees). Many thanks to *rais* Mahmud Faruk for his technical assistance.

- Treatment process

Structural interventions

The first treatment applied was the withdrawal of the modern cement coatings. This intervention allowed us to uncover sandstone blocks masonry sealed with a mortar made out of limewash and brick powder.³⁶

We decided to keep this past intervention because of its good condition and also because of the use of safe and stable materials.

The blocks from the bedrock that are in an advanced disintegration condition have been purged then desalted on their surface with the application of clay compresses. This clay has the necessary soaking skills for the withdrawal of salt efflorescences.³⁷

Consolidation treatment

The blocks presenting a substantial granular disintegration state have been treated with ethyl silicate.³⁸ This treatment had also been applied locally, on smaller powdering areas.

The consolidating product should progressively permeate in the sanding area of the stone. Therefore, openings have been made each 15 cm allowing us to inset a drip system. The depth of the openings is adapted to the treated area we are willing to reach.

This intervention is lasting approximately 4 hours to optimize the progressive permeation of the silicate into the stone. The blocks are then wrapped with tarpaulins in order to increase the evaporation time of the solvent and thereby encourage the hydrolysis reaction of the consolidating product. Following this phase, the chemical process needs another 3 weeks but then unwrapped before any other intervention could be applied on the stone.



Consolidation of the upper stones (a and b), the granular disintegration is advanced and the sandstone is reduced like powder (c). © CNRS-CFEE/TK/L. Antoine.

The areas with superficial cohesion lacks have been consolidated with a nanophasic calcium hydroxyde in dispersion within isopropyl alcohol.³⁹ This solution has been applied three times with a brush.

³⁶ Treatment led by Georges Legrain.

³⁷ Comresse made out of sand and a mix of two kinds of clay with equal proportions: attapulgite (high quality clay free of impurities) and *biba* (local clay).

³⁸ Wacker Silres BS OH 100 up to 50 % in ethanol.

³⁹ Nanorestore®.

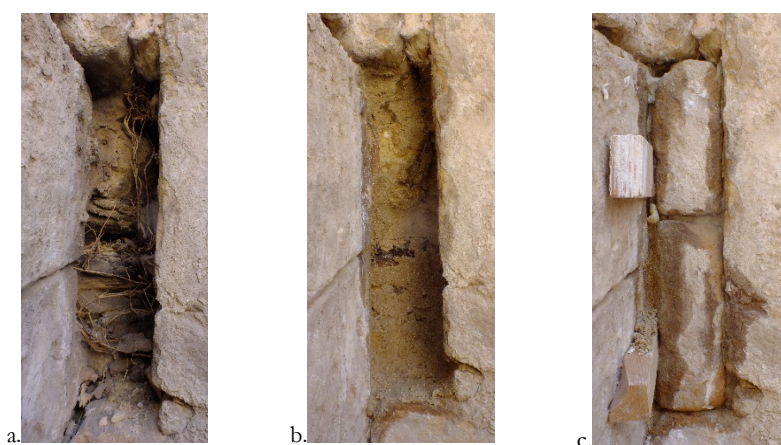
Antique mortars made out of whitewash that have been uncovered and observed in the joints between the blocks, have a powdery texture. They have been consolidated with ammonium oxalate⁴⁰ diluted up to 5 % in demineralized water and applied with a syringe.

Stone fragments separated and movable

After the removal of the modern coating, some fragments that it was maintaining were dissociated from the block. Different treatments have been applied depending on the situation.

The small fragments were fixed with an epoxy resin.⁴¹ Prior to that treatment, a thin layer of thermoplastic acryl resin,⁴² Paraloid B72 up to 5 % in acetone, has been applied on the sticking areas in order to make a superficial consolidation and to help the possible reversibility of this intervention.

The “patches” that were dissociated from the structure were again sealed with a mortar from lime and sand. It was all consolidated with whitewash injection.



Stone obturators separated (a), cleaning of the area and new sealing with mortar (sand and lime) and lime injection (b and c).

© CNRS-CFEETK/L. Antoine.

Some of the blocks with crossing breakings have been dowelled with fiberglass stems that were previously coated with epoxy resin.⁴³ To ensure the reversibility of the treatment, the openings were previously isolated with whitewash. A fragment located between two blocks with inscription has been unsealed in order to adjust its position.⁴⁴ It has been fixed to the block above with epoxy resin.⁴⁵ The interspace with the block below had been filled with mortar and sandstone fragments in order to create a good base.

Surface interventions

Paint layer consolidation

The interventions focused on the remains of paint layer in the funeral chamber 2 (CF2) were realized by Manon Lefèvre, conservator of paintings.

A consolidation located in powdery areas of the antique preparation layer was made with an ammonium oxalate solution up to 5 % applied with a brush.

⁴⁰ Salt reacting with calcium carbonate making the consolidation possible.

⁴¹ Araldite 2011 charged with micronized silica.

⁴² Paraloid B72 up to 15 % in acetone.

⁴³ Araldite 2011.

⁴⁴ This fragment was probably sealed at the time of Georges Legrain, the mortar is characteristic (limewash and brick powder).

⁴⁵ Araldite 2015.

Prior to any intervention, the paint layer which was also powdery needed a pre-consolidation with a synthetic resin⁴⁶. This step allowed to do the following cleaning treatment without any risk of losses.

A first phase of cleaning was mechanical, with scalpels and smooth brushes removed the widespread dust.

The chemical cleaning is a treatment used to remove the residues inlaid in the original material. After a series of tests, it is a gel from carboxymethylcellulose up to 3 % in demineralized water⁴⁷ that has been chosen. It is left on to react with the surface for 5 minutes and then cleaned with cotton and water. The use of water has locally dragged along salt lifts to the surface. They have been removed with compresses of attapulgit which is an absorbing clay.

The consolidation has been finalized with the same resin used for the pre-consolidation but with a higher concentration up to 5 %.



After the withdrawal of the modern cement coatings, application of two layers of plaster rich in lime whitewash and sand, the last one is colored with pigments (b). © CNRS-CFEETK/L. Antoine.

Cleaning

All the walls without any polychrome tracks have been mechanically cleaned with brushes then with moistened absorbing papers applied on the resistant residues of dust.

The floor was covered by gravels, and the chapels are now opened to visitors.

3.2. The “Sokarian rooms” of the *Akh-Menu*

The restoration of the “Sokarian rooms began in April 2017 with the first one (SK4) to continue with the two other ones (SK5-6). The work finished at the beginning of 2018. The three rooms present the same configuration: the raised floors with reliefs and a paint layer in good state of conservation, and below the “proto-crypts”.⁴⁸

⁴⁶ Klucel G up to 3 % with ethanol.

⁴⁷ The gel is applied on absorptive paper to be easier to remove it.

⁴⁸ Name given by J.-Fr. Carlotti.




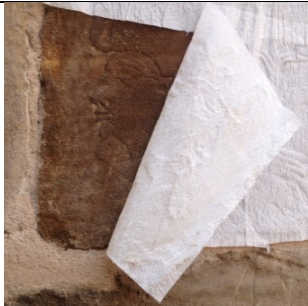
View of the “Sokarian room” SK4 after treatment. © CNRS-CFEETK/G. Muller.

• Treatment

The three rooms were in a similar stage of conservation, we applied the same treatment for each one. This table list is the synthesis of the most important treatments realized in these three rooms.

<p>The withdrawal of the modern coatings in cement to apply a new permeable coating made with lime and sand.</p>	
<p>We observed the same masonry for all the rooms, they are dated to G. Legrain interventions. Some parts present more recent interventions with bricks and cement or stones and cement. They have been removed when it was possible.</p>	
<p>The bedrocks were purged, as they present a granular disintegration, in order to consolidate them with a new masonry with sandstone blocks and a mortar made made of lime and sand.</p>	

⁴⁹ Paraloid B72 up to 15 % in acetone.

<p>The consolidation of the antique mortars, which present a powdery texture, with a solution of Ammonium Oxalate up to 5 %. When possible, the peelings have been consolidated by liquid mortar (PLM) injections, or with acrylic adhesive.</p>	
<p>The local consolidation of the paint layer to recover the cohesion of the pigments and adherence to the support. This treatment was applied with a cellulosic adhesive named Klucel G, up to 5 % in ethanol.</p>	
<p>The reduction of the black aureole of humidity observed on the ceiling tiles. This treatment was done with compresses of clay (Attapulgate/Hiba) and cellulose powder.</p>	
<p>Surface cleaning with brushes and moistened absorbing papers applied on the resistant residues of dust.</p>	

- Specific treatment

Thanks to A. Garric and his team, we have been able to carry out some works to improve the readability of the “Sokarian rooms” SK.5-6. Because of his instability, the west pillar of the SK.5 was consolidated in 1967-1968 with two new blocks of sandstone. Taking into account the surface of the last original block, we decided to adapt them; one of the members of the cutting stone team reduced them.



On the left, the pillar in 1967 ; in the middle in 1990 and on the right, the pillar after treatment. © CNRS-CFEETK 13/L. Antoine.

Two blocks representing *khokeru* pattern were conserved on the raised floors of the SK6 (SK.6.b11 and SK.6.b12). Although the exact location of these blocks is unknown, they should belong to the frieze on the upper part of the wall east or south. The room SK.6 is the most incomplete all, we made the choice to include them on the east wall where the place was ready.



The move with the crane, and the two blocks on the east wall. © CNRS-CFEETK/L. Antoine.

The conservation-restoration of the “Sokarian rooms” SK.4 and SK.5 is finished. Now, in order to keep the “proto-crypts” clean a solution would be to close them by a grid construction.

Concerning the SK.6, the project is to install the two architraves conserved behind the east wall, with the help of A. Garric and his team. After that, the finishing coating will be applied for the east wall.

The work is currently going on on the hypostyle hall (SK.Sh), and on the three adjacent chapels (SK.1-2-3).



Conservation work on the hypostyle hall. © CNRS-CFEETK/Chr. Thiers.

4. ARCHIVE AND SCIENTIFIC DOCUMENTATION

4.1. Scientific archive (S. Biston-Moulin 2017-2018; J. Hourdin 2018)

Photographic database of the Archive

The work on the scientific archives of the CFEETK continued in 2018. The Centre's annual photographic production has been integrated into the archives with around 7,500 documents being added on ArcheoGrid Karnak (a web application developed by Archeovision, UMS 3657) this year.

The work on the Karnak Project (see above) facilitated the reorganization of the existing CFEETK archives and the addition of new documents by linking the scientific information from the project to photographs in the CFEETK scientific archives. The work of inventorying inscriptions in the temple also makes it possible to complete the archives by identifying objects and scenes of monuments for which the photographic documentation kept in the CFEETK archives is insufficient. A program of photographic surveys based on this inventory was initiated with the CFEETK photographic service in 2014 and continued over this last year (Ramesses III temple, Amenhotep II temple, etc.).

Since 2016, the CFEETK's scientific archives have been made available online (<http://www.cfeetk.cnrs.fr/archives/>). This interface combines all of the team's information sources and projects (ArcheoGrid Karnak, bibliographic project, Karnak Project). It received more than 2,400,000 visitors and the photographs were downloaded a little over 3,700,000 times. With just over 10,000 full-resolution photographs available at the opening, there are now more than 37,500 full-resolution photographs available for download online. The interface for consulting the archives is based on a Nakala repository, a service set up by the TGIR Huma-Num (<https://www.nakala.fr/>), to store the digital data of the unit in a secure repository that ensures both accessibility and reliability over time. The Nakala repository offers interoperable access to the photographic metadata, i.e. the possibility of linking them directly to other projects within the unit or to external projects.

At the end of 2018, the ministry of Egyptian Antiquities launched a new inventory of magazines of Karnak temples. The CFEETK archives department is involved in this work sharing with our Egyptian colleagues the photographs taken during the last inventory of the magazine Cheikh Labib between the end of the years 1980 and 1990.

CFEETK Library

The CFEETK library was expanded this year with about 70 new titles. In addition to the members of the French-Egyptian Centre, the library welcomed Egyptian and international researchers, inspectors and Master's students mainly from Qena University throughout the year.

Website

A new CFEETK website opened in December 2018 (<http://www.cfeetk.cnrs.fr/>). It was designed from a Wordpress "kit labo" provided by the CNRS and is hosted by In2p3. The content of the website will be completed in 2019 in linked with the presentation of the new projects of the CFEETK. English and Arabic versions of the website are also planned.



USR 3172

Centre Franco-Égyptien d'Étude des Temples de Karnak - CFEETK USR 3172 du CNRS - MAE

Bienvenue sur le site du Centre franco-égyptien d'étude des temples de Karnak (CFEETK). Ce site est destiné à diffuser les différentes activités du Centre (Ministère des Antiquités d'Égypte/CNRS USR 3172), en présentant les travaux en cours et les programmes à venir. N.B. : Ce nouveau site internet est en construction ; certains contenus manquants seront progressivement mis en ligne.



[En savoir plus](#)

The new website of the CFEETK.

4.2. Photographic department (É. Saubestre)⁵⁰

In the 2018 Season, the activity of the photography department was primarily focused on finalizing the orthophotographic surveys of the Temple of Rames II (East Karnak), of the colonnade of Taharqa (Karnak East) along with the beginning of survey of the Chapel of Osiris Heka-djet.



Temple of Ramses II and colonnade of Taharqa. © CNRS-CFEETK/É. Saubestre.



Chapel of Osiris Heka-djet. © CNRS-CFEETK/É. Saubestre.

We also made a photographic campaign in studio in order to photograph the objects, stones, fish bones and blocks found by B. Durand around the Temple of Ptah. In this area, our team accompanied the end of the excavation, making a photographic survey of the whole area of Ptah from different angles and from a height of several meters using a lifting platform.

⁵⁰ With K. Dowi Abd al-Radi, A. Ruby (MoA-CFEETK), and H. Bellenger (CNRS trainee).



Sandstone block and bassin from Ptah Temple excavation. © CNRS-CFEETK/É. Saubestre.

The photographic team kept an important activity in collaboration with the documentation department, and with visiting missions, completing the reproduction of the objects found at the Chapel of Osiris Neb Djefau.



Pottery set from the Chapel of Osiris Neb Djefau. © CNRS-CFEETK/É. Saubestre.

Along this work the team made photographic reproduction of several blocs from the central part of the temple and from Philip Arrhidaeus bark-shrine. We also made some experimentations on selected ceramics to produce Infrared images in order to make visible paint that remains on the ostraca and maybe find more informations in the texts.

To finish with, we continue the project of digitalization in high definition of all the CFEETK's film archives.

4.3. Topographical department (Ch. Wolff)⁵¹

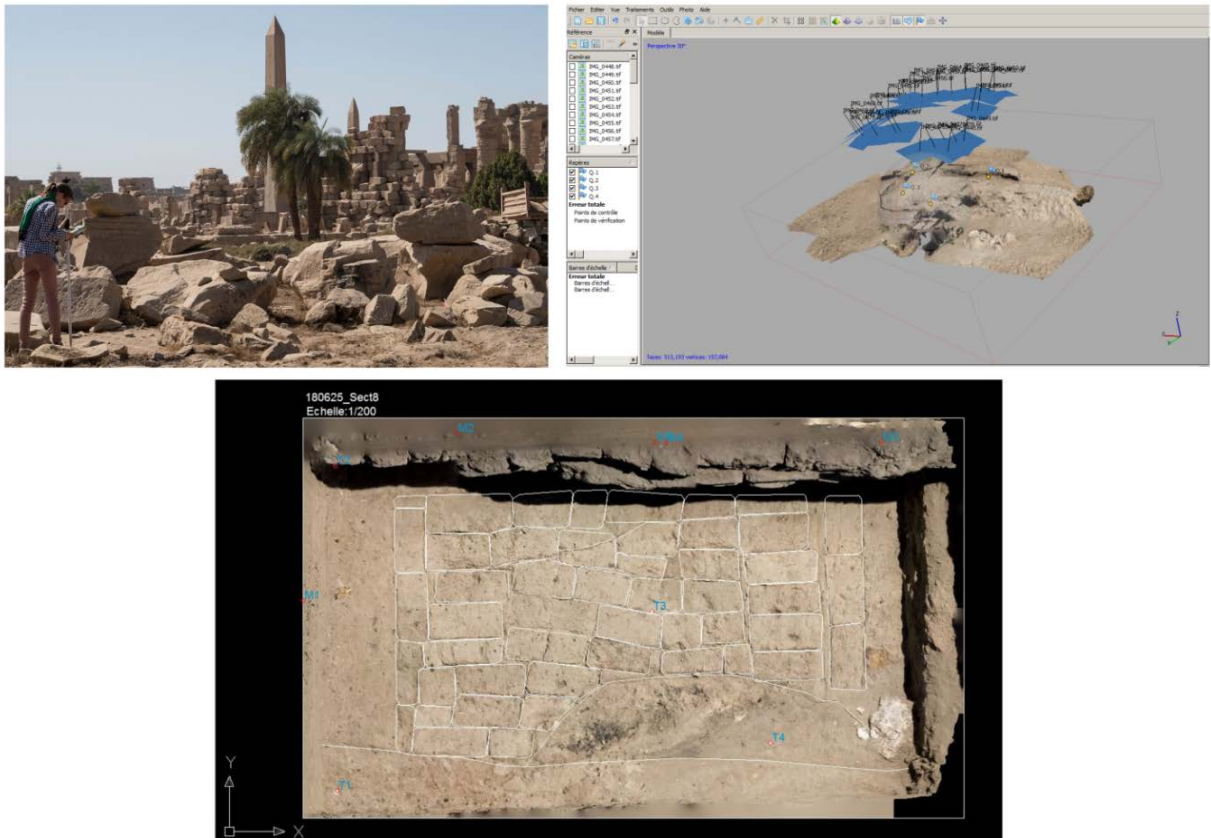
This year, the excavation site located next to Ptah temple is coming to an end. Since less excavations were proceeded, the topographic service was less asked to realize orthophotographic and topometric surveys on this area. The two main missions for the topographic service were:

- Topographic and photogrammetric surveys (plans and sections) on the excavation site of Ptah when needed by the archeologists in order to complete or precise the general plan of this area.

⁵¹ International Volunteer, MEAE-CFEETK.

Some items found during the excavation and restored have also been built in three dimensions. Furthermore, a UAV flew over the area. A main orthophotograph of the complete area has been drawn with a 1cm-resolution.

- Photogrammetric surveys of walls and statues as part of the *Karnak Project*, to build orthophotographs enriching the database.



Field work on the excavation site of Ptah. Top left: Topographic points measurement for the orthophotos georeferencing; Top right: Images and points treatment using the software Photoscan; Down: Results with the software Autocad and vectorization of the mud brick wall. © CNRS-CFEETK/Ch. Wolff.

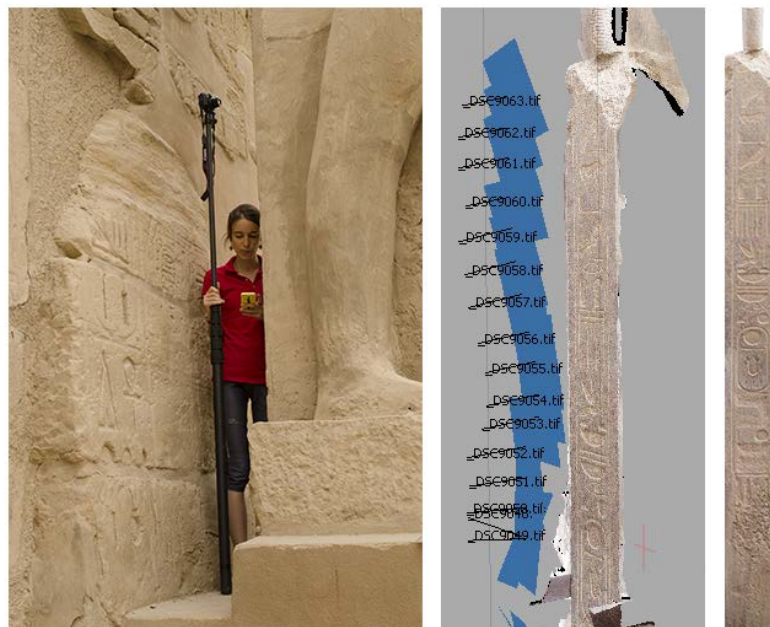
The second mission mentioned above was led with the help of the photographic service. This year, the acquisitions focused on the Ramses III temple and on the Amenhotep II temple. Regarding the later, for now on, only walls and columns at the entrance as well as the walls in the main room have been surveyed. The next step would be to draw the orthophotographs of all the pillars in the main room and the different walls of the annexe rooms.

Regarding Ramses III's temple, the orthophotographs of the majority of the temple's decoration are already recorded in the database. What remains to be done are areas difficult to access, that is to say embarrassed by height, shadow and not enough place to install scaffolding. To solve these problems, the CFEETK bought a compact camera (Canon powershot G5X) and a light pole in carbon. The main advantage of such a camera (in addition to its lightness) is that it can be used remotely thanks to a smartphone application. Thus, this affords us to take pictures in area hard to access.

The camera and the pole were also required to build the orthoimages of the back of some statues, for instance those at the entrance of Ramses III's temple, where the space between the statue and the wall is about 50cm.

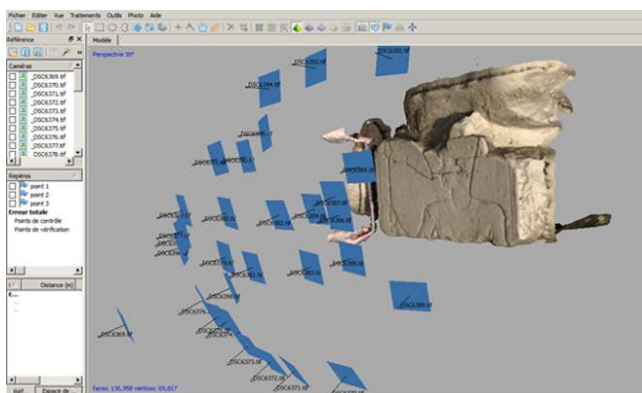


Left: Shooting in Ramses III temple using a pole and a flash; Right: Orthophoto obtained after images treatment with Photoscan and Photoshop. © CNRS-CFEETK/Ch. Wolff.



Left: Shooting of the back pillar of a statue using the pole; Middle: Images treatment with Photoscan; Right: Result integrated in the database. © CNRS-CFEETK/Ch. Wolff.

Except these two main activities described above, the topographic service intervened on punctual missions. For instance, the service helped some excavation missions providing a topographic support. Furthermore, the epigraphic face of some blocks located on benches have been captured to build orthorectified images and have been integrated in the database. Indeed, these blocks are very damaged by the salt and may probably disappeared in the future. About 200 blocks have been shot, mainly located close to the sacred lake. The shooting is proceeded very close to each block in order to have a very good resolution, to distinguish the details which will help the drawing works.



Left: Images treatment with Photoscan; Right: Result obtained after treatment with Photoscan and image-cutting and scale add with Photoshop. © CNRS-CFEETK/Ch. Wolff.

In addition to these activities, there is the autocollimation verification for both tacheometers of the CFEETK, to check if the double-reversal is required during a topographic survey and/or if the devices need to be recalibrated. After mesearments done on the top of the CFEETK center, the measure difference between turn I and turn II can be neglected: for the accuracy required in this matter (half cm), the double-reversal is not needed.

The control survey for both standing obelisks have also been realized in May, and led to the conclusion that they did not move since the last control carried out two years ago.

4.4. The scattered blocks survey

The inventory work of the loose blocks lying upon benches has continued, using the same protocol as in the previous years: numbering on a piece of metal, schematic drawings, photography and incorporation into a database. A team of Karnak inspectors (scientific department),⁵² using booklets made by S. Biston-Moulin, is currently working on a complete survey of the blocks, statues and stelae present inside Karnak temples.

⁵² Hassan El-Tawab, Abdelmenen Ahmed, Amira Fawzy, Rihab Sabri, Marwa Nur el-Din, Sohad Aly (MoA-CFEETK).

5. TRAINING PROGRAMMES

Training is provided for shooting and processing images by the photographic department. Trainings to epigraphic survey techniques and digitization software (digitally inked drawings) were provided to the inspectors wishing to acquire these techniques.

MoA inspectors were involved in the Ptah Temple archaeological programme, and trained in different field work.

Similarly, many French trainees (conservators, architects, egyptologists and archaeologists) were welcomed into the CFEETK, to practice fruitful exchanges in joint field programmes and activities.

Access to the library of the Centre used to receive young MoA inspectors preparing Masters (especially from Univ. of Qena). Guidance and assistance to bibliographic research are regularly taught Ch. Labarta, A.I. Fernandez, J. Hourdin in 2017-2018 (LabEx Archimede, CNRS-CFEETK).

6. PUBLICATIONS AND LECTURES

6.1. Selected publications of CFEETK members and associated missions (2016-2018)

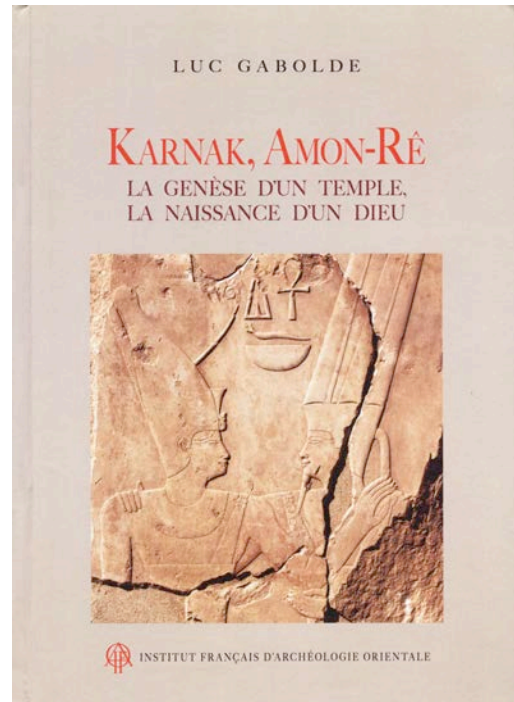
A short activity report of the CFEETK is published every sixth months in the revue *Egyptian Archaeology* (“Digging Diary”).

- BISTON-MOULIN S., THIERS Chr., “The Karnak Project: A Comprehensive Edition of the Largest Ancient Egyptian Temple,” in A. De Santis, I. Rossi (eds.), *Crossing Experiences in Digital Epigraphy. From Practice to Discipline*, Berlin, 2018, p. 153-162.
- BORAİK M., GABOLDE L., GRAHAM A., “Karnak’s Quaysides Evolution of the Embankments from the Eighteenth Dynasty to the Graeco-Roman Period,” in H. Willems, J.-M. Dahms (eds.), *The Nile: Natural and Cultural Landscape in Egypt*, Mainz, 2017, p. 97-144.
- BOULET St., “Les productions céramiques de la XXV^e dynastie dans le secteur du temple de Ptah à Karnak”, *BCE* 27, 2017, p. 53-62.
- BOULET St., “Ceramic Industry Developments in the Theban Area during the Twenty-fifth Dynasty: Between Traditions and Innovations,” in E. Pischikova, J. Budka, K. Griffin (eds.), *Thebes in the First Millennium BC: Art and Archaeology of the Kushite Period and Beyond*, *GHP Egyptology* 27, London, 2018, p. 335-356.
- CHARLOUX G., THIERS Chr., “The early temple of Ptah at Karnak”, *Egyptian Archaeology* 50, 2017, p. 11-15.
- CHARLOUX G., THIERS Chr. *et al.*, “The afterlife of Egyptian statues: a cache of religious objects in the temple of Ptah at Karnak”, *Antiquity* 359, 2017, p. 1189-1204.
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6.2. Colloquium and lectures

- 09.05.2018, *Journée de l'archéologie française en Égypte*, IFAO-Institut français d'Égypte, Cairo: “Le Centre franco-égyptien d'étude des temples de Karnak, bilan 2017-2018” (Chr. Thiers).
- 12.06.2018, *Rencontres de la TGIR Huma-Num 2018*, Valpré : “Le projet d'édition des textes hiéroglyphiques des temples de Karnak: un exemple d'utilisation des services d'Huma-Num” (S. Biston-Moulin).
- 27.06.2018, *Current Research in Egyptology 2018*, 25-28 juin 2018, Prague: “Theological traditions in Esna II, 31: connections to Evergetes Gate in Karnak” (A.I. Fernández Pichel).
- 15.05.2018, *Scientific Research Department at Karnak*, Louqsor: “French-Egyptian Center at Karnak: 1967-2017” (Ch. Labarta).
- 14.09.2018, *14^e Congrès des études nubiennes*, Paris, Musée du Louvre: “The Edifice of Taharqa by the Sacred Lake: a preliminary study of the loose blocks” (J. Hourdin).
- 14.09.2018, *14^e Congrès des études nubiennes*, Paris, Musée du Louvre: “Vulture wings and royal cartouches: inlay decoration of a wooden portico in the Treasury of Shabaqo (Karnak)” (N. Licitra).
- 19.11.2018 Universidad de Zaragoza, Abraham Ignacio Fernandez Conférence « El templo de Khonsu en Karnak y el trabajo del CFEETK », dans Seminario Visiones sobre Egipto III.
- 02.12.2018, *Les rendez-vous de l'archéologie*, IFAO-Institut français d'Égypte, Cairo: “Karnak: géomatique et restauration au service du patrimoine” (L. Antoine, Ch. Wolff).

7. CFEETK MEMBERS AND COLLABORATIONS

7.1. CFEETK MEMBERS

MoA members

- Dr. Mohamed ABDEL AZIZ General director of Luxor and Upper Egypt
- Mohamed YAHYAH General director of Luxor antiquities east and west banks
- Mustafa EL-SAGHIR General director of Karnak Temples and Sphinx Avenue
(since October 1st)
- Fawzy HELMI Director of Karnak Temples
- Badri ABD AL SATTAR Co-Director of the CFEETK
- Ghada IBRAHIM Chief inspector, in charge of foreign missions
- Tarek MILAD ZIKRI Chief architect of Upper Egypt
- Ahmed ABDEL NASSER Chief conservator Luxor
- Abder Radi ABDEL
 MONEM MOHAMED Chief conservator Karnak
- Mamduh ABD EL GHASSUL Draftman
- Magdi LOUIZ Documentation officer
- Karima DOWI ABD AL-RADI Photographer

- Ahmed RUBY Assistant photographer
- Mahmud FARUK Raïs

- Moamen SAHAD Chief inspector
- Salah AL-MASEKH Chief inspector
- Wahid YUSSEF Inspector
- Emad ABDEL HARIH Inspector
- Ashraf GAD EL-RAB Inspector
- Ahmed NASSEH Inspector
- Mona ABADI Inspector
- Yasser MOSTAFA Inspector
- Mohamed BADAWY Inspector
- Salwa NUR ED-DINE Inspector
- Hoda ABD EL-SADEK Inspector
- Hala HASSAN Inspector
- Amira ABD EL-KUDUS Inspector
- Peter EL-FADI Inspector
- Asma MUSTAFA Inspector
- Sohad ALI Inspector
- Ali ARAFAT Inspector
- Sadham SADIK Inspector
- Abul Hassan MOHAMED Inspector
- Saâd BAKHYT Inspector

CNRS members

- Dr. Chr. THIERS Director of the USR 3172, co-director of the CFEETK (until 2018/12/31)
- Dr. L. GABOLDE Director of the USR 3172, co-director of the CFEETK (from 2019/1/1)

- Dr. J. HOURDIN Documentalist-egyptologist (from December 1st 2018)
- K. BENCHABANE Administrator
- A. GARRIC Stone-cutter
- É. SAUBESTRE Photographer
- Dr. B. DURAND Archaeologist (until December 2018)

Univ. Paul-Valéry Montpellier 3 - LabEx Archimede, programme "Investissement d'avenir", ANR-11-LABX-0032-01

- Dr. A. FERNANDEZ PICHEL Egyptologist (until december 2018)
- Dr. Ch. LABARTA Egyptologist
- Dr. J. HOURDIN Egyptologist (until December 2018)
- Fl. PIROU Epigraphist

International Volunteers MEAE

- L. ANTOINE Conservator (until December 2018)
- Ch. WOLFF Surveyor (until December 2018)
- J. JACQUEMET Surveyor (since december 2018)

Trainees CNRS 2018

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| - Y. BOURHIM | Archaeologist |
| - G. MULLER | Photographer |
| - M. SCHNEIDER | Conservator |

7.2. ACADEMIC COLLABORATIONS

France

- UMR 5140 – Univ. Paul Valéry-Montpellier 3 (LabEx Archimede IA-ANR-11-LABX-0032-01)
- EPHE EA 4519
- UMR 5189 – HiSoma Univ. Lyon 2
- UMR 8164 – Halma Univ. Lille 3
- UMR 8152 – Univ. Paris IV Sorbonne
- USR 3134 – Centre d'études alexandrines (CeAlex)
- Institut français d'archéologie orientale (Ifao)

Other countries

- American Research Center in Egypt (ARCE)
- Chicago House (Luxor)
- Univ. of Tübingen
- Univ. Libre de Bruxelles
- Univ. of Quebec (Montréal)
- Univ. of Memphis (Tennessee)
- Univ. of Oxford