



ARCHAEOLOGICAL MISSION OF THE UNIVERSITY OF PISA AT DRA ABU EL NAGA

Preliminary report of the 17th archaeological season (November 2022)

Mission Director: Prof. Marilina Betrò

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The 17th archaeological season of the University of Pisa at Dra Abu el-Naga worked from November 7 to November 29, 2022.

To this season contributed the following members of the expedition: Marilina Betrò (Director); Cristina Alù (Egyptologist); Riccardo Andreozzi (Egyptologist and Archeobotanist), Anna Consonni (ceramologist); Anna Giulia De Marco (Egyptologist); Lucia Grassi (Egyptologist and drawer); Mattia Mancini (Egyptologist and photographer), Gianluca Miniaci (Egyptologist), Emanuele Taccola (Archaeologist, Photogrammetry and 3D virtual reconstruction). The Supreme Council of Egyptian Antiquities was represented by the inspector Mohammed Sayed Youssef.

Since the Permanent Committee had not granted the permits for excavation as requested in the 2021 application, the mission focused the following goals, carried out during the season:

1. complete photogrammetric survey of:
 - the tomb M.I.D.A.N.05,
 - its internal shaft "f" with its chambers "g", "h", "i", "j",
 - the small later tomb on the southern side of the court (between M.I.D.A.N.05 and TT 14), provisionally named by the mission as "E".
 - Room "K" in the outside shaft P3.
2. 3D model of the tomb and the surveyed shafts and structures.
3. Preliminary study and check of the records concerning the finds from M.I.D.A.N.05 from 2005 up to 2014. Integration of the documentation (records, photos, drawings when needed).
4. Work on the decorated carved fragments coming from the facade of M.I.D.A.N.05.
5. Check and integration of documentation for the objects found in 2014 in shaft P3 and its chambers K, L and M, in view of its next publication.
6. Monitoring of the structural conditions of TT 14, M.I.D.A.N.05.

Introduction

M.I.D.A.N.05 was totally unknown before the mission's archaeological investigation in this area, as well as the two tombs, provisionally named by the mission T1 and T1, in its court. Before the University of Pisa archaeological exploration in the area, the site, except for TT 14, was covered by a high number of debris and flash-flood deposits from two nearby wadian. The three tombs had never been reported, nor Friederike Kampp in her book on the Theban necropolis (1996) recorded their existence (Fig. 1).

They formed a cluster of tombs, possibly belonging to the same family and dating the true beginning of the 18th Dynasty, as some uncommon features which they all share (e.g. the small single window on the right of the main entrance) indicate. For this reason, their joint study is important and necessary for the reconstruction of the archaeological landscape and overall context.

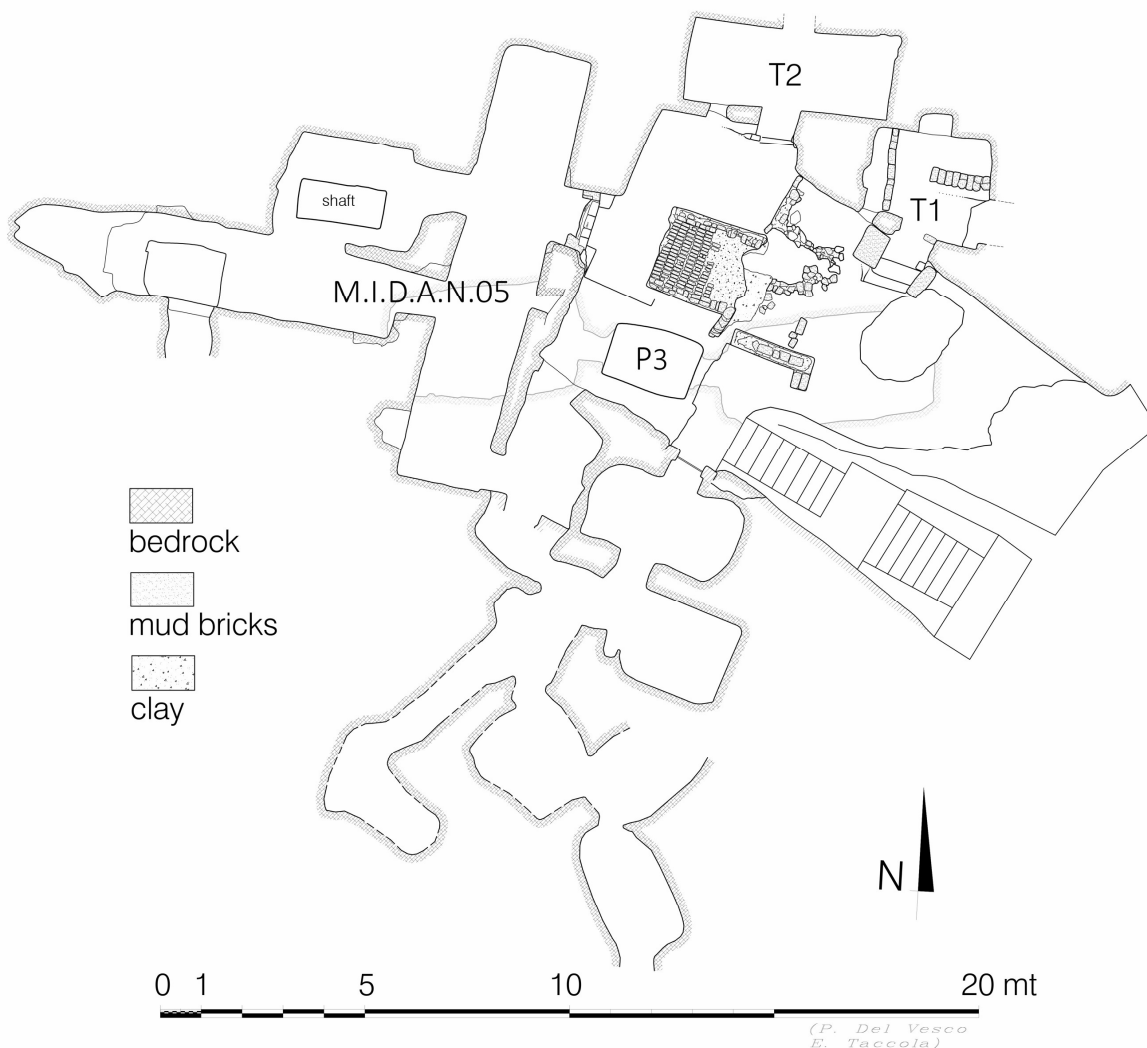


Fig. 1. Plan of the area with tombs M.ID.A.N.05, TT 14, E, T1, T2 and shaft P3 (Drawing by P. Del Vesco and E. Taccola). @MIDAN.05

Description of the work

The team arrived in Cairo on November 5 night and in Luxor on the 7th. After the necessary paperwork, work started on November 8 and went on until November 29.

1. Complete photogrammetric survey

The photogrammetric survey and subsequent 3D reconstruction were carried out by Emanuele Taccola since November 19 (Fig. 2-6). To complete it, it was necessary to empty the entire tomb M.I.D.A.N.05 and its two shafts "f" and "P3", including their funerary chambers, of the objects and other materials stored in them. This operation was carried on in the previous week, recovering all the boxes with inventoried objects in TT 14 and in Room M in shaft P3, while vegetal remains, bones and miscellaneous not inventoried finds were placed under the tent built by the mission



Fig. 2-3. Photogrammetric survey by Emanuele Taccola in M.I.D.A.N.05. @MIDAN.05

Once moved all the boxes from Room K to Room M in shaft P3, Emanuele Taccola was able to complete the photogrammetric survey of K, which dates, as the other two funerary rooms of shaft P3, between the true end of the 18th and the 19th Dynasty, with robberies dating the Third Intermediate Period and reuse of the funerary goods.

2. 3D survey of the tomb and the surveyed shafts and structures.

Photogrammetric survey is the basis for 3D reconstruction, to study with high-precision detail and from otherwise unreachable perspectives, every structure. It also makes it possible, when applied in the course of archaeological investigation, to reconstruct each of the removed layers and relocate them virtually, along with the finds they contain. For example, this methodology was applied in part to the excavation of shaft P3 and room M in 2014, as also in the excavation of tombs T1 and T2 in 2018.

One of the 2022 mission's main goals was the 3D photogrammetric survey of the interior of the tomb M.I.D.A.N.05 and of room K of the outside shaft P3 in the forecourt; the photogrammetric survey of this room, the upper funerary chamber of P3, had indeed not been completed in 2014 with the remaining part of the shaft. The entire 3D reconstruction of the tomb M.I.D.A.N.05 and its shafts and chambers was completed by Emanuele Taccola during the expedition.

The photogrammetric acquisition was preceded by the positioning and measurement of targets (or ground control points) with a total station, consistent with the local reference system used since the beginning of the excavations (Fig. 4).

A constant colour temperature LED light was mounted on the camera to obtain homogeneous illumination of each photographic shot. Every single image was acquired at a distance from the tomb's walls such that the light beam emitted coincided with the field of view of the camera's sensor itself.

To complete the 3D photogrammetric survey of the interior of the M.I.D.A.N.05 tomb and room K, 2367 and 144 photos were taken (Fig. 2-3). The images were processed within the photogrammetric reconstruction software, which resulted in a dense point cloud and a texturized 3D polygonal model. This work completed the 3D survey of what is visible and archaeologically investigated to date in the context of the University of Pisa excavation concession in the Theban necropolis. Thus the 2022 surveys add up and integrate what has already been done in the previous campaigns, namely part of the forecourt with its shaft P3 (2014), the tombs T1 and T2, as concerns the investigated portions (2018), and TT14 (2005-06; 2020) (Fig. 7).



The processed data will allow archaeologists to obtain the metric information necessary for studying the structures (plans, sections, etc.; Fig. 5-6), the stratigraphy and the objects found. On the other hand, the 3D models, and the 3D animations (<https://bit.ly/3H0NFpX>) will be useful tools to share and disseminate our research results to a wider audience.

Fig. 4. Topographic survey with a total station inside the tomb M.I.D.A.N.05. @MIDAN.05

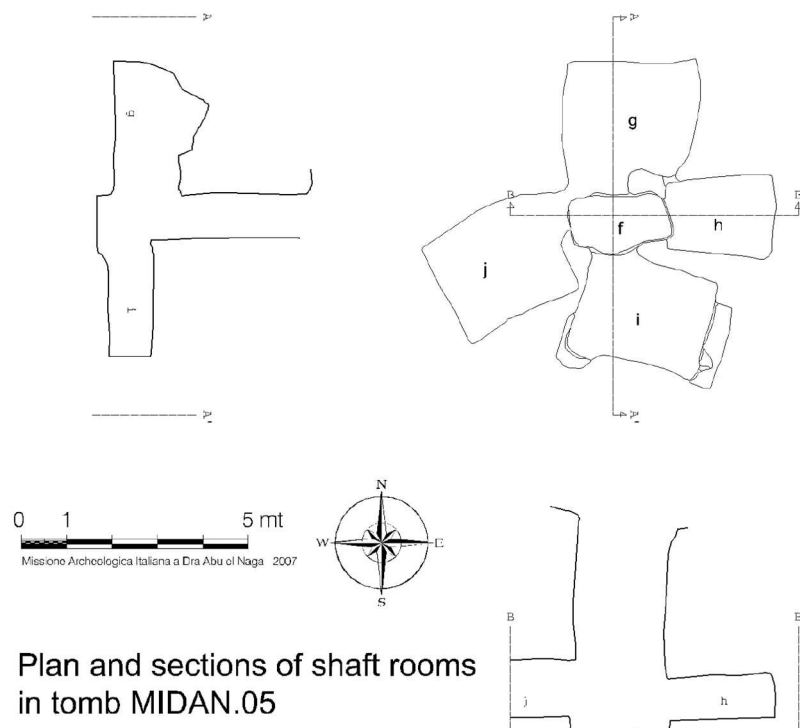


Fig. 5. Plan and section of the shaft “f”. @MIDAN.05

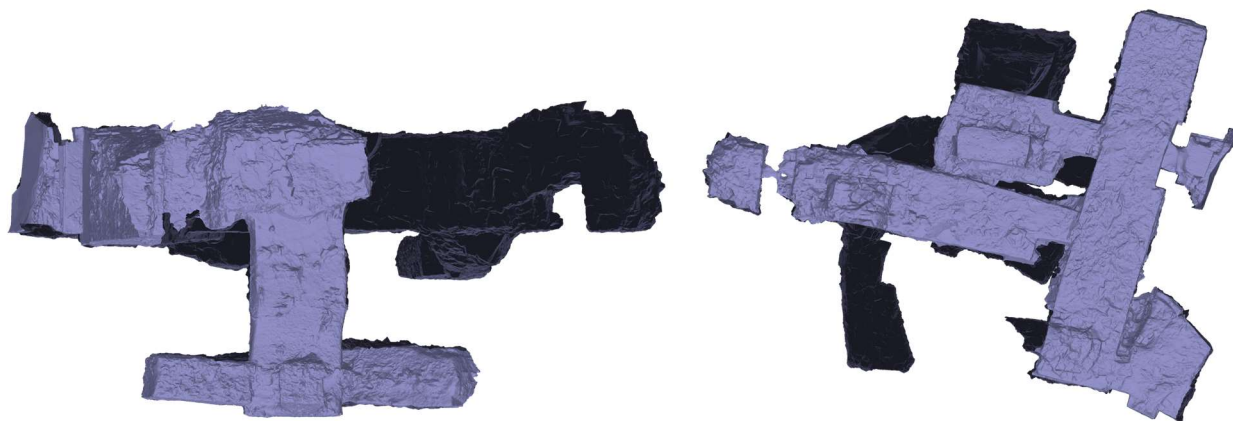


Fig. 6. Results of the photogrammetry carried out by Emanuele Taccola (left: plan and section of the shaft “f”; right: plan and section of the 3D model of MIDAN.05, view from the top). @MIDAN.05



Fig. 7. Sectioned top view of the 3D point cloud of the tombs and the forecourt. @MIDAN.05



3. Study of the finds.

Once emptied the tomb and its shafts, this preliminary step allowed to open and study the boxes with finds of the previous seasons.

Under the supervision of the mission's Director Marilina Betrò, the documentation of the objects in the boxes kept in the tombs of the concession was checked by the team (Fig. 8): records of the objects have been updated where necessary, and so have the photos, supplemented with views of all sides of an object where they were missing. Where needed, Mattia Mancini took care of photographing the objects (Fig. 9), while Lucia Grassi drew them (Fig. 10).

Fig. 8. Marilina Betrò, Lucia Grassi, Anna Giulia De Marco, Riccardo Andreozzi during check and documentation @MIDAN.05



Fig. 9. (left) Gianluca Miniaci and Cristina Alù checking recording of the finds; Mattia Mancini on the background photographing objects @MIDAN.05
Fig. 10. (right above) Lucia Grassi drawing the objects @MIDAN.05

Anna Giulia De Marco especially focussed wood remains, recording details useful to understand their techniques of assemblage and decoration, and conservation notes (Fig. 11). In cooperation with Riccardo Andreozzi, with the help of a portable microscope, also notes on the kind of woods were made. All vegetal remains, especially remains of garlands and bouquets found during previous excavations, were studied by Riccardo Andreozzi (Fig. 12). Anna Consonni started to review and study pottery coming from the lower stratigraphic contexts of the external court (Fig. 13).



Fig. 11. (left) Anna Giulia De Marco documenting and recording wooden objects. @MIDAN.05
Fig. 12. (right) Riccardo Andreozzi documenting and recording vegetal remains. @MIDAN.05

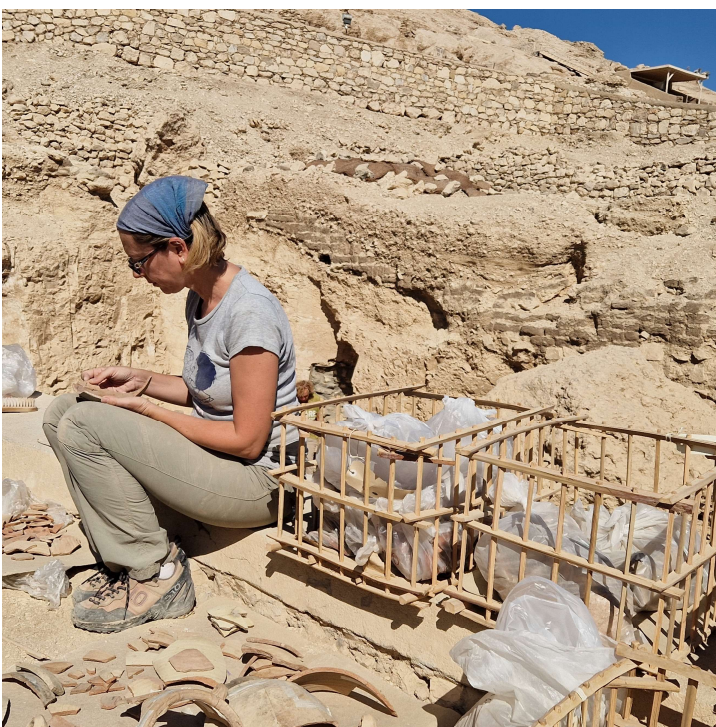


Fig. 13. Anna Consonni working on pottery. @MIDAN.05

4. Study and 3D photogrammetry of the decorated fragments from MIDAN.05 facade.

A special analysis has been devoted to the decorated fragments from MIDAN.05 facade. The present facade shows only bare rock and is devoid of decoration, but after the mid-18th Dynasty, the original window on the southern part of the façade was closed by means of mud bricks and the façade was decorated with carved scenes and text (Fig. 14). Later, the limestone facade collapsed and some dozens of decorated fragments were found both at the foot of the facade and inside the tomb and its shafts. These have been recorded, drawn and photographed during the mission (Fig. 15) and different hypothesis of reconstruction tested (Fig. 16).

Emanuele Taccola also carried out the photogrammetry of these fragments so that to test their placement on the 3D virtual reconstruction and rendering of MIDAN.05 facade.

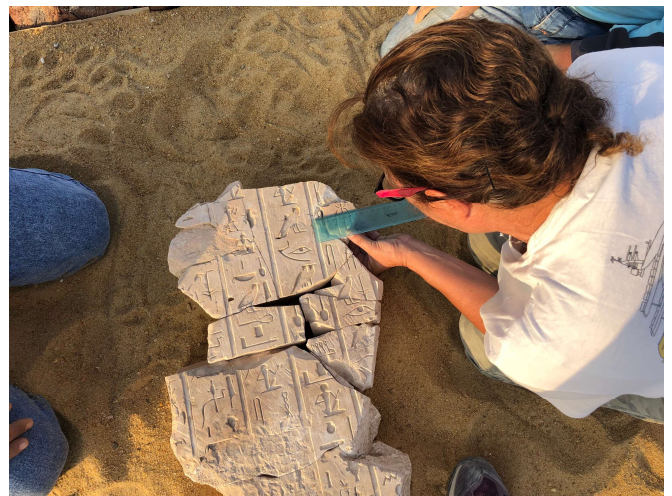
The study of the decorated facade, datable in the first half of the 18th Dynasty, will be completed in Pisa, through iconographic and textual comparisons.



Fig. 14. The facade of MIDAN.05 with the original window, later closed. The closure mud bricks are still visible in the lower part.
@MIDAN.05

Fig. 15. Left: Lucia Grassi recording the blocks of the façade;

Fig. 16. Below: 3D virtual hypothesis of reconstruction of some of the scattered blocks from the façade. @MIDAN.05



5. Check and integration of documentation for the objects found in 2014 in shaft P3 and its chambers K, L and M, in view of its next publication.

Gianluca Miniaci and Mattia Mancini made a last check and integration, when necessary, of all the data concerning the stratigraphy of the shaft and its chambers, their finds and their documentation, for the publication of this shaft, belonging very probably to the same users of MIDAN.05, from the end of the 18th Dynasty up to Ramesside Period (Fig. 17). The publication is planned in 2023.

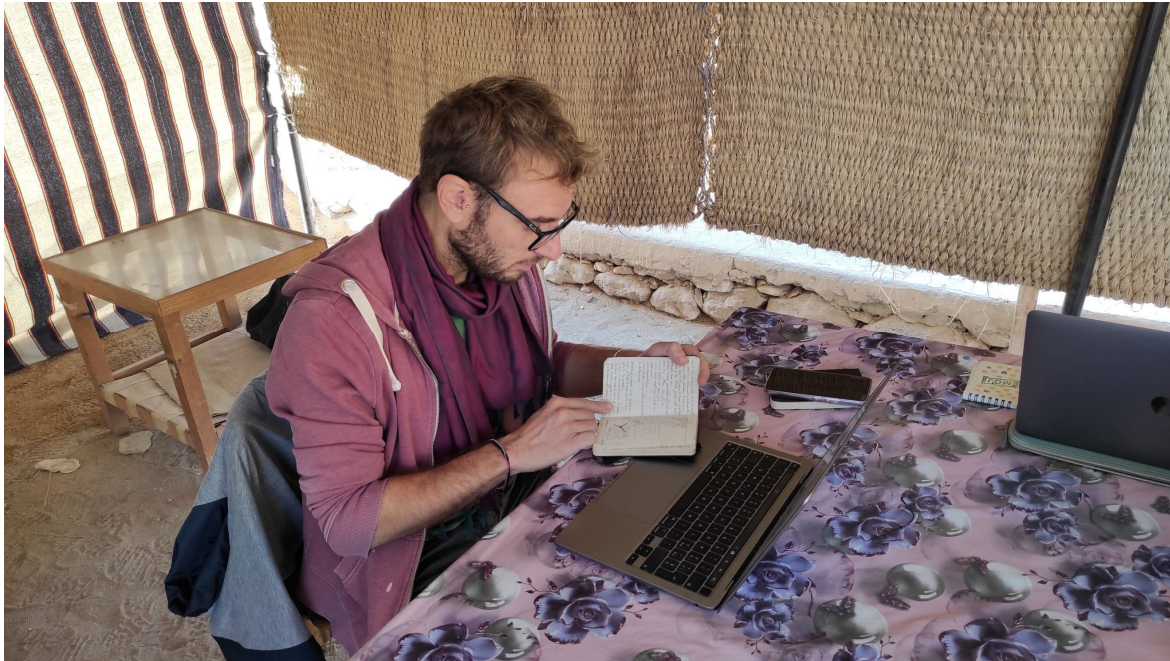


Fig. 17. Gianluca Miniaci checking P3 documentation for its publication, planned in 2023.

6. Monitoring of the structural conditions of TT 14, M.I.D.A.N.05.

As usual, the two tombs were checked and controlled at the beginning of the season, to verify their structural conditions, which resulted good, without alterations.

Latest publications on the mission's work:

2023 M. Betrò, *Ancient robbery and reuse between the end of the 18th and the beginning of the 19th Dynasty: a view from the tomb MIDAN.05 at Dra Abu el-Naga*, in M. Pitkin (ed.), *Studies Strudwick*.

2020 M. Betrò, P. Del Vesco, M. Mancini, E.Taccola, *Two new tombs in the forecourt of M.I.D.A.N.05 at Dra Abu el-Naga. Preliminary report of the 2018 season*, *Egitto e Vicino Oriente* 43, pp.63-84.

2019 M. Betrò, P. Marini, *“Woman with a pearl necklace”. A fragmentary statue from Dra Abu el-Naga*, In *Egitto e Vicino Oriente* 42, pp.33-44.

2018 M. Betrò, G. Miniaci, *Used, reused, plundered and forgotten: a rare group of early Ramesside coffins from tomb MIDAN.05 in the Theban necropolis*, in J. Taylor, M. Vanderbeusch (eds), *Ancient Egyptian Coffins: craft traditions and functionality*, Peeters Leuven, pp. 161-184.