

University of Basel Kings' Valley Project

Report on work carried out during the field season 2019

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Abstract:

The season 2019 was carried out from the 3rd of January to the 13th of April 2019. It was mainly dedicated to documentation and conservation work on the numerous fragmented remains from KV 31 and KV 40. The main archaeological activity was dedicated during this season to the clearing of the surroundings on the south side of KV 17 and in the front of KV 30. In the tomb of Seti Ist KV 17 and the adjoining KV 18, the analysis of decorated wall fragments was continued. The team of geologists conducted rock fall and rock fracture mapping and carried out a geodetic survey; they checked the functionality of the weather sensors and seismometer and evaluated their results.

Key-words: Valley of the Kings, tomb architecture, tomb decoration, conservation, anthropology, pottery, textile, cartonnage, royal family, Amenhotep III, Seti Ist, Third Intermediate Period.

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Participants during the season were: Susanne Bickel, Project Director, Egyptologist; Elina Paulin-Grothe, Field-Director, Egyptologist; David Aston, Egyptologist; Ludowic Bellot-Gurlet, Archaeometrist; Andreas Dorn, Egyptologist; Charlotte Hunkeler, Egyptologist; Mahmoud Ibrahim, Project Consultant; Matjaz Kacicnik, Photographer; Marija Lukovic, Geologist; Jasmin Maissen, Geologist; Florence Mauric-Barberio, Egyptologist; Erico Peintner, Conservator; Matthew Perras, Geologist; Anita Quiles, Archaeometrist; Pamela Rose, Egyptologist; Martin Ziegler, Geologist.

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1. The documentation of finds from previous seasons from KV 40 and KV 31

Charlotte Hunkeler

The documentation of objects from KV 40 focused on some final checks on jar inscriptions before publication. A number of objects were photographed.

The finds made in 2010 during the clearing of KV 31 were reconditioned in appropriate storage. The preliminary study focussed on wooden and cartonnage fragments. These fragments can be divided into three categories: furniture, coffins and masks.

Furniture

Fragments that have a rather thin wall-thickness of about 1.3 to 2.2 cm and are straight or show typical shapes of furniture-posts were recorded. Three of the furniture objects are boxes or chests dating to the New Kingdom, one with black bitumen coating, one with a clear surface and incised hieroglyphs. A fourth object might as well be some sort of a chest with little posts ('feet'), but with no clear dating so far. Additionally, there are 15 wooden fragments that are clearly not

deriving from a coffin, but also seem not to belong to a regular furniture such as a stool, box or chest.

Coffins

Fragments of five or six coffins could be distinguished so far. Three of them are clearly dating to the Eighteenth Dynasty. All Eighteenth Dynasty coffins are of the 'black' coffin type⁴, however, with a slight variety in manufacture. For the other two to three coffins clear dating indications are still missing.



Fig. 1. Fragment of a New Kingdom coffin of the 'black' type with a carved inscription and blue hieroglyphs. Photo UBKVP.

Cartonnage

Fragments belonging to three cartonnage masks could be identified. Further study is required to identify further pieces and renumber all the fragments according to each mask. One mask is in a very fragile condition and needs conservation. Although all masks differ in material and decoration style, they seem to follow the same manufacturing process.



Fig. 2. Fragments of cartonnage from the Eighteenth Dynasty from KV 31. Photo UBKVP, Kacicnik.

2. Research on organic material

Research on organic material concentrated on the analysis of linen of different qualities. Several fragments could be analysed on site by infrared spectrometry and raman spectrometry. A number of fragments were transported to Cairo by the Centre of Research and Conservation and transferred to the French Archaeological Institute for Carbon 14 analyses and dating. These analyses are relevant for the identification of the textiles themselves to attribute certain qualities to the two periods of use of the KV 40 (Eighteenth Dynasty and Third intermediate period).

3. Pottery from KV 42

David Aston

Whilst the workmen's pottery from in front of KV 59 and KV 61 was examined in January, the major part of the season was devoted to a study of the pottery from KV 42. KV 42 was discovered by Chinouda Makarios and Boutros Andraos in November 1900 and first entered by Howard Carter the following December. Within one of the chambers he saw at least thirty storage jars, some with their mud seals still intact, whilst on the entrance stairway were apparently several vases. As usual Carter left all the pottery in the tomb. Following Mohammed el-Bially's reclearance of the tomb in 1999, Pamela Rose made a preliminary study of the pottery in summer 2000. By then all, except one, of the storage jars had been smashed and no mud seals remained at all. In a short report she illustrated 46 pieces. This season the entire ceramic assemblage was brought out of the tomb, and studied anew, and 25 of the slightly more than thirty storage jars were reconstructed by our workmen. At present 300 diagnostic pieces have been drawn. Whilst most of the pottery was probably locally made, it also included the remains of three Canaanite jars, seven Marl D amphorae, two other Marl D vessels and four marl clay bowls.

The Nile clay corpus consisted primarily of the 33 to 35 large white washed storage jars so typical of Eighteenth Dynasty tombs in the Valley of the Kings. Several hardly readable black inscriptions were discovered. Otherwise there were only three other jars and various rims and bases of flat- and ring-based bowls and dishes.

Most of the pottery, however, comprised a number of miniature dishes – Rose reported seeing fragments of 44 in 2000, nineteen of which have been completely restored – and miniature jars – a base count suggesting there were at least 81 with ten larger examples. In addition, there were the upper parts of six breadmoulds, and the lower parts of three others. Whilst miniature vessels are found in Eighteenth Dynasty tombs in the Valley of the Kings, they are never found elsewhere in such high numbers, and both Nicholas Reeves and Pamela Rose have suggested that this pottery would have originally come from a foundation deposit.

Although the tomb is often ascribed to Hatshepsut Merytre, because of the foundation deposits found near the entrance, the KV 42 pottery is clearly later than the reign of Tuthmosis III, and would better fit a dating in the reign of Amenhotep II.

4. Study of decorated wall fragments from KV 17

Florence Mauric-Barberio

The time-consuming process of numbering, documenting, photographing and analysing the decorated wall fragments from the tomb of Seti Ist KV 17 was continued and the storage of the fragments within KV 18 was carried on. Over 7000 fragments are inventoried by now, several hundred fragments retrieved in previous seasons from the debris in room Jc in KV 17 remain to be treated. Several significant new identifications of decorated fragments could be made. Some remains of pigments were analysed with raman spectrometry to identify different materials and qualities of colour.

A number of particularly important wall fragments were prepared to be scanned by the Theban Necropolis Preservation Initiative (University of Basel and Factum Foundation).

During this season we continued the inventory of the “Seti-fragments” found in KV 17 in the undecorated side-room Jc. Between 2015 and 2018, 1953 decorated fragments have been listed (SI-115 to SI-2067; numbers SI-001 to SI-114 were previously given to the fragments found in the side-room Jd). Many of these fragments still have to be photographed. They belong to the damaged walls or pillars of the tomb KV 17. This season we listed new fragments (SI-2068 to SI-2298) and took pictures of 724 pieces. Most of them were small in size, but there were also some bigger ones. One example in two joining pieces with white background colour (SI-2013 + SI-2005) shows the feet of the king standing before the remains of a “*meret*”-chest.



Fig. 3. Fragment of wall decoration with white background from KV 17. Photo UBKVP.

One interesting fact is that SI-2005 has another decorated face with the feet of a smaller figure depicted on a yellow background. Together with another big fragment showing two different faces (SI-305 to which the small fragment SI-1151 could be added), the joining pieces SI-2013 and SI-2005 belong to a corner: their original position can be located at the junction between the doorway leading to side-room Jc and the burial chamber decorated with the 3rd division of the *Book of Gates*.

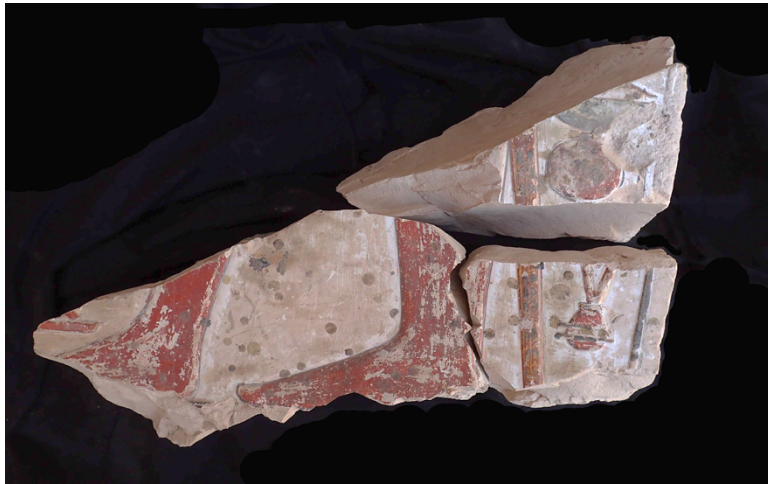


Fig. 4. Composition of several fragments of wall decoration from KV 17. Photo UBKVP.



Fig. 5. Fragment of wall decoration with yellow background from KV 17. Photo UBKVP.

Other fragments with yellow background colour are connected to the pillars of the burial chamber. One of them (pillar E) is now completely destroyed: we only know its original decoration by the drawings made by Belzoni and Ricci just after the tomb was discovered. One of the faces was decorated with the King (turned to the right) facing Osiris. A part of the god's face turned to the left has been identified on the fragment SI-1851: beside the nose and the mouth painted in green are the remains of the *heqa*-sceptre painted in yellow with red outlines and blue strips.

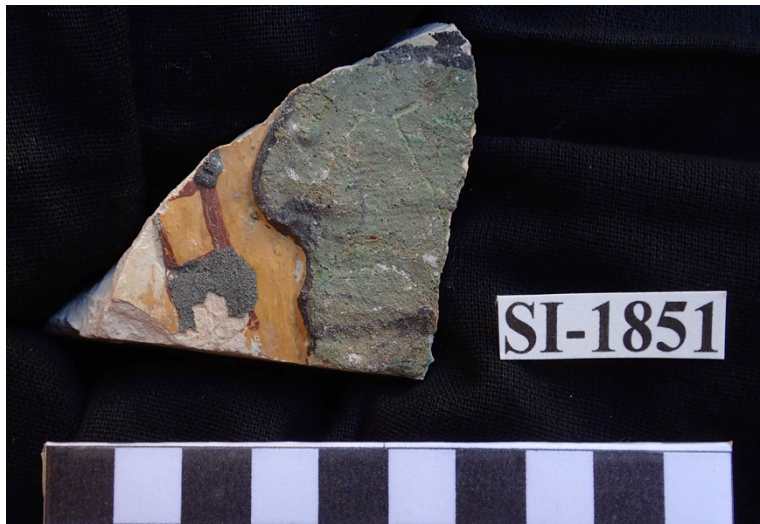


Fig. 6. Fragment of the face of Osiris. Photo UBKVP.

Most of the listed fragments with white background originate from the side-room Jb surrounded with a kind of bench decorated with a cornice. Below the cornice, the bench was divided into compartments where pictures of the tomb furniture like beds and shrines were represented. Fragment SI-2010 belongs to a bed in the form of a cow, while SI-1951 belongs to a shrine with multicoloured pattern standing on a red sledge.



Fig. 7+8. Fragments depicting funerary objects, from Room Jb, KV 17. Photos UBKVP.

The dividing elements separating the compartments were inscribed with the names of the justified king written in cartouches. Different joining pieces inscribed with the words "true of voice" (*m³c-hrw*) that follow the cartouche are part of these dividing elements.



Fig. 9. Assemblage of fragments from room Jb of KV 17. Photo UBKVP.

5. Clearing of the area on the hill on the south side of the entrance of KV 17

Elina Paulin-Grothe

The work on the south side of the tomb of Seti Ist started already in the last season 2017-2018. The aim of this work is to clear some theories of possible accidents and changes in the architecture of the tomb during the building time.



Fig. 10. Area south of KV 17. Photo UBKVP.

The ceiling in the burial chamber might have collapsed and a new vaulted ceiling, the first in the Valley, had to be built. From the first flat ceiling with astronomical scenes we have collected fragments in the earlier years of our work, and one additional piece was found in this season.



Fig. 11. Fragment of original, flat ceiling of the burial chamber of KV 17. Photo UBKVP.

Possibly there are more of these fragments in the debris, which lies as a big heap behind KV 17. The debris consists of white limestone chips in different sizes. It clearly is building material from KV 17, mixed with pottery of poor quality, mainly the so called “beer jars” and fragments of amphorae.



Fig. 12. Beer jars used by the builders of KV 17. Photo UBKVP.

The pottery was used by the workmen mainly as containers for mortar and plaster, mostly made of limestone or gypsum powder. This shows that the workmen fixed the dangerous or weak areas during the mining of the tomb with mortar. They also painted the ceilings during the early phase of the mining work as they still could reach the ceilings by standing on the high rocks without the need of scaffolds. This method is shown by the many fragments with drops of black or red colour on their surfaces found in the debris. Many of the limestone boulders and chippings show chisel marks. Some pigments are also among the finds.



Fig. 13. Pot with gypsum. Photo UBKVP.



Fig. 14. Remains from the construction of KV 17, boulders with chisel marks. Photo UBKVP.

Very few ostraca have been found, all of them drawn with charcoal. It seems that it was not yet the habit to write about the work or make lists of the workmen, like in the later Nineteenth or Twentieth Dynasties. From the Eighteenth Dynasty, there are very few finds outside the tombs in the Valley of the Kings. However, one bronze object appeared in the debris, It is a damaged vessel or flask without the neck part. It probably originates from KV 43, because the inscription mentions the name of Thutmose IV. The piece needs restoration in the coming season.



Fig. 15. Bronze vessel with name of Thutmosis IV. Photo UBKVP.

Patches of halfa grass and plant remains as well as seeds together with fishbones were often associated with the pottery. Specialists will give us more information about these organic remains and their use by the workmen.



Fig. 16. Patch of halfa grass above KV 17. Photo UBKVP.

The area excavated during this season shows a profile of 6 meters high. In the end of the season it was protected with limestone boulders to avoid any collapses and to show where to continue in the next season. The excavated trench was named SI-north and we plan to continue the clearance on its south and west side as the study of this area gives most interesting insight into the construction and decoration process of KV 17 and aspects of the life of the workmen.



Fig. 17+18. Profile and side view of trench S1-north. Photo UBKVP.

6. Documentation of materials from KV 17 J c

Andreas Dorn

The work on the documentation of fragmentary preserved burial equipment of Seti Ist, started in spring 2018, was continued this season. The visualisation of all material, mainly consisting of wood, including shabtis and wooden furniture (no diagnostic pieces identifiable), faience and alabaster was finished and the documentation with drawings and description was continued mainly focusing on smaller alabaster fragments belonging to the canonic box of the king.

7. Clearing the area in front of KV 30

Elina Paulin-Grothe

The other excavation area of this season was in front of KV 30. The aim was to find the original Eighteenth Dynasty layers of the side valley leading to KV 34. This work also serves the protection of the tomb entrance from flash floods by lowering the surface. In front of KV 30 a very rare floor, “dakka”, was found, which belongs to the Eighteenth Dynasty and thus shows the height of the surface at the beginning of the New Kingdom. In the past, all the tombs were situated on the hillslope and therefore protected from floods in a very easy and cheap way. To reach the tomb one had to climb up to the opening of the shaft or to the steps leading downwards like in KV 32. We intend to remove the debris deposited by the teams of Belzoni, Mariette, Davis, Carter, Loret etc. who all have excavated in this side valley and accumulated big amounts of debris in the path and around the tombs. Lowering the surface of the entire path for the protection of all the tombs in the area is part of our site management plan beside the covering the tombs with iron doors.



Fig. 19. *Dakka* in front of KV 30. Photo UBKVP.

8. Geological work

Martin Ziegler, Matthew Perras, Jasmin Maissen, Marija Lukovic

Rock fall and rock fracture mapping, and geodetic surveying

In order to survey the morphology of the valley and its rock cliffs we conducted laser scans and obtained digital photographs that we will use to produce a photogrammetric model of the valley's upper slopes.

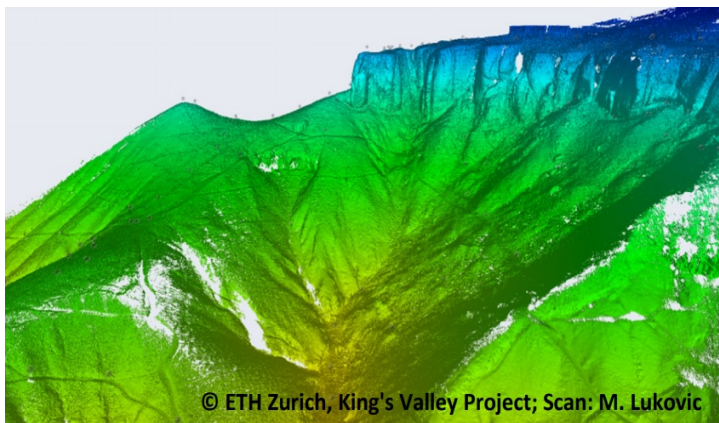


Fig. 20. Example of a laser scan point cloud representing the valley's surface. Data was recorded with a FARO Focus S120 laser scanner. Photo ETH Zurich, Lukovic.

These data record the landscape surface and will be used, together with geological mappings of rock debris and past rock fall deposits, as input data for rock fall numerical analysis. In addition, we mapped important rock mass fractures that could lead to rock slope instabilities. The aim of

this work is to obtain information of potential rock instabilities, especially of rock falls, and to assess rock fall risk and hazard.

Rock fracture mapping and geodetic surveying in the undecorated room in KV17

In the undecorated room of KV17 connected to the sarcophagus chamber, rock fractures can be seen, partly with dislocations in the walls and columns. For an analysis of the origin of these fractures, we conducted detailed geological mapping. The data will be used for later stability analyses. The fracture orientations were measured with a geological compass, and the visible dimensions and apertures were noted. We used a laser scanner to record the geometry and dimensions of the room.

Collecting of rock samples

We collected eleven marly limestone rock samples from different places in the Valley of the Kings. Each block has a weight of approximately 20 to 30 kg and will be used for rock-mechanical and petrophysical testing to be conducted. Sampling criteria were intactness, origin/lithology, and size. Only samples away from tombs at the surface were taken, and their position was recorded with a GPS. In addition, we photographed the samples.



Fig. 21. Collected rock block samples for laboratory rock strength testing. Photo ETH Zurich, Maissen.

The samples have been transported to the laboratory in South Valley University of Qena, where the rock-mechanical and petrophysical investigations will be carried out in April. Rock-mechanical properties will be used as input for numerical simulations to study the stability of the fractured rock cliff above KV42 and future modelling of other areas.

Installation of a seismometer in KV37

In February 2019, we installed a Raspberry Shake seismometer, together with a 80 Ah battery, battery charger and voltage converter, inside KV 37 to record local ground vibrations, and near and remote earthquakes. In contrast to the seismometer at the surface close to the entrance of KV42, the seismometer in KV 37 is located on the floor of the chamber, about 7 m below ground surface.



Fig. 22. Metal box with inside battery and voltage converter. On top of the protective box the battery charger can be seen. The Raspberry Shake seismometer is in front of the box. Photo ETH Zurich, Maissen.

Maintenance and update of environmental sensors

In May of 2018, we installed a weather station that monitors environmental parameters, as previously reported. The system transmits the data via the 4G mobile network and the program can be updated remotely. However, we have experienced transmission errors, which required physical access to the device to download missing data and make corrections to the operation of the unit. In addition to this maintenance, the environmental monitoring system was updated to include a thermal station close to the entrance of KV32 which images the temperature contrast of the cliff face being monitored by the crack meter. The picture of the real rock slab can be compared to the thermal image.



Fig. 23. Picture of the Thermal Station mounted on a pole near the entrance of KV 32 that monitors the temperature of the rock slab above KV 42. Photo ETH Zurich/York University, Ziegler.

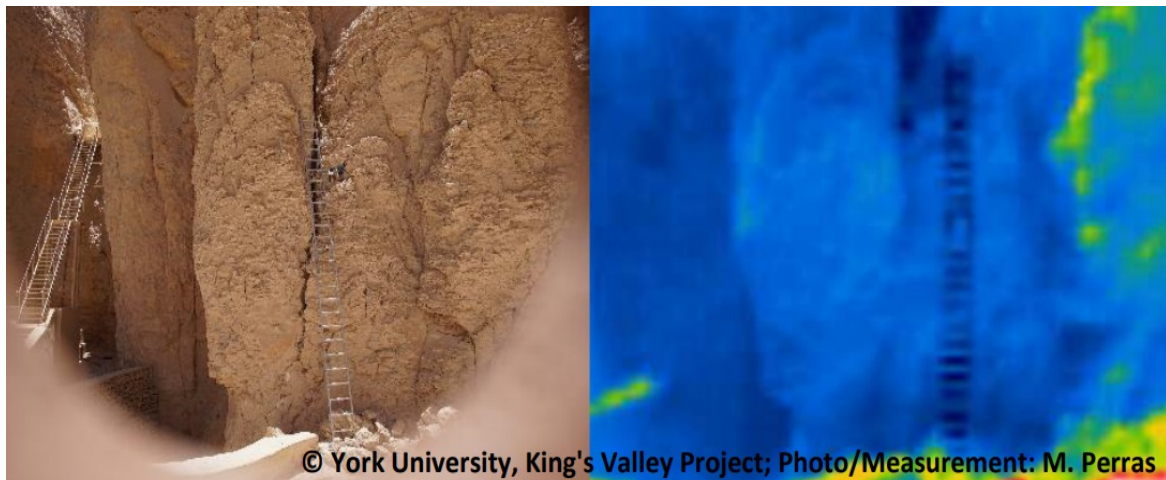


Fig. 24. Picture of the rock slab from the view of the Thermal Station (left) and the final thermal image (right) showing cool (blue) and hot (red) portions of the rock slab as the sun starts to shine in the valley. Photo ETH Zurich/York University, Perras.

9. Documentation of objects deposited in the Carter Museum Magazine of the SCA.

During two days, objects from the tomb of queen Tiaa KV 32 stored in the Carter Museum Magazine were reidentified and photographed for publication.



Fig. 25. Ushebti of queen Tiaa from KV 32. Photo UBKVP, Kacicnik.

10. Database of objects from the Kings' Valley in the Carter Museum Magazine of the SCA. Mahmoud Ibrahim, Susanne Bickel

The project of inventory of all objects from the Kings' Valley currently stored in the Carter Museum Magazine of the SCA was started in cooperation with the Magazine staff.

Inventory sheets in Arabic and English for the database were prepared and a work flow was established during which each object would be identified (type of object, find location, find date), described, measured, and photographed. During three days, a workshop for capacity building and instructions to implement the database by the Magazine staff was carried out.

The aim of this project is to get an overview of the finds from the area of the Valley stored in the Carter Magazine, to create a high standard and accessible documentation and lay the basis for further research in cooperation with the inspectors of the Magazine.

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