Report on the Excavations at Elephantine by the German Archaeological Institute and the Swiss Institute from autumn 2016 to summer 2017

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1. Introduction

The investigation of the ancient town and temples of Elephantine has been carried out by the German Archaeological Institute Cairo (DAI) in cooperation with the Swiss Institute for Egyptian Building Archaeology (Swiss Institute) since 1969. The 2016-17 season began on October 7th, 2016 and finished on June 8th, 2017*.

The DAI continued its archaeometric project 'Realities of Life' in the ancient north-western town of Elephantine (section 2). Between autumn 2016 and summer 2017, one season of excavation was conducted and two seasons were dedicated entirely to the study of the finds. The Swiss Institute resumed the excavation of house 55 to the south of the sanctuary of Heqaib in the framework of its study of the New Kingdom town of the island. In the Khnum temple area work concentrated on various aspects of the late temple, its precinct and its furnishings (section 3).

In addition, several projects were aimed at the study of single objects and object groups. Field research on the decoration of the Greco-Roman temples of Elephantine was continued (section 4). The Swiss Institute did further work for the conservation and rebuilding of the temple of Osiris Nesmeti (section 5). The DAI conducted a project on the context of finds and the objects of the early periods of the history of Elephantine through functional settlement analysis (section 6).

With great pleasure, we can furthermore report the re-opening of the excavation museum (the so-called Annex Museum), built and refurbished by the DAI, which took part in spring 2017, as well as the inauguration of a small auditorium in the German excavation house on the island, for training purposes of our local colleagues (section 7).

(J. Sigl)

2. The project ‘Realities of Life’ – excavations in the north-western town of Elephantine

Since autumn 2013 the German Archaeological Institute Cairo adjusted its excavation methodology on Elephantine Island considerably to fit the requirements of its research project ‘Realities of Life – A Synthesis of Archaeology and Natural Sciences (Archaeometry)’. The project focuses on a small area of the Middle Kingdom town of Elephantine in the north-western section of the ancient settlement (**Fig. 1**).

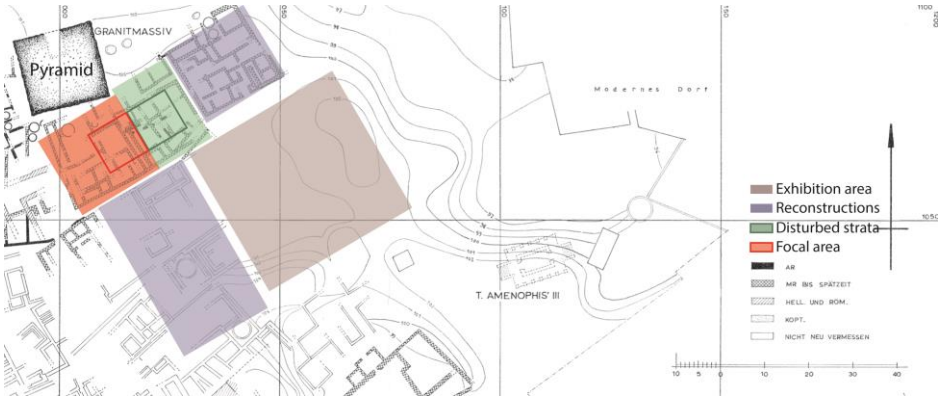

Fig. 1: Plan of Elephantine archaeological site showing features around the focal area of the ‘Realities of Life’-project. Outlined in green: trench excavated from autumn 2013 until autumn 2015; outlined in red: trench worked in since spring 2016 (J. Sigl, DAIK).

According to its title, the investigation of what daily life for the inhabitants of the island-town looked like during the 3rd millennium BC, is the central point of this archaeological research. Daily life[1] is herein understood as being marked by the actions of people to ensure their bodily and general well-being, taking part mainly within their homes and the direct surrounding areas. Daily life is influenced by the regional and international connections of the individuals. Activities and locations can be summarized as three major foci, which can be studied through material culture: a) food and drink, b) work and c) living environment.[2] These three aspects are also reflected, with a certain degree of ideological, religious and individual adjustment, in contemporary tomb paintings, models and written documents. In order to utilize the excavated archaeological evidence material as fully as possible, the excavation work and handling of finds has been adjusted according to the demands of the scientific analysis to be performed on it.[3] Methods derived from natural sciences[4] are crucial in the research process and for the interpretation of the finds. The ongoing exchange between international scholars from various disciplines participating in the project is essential for the final formulation of results. Thus, the following sections of this article will not only reflect on the archaeological results from the previous season but

also, on methodological approaches to investigations on various kinds of artefactual material, especially on ceramic studies.

(J. Sigl)

a) Excavations in the Middle Kingdom settlement of Elephantine

In spring 2017[5], the German Archaeological Institute continued the excavations in the north-western town in the frame of the project 'Realities of Life'. Since autumn 2013, four main building layers spanning from the First Intermediate Period to the early 13th dynasty were excavated.[6] A second trench measuring 10 x 10 m and located southwest of the first one (**Fig. 2**) has been the focus of investigation since spring 2016.

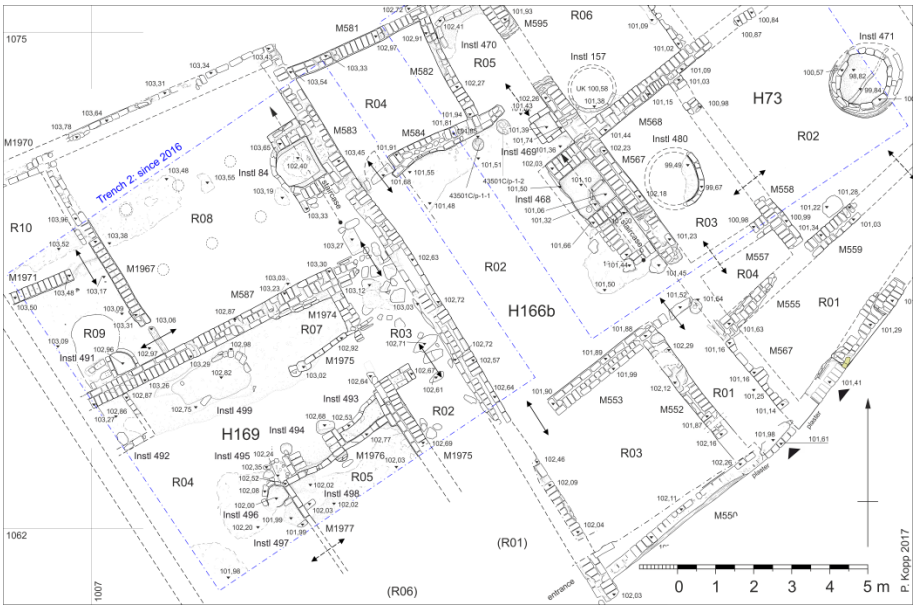

Fig. 2: Houses 166 and 169 in the north-western town (original drawings: N. Brown/P. Kopp, DAIK; digital inking: P. Kopp, DAIK).

The first investigations were carried out in this location by a German team at the beginning of the 20th century. Further research was conducted around 1990 by the German Archaeological Institute[7]: at this stage most of the features dating from the New Kingdom were removed.

After completing the documentation of the remaining features of the New Kingdom and the Second Intermediate Period in the previous year, this season the layers of the late 12th and 13th dynasties were investigated. Due to later building activity, the 13th dynasty contexts were very poorly preserved in this area. Primarily, features situated below floor levels were found, including three beehive-shaped cellars of different sizes and a wall foundation.

The foundation trenches of the cellars were cut into the remains of an older house (house 169) that had been built in the late 12th dynasty and was used until the middle of the 13th dynasty (**Figs. 2 and 3**). With an area of 150 m^2, house 169 is one of the largest houses of the Middle Kingdom known from Elephantine.[8] It had a central courtyard and probably nine other rooms, and it was entered from the public alley to the southwest. From an entrance room, one had to pass through a short corridor turning left into the central courtyard (R04). In the elongation of the axis of the corridor straight from the entrance, a staircase at the end of the house ran over a storage feature under an arch supporting the steps (**Figs. 2 and 3**, top left). Similar storage emplacements have been identified in several other houses, but their specific use is still unknown.[9] Unfortunately the one in house 169 had already been emptied during earlier investigations, and thus held no clues as to its usage either. The staircase led to a second storey or to the roof of the house, neither of which are preserved. It was part of a larger room in the rear third of house 169 (R08). Only the negative of one removed column base was preserved, but due to the position of this negative, the dimensions of the room and parallels from other houses from the island, it can be assumed that the ceiling of R08 was once supported by six columns. On the western side of room R08 were two smaller rooms, one equipped with a quern emplacement (R09).[10]

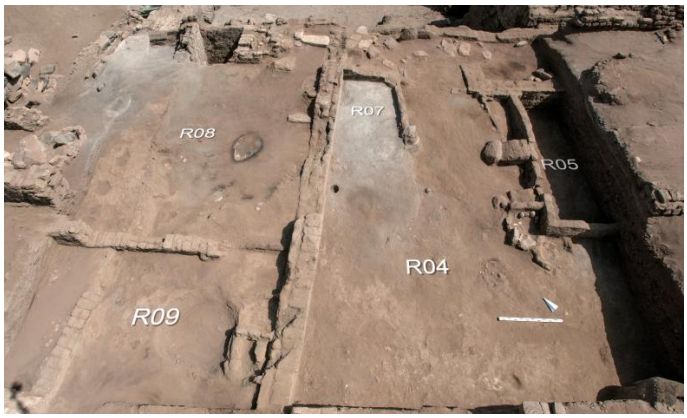

Fig. 3: House 169, central court on the right side (R04) (photo: P. Kopp, DAIK).

The central court of house 169 was L-shaped (R04). On its southern side a row of small storage bins was built along the wall of room R05 (**Fig. 3**, right). On the northern side there was an oven room measuring 1.4 x 1.65 m (**Fig. 3**, R07, and **Fig. 4**). During its use, it had slowly filled with thin layers of white / grey ashes containing hardly any finds except for a remarkably small number of tiny pottery sherds (**Fig. 4**, phase 1). The vitrified bricks of its walls are testimony to the heat action inside. A brick threshold built in the entrance kept the ashes within the room for some time, but after a while, the

threshold was covered and the ash layers expanded into the court in straight line along its northern wall. Here, some circular pits of up to 60 cm in diameter were used to make fire (**Fig. 4**, phase 2a). A refurbishment of the northern wall of the oven room with bricks and stone slabs shows that the room was still in use at this point (**Fig. 4**, phase 2b).

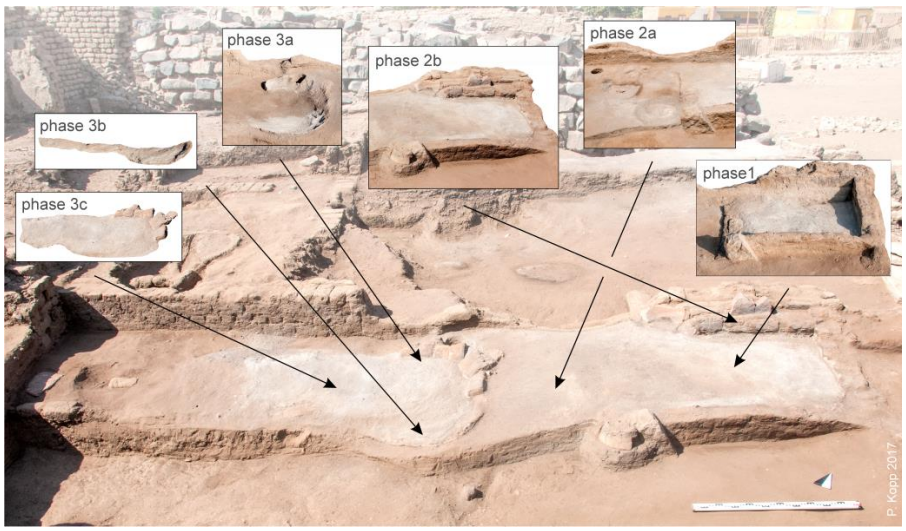

Fig. 4: Oven room and fireplaces in the court of house 169 and their phases (photos: P. Kopp, DAIK).

Finally the ashes extended to the western side of the house (**Fig. 4**, phase 3). Their spreading into the court was not due to a displacement of ashes from the oven room but to a shifting of the fireplaces into the court. Several pits showed clear signs of heat, and the surrounding soil was vitrified. Some of the pits were brick-lined like in the oven room.[11] A well preserved brick-lined example had an oval shape of approximately 1.6 to 1.0 m (**Fig. 4**, phase 3c): the unfired mud bricks formed temporary constructions, which were removed after a certain time of use.

The ceramic assemblages found in these fireplaces might indicate their function. Normally about 5-10 % of the ceramics gathered from one feature comprises of bread mold sherds. The ashy deposits in the northern part of the court R04 of house 169, however, regularly constituted more than 40 % bread mould sherds in the ceramic assemblage of those deposits (**Fig. 5**). Therefore, it is fairly probable that these fireplaces were used for the baking of bread. Same is assumed for the ash filled oven room, even though in here the bread mould sherds were surprisingly not found in larger numbers. Other rooms of this kind on Elephantine excavated in the past, however, have yielded similar distributions of sherds: in house 86b there was even a deposit of complete bread moulds preserved.[12] The high number of such oven rooms on Elephantine shows that the baking of bread was generally done in the domestic buildings.[13]

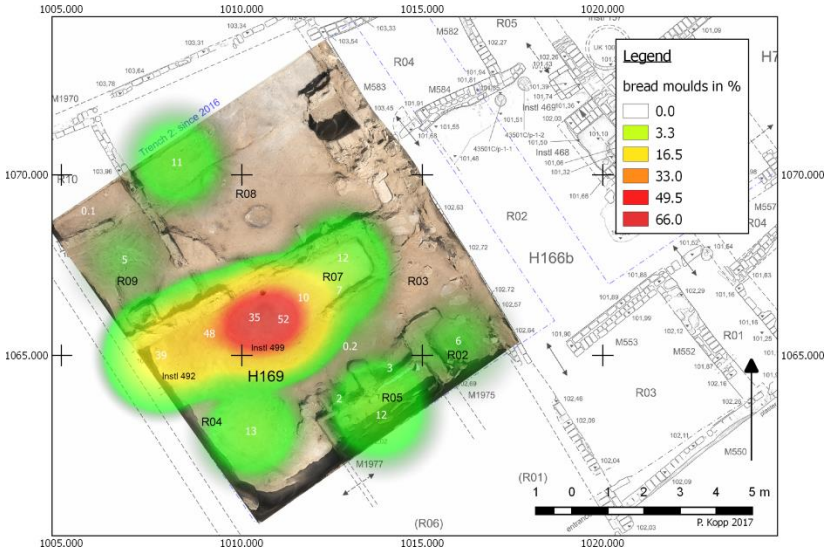

Fig. 5: Percentage of bread moulds in the pottery assemblage in the excavated part of house 169 (plans, photos and statistics: P. Kopp, DAIK).

The western corner of the court R04 at least temporarily hosted a square storage bin measuring 1.0 x 1.0 m. It was brick-lined and contained the fuel for the fireplaces. Goat faeces and small pieces of wood were found inside.[14]

Many small fragments of semiprecious stones were found in house 169, as in the neighboring houses 166 and 73 and in the buildings that preceded them. Unlike the neighboring houses, where carnelian fragments and flakes were the majority, in house 169 amethyst pieces dominated. In the Middle Kingdom, amethyst was mined not far from Elephantine Island in Wadi el-Hudi, located about 35 kilometres southeast of Aswan.[15] This mining area might have been where the raw material was initially prepared and then sent to Elephantine for further processing. The production of jewellery and stamp seals made of stones[16] in the north-western town is documented by the manufacturing waste, but also by semi-finished pendants and stamp seals. Especially beads of semiprecious stones were therefore not necessarily manufactured in special workshops but in domestic settings.

(P. Kopp)

b) Studies on Middle Kingdom Pottery – Ceramic Processing: Methodology and Preliminary Findings

Multiple specialists work with the ceramics collected by the ‘Realities of Life’ project. Ceramic finds go through several levels of triage, at each stage processed by a different individual. Each level is designed with different research questions and goals for the pottery. Distributing the material therefore

allows us to conduct multiple levels of analysis as well as to - in the simplest terms - process far more ceramics than would be possible were only one individual in charge of this mass of artefacts.

The phases of processing, and the goals of each stage, are as follows:

- Primary Processing: This is, appropriately, a first-level triage of the ceramic material immediately after it is excavated; ceramics from every excavated feature go through this process. During this phase, the number of diagnostics versus body sherds is determined and coarse divisions in the fabrics (for example, silts versus marls) are made. Select, chronologically diagnostic forms are identified, allowing each feature to be assigned a date range. It should be noted that all contexts excavated by the 'Realities of Life' project are mixed contexts; therefore, assigning a date range is more appropriate than treating a given feature as a closed, single-period context. At this stage, occasional vessels are drawn and samples taken for future scientific investigation. Peter Kopp oversees primary processing, whose primary goals are coarse identification of form and, most importantly, chronology. Material from primary processing allowed Kopp's work on dating sequences (see below: section 2c) in that it enabled his selection of appropriate features for study. Much of the material he references below came from his additional data collection on contexts he identified as being promising during primary processing.
- Secondary Processing (see also below: section 2d): This research step focuses on fine-grained identification of fabrics, wares, and forms, in order to both enable a discussion of corpus as well as give detailed data about individual forms and temporal change. Body sherds are grouped into wares (fabric and surface treatment); sub-groups allow the ceramicist to note any burning or use marks on the surfaces. Diagnostics are individually recorded, including their ware and dimensions (rim diameter and percent preservation; rarely wall thickness), in order to build a corpus of all forms identified in the houses rather than just recording or identifying those that are the best known, the most common, or the most chronologically relevant. Weights of all categories of sherds – body sherds by ware, diagnostic sherds by type – are taken because weights are more statistically valuable than sherd counts.[17] A great number of drawings are produced at this stage; when the drawings are combined with the metrics collected from all diagnostic sherds, it is possible to discuss vessel size, form, and change over time based on a large, statistically significant data set. All data are inserted into a Filemaker database. As this work requires that every sherd be looked at individually, it

provides an ideal time to select systematic samples for future thin-section and residue analysis.

Due to the time-consuming nature of collecting such fine-grained data, only select contexts undergo secondary processing. Features are selected based on chronology (as determined via primary processing) as well as provenience, with priority given to features that are vertically stratified. We hope that this level of detail will advance future work on analysis of mixed contexts. During the May 2017 season, secondary processing was conducted under my supervision largely on material from a vertical exposure in the courtyard of house 169, allowing the ceramics and the archaeology to be tied together in a discussion of diachronic change.

- Scientific Analysis: Samples are selected on a targeted basis during primary processing and a systematic basis during secondary processing. Sherds with abundant visible residues are selected during primary processing so that we may test the preservation of residues and the ability to conduct residue analysis on the island. Additional sherd types were targeted for testing during secondary processing in May 2017, including bread moulds, vessels with blackened interiors, and cooking pots with triangular rim sections. 67 sample sherds selected in 2015, and 2016 were sampled in fall 2016; 41 additional sherds were collected for residue analysis in May 2017. The sherds are sampled and analyzed by V. Steele (see below: section 2e).

  Additionally, during secondary processing, sherds are selected for future thin section analysis, with the main goal of testing our fabric identification system as well as investigating manufacture of select forms (Egyptian vs. Nubian cooking vessels, Egyptian bread forms). Further, more detailed questions are to be answered though this method as they arise during the first steps of processing. 121 sherds were selected as potential samples during the May 2017 season and packed for future study by John Gait.

- Nubian Ceramics: During primary processing, all sherds identifiable as belonging to Nubian culture in design, manufacture, and fabric are separated for a parallel study by Marie-Kristin Schröder. All sherds are drawn and entered into a database in order to identify chronological sequences (see below: section 2f). Schröder also selects sherds for future residue and thin section analysis, which are then handed off to Steele and Gait, respectively.

c) Studies on Middle Kingdom Pottery – Preliminary results of the primary processing: Dating of First Intermediate Period and Middle Kingdom Pottery

Elephantine offers a unique opportunity to study the development of ceramic shapes over an extended time span because of the long sequences of layers that have built-up over centuries. The processes of accumulation and removal of material in this building, which are the results of human action and other influences, are (mostly) well understood, and sequences were checked with the adjacent profiles. Therefore, the formation of ceramic assemblages and ways in which finds have become mixed via re-deposition, and repeated dumping is explainable.

Various attempts have been made in the past to arrange the ceramic material of Elephantine in chronological order according to 'building layers', and thus to present the 'Ceramic Inventory of Building Layer XY'.[18] However, this approach involves a number of risks. First of all, it requires that the 'building layers' are correctly understood across different, physically un-connected excavation areas, and the ceramics assigned accordingly. As soon as ceramics from different excavation areas are investigated together, the risk of mistakes in the stratigraphic assignment increases because temporally different houses might have been mistakenly combined.[19] The greatest problem with this method is that it depends upon flawless excavation methods, with 100% perfect identification of the sequences of deposits and their horizontal relationships – something that is essentially impossible to achieve.

A further weakness in an analysis based on 'building layers' is that buildings thought to be in use within the settlement at same time were combined by past archaeologists to form a 'building layer', ideally meaning that a given 'building layer' reflects all buildings existing at any given time. The problem with this is that it imposes a totally un-natural framework of chronological divisions upon the detailed sequence of development of the settlement. In reality, within any given 'building layer', individual houses may have built redeveloped, demolished and rebuilt at any time, and equally, houses may have been built and remained the same across more than one 'building layer'. The precise sequence of house construction, development and demolition may have been considerably different between two neighboring areas, especially on Elephantine where the natural form of the Island means that contemporary houses may be several meters above or below each other. Combining houses in 'building layers' represents a simplification that is useful to show the development of the settlement over a long time span, but for the ceramic investigation it is unwanted, since it opens up the possibility that ceramics of different periods are treated as concurrent. A division

of the ceramic finds based upon ‘building layers’ will thus lead in most cases to a fuzzy result, hindering the nuanced consideration of the development of ceramic shapes. In order to rule this out, the ceramics selected for the chronological investigation should derive from only one specific site, where the sequence of deposits is relatively uncomplicated, and the relationships of the layers are clear.

In addition to the use of ‘building layers’ to analyze ceramics, a relative-chronological sequence model of Egyptian pottery has been created on Elephantine, in which regularly occurring, characteristic forms of a period are summarized and divided into groups termed ‘Formations’. It was initially developed completely independent of the historical division into dynasties or ‘building layers’, instead being solely based on the development of ceramic shapes and technologies. The system is essentially based on the empirical observations of the archaeologists, who recognized combinations of ceramic forms which were being found frequently, and their position in the stratigraphy. This model begins in the Naqada Period and continues, so far, through to the 17th dynasty.[20] Because it is essentially based on fragments of mass products, it is suitable for the chronological classification of most of the ceramic assemblage despite the abundance of sherd material and the scarcity of complete vessels.

In spring 2016, these observations were examined by ‘correspondence analysis’ to prove or correct the former results and to add a wider range of shapes. A sequence from the recently excavated area of the ‘Realities of Life’ project in the north-western town was chosen for this research because we have created abundant documentation. The archaeological deposits had a depth of nearly four meters and consisted of 38 layers, walls and floors. The chronological range was, according to the primary processing, from the late 6th dynasty (Formation D5[21]) to the middle/late 13th dynasty (Formation F4). To get more material to increase the robustness of the data, pottery from 35 features from the adjoining trench were added. More than 3900 diagnostic sherds were recorded in a catalogue of 143 types.[22] On this basis the correspondence analysis was made.

As the arrangement of formations’ alpha-numeric, chronological order in the scatterplot from D5 to F4 shows (**Fig. 6**), the result confirms that this system, utilizing Elephantine pottery formations is a relatively reliable way to arrange the ceramic material in chronological order. Some single features do not fit perfectly, but this is likely to be a sign that these features included relocated sherds of older types, or chronologically relevant types missing from an assemblage.

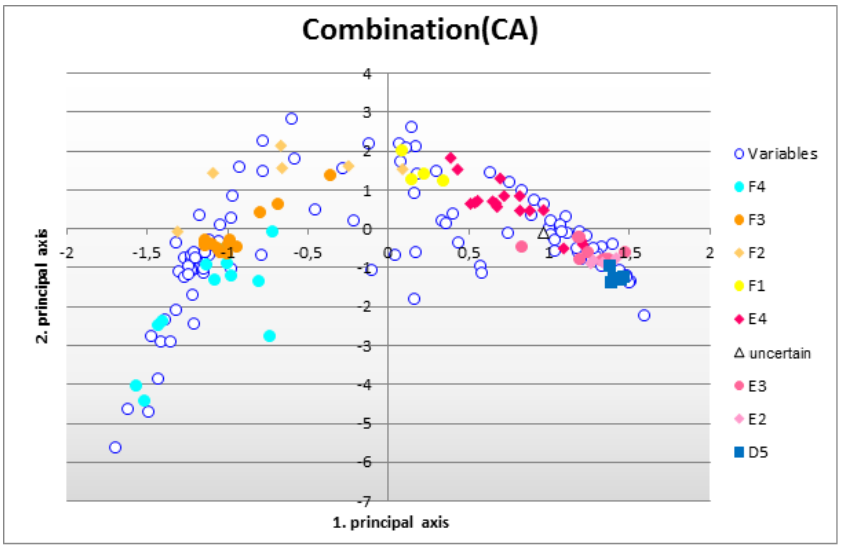

Fig. 6: Scatterplot of the layers/features of axis 1 versus axis 2 after correspondence analysis of pottery inventories of the late 6th to the late 13th dynasty (P. Kopp, DAIK).

The shape of an inverted parabola in the scatterplot is typical for a chronological order as is expected for this material.[23] The direction of the development is predefined by the stratigraphy. The phase E1 (containing ceramics of the early First Intermediate Period) is not represented in the material, but is attested in other areas of Elephantine.[24]

The various shapes of bread moulds indicate the development from the late 6th dynasty until the late 11th/beginning 12th dynasty (**Fig. 7**). Formation D5 is defined by small bread moulds, whose shapes follow the tradition of the Old Kingdom with a diameter of about 12 cm (A01.01).[25] In the First Intermediate Period (E1/2) moulds appear with a folded rim (A01.02–03) that disappears in the middle of the 11th dynasty (E3).[26] In Formation E1/2, they have already the elongated shape typical for the Middle Kingdom (A01.04). Not until the formation E4 in the late 11th/early 12th dynasty do the first thin walled bread moulds appear in the material (A01.06).

The first records of thin walled, narrow hemispherical cups without any coating (B08.02) define the formation F1 (early 12th dynasty).[27] Beginning in the middle of the 12th dynasty (F2), these drinking cups are deeper with steep sides (B08.03). New in formation F3 (late 12th/early 13th dynasty)[28] are hemispherical cups with a red rim (B08.04). Characteristic for the youngest formation in this sequence of the middle/late 13th dynasty (F4)[29] are rims of marl flasks (C05.11)[30] and the so-called beer bottles with kettle mouth rim.[31]

(P. Kopp)

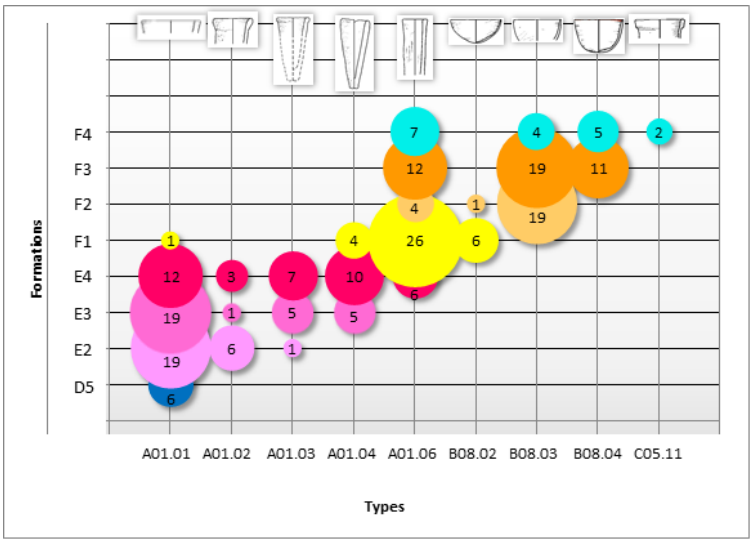

Fig. 7: Examples for the percentage of pottery types in the different formations in the examined material (P. Kopp, DAIK).

d) Studies on Middle Kingdom Pottery – Preliminary results of the Secondary Processing

My focus during the May 2017 season, as noted above, was on secondary processing. The vertical exposure selected for this level of processing came from the courtyard and north-western quadrant of House 169; features largely dated to the late 12th-13th dynasty. Additional assemblages from the 44th campaign were also selected for analysis in order to obtain comparative corpora from the First Intermediate Period. The season itself was spent recording the complete ceramic corpus from over 40 archaeological features – a total of over 18,000 sherds analyzed, yielding 510 drawings (including some drawings from the spring season). Very initial data show that coarse Nile Silts, unslipped on their interior or exterior, were the most dominant wares in most of the features; however, the distribution of burn marks suggests that finer wares (of all forms – both open and closed types) were fundamental for cooking. Some of the finest unslipped fabrics showed consistent burning that baked through vessels' walls. Coarse wares seem to have been used for large scale preparation and storage; finer wares were used for cooking and serving, activities that of necessity required vessels that one could easily move. There is also a ware difference that occurs between late Old Kingdom and late First Intermediate Period features. During this time, the firing conditions seem to have changed, though the composition of the fabrics has not. The later fabrics are more friable. More work needs to be carried out (both at the level of secondary processing and thin section analysis) to test when, and potentially why, this occurs.

Several forms were given special attention, particularly bread moulds. Bread moulds provide a dating criterion for the site,[32] they also played a fundamental role in the subsistence and economy of the village, making them important puzzle pieces in the project's study of daily life. Cylindrical bread moulds, in particular, show formal and technical change from the First Intermediate Period to the Middle Kingdom. Within our small sample of 40 features, bread moulds decreased in frequency, moving from as much as 61% of the corpus in the First Intermediate Period (43501E/z) to no more than 18% in the Middle Kingdom features processed (this figure comes from 46501F/e). Of course, these figures are based on a small (though spatially similar) sample and must be tested against data from other household features. Photogrammetry and drawing were used to document instances of bread mould reuse, as indicated by multiple layers of interior sandy lining (F**ig. 8**).

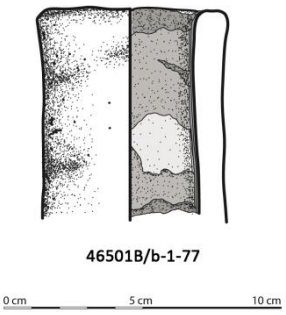

Fig. 8: Bread mould with three layers of interior sandy lining (drawing by P. Collet).

The fabric classification system employed during secondary processing is a local one, established in 2015 for application to the ceramics from the 'Realities of Life'. By using a local fabric classification system, we allow for relationship to the Vienna System[33] while permitting investigation into, and analysis of, local production. Though the system is too long to list in this report, it is worth highlighting two fabrics which, in bread moulds, are additional markers of temporal change. NS I, a coarse Nile silt fabric with a relatively dense matrix, includes relatively low amounts of burn-out or air holes. Its paste is defined by frequent to abundant sand inclusions, typically fine, but occasionally including small to medium grains. Common to frequent inclusions most characteristically include ground bone and plant remains, in roughly equal amount. Bone is pulverized and ranges from fine to medium particle size. Plant materials range from small to large, and can be burnt before their addition to the clay. This is the dominant fabric for bread moulds manufactured during the Old Kingdom and First Intermediate Period (using Kopp's terminology, through Formation E).

Late Middle Kingdom (Formation F) moulds, on the other hand, were manufactured of NS V. This Nile silt fabric has a characteristic porosity that appears almost like a 'fluffiness', with small to large

round/semi-round voids common. It is poorly mixed, with inclusions at odd angles to each other, which suggests the fabric was not compacted through careful mixing, wedging, or throwing. Fine sand is a common inclusion, and occasionally small-medium sand can be identified. This fabric, or a variant containing abundant ground bone, is exclusively used in late Middle Kingdom cylindrical bread moulds. Additional work is required to help define transitional fabrics and/or bread mould forms in the early Middle Kingdom; as excavations proceed further down the current trench in 2018 these data should become accessible.

(L. A. Warden)

e) Studies on Middle Kingdom Pottery – Ceramic Residue Analysis: Sampling methodology and goals

In the autumn of 2016, 95 samples were taken for organic residue analysis. The aim of the analysis was primarily to determine whether organic residues are preserved in ceramics and soil/sediment at the site. A further goal was to identify if particular types of ceramics yield organic residues, in particular, if any residues remain from bread-making or brewing, as beer and bread residues have never been systematically studied anywhere.

To achieve these aims, the samples were taken from 44 Egyptian and 23 Nubian vessels that had been identified by Eman Khalifa and Marie-Kristin Schröder in 2015 as potentially yielding data for residue study. Twenty-seven soils/sediments/visible residues associated with these vessels were also identified and sampled. The samples were taken from beer jars (13), bread moulds (3), bowls (16), cups (1), cooking vessels (17), some unidentified shapes, two sherds reused as scrapers, made of Nile Silt and Marl Clay and of Nubian fabrics. The samples included both washed (11) and unwashed sherds (56) with the aim of determining whether the washing process removes significant amounts of residue. Two faience sherds from the Roman Period were also sampled as there is no published work on the potential for organic residue preservation in faience and this provided an opportunity to determine whether these sherds yielded any residues. Many of the vessels still contained large amounts of fill; in 11 cases (10 Egyptian vessels and one Nubian) the vessel and soil were sampled separately. Five additional soil samples were also taken to establish the background of organic compounds present at the site. Visible residues were rare but were sampled separately where they occurred. Exterior sooted residues from six vessels (three Egyptian, three Nubian) were sampled along with five interior food residues (two Egyptian, three Nubian).

Where possible, samples were taken from both sides of each sherd as this provides a check on the levels contamination present – contamination is usually present on both sides of the sherd while residues of archaeological interest will only be present on one surface. Where this was not possible or not appropriate, for example sherds with highly decorated external surfaces, only the interior surface was sampled (four Egyptian sherds, seven Nubian sherds). In all but two of these cases (one each of Egyptian and Nubian sherds) it was possible to sample the fill or visible residue for comparison with the absorbed residues.

Nitrile gloves were worn at all times, sampling was carried out on clean aluminium foil and all tools and glassware were triple washed in acetone before use and between samples to avoid introducing contamination during sampling. In addition vials used for storing samples were washed and heated to 150 °C before use and the plastic caps lined with clean foil. Samples were taken using a modeling drill (Dremel) with a tungsten carbide bit. Fill, soil and visible residues were sampled using a spatula. All samples were weighed to allow quantification after analysis. The ceramic samples were between 0.5 and 3 g, soil and fill samples were larger as more material was available (up to 6 g) while the visible residues were generally smaller (0.05 – 0.5 g). All samples were stored under refrigeration to preserve as much as possible of any organic material present.

The aim is to extract and analyse the residues using gas chromatography-mass spectrometry (GC-MS) as soon as possible. This will determine whether organic residues are preserved at the site and give some indication of the kinds of residues which may be present. Depending on the results of this analysis, a project on beer and/or bread residues could be the next step and, with no previous biomolecular studies of beer residues, an experimental study will be needed. Assuming residues survive, further studies will be possible, for example an examination of how vessels of different shapes were used or a comparison of Nubian and Egyptian vessels etc. The direction of future research will need to be developed in consultation with the archaeologists and should be led by the questions they have about the use of ceramics at the site.

(V. Steele)

f) Studies on Middle Kingdom Pottery – Nubian Ceramics

A small but nevertheless significant part of the pottery assemblage from the recent excavations in the north-western town consists of pottery of Nubian cultural origin. The Nubian pottery was recorded during the 43rd to 46th campaigns; their state of preservation is heavily fragmented. In total, Nubian

pottery occurs in a quantity of only 1-2 % of the overall pottery assemblage. The importance of the Nubian pottery from the settlement of Elephantine Island lies in its deposition within an Egyptian settlement at the ancient border between Egypt and Nubia at the First Cataract. Nubian pottery is to-date almost exclusively known from the numerous cemeteries in Lower and Upper Nubia dating to different periods of Nubian occupation: very little is known about Nubian pottery from settlements.[34] A first comprehensive study on domestic Nubian pottery from Elephantine Island was conducted by Dietrich Raue.[35] He had access to the ceramic material from 39 field seasons from different functional areas (domestic/sacred/funerary) and periods (4th and 2nd millennium BC). To undertake another study on Nubian pottery from this site is justified first of all due to the unique character of the recent excavation. For the first time on Elephantine Island, we can follow a stratigraphic sequence from the late Old Kingdom up to the very early New Kingdom within an enclosed area of two 10 x 10 m trenches with the associated Egyptian and Nubian pottery.[36] The study of the Egyptian pottery from these trenches and the development of a fine chronology help, in turn, to define the chronological classification of the Nubian domestic pottery. Secondly, a quantitative and qualitative study on Nubian pottery can be carried out, including diagnostic and non-diagnostic sherds. To date, the presence of pottery of two main Middle Nubian cultures is attested:

1. pottery of the C-Group culture (Lower Nubia, 6th Dynasty to late Middle Kingdom);
2. pottery of the Pangrave culture (Lower Nubia/Egypt, 2nd Intermediate Period to New Kingdom).

The ceramic material of both pottery traditions consists of the typical Nubian hand-made pottery manufacture (e.g. fine fabrics with black fractures, limited vessel shapes, surface treatment in form of burnishing/scraping and geometric decoration). The prevalent pottery of both cultures can be assigned to simple household wares, and within this group mainly cooking vessels with a smoked exterior surface occur (**Fig. 9:1-2**). These are often decorated with incised geometric patterns but can also appear blank. Fine wares appear regularly but in much smaller numbers, in the form of mainly black-topped and rarely incised bowls (**Fig. 9:3-4**). The typical incised bowls are primarily known from the Nubian cemeteries and their characteristic decorative patterns were used to establish the chronology of the C-Group culture.[37]

In the late Middle Kingdom a sudden change in the Nubian pottery assemblage took place: within a short period of time, C-Group pottery was replaced by Pangrave pottery with its characteristic off-set rim and decorative pattern limited to the rim zone (**Fig. 9:5-6**). The exact point of this change has not yet been detected but with the continuing excavation we will be able to determine the time frame and

hence will get a better understanding of when C-Group culture lost its importance and Pangrave culture became the dominant Nubian culture in Egypt and Lower Nubia.

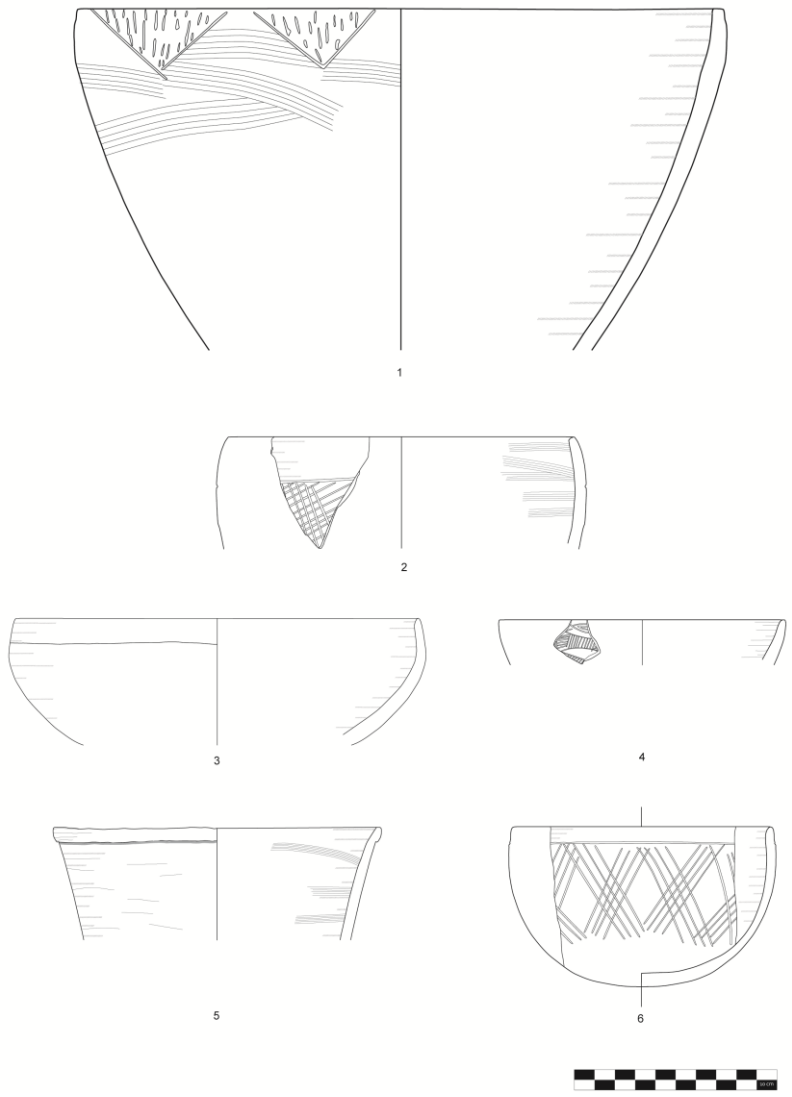

Fig. 9: Nubian pottery from Elephantine Island, Northwestern town (drawing M.-K. Schröder). 1: Cooking vessel(C-Group; find context 44501S/n); 2: Cooking vessel (Pangrave; 45400); 3: Black-topped bowl (C-Group; 44501N/v); 4: Incised bowl (C-Group; 44501R/m); 5: Red polished bowl (Pangrave; 45502K/q-1); 6: Incised bowl (Pangrave; 45502A/d-1-2).

Summing up, the main goal of the study on Nubian pottery is to gain a better knowledge of domestic pottery traditions of two Middle Nubian cultures since little is known until now due to the scarcity of settlements in the Nubian archaeological record. Furthermore, thanks to the continuous stratigraphy in

the Northwestern town, a refined chronology of both the C-Group and Pangrave pottery can be established and the transition between these two cultures studied and pinpointed.

(M.-K. Schröder)

g) Further thoughts on animal remains from the Middle Kingdom settlement

In the scope of the project 'Realities of Life' the study of animal remains plays a double role. Primarily, animal remains give insights into food choices and food production, breeding traditions and the use of bones, teeth, mollusk or egg shell and other animal parts as raw materials; secondarily the deposition of animal remains, after having solved their primary or secondary purposes, can be used as a factor for understanding the use of spaces and living environments (e.g. how clean were people houses?), and the location of production and processing sites. A limiting factor to this second purpose in the case of the settlement of Elephantine, is the fact that most of the collected animal remains derive from fill and leveling layers. The contents of these strata can in theory come from any place in the ancient settlement or could have accumulated over a longer time, while the structure was used as dumping ground. Fill layers, hence, do not give direct evidence as to the use of the rooms in a building. Only finds, which are recovered in the context of floor levels or from use layers, such as the aforementioned ash layers in the oven room and court of house 169, can be used as such.

Since spring 2014 the animal remains of 25 floor layers have been examined. These stratigraphic features are defined as mud plastering of the floors of rooms and compressed walking horizons without discernable mud plastering. The dating of these layers corresponds to the main occupation phases of the excavated houses 57, 167, 170 and 171.[38] Animal remains were recovered by dry sieving and floatation (0.5 mm) as well as hand selection during excavation.

As in the general assemblage of bones, which has been reported previously,[39] fish remains dominate the faunal material recovered from these features (NISP = 1173). Bones of mammals are highly fragmented (NISP = 211). Finished or semi-finished beads of ostrich egg shell form the third largest group: 12 flat rounded beads with a diameter of 3.6-7.5 mm were recovered by hand and through sieving.

It is assumed that food remains were generally not disposed of within the houses, but rather on the street, on collective rubbish dumps outside the town, or in abandoned buildings. Animal remains could end up in floor layers either through accidental loss or because they were already present in the raw material used to make the floor, namely the mud. Through traffic inside the rooms of a house, bones

are likely to become fractured and trampled into the ground. Therefore, only small bones or bone fragments will be preserved. Indeed, the material discussed here comprises primarily of fish bone remains measuring a few millimeters (NISP = 797), which cannot be identified to a specific body part. Mammal bones were probably already smashed during primary use to recover bone marrow, or for use as raw material for household tools or jewelery. Further destruction happened after their deposition through foot traffic. Most of these (NISP = 155) could neither be identified to the species or the bone they were once part of. The animal remains which could be identified, derived from small species and might have avoided destruction mainly because of their small size, the softness of the mud floor or their deposition close to walls and therefore outside of the way of foot traffic. The beads of ostrich egg shell were either lost from existing jewelry items or might indicate their production in this domestic context, as has been mentioned earlier already for semi-precious stone beads. Thus, floor levels seem to be rather 'clean' to the naked eye, while seen during the excavation work, taking into account the bone remains described here are near to microscopic in size. However, research on floor levels alone is not enough to estimate the cleanliness in the houses, which are under investigation in the project 'Realities of Life'. Occupation layers of the rooms above these floors have to be studied more thoroughly before interpretations can be formulated. These will be a focus during the upcoming seasons along with other faunal remains from the excavation.

(J. Sigl)

h) Preliminary report on archaeobotanical studies on Elephantine

As part of the 'Realities of Life' project currently under progress on Elephantine (43rd-46th campaigns, 2014 - 2017), the study of plant macro-remains began in February 2016. An initial assessment was conducted during February 2016 in order to establish protocols and work-flow, followed by two seasons of analysis (November-December 2016, February-March 2017) during which the methods and strategy were refined. Plant remains are well preserved on Elephantine Island. The arid climate and lack of rain, combined with the fact that the settlement on the island was always above the level of the annual inundation, and is well above the water table, means that organic preservation by both charring and desiccation is possible – unlike the majority of flood-plain settlements in Egypt at which desiccated remains are extremely rare.

The principal research questions in this project relate to daily-life activities within selected buildings of the Middle Kingdom to Second Intermediate Period town on Elephantine. For this reason, the

sampling strategy is designed to identify routine practices. In addition to the gathering of all plant remains collected from on-site bulk sieving, samples are taken from every feature, and processed via both fine dry-sieving and flotation.

During the spring 2016 season the overall botanical sampling strategy and recording system was established, and a team member was trained in flotation work. During the autumn 2016 season samples were assessed: bulk-sieve, dry-sieve and flotation. Work during the spring 2017 season focused on the dry-sieve samples as these had been identified as having the greatest taxa diversity.

At present the method is as follows:

- A ca. 10 liter sample (one *muktaf*) is taken from every feature during excavation for archaeobotanical analysis
    - Of the 10 liter 'flotation' sample, 1 liter is kept for **dry-sieving**. During the autumn 2016 season it was noted that the <1 mm portion of the sample contained a restricted number of different taxa, and so during the spring 2017 season a sub-sampling protocol was established. All material >1 mm is sorted and identified, 10% of the <1 mm material is sieved though a 500 µm, 250 µm geological sieve stack, sorted and identified. This allows a larger number of samples to be studied, gaining a broader picture of activities in the settlement
    - The rest of the **flotation** sample is sieved through 500 µm mesh (to remove the fine silt which hampers flotation), and processed via machine flotation (250 µm mesh, with 1 mm mesh for the heavy fraction) and carefully sun-dried. Samples are randomly selected for analysis. During the autumn 2016 season between 20-100% of each sample selected was studied.
- Other than material taken for various different analyses by specialists, all remaining spoil from every deposit is dry sieved through a 5 mm mesh onsite during excavation (**bulk-sieve** samples). Any plant remains (including wood) found in the sieves, are collected by the excavation team. All samples are sorted by the archaeobotanist and any non-wood items are identified and quantified.
- During the 43rd and 44th campaigns bulk-sieve samples were collected, during the 45th and 46th campaigns, bulk-sieve, flotation and dry-sieve samples were collected.
- All remains are sorted and identified in the Elephantine work-rooms under a BMZ zoom stereo microscope at 6-30x magnification. All specimens are identified on the basis of morphology and comparison with modern reference specimens and reference illustrations.[40] Nomenclature of wild plants follows Boulos *Flora of Egypt* (1999-2005).

Species identified to date[41] (listed by taxa group):

Cereals:

- 6-row hulled barley - *Hordeum vulgare* subsp*. vulgare* L. (awns, lemma, palaea, spikelets, grains, rachis internodes)
- Emmer wheat - *Triticum turgidum* subsp. *dicoccum* (Schrank) Thell. (spikelets, grains, spikelet forks, glume bases)

Wild grasses:

- Halfa - *Phragmites australis* (Cav.) Trin ex Steud. / *Desmostachya bipinnata* (L.) Stapf. (culms)
- Wild sorghum - *Sorghum* cf. *halepense* (grains, rachis)
- Millet - *Panicum* sp. (grains, rachis)
- Canary grass - *Phalaris* sp. (grains)
- Ryegrass - *Lolium* sp. (grains, rachis internodes)

Fibre / oil crops:

- Linen (flax) - *Linum usitatissimum* L. (fruits, seeds, pedicels)

Legumes:

- Fava bean - *Vicia* cf. *faba* (seeds)
- Clover - cf. Trifolieae tribe (seeds)

Reeds and sedges:

- Sedge - *Cyperus* sp. (nutlets)
- Rush - *Schoenoplectus* sp. (nutlets)
- Annual fimbry - *Fimbristylis bisumbellata* (Forsk.) Bub. (nutlets)
- Spikerush - *Eleocharis* sp. (nutlets)

Other wild / weed species:

- Hairy glinus - *Glinus lotoides* L. (seeds)
- Sea ambrosia - *Ambrosia maritima* L. (seeds)
- Nightshade - *Solanum* sp. (seeds)
- Berrys - *Rubus* sp. (seeds)
- Catchfly - Caryophyllacae family (seeds)
- Borage - Boraginaceae family (seeds)

Fruits, trees and palms:

- Sycomore fig - *Ficus sycomorus* L. (fruits, compound fruits)
- Common fig - *Ficus carica* L. (fruits, compound fruits)(uncertain identification of possible immature fruits)
- Christ's thorn - *Ziziphus spina-christi* (L.) Desf (endocarps)
- Desert date - *Balanites aegyptiaca* (L.) Delile (epicarp, endocarp)
- Dom palm - *Hyphaene thebaica* (L.) Mart. (endocarp, seeds)
- Argun palm - *Medemia argun* Wuert. ex H. Wendl. (fruit)
- Nile acacia - *Acacia nilotica* (L.) Delile (fruits, seeds)
- Nile tamarisk - *Tamarix nilotica* (L.) Delile (leaflets)
- Tamarisk - *Tamarix aphylla* (L.) Karst. (leaflets)
- Persea - *Mimusops laurifolia* (Forssk.) Friis (seeds)

To date 347 bulk sieve samples, 43 flotation samples (140.5 liters total sample volume) and 97 dry-sieve samples (total 94.5 liters sample volume) have been examined; 186,801 items have been identified. Only 6% of the overall count of items came from the bulk-sieve samples, demonstrating the importance of the collection of samples for fine sieving. However, some species are only present in significant quantities in the bulk sieve samples, highlighting the benefits of using all methods of recovery possible. For example, desert date and doum palm are rarely present in the dry-sieve or flotation samples, and the overwhelming majority of halfa grass also comes from the bulk-sieve samples, but sycamore fig 'seeds' are only found in any significant quantities in the dry-sieve samples (See **Tab. 1**).

Species / Item	Dry sieve (250 µm)	Flotation (500 µm)	Bulk sieve (5mm)
Acacia nilotica - pod	x	x	xxx
A. nilotica - seed	xx	xx	x
Ambrosia maritima	***X***	xxx	
Balanites aegyptiacus	x	x	xxx
Boraginaceae	xx	x	
Caryophyllacae	xx	x	
Cereal - culm base	x		xxx
Cereal - culm fragment	***XXXX***	***XX***	***X***
Cereal - culm node	***X***	xx	xxxx
Citrullus lanatus/colocynthus	xxx	xx	x
Cyperus sp.	xxx	xx	
Dung - sheep/goat	xx	xx	xxx
Dung fragments - loose	x	x	xx

Eleocharis sp.	xx	x	
Fabaceae - pod		xx	xx
Ficus carica (possible immature 'seeds')	xxx	xx	
Ficus sp. - compound fruit	***X***	xx	xxx
Ficus sycomorus - 'seed'	***XXXX***	***X***	
cf. *Ficus sycomorus* - leaf	***X***	xxx	xx
Fymbristyllis bisumbellata	xxx		
Glinus lotoides	xxx	xx	
Halfa Grass culm	x		***X***
Grass rhizome (root)	xx	x	xxx
Hordeum vulgare subsp*. vulgare* - grain	***X***	xxx	***XX***
H.vulgare - spikelet	xx	x	
H. vulgare - awn	***X***	***X***	
H. vulgare - lemma	***XXX***	***XX***	xxx
H. vulgare - rachis internode	***XX***	***XX***	xxx
Hyphane thebaica	x		xx
Linum usitatissimum - capsule	***X***	xxxx	x
L. usitatissimum - pedicel	xx		
L. usitatissimum - seed	xxx	xx	
Lolium sp. - grain	xxx	xx	
Lolium sp. - spikelet	xx	xx	x
Lolium sp. - rachis internode	xx		
Medemia argun	x	x	xx
Mimusops laurifolia	x		xx
Panicum sp.	xx		x
Phalaris sp.	xxx	xx	
Rubus sp.	xx	x	
Schoenoplectus sp.	xx		
Solanum nigrum	xx	x	
Sorghum cf. *halepense*	xx		
Tamarix aphylla - leaflet	xxx		
Tamarix nilotica - leaflet	***X***	xx	
Trifoliae tribe	xx	xx	
Triticum turgidum subsp. *dicoccum* - grain	xx	xx	xxx
T. dicoccum - glume base	***X***	xxx	x
T. dicoccum - spikelet	xx	xx	xxx
T. dicoccum - spikelet forks	xxxx	xxx	xx
Vicia cf. *faba*	xx		x
Ziziphus spina-christi	xxx	xx	xxx

Table 1: Presence of species and plant items (Key: x – 1+; xx – 10+; xxx – 100+; xxxx – 500+; ***X*** – 1000+; ***XX*** – 2500+; ***XXX*** – 10,000+; ***XXXX*** – 25,000+).

The recovery-rate of items from dry-sieve samples is over ten times greater than from flotation samples: 1377 items per liter (IPL) from dry-sieve v. 103 IPL from flotation samples. 36 different taxa were present in dry-sieve samples, 33 in flotation samples, and just 19 different taxa were found in the bulk-sieve samples. One reason flotation is generally not carried out on desiccated samples like those at Elephantine is due to the fact that the process can detrimentally affect the condition of plant items, and if not properly handled they become prey to mould and infestation. This was not a problem with these samples, but the loss of large numbers of plant items and lack of diversity in the Elephantine flotation samples does demonstrate that this process is not ideal here. However, the presence of

significant quantities of other classes of material culture from the 'heavy fraction' has been deemed to be important enough to continue to process at Elephantine. The process of washing and recovery in a 1 mm mesh has provided a means for the recovery of tiny beads and lithic micro-debitage, which are otherwise virtually impossible to find. As the research develops, the sampling protocol will be adjusted to best suit our goals. A study of mud-brick contents is planned, and this may well require the use of flotation (as was the case at Amarna).[42]

The principal research questions being addressed in this project revolve around the possibilities of detecting the minutiae of daily life activities in the settlement. Food, fuel and household goods are obviously significant aspects of every-day life, and as such archaeobotany has the potential to make a significant contribution to these debates. At this early stage it is not possible to enter into any detailed discussions, but several general observations can be made.

The assemblage of plant remains is overwhelmingly dominated by the fruits ('seeds') of sycomore fig, and chaff of 6-row hulled barley. The presence of cereal processing waste in the samples is to be expected: it is found in virtually all settlement contexts across Egypt, and indeed probably across the world where people traditionally relied upon cereals as staple foods. There are some remains of emmer processing, but the ratio of barley: emmer is 5.2 : 1.[43] This is perhaps unsurprising as barley is far more tolerant of harsher drier conditions, and would have survived the conditions in the Elephantine area far better than emmer. However the cultivation of emmer around Elephantine cannot be ruled out. Archaeobotanical reports on work at New Kingdom Amara West (Sudan) suggest that both barley and emmer were cultivated in ancient Nubia. [44] The relative lack of emmer processing remains may be due to differential use of this cereal by-product. For example, if emmer chaff was utilized as a domestic fuel, even though charring does preserve some plant remains, the quantities found preserved in samples will be reduced. The samples also contained significant quantities of cereal culms, as well as barley lemma fragments and awns, suggesting the storage/use of threshing waste in the settlement. The high presence of the remains of sycomore figs is harder to explain. Sycomore figs tend to remain attached to the tree long after they have gone beyond ripeness, and even desiccate on the branches. The fruits may therefore have come into the house via the use of sycomore wood as fuel, or use in making household objects. Figs may also have been provided as fodder for animals in the settlement.[45]

At Amarna (18th dynasty workmen's village) a similar combination of cereal chaff with frequent fig specimens was found in the animal pens,[46] and it is tempting to draw a comparison here. If this

assemblage is the remains of plants collected for animal fodder, the high presence of barley relative to emmer may well be due to the fact that barley was more commonly used as animal fodder than emmer in ancient Egypt.[47] The majority of samples recovered, derive from the courtyard area of the buildings under investigation, and as such it is highly possible that the plant remains here reflect a multi-purpose usage. The space is likely to have been utilised for storage and processing of plants for human and animal food, as well as the production of household objects such as matting, baskets, and wooden objects. Additionally, the space may well have housed animals for at least some of the time, and so the remains of straw and plants used as animal bedding and fodder can be expected to be present. The detailed analysis of this assemblage could inform us about animal diet and husbandry, as well as processing of food for human consumption, and production of household goods.

The one other species present that was likely to have been cultivated, possibly locally, is flax. The presence of capsules, seeds, and stems (pedicels) does suggest the processing of flax for linen production. The seeds were far less frequently occurring, suggesting that they may have been processed for oil. A number of objects associated with textile production have been recovered during excavations including spindle whorls, and wooden objects such as spindles and needles, as well as small fragments of spun thread and textile.

The wild grasses may have entered the village alongside the crops. Both ryegrass and canary grass were (and still are) ubiquitous weeds in cereal fields throughout Egyptian history and are commonly found in assemblages of cereal processing by-products in Egyptian settlements. The few specimens of other grasses (wild sorghum and millet) may also represent crop weeds. They are considerably less common in Egypt than other wild grasses, but are frequently found in Nubian contexts. Tufts of halfa grass were ubiquitous, and the grass is still very common all over Egypt. Halfa grass may have been collected in order to make matting or baskets, equally, it may have been collected to use as tinder in household fires: many of the tufts showed signs of charring at the tips. Halfa also has medicinal uses (for stomach complaints), and can still be found in all the Aswan markets. The presence of several species of reed and sedge is unsurprising. Today all the islands and the river banks in the Aswan area are fringed with dense stands of these plants.

Many of the species present are quite likely to represent the remains of human food: Christ's thorn, desert date, doum palm, watermelon / colocynth, and fava bean may well have been a part of the diet of the inhabitants. Doum palm fruits have been found across Egypt, in archaeological sites dating from the Late Palaeolithic onwards,[48] and doum is still found growing in Egypt, principally in the south, and

in the Oases. The wood is stronger and better suited for construction than date palm, and the fruits are edible. The seeds of watermelon or colocynth were relatively frequent in the samples. Colocynth still grows wild on the shores of Elephantine Island today. It is thought that colocynth may be the wild ancestor of watermelon, but there is some debate about the history of these species in Egypt.[49] Some reports claim that colocynth was only present in early periods of Egyptian history, whilst others argue that most current identifications of watermelon should be revised. The precise identification of the specimens found on Elephantine is therefore especially important. Colocynth is very bitter, but can be used medicinally and is found dried in Aswan markets. Watermelon fruit and seeds, conversely, are certainly edible and both remain highly popular in Egypt today.

Christ's thorn is indigenous to Egypt and is still found growing wild throughout the country, the fruits are highly edible, easily dried for storage and remain popular to this day.[50] The timber was commonly used to make smaller objects and items of furniture. The presence of the tough endocarps (pits) of this fruit in the Elephantine assemblage is unsurprising. They are likely to have been brought into the settlement for human consumption, with the waste then disposed in the building. Desert date is found more commonly growing in Sudan than Egypt today, the fruits can still be found seasonally in Aswan markets. The fruit is bitter but popular, and both the flesh and stone have many medicinal properties. The remains of desert date have been found in funerary and settlement contexts in Egypt, dating from the Predynastic Period onwards.[51] This may be present in samples from Elephantine due to the consumption of the fruits by humans, or their use in medicines.

Argun palm is thought to have been introduced to Egypt from Nubia.[52] It was never common in Egypt, and may have only been grown as an ornamental garden tree. The fruits have been found in New Kingdom tombs, but as they are inedible without having first been processed, their presence suggests that they were seen as a representation of elite status and access to exotic goods. In Nubia (Sudan) the fruits are buried to make them palatable. The fact that in most instances at Elephantine the fruits were found intact suggests that they were not brought into the settlement for consumption. At Lahun specimens were found carved into small furniture fittings,[53] so it is possible that they may have been intended for a similar purpose at Elephantine. The wood of tamarisk and acacia were also almost certainly used in the household, acacia pods might have been provided as animal fodder.

Other species present (hairy glinus, sea ambrosia, nightshade, goosefoot, catchfly and borage) are all plants that grow along canal and river banks, or in wastegrounds,[54] and the few seeds present may have come into the settlement alongside halfa grass being collected for various purposes.

To date, all of the bulk-sieve samples have been studied and just over 20% of the fine sieve samples (flotation / dry sieve) have been studied. The picture emerging from archaeobotanical materials on Elephantine points towards probable multi-purposing of the main courtyard space in the building. The evidence suggests that cereal processing by-products (chaff) may have been processed and/or stored in the space, that animals may have been fed or housed in the space, and that household plant-food waste may have been disposed of within the space (or fed to animals). Flax may have been stored or processed for textile production in the space, wild grasses (halfa) were collected and stored in this space for use in making household objects or for use as tinder in fires / ovens, and figs were either collected and then stored in this space for animal fodder, or the wood was collected and figs dropped of the branches before the wood was burned.

(C. Malleson)

3. Archaeological work of the Swiss Institute on Elephantine

a) House 55: A workshop of the late 17th and early 18th Dynasty (Area VIII)

One of the best preserved houses in the town of the early 18th Dynasty is located in the town center adjacent to the south of the former Heqaib sanctuary (**Fig. 10**). Initial investigations had already started in the 18th and 26th seasons of work before a full excavation and study of the house was initiated in 2014.[55] A massive amount of debris which had been dumped above the abandoned house in the mid-18th Dynasty had been removed, and the latest building stage of the house had been exposed during the previous two seasons. This season's work was devoted to clarifying the earlier development of the house and, in particular, its function.

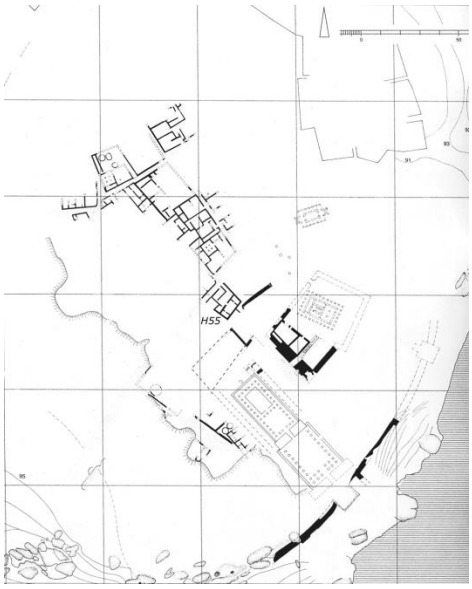

Fig. 10: Location of House 55 in the town of the 18th Dynasty (Graphics: C. von Pilgrim, SIK).

The excavation was conducted in a sequence of trenches, in order to obtain a series of profiles. These are necessary to control the stratigraphic connection between the trenches, and to study the nature of accumulated layers in the rooms.

House 55 was built as a terraced house into the slope of the eastern mound of the town and covers an area of about 155 sq m. It was founded in the 17th Dynasty and the earlier building stages (c and d) of the house are linked to stratum (*Bauschicht*) 11 in the northern part of the town. Three main building stages (H55b – H55d) can be distinguished (**Fig. 11**).[56] The earliest building stage of the house (H55d) corresponds to the type of courtyard-houses well known from the residential quarters in Elephantine.[57] The (almost) square courtyard (6.5m x 7m) in the western part of the house was accessible from the street by a narrow entrance room. A door in the eastern wall of the courtyard led into the central room of an eastern wing in the house. This room was flanked by two side chambers which were not connected to the courtyard.

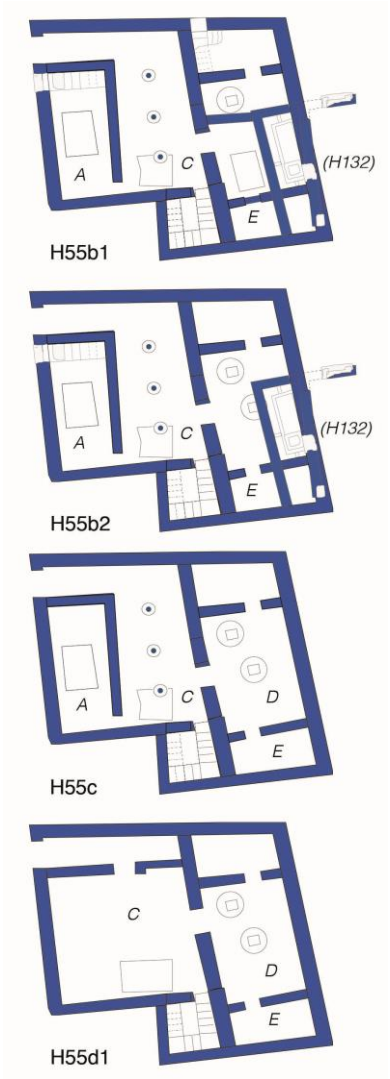

Fig. 11: Scheme of architectural development of H55 (Graphics: C. von Pilgrim, SIK).

A stairway with three flights (**Fig. 12**) gave access to the roof of the eastern wing. It was subsequently installed in a small room to the south of the courtyard, where a continuous sequence of ash layers indicates the permanent use of ovens. Only two flights of the steps are preserved, both resting on vaulted substructures. The former presence of a third flight of steps, which was necessary to reach the next floor, is attested by an imprint of a third vault on the face of the western wall of the room. The staircase led to the roof of the eastern wing and clearly indicates the height of the rooms at about 4m. This ground plan of the house does not necessarily reflect its initial lay-out, but it is the earliest building stage that can be connected with floors and use layers.

Fig. 12: Staircase in Room F of H55 (Photo: C. von Pilgrim, SIK).

Certain constructional details, however, indicate the existence of an even earlier and presumably simpler floor plan. At least the south-eastern room (E) was only later separated, since the partition wall between Room D and Room E was built against the plastered rear wall of the room. The plaster is of high quality and still bears traces of a graffito-like drawing of a ship (**Fig. 13**).

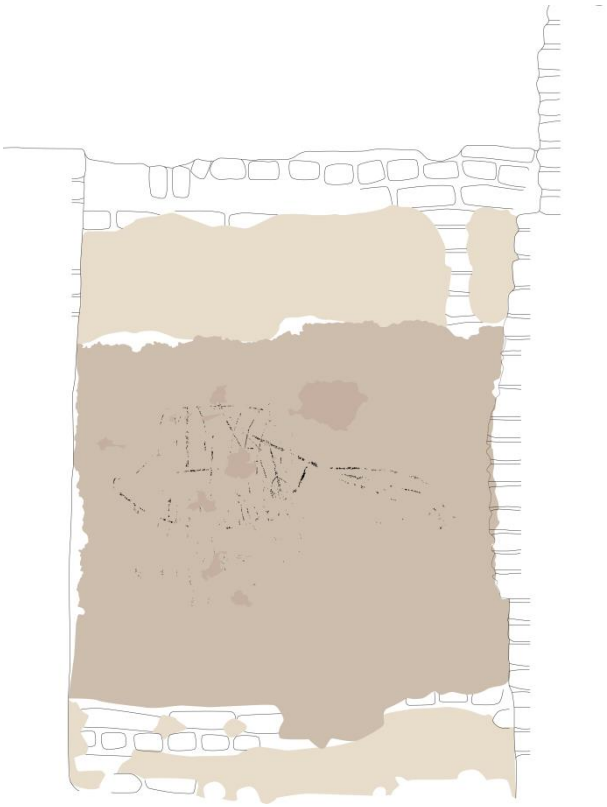

Fig. 13: Sketch of a ship at the southern end of the mud-plastered eastwall of H55 (Graphic: B.-C. Schiebe/O. von Pilgrim, SIK).

In contrast to the paintings in Room D, which had been recorded in the previous seasons,[58] the drawing in Room E was executed in a simpler style, exclusively in black color.

The second building stage (c) of House 55 is characterized by substantial modifications to the western part of the building (**Fig. 14**). Whereas the eastern wing was left unchanged, the former courtyard was split into a long rectangular room (A) and a central hall (C). The narrow entrance room was shortened and its eastern end became part of the central hall. Three column bases in the hall indicate the position of columns, which supported the roof. Distinctive traces on the surfaces of the bases suggest the columns had a circular cross section of 25 cm, presumably made of wood. The moderate width of the central room (4.2 m maximum) might however indicate that the roofing did not necessarily require any additional support by columns.[59] Considering the modest width of the walls of Room A, it is not unlikely that only the eastern half of the room was covered and the narrow space along the newly built partition wall was left open. Room A was probably also kept unroofed, a situation that changed only in the final building stage (b) of the house.

Fig. 14: View on House 55 from the west (Photo: C. von Pilgrim, SIK).

The second remodeling of the house (H55b) was caused by an extension of the adjoining house (H132) east of H55 which was located upslope on a higher level. The southeastern quarter of the eastern wing of H55 was separated by a supporting wall and the dead space was either filled in (Room E) or used for the installation of a vaulted cellar (Room D). The reduced space of Room D, however, continued to be used. It was left first unroofed, after the former roof had been destroyed, before the supporting wall was built. The remaining space of Room E, however, was abandoned and slowly filled up with windblown sand. The northeastern quarter of H55b was eventually separated from the rest of the house by a partition wall and most likely used as an individual house unit. It was made

accessible from the small alley between House 55 and the Heqaib Sanctuary by an additional door in the outer wall.

The narrow doorway led directly to the mid-landing of stairs continuing down to the floor-level of Room H and to an upper floor respectively. According to the stairs' upward gradient the level of the upper floor in this house unit was about 1m lower than the roof of the central room of H55. A similar development can be noted in Room A. In H55b a new entrance had been cut in the west wall, which gave direct access from the main street to a staircase (**Fig. 14**), and to an upper floor respectively, which was situated on about the same level as the upper floor in the north-eastern house unit.

In all building stages the same kind of storage and working installations are attested, which are all common in residential buildings in the town of this period.[60] Quern emplacements were located in the courtyard of H55d, in Room A and Room C of H55c and in Room C of H55b. An additional quern emplacement was subsequently installed in the ground floor of the northeastern room of H55b1. Two circular and domed underground storage facilities were located in Room D. They were kept in use through all building stages until the northeastern rooms had been separated from the rest of the house. Vaulted rectangular cellars had been installed in the courtyard of H55d, in Room A of H55b and eventually in Room D of H55b.

Sequences of floors and use layers are not preserved in all rooms to the same extent. This can be explained in part by the destructive processes of later construction works (of H55b) in the eastern wing of the house and in Room A (building of second floor). Furthermore, not all rooms had been used with the same intensity. In fact, after the house was modified in H55b the southern half of the rooms A and D were only occasionally used, whereas Room E was blocked off and fell into disuse entirely. However, an impressive sequence of countless mud floors and more or less hardened surfaces indicate a remarkable continuity of use in the courtyard and the central hall C respectively throughout all building stages of H55. Moreover, similar features in the floors point to an enduring function for this part of the house. The most prominent features are hundreds of small stake holes perforating the surfaces in certain zones (**Fig. 15**).

Fig. 15: Section in the central room showing accumulations of fireplaces, ash midden, floors and surfaces with stake holes (Photo: C. von Pilgrim, SIK).

The majority of them have a diameter of 1-3 cm but larger sizes were also attested. The holes derive from wooden sticks or pegs but not all of them must necessarily stem from the same activity. In some holes the lower ends of sharpened wooden sticks were still found (**Fig. 16**). Moreover, all surfaces dissolve along the eastern wall of the courtyard (and central room) due to an extensive use of water that also strongly affected the lower part of the wall. Numerous fire-places in the floors and thin layers of ash middens between individual floors point additionally to a constant use of small fires in this central part of the house. The use of water and fire in combination with a large number of stake-holes in the same activity zone is not unparalleled.

Fig. 16: Wooden pole in situ (Photo: C. von Pilgrim, SIK).

A similar observation was made in a contemporary building in Tell el-Maskhuta, even though it was not possible to identify any specific activity that may have left these traces.[61] Judging from splinters of wood embedded in some floors, as well as from the large number of wood fragments remaining on the

floors, wood-working seems to be one of the most plausible crafts carried out in H55. The use of fire and water may be then tentatively associated with the bending of wood, for instance for the production of bows. Other activities performed in the house left no traces on the floors or at the walls but are evident by the presence of distinctive waste spread in all rooms. Cores and chippings of flint as well as hammer stones, pebbles and other striking tools are the main groups of objects discovered in the building throughout its entire occupation. The processing of flint tools, therefore, may have been another activity to be connected with H55.

The constant use of the central room of the building for the same kind of activities throughout all phases of the house, while the overall space being utilized in the house gradually decreased, suggests that H55 was a pure workshop rather than a residential house with an integrated workshop. A final analysis, however, and a model of explanation for the specific crafts in particular, must await a full study of all finds related to the use layers of the building.

Among the large variety of finds, two objects are of particular importance: two metal axes made of bronze or copper.[62] They were deposited in a small pit in one of the uppermost floors of H55b. The pit was located between the northern column and the northern wall and it was very visible in the profile of the room. Since the pit was sealed by another sequence of floors there is no doubt that the axes were deposited in the time of Thutmosis III, before the house was abandoned at the end of his reign, or in the early years of Amenhotep II.

Fig. 17: Egyptian axe from deposit 46603U/b (Photo: E. Peintner, SIK).

One of the axes is symmetrical with elongated lugs (**Fig. 17**), a type that started to appear in Egypt in the Second Intermediate Period. The axe was heavily corroded and is badly cracked. It is best compared with the group of splayed axes with straight sides as defined by W.V. Davies that became a common form in the 18th Dynasty. This axe type was most probably used as a tool.[63]

Fig. 18: Syrian axe type from deposit 46603U/b (Photo: E. Peintner, SIK).

The second axe found in the same deposit is most exceptional and clearly of foreign origin (**Fig. 18**). It has a shaft-hole to mount the haft into the axe, a technology which never seems to have been adopted by Egyptian manufacturers. The axe is characterized by four spikes on the opposite side of the blade and corresponds to the Type of "Nackenkammäxten" known from the northern Levant.[64] Two almost identical pieces have been found in a sanctuary of stratum VIII in Beth Shan (North Palestine) and in a tomb in Ugarit (Syria). The chronological context (LBA IIa and IIb) of both pieces, however, is slightly later than the piece from H55, a fact that may possibly be explained by the longevity of such precious weapons (or tools) and their eventual deposition in sacral and funeral contexts. According to a full study of the pottery, the axes from H55 should have been deposited not later than in the time of Amenhotep II, probably even in the time of Thutmosis III, and may have found their way into Egypt during the direct contacts (and conflicts) between Egypt and Mitanni in this period.

(C. von Pilrgim)

b) Study of the New Kingdom pottery from house 55

The study of the New Kingdom pottery from Elephantine was continued by the Swiss Institute in cooperation with the ERC project AcrossBorders headed by J. Budka. The focus was on the material from House 55. Both ceramics from the last season (45th season) and from the current excavations (46th season) were studied. The two main working steps conducted during the 2016 season were: 1) documenting the statistics and establishing the dating for pottery; 2) drawing and photographing of the material. The processing of a total of 410 ceramic assemblages from the 45th season and the current 46th season was carried out (40.000 sherds with more than 10.000 diagnostics). More than 25 complete vessels were found *in situ* and studied in detail. A total of 350 significant diagnostic sherds and complete vessels were drawn, and 400 new entries in the database were created.

(J. Budka)

c) The spatial development of the Khnum Temple precinct before the 30th Dynasty

In the framework of the Swiss Institute's long-standing research on the spatial organization and development of the Khnum temple precinct, work was continued in the 46th season in two limited areas to the north and to the south of the temple of Nectanebo II. The excavations were almost completed, and only limited baulks were left in order to control and re-examine the stratigraphy of the excavated areas in the working season to come.

Fig. 19: Overview on Area XXIX (Photo: C. von Pilgrim, SIK).

The broad lines of the stratigraphic development in the area to the north of the temple had already been generally established during the previous seasons.[65] The Late Period remains can be assigned to three major phases of the temple's history, represented by a stone-paved processional route of the 25th Dynasty, the foundation pit of a Saite chapel, most probably built in the time of Psametik II, and a huge transportation route sloping down from the temple towards the north which was left over from the construction of the temple in the time of Nectanebo II (**Fig. 19**).[66] It was therefore the aim of the current season not only to fully expose the processional route and the foundation pit of the chapel, but also to clarify the small area to the north of the wall which borders the street of the 25th Dynasty (**Fig. 20**).

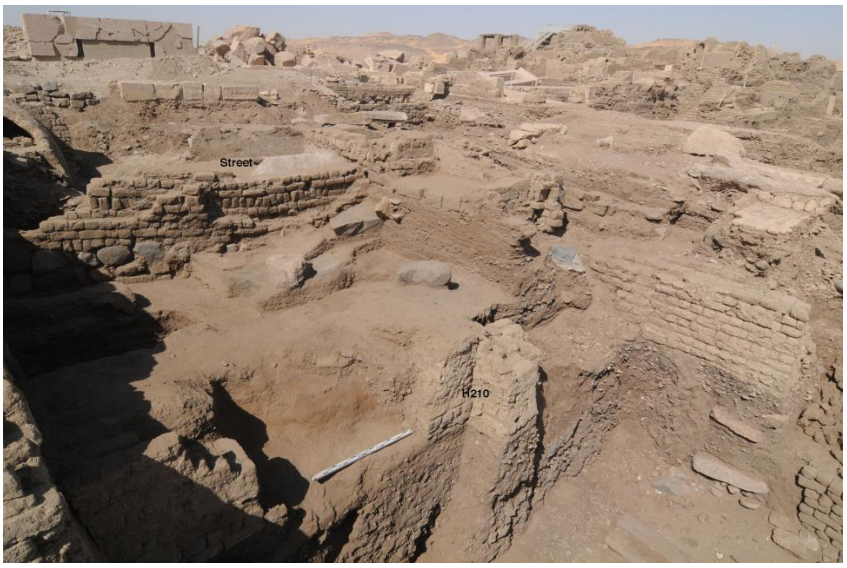

Fig. 20: View on remaining room of H210 to the north of the processional route in Area XXIX (Photo: C. von Pilgrim, SIK).

The 9m x 5m wide area is limited in the west by the transportation route of the 30th Dynasty, and in the east by the enclosure wall of the Satet Temple. In the north it ends at a distance of 5m, at a steep cut caused during the second season of the excavations of the French Mission in 1907-1908. The data left by J. Cledat, however, raised several questions, particularly in regard to contradictory dating of objects recorded by Cledat and of visible walls and their stratigraphic relationships as assessed by F. Arnold.[67] Moreover, the results of the French excavation give reason to assume that workshops related to the construction of the Khnum Temple may have been located at this particular site. Most of the walls exposed by the early excavations have now disappeared. They once delimited two long narrow rooms (H210). In the western room four large *pithoi* were found of which one contained remains of lime. The southern end of the rooms is still preserved below the foundations of a Roman house (H200).[68] After the foundation courses of the house had been studied and disassembled, it was possible to study the Late Period deposits below in detail. The distinctive nature of the layers allows two different phases to be distinguished, both connected to H210. According to a thick and extremely homogenous layer of pure animal dung at the bottom of the rooms (**Fig. 21**), the building was initially used as a stable. No sherds were found in the dung in order to specify a date within the Late Period.

Fig. 21: View on collapsed vaults of H 205 in Area XXVI (Photo: C. von Pilgrim, SIK).

In the 30th Dynasty the function of the building was radically changed and it was converted into a workshop. The rooms gradually filled up with midden deposits, and alternating working surfaces. Large quantities of iron slag and crucibles as well as remains of iron crumbs and objects (chisels) point to the production of iron tools in the (destroyed) northern extension of the building. In addition to the processing of iron, chippings of diorite indicate stone working activities occurred in the same workshop area. The type of stone suggests that the refuse derived from a sculptor's workshop, or from the production of other cultic equipment for the temple, such as shrines, pedestals or bases.[69] The conversion of the building was presumably preceded by the removal of earlier debris, and large-scale operations to lower the ground level. In fact, the entire area along the west wall of the building was excavated below the foundations in order to create the slope for the transportation route. A similar but much larger complex of rooms, dated to the 25th Dynasty, was also uncovered to the south of the temple of Nectanebo II (Area XXVI). It consists of two units of at least 5m long and 3.30m wide vaulted chambers, separated by a 5.60m wide and partly vaulted courtyard in the center. Some rooms evidently served as stables whereas the central courtyard was partly occupied by a large circular granary. The vaults of the eastern unit of the complex collapsed simultaneously (**Fig. 22**). The collapse filled the rooms up to a height of about 1m. In subsequent periods (26th Dynasty and 30th Dynasty) the debris was repeatedly exploited for the production of mortar and mudbricks. The pits were eventually backfilled with garbage containing hundreds of mud-sealings which provide further evidence for the chronological evaluation of the recorded stratigraphy, as well as a rich source of

prosopographic data. The western part, however, was left abandoned for a longer period of time and slowly filled up with wind-blown sand before the vaults of the rooms collapsed as well.

(C. von Pilgrim)

Fig. 22: Backside of rebuilt Osiris-Nesmeti Temple (Photo: C. von Pilgrim, SIK).

d) Study of cultic equipment from the late Khnum Temple

During a one-week stay at the end of the season T. Krapf (Swiss School of Archaeology, Athens) continued his study on the cultic equipment of the late Khnum Temple. He added some more fragments of statues and naoi to the catalogue of finds and conducted a final verification of previously joint object parts.

(C. von Pilgrim)

4. Study of the remains of Ptolemaic and Roman temples from Elephantine

This year's research on Ptolemaic and Roman temples on Elephantine constituted the next stage of preparation before the presentation of the study of works related with the material collected in the Elephantine lapidaria since 1996. The documentation has been focused on two groups of fragments from the temenos of the temple of Khnum. The first includes fragments belonging to relief decoration complexes, identified years ago, which set the stages of construction and decoration of the temple.[70] The second group consists of those used to address the as-yet un-answered questions concerning the number of sacred buildings within the temenos of the temple of Khnum, the presence of decoration with different stylistic features in the pronaos of the temple, and the scope of renovation of the Ptolemaic reliefs undertaken during the reign of Trajan and Antoninus Pius.

What is significant is that the classification of relief decoration complexes proposed in the first stage of research can be maintained and referred to in the documentation works. New fragments have enriched complex VII, representing the sunken relief decoration of Ptolemy VIII Euergetes II, which covers the outer naos walls of the temple of Khnum. Other fragments indicate the presence of supplementary decoration from the upper wall segments executed under Trajan.[71] Newly documented fragments allow also us to uphold the finding that the dominant segment of the decoration located in the interior of the pronaos in the temple of Khnum consisted of high relief executed under the reign of Ptolemy VIII Euergetes II belonging to complex VIII.[72] The continuous enlargement of this group of fragments provides an opportunity to determine their stylistic features in order to distinguish them from the visually similar Domitian reliefs.

Carefully selected fragments have also been included in complex IX, debated for years, whose presence in the pronaos interior can already be excluded. This allows us to advocate the old hypothesis which would see this decorative complex executed in high relief on the court walls of the Khnum's temple, where decoration with strikingly similar stylistic features has been preserved *in situ*.[73] Dating this decoration to the Ptolemaic period, as well as its connections with complex IX mean also that the hypothesis situating the origin of the temple court in that period can be revived.

Progress has again been achieved in research on the façade of the pronaos in the temple of Khnum. This is a result of having performed further studies on the door fragments accumulated in the temple lapidarium and verification of findings from the first stage of research. The present vision of this part of the temple is grounded on having identified fragment GR 11160 as an element of the main door to the pronaos. This fragment encodes information concerning the door parameters, as well as mutual relations between door elements and the screen walls of the pronaos façade.

This year's comparative studies, encompassing elements of architecture, allowed us to distinguish fragments of images represented on screen walls, toroi surrounding the screen walls, as well as corniches crowning the screen walls. All the aforementioned elements of the façade decoration were covered with thick plaster. It is now being interpreted as evidence of renovation works performed on the façade.

Of significant informative value are fragments of columns covered with thick plaster and associated with the Khnum temple's façade, in particular the registers of vertical texts belonging to the decoration program for these columns. The large scale of these texts confirms, at the same time, stylistic and

functional distinctness of columns belonging to unidentified buildings in the neighborhood of the temple of Khnum.

Additional information has also been gathered on corniches associated with the pronaos façade and their decoration program. Studies were conducted on fragments of corniches with columns of text under the sign *pt*. Their thick plaster covering allows us to situate them in the pronaos façade. It should be assumed that the corniche decoration was composed of palm leaves, royal cartouches crowned with feathers and text columns.

Further fragments have been included in the documentation of study material for the identification of decoration executed in sunken relief on walls and columns, whose locations have never been established. These fragments were compared with the *facsimiles* of the Augustus sunken relief decoration preserved on the naos socle in the temple of Khnum,[74] which excluded the possibility that these decoration groups were identical. There is a serious research dilemma related to the fact that no relationships have been established between groups representing the sunken relief, and their functional counterparts in high relief from the building's interior.

In the period covered by the report, the documentation process concerning fragments accumulated in the lapidarium and qualified as complex XVI,[75] established years ago, has been completed. The complex, consisting of small fragments of texts executed in sunken relief, represents Roman decoration, probably of Augustus, sculpted on the walls of the building erected under the reign of Nectanebo II. The location and function of this text have not been determined thus far.

Apart from documentation and study works in the lapidaria, collaboration with Dr Achim Krekeler, performing another phase of works on the reconstruction of the temple of Osiris Nesmeti, was continued. Epigraphic consultations covered the location of blocks crowning the end wall of the sanctuary, incorporation of a fragment of an unpreserved scene from the second layer of this wall, as well as the location of blocks from the top layer of the naos façade. Additional documentation was prepared in order to assist in the reconstruction of the fragmentarily preserved lintel of the sanctuary door. Collaboration comprised also the reconstruction of the door in the pronaos façade, as well as columns located in the façade.

(E. Laskowska-Krusztal)

5. Reconstruction of Osiris-Nesmeti Temple (Fig. 13)

The Swiss Institute continued the reconstruction of the Osiris-Nesmeti temple ("Temple Y") between February 18th and March 9th.[76] The walls of the sanctuary were rebuilt up to the uppermost layer of stones. The fragment of an original roofing beam was put in place at the rear left corner of the sanctuary in order to indicate the original height of the room. Missing blocks were replaced by masonry consisting of lime-sandstone bricks and lime mortar. The joints of the original masonry were filled with lime mortar.[77] The masonry will be plastered during a final stage of the work. The fragmented lintel block of the sanctuary was consolidated by inserting stainless steel anchors in the broken side. The missing part of the block will be completed next season with a casted prosthesis. At the side entrance of the temple the partly missing lintel was replaced by a casted beam.

Besides the anastylosis of the temple, the reassembling of both capitals and columns of the entrance into the pronaos was continued. All fragments with joining surfaces were reassembled. Bonding of the fragments was conducted with Araldite in 2015, locally thickened with stone powder and/or gravel when a structural connection was required in some gaps. Doweling was made with fiberglass dowels of 6mm diameter for the smaller fragments and with stainless steel dowels of 12mm for the bigger groups.

(C. von Pilgrim)

6. Objects and space – functional settlement analyses

The recently begun project 'Der Fund im Raum' includes - in collaboration with the IFAO – work on different settlement areas from Elephantine Island and Ayn Asil (Dakhla Oasis), dating from the Old Kingdom to the earlier Middle Kingdom (approx. 2600 – 1900 BC). The project, supported by a research fellowship of the German Archaeological Institute, focusses on the material culture and its spatial analysis at both sites. Thereby, this project aims to address differences between building complexes and/or settlement areas as expressed by the combination of finds, features and architectural elements. In addition, further studies of the different find groups are integrated, whereby questions of quality, selection and access within a settlement are addressed.

After initial work on the material coming from the Satet West area at Elephantine Island in 2015,[78] the research began this year with the second settlement area: Satet North. This excavation from 1980s has been previously published by M. Ziermann,[79] but with a clear focus on architecture and building development. The material culture was not studied in any detail. To allow further comparisons

between the different sites, the earlier descriptions have been reviewed and if needed, enhanced during spring season 2017. The main focus has been the ground stone implements. The tools of both excavation areas at Elephantine Island have been reviewed and recorded according to the classification system established in Ayn Asil in 2008,[80] which has since been modified and enlarged as necessary. This system consists of four main categories and a cluster of non-classified items. The main criteria for classification are the physical movements involved in usage[81] (i.e. long or short strokes) as expressed in different use alterations, i.e. stress marks, polished areas. Other criteria are the position of these alterations (work face or edge) as well as the manner of handling of the tool (active, passive, mounted, recess of ease of handling).

The established database thereby allowed an initial comparison between the individual research areas but also between the settlements at Elephantine Island and Ayn Asil. For example, both settlements show similar strategies of selection of raw materials. Not only were local stone variants used almost exclusively, but the most easily accessible materials are dominant. Despite that, specific workshops for groundstone implements are so far absent on all sites. Nonetheless, we may assume that tools might have been produced (on demand only?) in the settlements. In contrast, a strong relationship between material selection and tool type is displayed by the grinding stones. In the case of Elephantine Island, specific quarries and adjunct workshops may be located at the near-by Qubbet el-Hawa on the west bank.[82] Thus, the strict selection of raw material and presumably specific quarries for obtaining grinding tools, appears to be state-controlled in both Elephantine Island and Ayn Asil. Moreover, concerning spatial analyses of the individual excavation areas, the tools and their frequencies indicate different (main) activities, which we hope to elucidate in more detail in future research.

(C. Jeuthe)

7. Renovation work at the public and private facilities on Elephantine Island

Thanks to a special permission of the Ministry of Antiquities the refurbishment and preparation for the reopening of the so-called Annex Museum on Elephantine Island could be undertaken. The museum had been built in the 1990s by the German Institute, to house finds from the excavations of the German-Swiss mission, especially from the area of the temple of Satet. The unfortunate political situation in Egypt around 2011 led to its temporary closure. After the refurbishment works, the installation of a new CCTV and fire alarm system and the rearrangement of the access area to the

museum with a small outdoor exhibition in summer 2016, the museum was at last ready for its re-opening.[83] The reopening took part on January 21st, 2017 in presence of the Minister of Antiquities, Prof Dr Khaled el-Enany, the Minister of Culture, Prof Dr. Helmi el-Namnam, and the governor of Aswan, Magdi Higazi. We are happy to report that the museum and the archaeological site have seen a steady flow of visitors both local and international since then.

A second refurbishment project of the German Institute was conducted in its own excavation house. This had been built in 1973 to the design of Dr. Horst Jaritz using a traditional local architectural styles based on elliptical inclined vaults and domes made from mud bricks, in combination with semicircular arches that frame windows and doors. The focus of the refurbishment work was the workroom area and former storage area of the house.[84] Apart from its archaeological work on Elephantine Island and at several other sites in the region of Aswan, the German Archaeological Institute is actively supporting the training of local colleagues. Lectures and teaching have in the past mainly been carried out on site or in close quarters in the old office rooms of the excavation house on Elephantine Island. The German Institute's commitment to support the enhancement of the professional skills of local colleagues was a major motivating factor behind the decisions taken during renovation. For this purpose, several old storage room compartments were converted into a larger, domed room, which can be used as a training classroom. Study work is possible thanks to the establishment of a small library section in other former storage rooms, which are now also equipped with desks and are housing reference material on archaeological work in the area of the first cataract as well as teaching volumes on field- and office work. As an official relaunch of the training activities of the German Archaeological Institute in the area of Aswan, a study day for inspectors of the region was hosted in the excavation house on March 25th, 2017. During this day, three university-style lecture sessions were held by members of the German Institute, focusing on modern archaeological methodology as well as several types of archaeological finds which are studied only marginally in archaeological work, such as mats, ropes, basketry and cloth fragments. As an example for the intercultural lifestyle of the area of the first cataract, another lecture was devoted to the so-called Nubian pottery, which provides evidence for the exchange of crafts and traditions at the southern border of pharaonic Egypt. The lectures were attended by more than 20 members of the various departments of the Ministry of Antiquities in Aswan and Cairo.

(J. Sigl)

List of Figures:

Fig. 20: View on remaining room of H210 to the north of the processional route in Area XXIX (Photo: C. von Pilgrim, SIK).

Fig. 21: View on collapsed vaults of H 205 in Area XXVI (Photo: C. von Pilgrim, SIK).

Fig. 22: Backside of rebuilt Osiris-Nesmeti Temple (Photo: C. von Pilgrim, SIK).

Table 1: Presence of species and plant items.

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* We are grateful to the members of the Ministry for Antiquities for their continued support, in particular the Directors of Aswan Inspectorate Nasr Salama, Ahmed Saleh and Osama Abdel Latif as well as the chief inspector Shazli Abdel Azim and the director of the museums on Elephantine Island Mustafa Khalil. Last but not least, we thank our inspectors Abeer Abdelradi, Mahmoud Abdidallah Abdalla, Galal Abdin, Mohamed Abdu, Karima Fahmi, Ahmed Fouad, Fatma Girgaui Ahmed, Abu Bakr Hasan, Ageibi Lamei Alabd, Somaya Mansour, Hanan Mohamed, Omneiya Mohamed, Rada Mohamed, Wafaa Mohamed, Mona Mohamed Ahmed, Waida Mohamed Ahmed, Ahmed Mohamed Sadun, Zeinab Ralid, Fakhuri Yakub Samuel, Hanan Yunis. Members of the teams were, apart from the authors: M. Adel, N. Brown, P. Collet, J. Fayein, J. Friedrich, K. Goldmann, M. Gundlach, E.-M. Hemauer, S. Gubler, C. Jeuthe, T. Krapf, A. Krekeler, T. Kunze, E. Laskowska, M. Looney, W. Mayer, E. Peintner, B. Chr. Schiebe, S. Seratakoupoulos, M. Shahen, O. F. Stephan, B. von Pilgrim, O. von Pilgrim. We are highly appreciating their efforts for the Elephantine Island excavation project during work seasons and between them!

1 The study of daily life is positioned in the archaeological research under the subfield of 'Household Archaeology'. See a summary of recent research and background as well as the papers of a workshop on that topic from 2013: M. Müller, 'Introduction: Household Studies in Complex Societies', in M. Müller (ed.), *Household Studies in Complex Societies, Oriental Institute Seminars* 10 (Chicago, 2015), xiii-xlii: www.oi.uchicago.edu/sites/oi.uchicago.edu/files/uploads/shared/docs/ois10.pdf, accessed: January 1, 2016.

2 See in more detail: S. Sigl, 'The project 'Realities of Life' – excavations in the north-western town of Elephantine', in S. Seidlmayer, *et al.,* 'Report on the Excavations at Elephantine by the German Archaeological Institute and the Swiss Institute from autumn 2015 to summer 2016': https://www.dainst.org/projekt/-/project-display/25953: Elephantine – Report on the 45th Season (ENGLISH), accessed: August 10, 2017.

3 S. Sigl, 'The Project 'Realities of Life', in S. Seidlmayer, *et al*., 'Report on the Excavations at Elephantine by the German Archaeological Institute and the Swiss Institute from autumn 2014 to spring 2015', 2-4: https://www.dainst.org/projekt/-/project-display/25953: Elephantine – Report on the 44th Season (ENGLISH), accessed: August 10, 2017.

4 The DAI currently works with Dr Hassan Khozeym of the Geological Department of the Faculty of Science of Aswan University and with the French Institute for Oriental Archaeology (IFAO) in Cairo. Further scientific co-operations with local institutions are in progress.

5 The autumn season 2016 was used only for studies on the small finds in the excavation's storage rooms on Elephantine Island.

6 P. Kopp, 'Realities of Life (Lebenswirklichkeiten): Excavation work during the 43rd (2013/2014) and 44th (2014/2015) excavation seasons', in S. Seidlmayer, *et al*., *'*Stadt und Tempel von Elephantine'*, MDAIK* 74 (in print); P. Kopp, 'The Project "Realities of Life". Excavations in the Middle Kingdom settlement of Elephantine', in S. Seidlmayer, *et al*., Report on the Excavations at Elephantine by the German Archaeological Institute and the Swiss Institute from autumn 2015 to summer 2016, 6-9: https://www.dainst.org/projekt/-/project-display/25953: Elephantine – Report on the 45th Season (ENGLISH), accessed August 27, 2016.

7 W. Honroth/O. Rubensohn/F. Zucker, 'Bericht über die Ausgrabungen auf Elephantine in den Jahren 1906–1908', *ZÄS* 45–46 (1910), 162–209; C. von Pilgrim, *Elephantine* XVIII: *Untersuchungen zur Stadt des Mittleren Reiches und der Zweiten Zwischenzeit*, *AV* 91(Mainz, 1996), figs. 108–110.

8 The coverage excludes the outer walls which are partly shared with other buildings.

9 H166, see fig. 1, R02, and von Pilgrim, *Elephantine* XVIII, 214.

10 See for quern emplacements on Elephantine von Pilgrim *Elephantine* XVIII, 213.

11 See fig. 1, house 166, installation 470 in room 05, and von Pilgrim, *Elephantine* XVIII, 210.

12 von Pilgrim, *Elephantine* XVIII, 210.

13 von Pilgrim, *Elephantine* XVIII, 210.

14 About such usage of animal faeces see H. Riemer, *El Kharafish. The Archaeology of Sheikh Muftah Pastoral Nomads in the Desert around Dakhla Oasis (Egypt), AfrPraehist* 25 (Cologne, 2011), 158–161.

15 K. Liszka, 'Gems in the desert: recent work at Wadi el-Hudi', *EgArch* 46 (2015), 37–40.

16 Another raw material used in the production of jewellery is mollusk and egg shell.

17 C. Orton/M. Hughes. *Pottery in Archaeology* (Cambridge, 2013), 208.

18 A building layer is the sequence of layers connected with a building. It is a combination of all layers from the building of a house, its use and finally its destruction. E. g. von Pilgrim, *Elephantine* XVIII, 15-16, 320–363; A. Seiler, 'Zur Formentwicklung der Keramik der 2. Zwischenzeit und der frühen 18. Dynastie', in W. Kaiser, *et al*., 'Stadt und Tempel von Elephantine. 25./26./27. Grabungsbericht', *MDAIK* 55 (1999), 204–224; T. Rzeuska, 'Elephantine – a Place of an End and a Beginning', in R. Schiestl/A. Seiler (ed.), *Handbook of the Pottery of the Egyptian Middle Kingdom*, Vol. 2, *DÖAW* LXXII (Wien, 2012), 330; T. Rzeuska, 'Grain, Water, and Wine. Remarks on the Marl A3 Transport-Storage Jars from Middle Kingdom Elephantine', *CCE* 9 (2011), 467. Seiler re-dated already one building layer, but she stays in her article in the system.

19 For Elephantine e. g. Seiler, in Kaiser, *et al*., 'Stadt und Tempel von Elephantine'*,* 223; A. Seiler, *Tradition und Wandel*, *SDAIK* 32 (Mainz, 2005), 129-130.

20 P. Kopp, *Elephantine* XXXII: *Die Siedlung der Naqadazeit*, *AV* 118 (Mainz, 2006), 50–55; D. Raue, 'Zu den Keramikfunden der frühdynastischen Zeit und des Alten Reichs', in P. Kopp, *et al*., *Elephantine* XXIV: *Funde und Befunde aus der Umgebung des Satettempels. Grabungen von 2006–2009*, *AV* 104, Chapter 9.2.3. (in print).

21 Formation D is defined by the first appearance of Egyptian wheel turned pottery and it ends when the Old Kingdom bread moulds are replaced by elongated shapes in the First Intermediate Period. See Raue, in P. Kopp *et al*., *Elephantine* XXIV (in print).

22 Nubian wares and Tell el-Yahudije ceramics were not part of this analysis.

23 T. Madsen, 'Multivariate Data Analysis using PCA, CA and MS in Capca', 21: www.archaeoinfo.dk/PDF files/2007 Multivariate data analysis.pdf (accessed: August 30, 2017).

24 Pers. Comm. D. Raue, 2015.

25 Compare phase IIA in Qau-Matmar. S. Seidlmayer, *Gräberfelder aus dem Übergang vom Alten zum Mittleren Reich: Studien zur Archäologie der Ersten Zwischenzeit*, *SAGA* 1 (Heidelberg, 1990), 196, fig. 82.

26 Compare phase IIB/C in Dendera. Seidlmayer, *Gräberfelder*, 117 and 121, fig. 46.

27 Thin walled hemispherical cups made of Nile B1, fine, are invented in the late years of Sesostris I. Do. Arnold, 'Pottery', in Di. Arnold, *The Pyramid of Senwosret I.* (New York, 1988), 116–119, 141 and 143.

28 The inventory of F3 is comparable to the complex 6 of the pyramid complex of Amenemhet III. in Dahshur. Do. Arnold, 'Keramikbearbeitung in Dahschur 1976–1981', *MDAIK* 38 (1983), 42, figs. 6–8.

29 The inventory of F4 is comparable to the complex 7 of the pyramid complex of Amenemhet III. in Dahshur. Arnold, *MDAIK* 38 (1983), 42, figs. 10–11.

30 Seiler, in Kaiser, *et al*., 'Stadt und Tempel von Elephantine', 219–221.

31 Schiestl/Seiler, *Handbook of the Pottery of the Egyptian Middle Kingdom*, 664–667 and 672–683.

32 Raue, in Kopp *et al*., *Elephantine* XXIV (in print), 226-241. Also see Kopp Section c (below).

33 J. Bourriau/H.-Å. Nordström, 'Ceramic Technology: Clays and Fabrics', in D. Arnold and J. Bourriau, *An Introduction to Ancient Egyptian Pottery* (Mainz, 1993), 143-190.

34 For an overview on Nubian cultures see: H.-A. Nordström, *Neolithic and A-Group sites*. *SJE* 3 (Uppsala,1972); S. Säve-Söderbergh, *Middle Nubian Sites*. *SJE* 4 (Uppsala, 1989); M. Bietak, *Studien zur Chronologie der nubischen C-Gruppe*. DÖAWW 97 (Wien, 1968). Note that after the flooding of Lake Nasser (Aswan) in the 1960s nearly all Lower Nubian sites were destroyed.

35 D. Raue, *Elephantine und Nubien vom 4.-2. Jt. v. Chr*. *SDAIK 40* (in print).

36 Kopp, in S. Seidlmayer, *et al*., 'Report on the Excavations at Elephantine by the German Archaeological Institute and the Swiss Institute from autumn 2015 to spring 2016', 8.

37 Bietak, *Studien zur Chronologie der nubischen C-Gruppe*.

38 P. Kopp, 'The Project "Realities of Life". Excavations in the Middle Kingdom settlement of Elephantine', in S. Seidlmayer, *et al*., Report on the Excavations at Elephantine by the German Archaeological Institute and the Swiss Institute from autumn 2015 to summer 2016, 6-9: https://www.dainst.org/projekt/-/project-display/25953: Elephantine – Report on the 45th Season (ENGLISH), accessed May 20, 2017.

39 E. g. J. Sigl, 'The Project "Realities of Life". Further animal remains from the Middle Kingdom settlement', in S. Seidlmayer, *et al*., Report on the Excavations at Elephantine by the German Archaeological Institute and the Swiss Institute from autumn 2015 to summer 2016, 20-21: https://www.dainst.org/projekt/-/project-display/25953: Elephantine – Report on the 45th Season (ENGLISH), accessed May 20, 2017.

40 Plantatlas.eu/: 'Digital Atlas of Economic Plants in Archaeology' and the 'Digital Atlas of Economic Plants'; R. T. J. Cappers, T. Van Thuyne, and L. Sikking, ‚Plant Remains from Predynastic el Abadiya 2 (Naqada area, Upper Egypt)', in S. Hendricks (eds.), *Egypt at its Origins. Studies in Memory of Barbara Adams* (Leuven, 2004), 277-293; S. Jacomet, *Identification of cereal*

remains from archaeological sites. 2nd Edition (Basel, 2006) (accessable through: https://ipna.unibas.ch/archbot/pdf/Cereal_Id_Manual_engl.pdf); M. Nesbitt, *Identification Guide for Near Eastern Cereals* (London, 2006); W. Smith, *Archaeobotanical investigations at Late Antique Kom el-Nana (Tell el-Amarna)* (London, 2003).

41 Item count of more than 10.

42 See C. Stevens and A. J. Clapham, 'Insights into the life of an Ancient Egyptian Village: excavation results from Amarna', in C. J. Stevens, S. Nixon, M. A. Murray, and D. Q. Fuller (eds.), *Archaeology of African Plant Use* (Walnut Creek, 2014), 154.

43 Based on a calculation in which the total count of barley rachis internodes is multiplied by three (6-row barley = 3 grains per node), emmer glumes are counted once and the number of spikelet forks is multiplied by two (each spikelet fork = 2 grains).

44 P. Ryan, C. Cartwright and N. Spencer, 'Archaeobotanical research in a Pharaonic town in ancient Nubia', *British Museum Technical Research Bulletin* 6 (2012), 97-107; P. Ryan, 'From raw resources to food processing: Archaeobotanical and ethnographic insights from New Kingdom Amara West and present-day Ernetta Island in Northern Sudan', in L. Steel and K. Zinn (eds.), *Exploring the Materiality of Food 'Stuffs'. Transformations, symbolic consumption and embodiments* (Abingdon, 2017).

45 Stevens and Clapham, in Stevens, *et al.* (eds.) *Archaeology of African Plant Use*, 159

46 Stevens and Clapham, in Stevens *et al.* (eds.) *Archaeology of African Plant Use*, 159

47 M. A. Murray, 'Questions of Continuity. Fodder and Fuel Use in Bronze Age Egypt', in A. Fairburn and E. Weiss (eds.), *From Foragers to Farmers. Papers in Honour of Gordon C. Hillman* (Oxford, 2009), 254–67.

48 M. A. Murray, 'Fruits vegetables, pulses and condiments', in P. T. Nicholson and I. Shaw (eds.), *Ancient Egyptian Materials and Technology* (Cambridge, 2000), 620.

49 Murray, in Nicholson and Shaw (eds.) *Ancient Egyptian Materials and Technology,* 334-39; M. Van der Veen, *Consumption, Trade and Innovation. Exploring the Botanical Remains from the Roman and Islamic Ports at Quseir al-Qadim, Egypt* (Frankfurt am Main, 2011), 106-108.

50 Murray, in Nicholson and Shaw (eds.) *Ancient Egyptian Materials and Technology*, 627.

51 C. A. De Vartavan, A. Arakelyan and V. Asensi Amorós, *Codex of Ancient Egyptian Plant Remains* (London, 2010), 52-53.

52 Murray, in Nicholson and Shaw (eds.), *Ancient Egyptian Materials and Technology*, 621.

53 Murray, in Nicholson and Shaw (eds.), *Ancient Egyptian Materials and Technology*, 621.

54 L. Boulos and M. N. El-Hadidi, *The Weed Flora of Egypt* (Cairo, 1984).

55 C. von Pilgrim, 'Excavation of House 55', in S. Seidlmayer, *et al*., 'Report on the Excavations at Elephantine by the German Archaeological Institute and the Swiss Institute from autumn 2014 to spring 2015', 10-12: www.dainst.org/projekt/-/project-display/25953: Elephantine – Report on the 44th Season (ENGLISH) . The excavation of House 55 is conducted by the Swiss Institute in close co-operation with J. Budka and her ERC project AcrossBorders (www.acrossborders.oeaw.ac.at/about/about-acrossborders/). Further members of the work were M. Gundlach, E. Hemauer, O.F. Stephan, T. Kunze, B. von Pilgrim, O. von Pilgrim and B.-C. Schiebe.

56 The latest building stage 'a' specifies the house after its collapse and encompasses all debris dumped above the abandoned ruin.

57 C. von Pilgrim, *Elephantine XVIII. Untersuchungen in der Stadt des Mittleren Reiches und der Zweiten Zwischenzeit*, *AV* 91 (Mainz, 1996), 196-204.

58 von Pilgrim, in S. Seidlmayer, *et al*., 'Report on the Excavations at Elephantine by the German Archaeological Institute and the Swiss Institute from autumn 2014 to spring 2015', fig. 8.

59 von Pilgrim, *Elephantine* XVIII, 202.

60 See von Pilgrim, *Elephantine* XVIII, 213-214.

61 P. Paice, J.S. Holladay, E.C. Brock, 'The Middle Bronze Age / Second Intermediate Period Houses at Tell El-Maskhuta', in M. Bietak (ed.), *House and Palace in Ancient Egypt*, DÖAW XIV, UZÖAI XIV (Wien, 1996), 159-173.

62 Object nrs. 46603U/b-2 and -3. Both axes have heavily corroded and we are most grateful to Erico Peintner whose skilful conservation work delivered the amazing results to be seen in the figures above.

63 Cf. W.V. Davies, *Catalogue of the Egyptian Antiquities in the British Museum VII. Tools and Weapons I: Axes* (London, 1987), 23-24, pl. 20-23.

64 Cf. Christian E. Schultz, *Metallwaffen in Syrien-Palästina an der Wende von der Bronze- zur Eisenzeit (14. bis 11. Jh. v. Chr.)*, *Universitätsforschungen zur Prähistorischen Archäologie* 256 (Bonn, 2014), 113-126, pl. 29 (Type Ax1, Ax3 and Ax4).

65 C. von Pilgrim, 'The spatial development of the Khnum Temple precinct before the 30th Dynsty', in: S. Seidlmayer, *et al*., 'Report on the excavations at Elephantine by the German Archaeological Institute and the Swiss Institute from autumn 2015 until summer 2016', 26-30: www.dainst.org/projekt/-/project-display/25953: Elephantine – Report on the 45th Season (ENGLISH).

66 F. Arnold, 'Untersuchungen im Bereich nördlich des Chnumtempels', in D. Raue, *et al*.,'Stadt und Tempel von Elephantine. 35./37./38'. Grabungsbericht, *MDAIK* 67 (2011), 202.

67 C. von Pilgrim, 'Anmerkungen zu den französischen Grabungen von 1906-1911 im Kontext der neueren Forschung in Elephantine', in E. Delange (ed.), *Les fouilles francaises d'Élephantine (Assouan) 1906-1911*, *MAIBL* 46 (Paris, 2012), 275.

68 Arnold, *MDAIK* 67 (2011), 202.

69 In this regard it is worth mentioning that a sculptors model has been retrieved from the same deposits in an earlier season (Object no 23652E/a-1).

70 E. Laskowska-Kusztal, *Elephantine XV*, *Die Dekorfragmente der ptolemäisch –römischen Tempel von Elephantine* (Mainz, 1996), 33-150.

71 Laskowska-Kusztal, *Elephantine XV*, 61-66.

72 Laskowska-Kusztal, *Elephantine XV*, 67-70.

73 Laskowska-Kusztal, *Elephantine XV*, 70-74.

74 S. Bickel, 'Die Dekoration des Tempelhaustores unter Alexander IV. und der Südwand unter Augustus', in H. Jenni, *Elephantine* XVII, *Die Dekoration des Chnumtempels auf Elephantine durch Nektanebos* II (Mainz, 1998), pl. 125 a-d.

75 Laskowska-Kusztal, *Elephantine XV*, 113-115.

76 Works were conducted in the field by A. Krekeler and the conservator J. Fayein. From the technical point the work was made possible by the support of the German Institute, who generously provided the Unimog-car and its driver Maher. On the virtual reconstruction of the temple, see Chr. Ubertini, 'Restitution Architecturale du "Temple Y"', in G. Dreyer, *et al*., 'Stadt und Tempel von Elephantine. 31./32. Grabungsbericht', *MDAIK* 61 (2005), 64-75.

77 The mortar consists of one part of putty lime, two parts of sand and ½ part of fired brick powder (for hydrolyzing of the lime). Sand and brick powder were sieved to a grain size inferior to 1mm.

78 See for an introduction and preliminary results C. Jeuthe/P. Kopp, 'Objects and space - functional settlement analyses', in S. Seidlmayer, *et al*., 2016, Reports on the Excavations at Elephantine by the German Archaeological Institute and the Swiss Institute from autumn 2015 to summer 2016, 40-41: www.dainst.org/projekt/-/project-display/25953: Elephantine – Report on the 45th Season (ENGLISH). See P. Kopp, *et al*. in print, *Elephantine XXIV: Funde und Befunde aus der Umgebung des Satettempels. Grabungen von 2006–2009*. *AV* 104; P. Kopp, 'Siedlung und Stadterweiterung westlich des Satettempels', in D. Raue, *et al*., 'Stadt und Tempel von Elephantine. 37./38./39. Grabungsbericht', *MDAIK* 67 (2011), 186-198 for the excavation and general presentation of the finds.

79 M. Ziermann, *Elephantine XXVIII. Die Baustrukturen der älteren Stadt (Frühzeit und Altes Reich). Grabungen in der Nordoststadt (11.-16. Kampagne) 1982-1986, AV* 108 (Mainz, 2003).

80 C. Jeuthe, *Balat X. Ein Werkstattkomplex im Palast der 1. Zwischenzeit in Ayn Asil, FIFAO* 71 (Cairo, 2012).

81 Based on the ideas of de S. de Baune, *Pour une archéologie du geste: Broyer, moudre, piler. Des premiers chasseurs aux premiers agriculteurs (*Paris, 2000*),* 20-23, 33-42.

82 J.A. Harrell and P. Storemyr, 'Ancient Egyptian quarries – an illustrated overview', in N. Abu Jaber, E. G. Bloxam, P. Degryse and T. Heldal (eds.), *QuarryScapes: Ancient Stone Quarry Landscapes in the Eastern Mediterranean*, *Norwegian Geological Survey of Norway, Special Publication* 12 (Trondheim, 2009), 7-50, fig. 7, fig. 31.

83 The refurbishment and installation works were supervised from the side of the DAI by Wolfgang Mayer and Erico Peintner. Great support came from the director of the museums on Elephantine, Mustafa Khalil, and his chief conservator, Mohamed Saad, as well as their inspector colleagues.

84 The work was carried out with permission from the Ministry of Antiquities under the supervision of the Aswan Inspectorate. All activities were executed by the team of Hagg Mahmud al-Taiyyib to the design, and under the direction of architect N. Warner.