

# PRELIMINARY REPORT

# *AKORIS*

2012

*Excavated Area*



*Leather Footwear*



*remains*



*Confirmed Quarry*



*Wooden Stamp*

HISTORY AND ANTHROPOLOGY  
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# 1 PREFACE

The area where we have carried out archaeological, architectural and epigraphical investigations since 1981 are the ancient city Akoris and nearby quarries. Through these investigations, the history of the main city zone from the end of the Old Kingdom to the Coptic Period was illuminated to a certain degree (*Akoris 1981–1992*). Based on those results, the south and west areas of the Third Intermediate Period in the Akoris ruins and the New Minya quarry of the Ptolemaic Period have been investigated since 2002 so as to study the “post glorious” age in Egypt. The objects of the 2012 season were the excavation of the South Area, the 3D measurement by laser scanning of the city zone and the confirmation of quarry sites unknown to the learned world. The details are described in the later chapters.

Strictly speaking, human occupation in the South Area peripheral to the main city zone started at the end of the New Kingdom according to our archaeological data. A large relief with the cartouche of Ramses III to which Dr. Habachi referred in his paper (*JARCE XI*), is on the west bluff adjacent to the South Area. Even if the settlement of this area traces back to the 20th Dynasty, the archaeological data would still apply to it. Evidently the South Area was used for military affairs in the beginning, judging from a large wall on the south slope of a crag and its fine view of both the

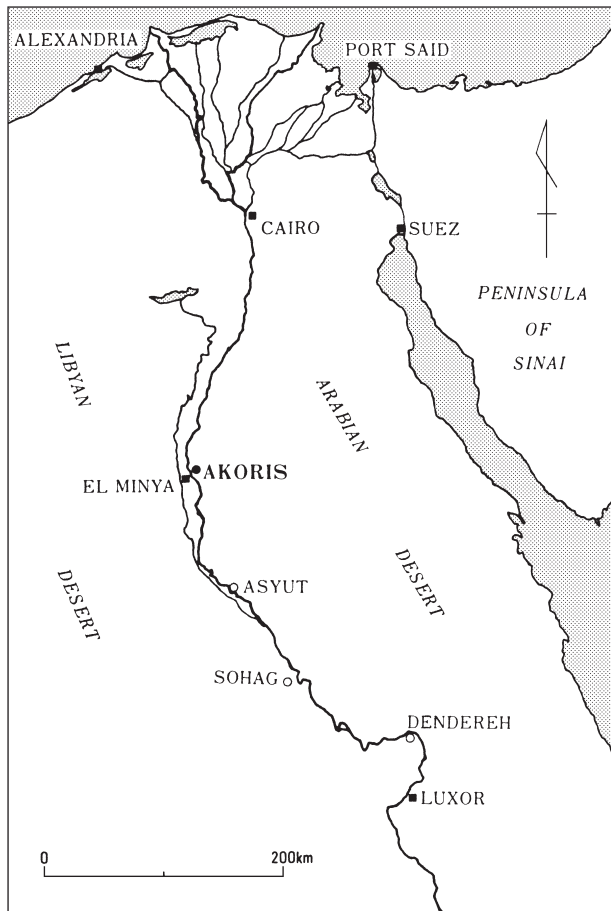


Fig. 1 Map of Egypt.

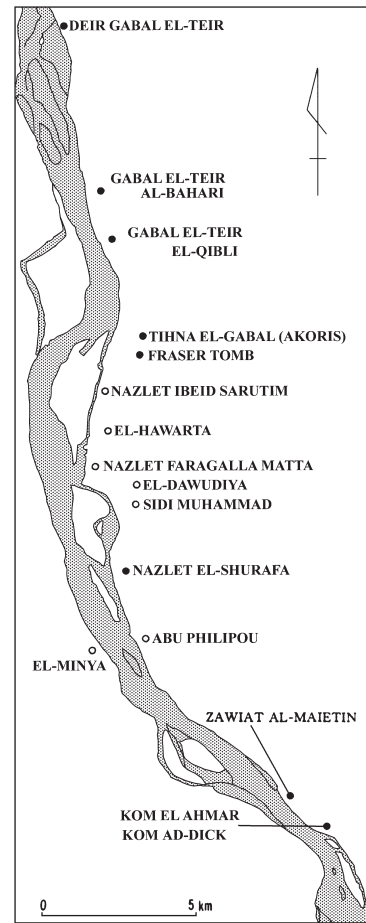


Fig. 2 Sites and villages near Akoris.

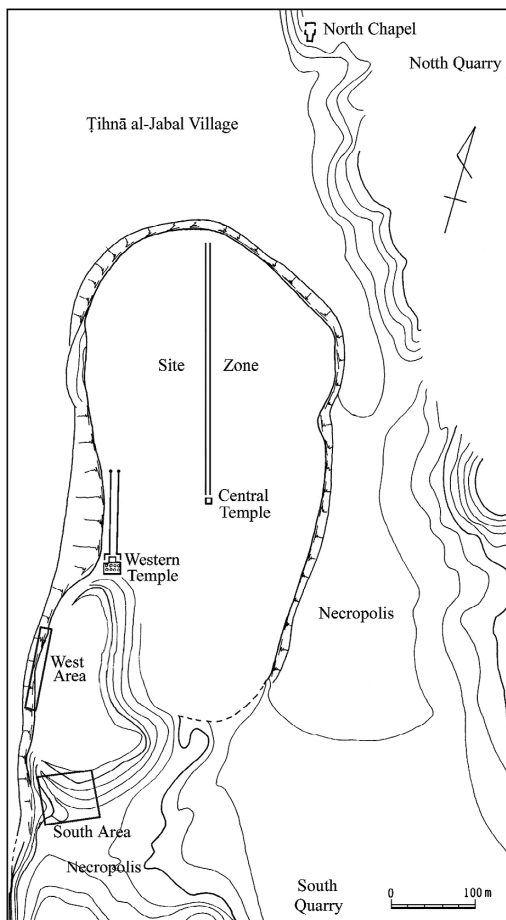
Nile valley and the desert road leading to the Red Sea district (Fig. 3). Furthermore, at the south end of the visual range as seen from there, an outstanding crag projecting out to the Nile valley is located, and its inland skirt yields the small site, Nazlet el-Shurafa (Figs. 2 and 39). It bears three large walls on the slope which date to the same period as similar example in Akoris based on the mud brick size and scattered pottery sherds on the surface (Fig. 4). Thus these facts allow us to infer that both sites were connected by a military network, and that some social tension which lead to the building of such military establishments were engendered under the 20th Dynasty.

Some time later, domestic human activities such as farming, fishing, manufacturing and trading covered the South Area replacing the military. The details has been described in our preliminary reports published annually. It is intriguing that these activities by common people arose while the dynastic power waned in comparison with the “glorious” antecedent period. Yet, the amplitude of the Nile floods shown by Dr. Butzer tells us that the flood level decreased greatly, and crop failures plagued Egypt around 1170–1110 B.C. which sent food prices skyrocketing until around 1070 B.C. (*Civilizations of the Ancient Near East I*). However, even if such milieu caused the dynasty to fall into eclipse and seriously damaged Egyptian society, our findings bespeak the disparate indications of the times, whose discrepancy presents a cardinal and intriguing issue.

As mentioned above, the main city zone preserves archaeological traces extending over 3000 years. To the contrary, human activities of daily living in the South Area which were transitory in

comparison did not continue to the Ptolemaic Period. If the inception human occupation for the military tells the actual circumstances of the society, the abandonment must also have some historical meaning even though limited to a quarter of middle Egypt. The excavation of 2012 provides much information to us in illuminating this issue. We hope that it, as well as various fruits in the 3D measurements and the quarry sites, draws your attention.

(KAWANISHI)



**Fig. 3** Map of Akoris.



**Fig. 4** Archaeological site of Nazlet el-Shurafa.



## 2 ARCHAEOLOGICAL INVESTIGATION

The south area,  $150 \times 150\text{m}$ , stretches on the south slope of a crag to the valley floor in the southwest area of the main city zone. The excavations from 2002 show that it consists of mud brick domestic buildings as well as pit burials. The slope teems with small buildings which are poorly preserved due to erosion. The valley floor was divided by streets forming a T-shape and a short alley. Large buildings were disposed along them.

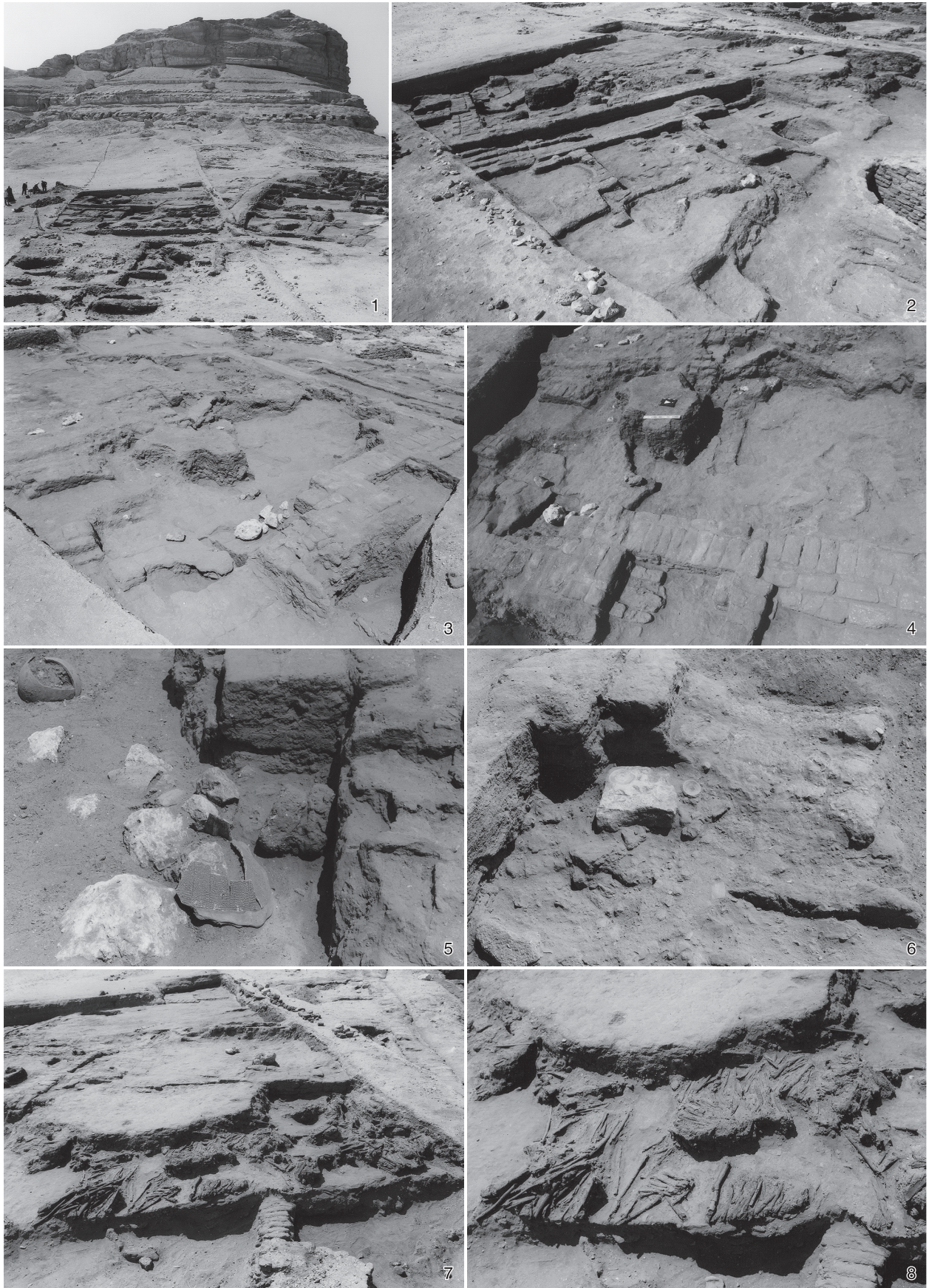
The area excavated in 2012 is situated eastward from the north-south and southward from the east-west streets. The west side is adjacent to the 2010 excavated area and the north side to the 2002, 03 and 06 areas (*Preliminary Reports 2002, 2003, 2006 and 2010*). It measures 14.0m north-south by 14.0m east-west with an extension of  $3 \times 3\text{m}$  at the southwest corner (Figs. 5 and 6).

The excavation in 2012 was limited to confirm the existence of structural remains which were revealed by the removal of not only a top sand layer of 10–30cm in thickness but also accumulated soil in destructive pits dug by someone. Though the complete grasp of structures must await the next chance, the excavated area can be divided into ten sections based on the disposition of walls, which are designated as Sections 1–10. As shown in the plan (Fig. 6), most confirmed structures are mud brick walls and they are parallel to or at right-angles to the east side wall of the north-south street unearthed in 2010.

On observing the east side wall along the street, two discontinuous parts can be noticed in the mud brick arrangement, one at the southwest corner of Section 4 and the other at the same corner of Section 7. These discontinuities seem to give witness to the difference of construction dates. If such inference has some validity, it can be estimated that the structural remains in Sections 1–5 and the 2002, 03 and 06 uncovered areas form one group, those in Sections 6–8 another and the position of Section 9 cannot be determined precisely because it is so poorly preserved. Two or three large round structures placed alongside the south side wall of the east-west street are included in the former group. The two well-preserved round structures are 3.3m in the inside diameter and 1.8m in the extant height. These seem to have been underground or half-underground silos, and each present volume reaches at least  $15\text{m}^3$ . Reckoning the volume, it seems better to consider the silos to have served for special storage such as for trade rather than for domestic use. Later, each interior space of the two was occupied by walls, and the ability to store abandoned. A T-shaped wall in the west silo and another, a right-angled one are 0.7 and 1.1m in thickness respectively. These thicknesses and the brick work in the stable walls are proper for large buildings, though the reason why the silos were thus disturbed is undetermined. (KAWANISHI)

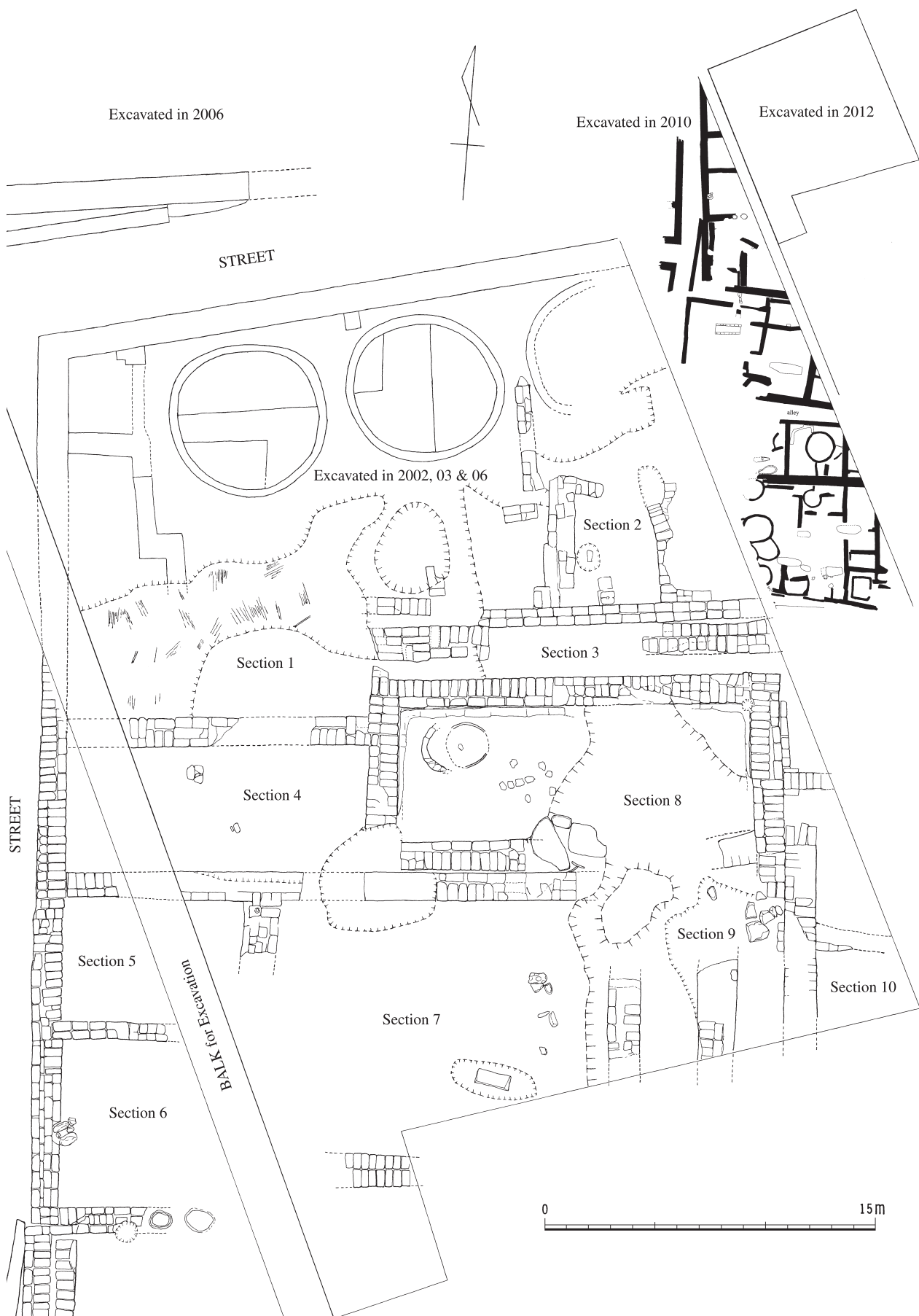
In Section 1 located at the northwest corner of the excavated area, many branches and mud lumps with pressed branches or their traces side by side in rows were found 0.5m under the surface (Figs. 7 and 8). They are scattered on a mud plastered floor (Floor B) in an area 5.2m east-west  $\times$  2.9m north-south extending to the north from the south wall. They are supposed to have been the roofing of room, however dimensions of the room are unclear because all the outer walls except for the wall in the south are missing. In addition, the disturbance is caused by the upper



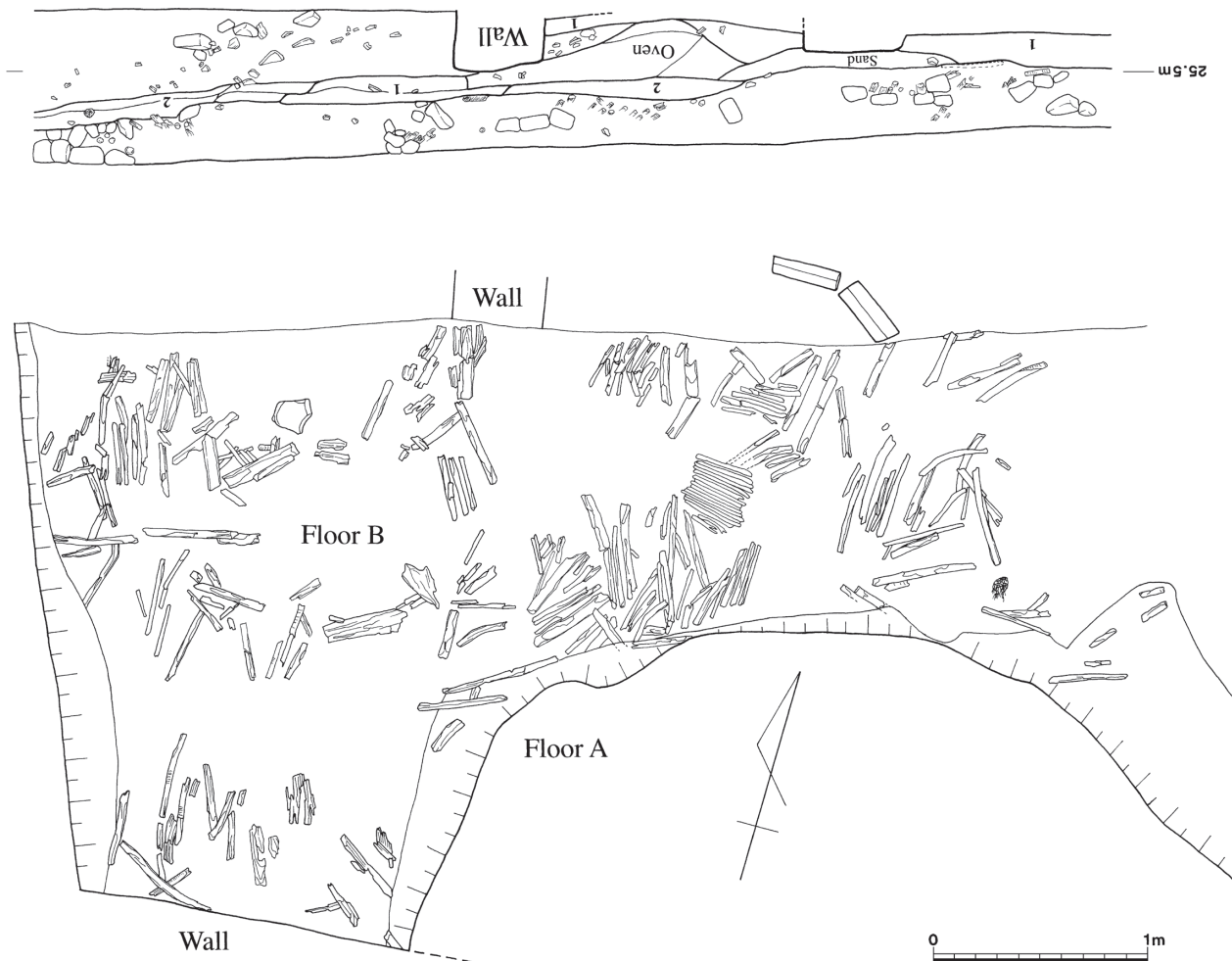


**Fig. 5** Excavated area. 1: Panoramic view, from north; 2: Excavated area, from northeast; 3: Excavated area, from southeast; 4: Destructive pit of Sections 8 and 9, from east; 5: Turtle in Section 9, from south; 6: Entrance with a door socket in Section 5, from west; 7: Roofing in Section 1, from north; 8: Detail of roofing, from north.





**Fig. 6** Plan of the area excavated in 2012.



**Fig. 7** Roofing in Section 1, plan and cross section. Layer 1: mud plaster; Layer 2: organic soil.

floor (Floor A) 0.3m higher than Floor B. A wood roofing such as that for this room was found on the north slope (Room 1 in *Preliminary Report 2007*), but it was in a bad condition of preservation.

Branches used in the roofing are divided into two kinds of wood, *Tamarix* (*T. nilotica*) and *Acacia* (*A. nilotica*). Most of the latter are more than 5cm in diameter while the slender branches including ones pressed to mud lumps are limited to the former wood. The thickest branches/woods of *Acacia* measuring more than 10cm in diameter were probably used as beams. Though a few pieces of board are also *Acacia*, it is impossible to know in which part of the roof they were used.

Finds in the room are only a rope made by twisting palm tree fibers in the western part and a flat stone which is possibly had been a base of a wooden pillar in the eastern part. Although a new construction (Floor A) was built on a collapsed room (Floor B) without removing debris in order to save time, almost no implements for living including pottery remain on the floor unlike in ordinary uncovered rooms.

Observing layers at the north end, it is noticeable that organic soil containing much straw accumulated under the roofing at places where plaster on the floor was lost. If this soil is cattle dung, the room was possibly used as a cattle shed.

In the middle, an oven containing charcoal and ash fill was revealed under the organic soil.



Under the floor and the oven, soil including many pottery shards accumulated. But the layers to the east side of the oven are different from the layers on and to the west of it. That is, sand accumulated near the oven and a floor plaster under soil including roofing is quite a bit lower than the floor plaster to the west. These differences might be caused by fact that the construction is lower than Floor B. (TSUJIMURA)

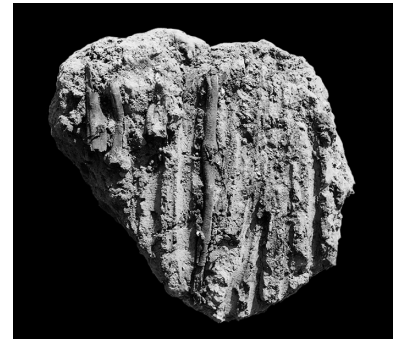


Fig. 8 Mud lump with branches.

In section 2, a hard soil layer formed by the tramping of human and livestock feet and rainfall was found under the thin top sand layer (Fig. 5 No. 2). Short and narrow walls remained though interrupted here and there by later destruction. It is difficult to reconstruct the then existing buildings through these poorly preserved walls. In any case, it is sure that the human and livestock tramping began after the buildings were abandoned and the debris accumulated in them. Such sequence shows the vicissitude of land use. In the west part of Section 2 an oblong pit of  $1.0 \times 1.2$ m in diameter dug by robbers, reached limestone bedrock at a depth of 1.5m from the upper edge, was confirmed. According to the stratigraphy shown in the cross section of the pit, three construction phases, including the top one already revealed, were on the bed rock.

Section 3 yielded a passage running east-west. The north side wall is 40cm in thickness and the south side wall 60cm. Another wall which partially closed the passage occurred in contiguity with the north side wall, whose thickness is also 60cm. The construction sequence of these walls is undetermined at this time and must await the next excavation period. The width of the passage is 1.15m while the width narrowed by the contiguous wall is 50cm, which allowed us to go through even though not easily. The west part of the passage was closed off and the west ends of the north and the contiguous walls were interrupted by later destruction.

Section 4 shows an orderly rectangular room when missing parts are reconstructed on our scale drawing. It measures 2.8m north-south by 6.7m east-west on the inside, and each surrounding wall is around 60cm in thickness. Considering that no traces of an entrance could be detected, it must have been positioned somewhere in the missing parts. Importantly there is no entrance which gives direct access to the street. It is a feature common to the buildings excavated on the valley floor that a front door opens not to the street but to the alley diverged from it or a less obvious part. Public order is thus surmised to have been unstable. The left sole of a leather footwear was unearthed from just under the topsoil (see the cover).

Section 5 also forms a rectangular room, when the missing parts of walls are reconstructed on our scale drawing. It measures 2.9m north-south by 4.1m east-west, whose ratio is 1 to  $\sqrt{2}$ . The preserved part of the east wall yielded a door socket set at the corner (Fig. 5 No. 6). Its position indicates that the door opened to Section 5. As for the thickness of walls, the south wall of 40cm is thinner than the others of 60cm. Furthermore the west wall in Section 6 is 60–70cm and the south one 60cm. The east part of the thinner wall is missing. If the preserved east wall of 60cm in thickness extends from Section 5 to Section 6 by drawing a line parallel to the extant west wall, Section 6 forms a square room of 3.9m and possibly the thinner wall between both sections is a

curtain wall. Furthermore the total of both sections measures 7.0m north-south by 4.0m east-west, which indicates an integer ratio.

As described in the *Preliminary Report 2010*, a straight thin wall which was added to the east side of the street extends southward from the southwest outer corner of Section 6. Its direction was somewhat changed from the existing side wall, and most walls unearthed in the southern part adjacent to the 2012 area hold the same direction as it does. This matter indicates that the 2012 wall group was built prior to the southern one.

Walls in Section 7 are poorly preserved and the south wall for the most part buried under the unexcavated area. Yet, when its missing and buried parts are reconstructed on our scale drawing, a clear-cut rectangular room appears whose dimensions are 5.8m north-south by 7.6m east-west, and its ratio nearly 3 to 4. Gypsum plaster was partially detected on the north and the east walls, though neither graffiti nor decorative paintings could be found on them. It suggests that this section was not a courtyard but a special room. According to the thickness of the preserved walls, measuring 60cm, this room seemingly had no vaulted ceiling. Thus, when it was constructed, timbers of 7m in length must have been acquired. The difficulty of the acquisition in Egypt also gives evidence of the importance of this room.

A rectangular limestone block was uncovered in a shallow, oblong pit of  $2.0 \times 0.8\text{m}$  which had been dug from the topsoil to the next layer in Section 7. It measures l.  $65 \times$  w.  $30 \times$  thickness 15cm and has no decoration. It seems to have been a member of a stone building unknown in the South Area. As the pit was filled with sand, it dates to after the abandonment of constant human activities in this area. A wooden stamp was unearthed from just under the topsoil (see the cover).

Section 8 shows a sequence of human activity which can be divided into three phases. The first is the construction of the room, the second is the reuse of the uninhabited room and the third is the destruction of the east part.

Explaining in due order from the first phase, the constructed room measures 3.0m north-south by 8.0m east-west which shows an integer ratio. The total of Sections 5 and 6 is 7 to 4, and Section 7 is 3 to 4. These examples were designed arithmetically while Section 5 of 1 to  $\sqrt{2}$  was geometrically and Section 6 of 1 to 1 by either method. The traces of an entrance could not be found on the uncovered walls. It probably had been positioned on the missing east part of the south wall, in that the missing southwest corner is too narrow. After the room was uninhabited, accumulated soil containing debris covered the inside to a height of 80cm, and the reuse of the second phase began. Edges that touched the preserved walls and the surface of the accumulated soil were filled with mud. It could be for smoothening the edges or protection against the erosion of the wall foundations. The mud traces were preserved on the north, the east and the west walls, though not confirmed on the south one.

Two round structures, poorly preserved, remained in the west part of Section 8, one made with mud brick and the other simply mud. The former is around 1m in the estimated inside diameter while the latter is 1.0m in the actual diameter. These structures cannot have been coexistent because they would overlap each other if reconstructed. Reckoning the preserved condition, the mud brick structure is surmised to have been built and used first. Though the actual uses are



unknown, based on our previous investigation data in this area there appears to have been a manger. It leads us to presume that Section 8 was used as a cattle shed and the mud filling at the edges had some practical use.

A large destructive pit dug for some reason extending to Section 9 yielded a wall at the southeast corner but it was poorly preserved (Fig. 5 Nos. 3 and 4). The direction is not coincident with the other walls, consequently it seems to belong to the lower construction phase. A large, thick mud plate of  $1.3 \times 0.7\text{m}$ , together with a flat abraded stone, was found on the southwest side of the pit (Fig. 5 No. 4). The mud plate is a part of a ceiling and the stone is a stepping stone for the entrance, yet they have lost their original positions. Observing the stratigraphy of accumulated soil in the pit, the thin top layer is ash, the second layer of 25cm in thickness contains pottery sherds and fodder, the third layer of 40cm in thickness is mainly mud bricks and the fourth layer of 15cm in thickness is minute soil with no debris. The fodder layer extends over the whole surface of the 2012 area. It is evident that the land use ended with stockbreeding and the destruction was antecedent. Furthermore the pit partially broke the mud filling probably for the cattle shed at the edge of the north wall, which evidences that the destruction came after the mud filling. In a word, the destruction is within the term of the stockbreeding.

The mud brick size, uncovered from the pit, is l. 36–38  $\times$  w. 17–18  $\times$  thickness 7–8cm, and is almost the same size as in the extant walls. Many pottery sherds belong to the end of the Third Intermediate or the beginning of the Late Period as shown in Fig. 10.

Excepting the northwest corner which was saved from the destruction, Section 9 is almost wholly occupied by the pit. The walls uncovered were poorly preserved and do not appear to have formed a room. At the lost part of the east wall a large turtle shell, accompanied by several stones, was detected (Fig. 5 No. 5). Supposedly the shell was placed here with some intension. A complete cooking pot (Fig. 10 No. 1) was revealed to the southwest at a distance of 1.5m. Observing the cross section of the south end, a sand layer reaches to the bottom of the pit from the topsoil, whose depth is 1.0m. It is concluded that the destruction in this part came after the complete end of constant human activities. Thus the sequence of the human activities shown by the stratigraphy in Section 9 is different from Section 8.

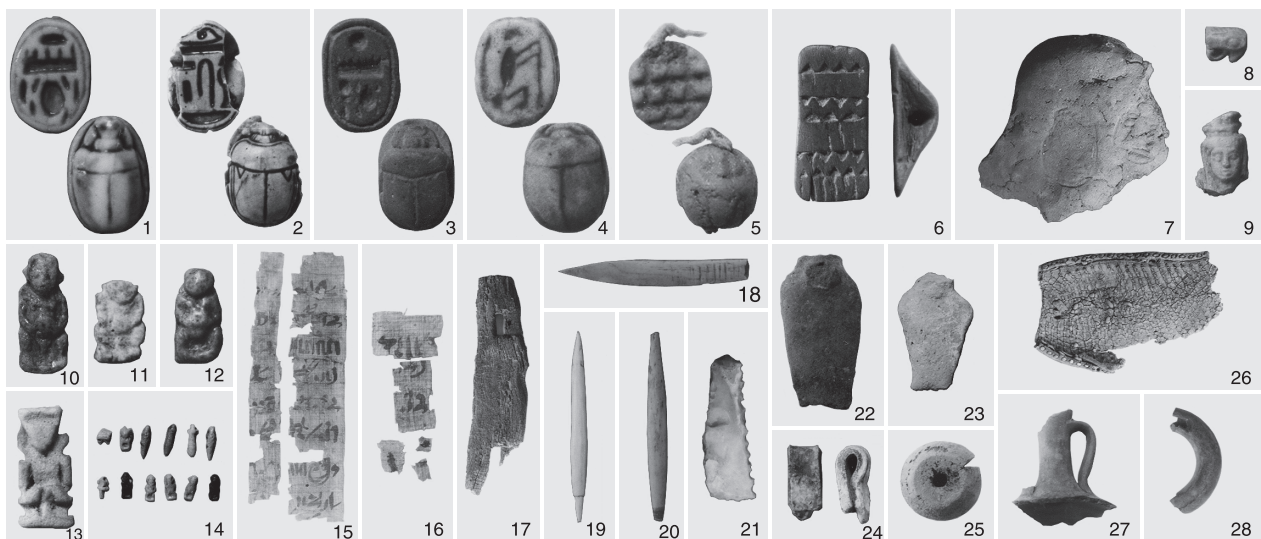
Section 10 partially yielded the vaulted ceiling of a burial chamber (Fig. 5 No. 3). All of more than thirty tombs excavated in the South Area are pit burials, which damaged the existent buildings and the original accumulated soil layers in their construction. They were not equipped with special facilities such as chambers. Furthermore, pursuing the historical sequence in the area excavated from 2002, evidently it was gradually shifted from a secular zone to a cemetery and stockbreeding farm. Yet, the tomb confirmed in Section 10 has a burial chamber and is contemporaneous with other domestic buildings in its construction. Based on the convention of Egyptian theology, making tombs in a secular zone was prohibited. Consequently this example tells us of the fall of the convention.

The tomb was mostly buried under the unexcavated part, and appears to have already been ravaged. The significance of the tomb, as well as a time shortage, made us postpone a full-scale investigation until the next season. Unfortunately, we received the news in Japan that it was ravaged again.

(KAWANISHI)

**Finds from the excavated area** (Fig. 9). Nos. 1–5 are scarabs. No. 1 consists of two jointed fragments, and each excavated part is different. One is from the 2006 area, the other from Section 8 and both of them are from the fill under the top sand soil (hereinafter referred to as the topsoil). Seemingly the material is glazed steatite. The inscription reads *Mn-hpr-R'*, which means the pharaoh's name though unidentifiable. The dimensions are l.  $1.45 \times$  w.  $1.02 \times$  h.  $0.63$ cm. No. 2 is from the fill under the topsoil in Section 8, whose material is bluish green faience. The inscription reads *Ir n hsy nb* which means the one made for the praised one of the lord (?). The dimensions are l.  $1.36 \times$  w.  $0.94 \times$  h.  $0.65$ cm. No. 3 is from just under the topsoil in Section 2, 3 or 8. The material is glass or faience, the Egyptian blue. The inscription reads *Mn-hpr-R'-nh*. The pharaoh's name of *Mn-hpr-R'* is not limited to Thutmose III. The dimensions are l.  $1.31 \times$  w.  $0.88 \times$  h.  $0.58$ cm. No. 4 is from the fill under the topsoil in Section 8, whose material is glazed steatite. It shows some design of a human figure with a stick. The dimensions are l.  $0.90 \times$  w.  $0.68 \times$  h.  $0.47$ cm. It is smaller than others. No. 5 is from the fill under the topsoil in Section 8. It is of bad make whose material is faience, and has a latticed design. A linen string is preserved through the hole. The dimensions are l.  $0.95 \times$  w.  $0.91 \times$  h.  $0.61$ cm. The scarabs confirmed in 2012 are no more than these four pieces and they are from Section 8 excepting the unspecifiable one, No. 3. It stems from the deep dig in the destructive pit.

The example on the cover is a faience ring, which is from just under the topsoil in Section 3. The inscription reads *Hpr-hpr-/-R'*. Probably it is *Hpr-hprw-R'* which represents the name of Ay, the last pharaoh of the 18 Dynasty, though the lower part and the hoop are lost. The extant dimensions are l.  $2.16 \times$  w.  $1.39 \times$  h.  $0.96$ cm. A multi-colored glass bead on the cover is also from just under the topsoil in Section 3. The dimensions are d.  $2.79 \times$  h.  $2.04$ cm, and the hole somewhat tapers from 1.0cm to 0.7cm in diameter excepting both widened ends. White oblique lines are on



**Fig. 9** Finds from the excavated area. 1–5: Scarabs; 6: Wooden stamp; 7: Stamped mud cap of vessel; 8: Amulet, Udjat-eye; 9: Amulet, Isis or Hathor; 10–12: Amulets, Pataikos; 13: Amulet, Bess or Thoth; 14: Amulets, Pataikos and so on; 15–16: Papyrus fragments inscribed with hieratic; 17: Wooden plank; 18: Pointed spatula of zoological bone; 19–20: Arrowheads of zoological bone; 21: Sickle blade of flint; 22: Clay cobra figurine; 23: Clay human figurine; 24: Fishing weight of lead; 25: Wooden spindle; 26: Leather footwear; 27–28: Cypro-Phoenician pottery.

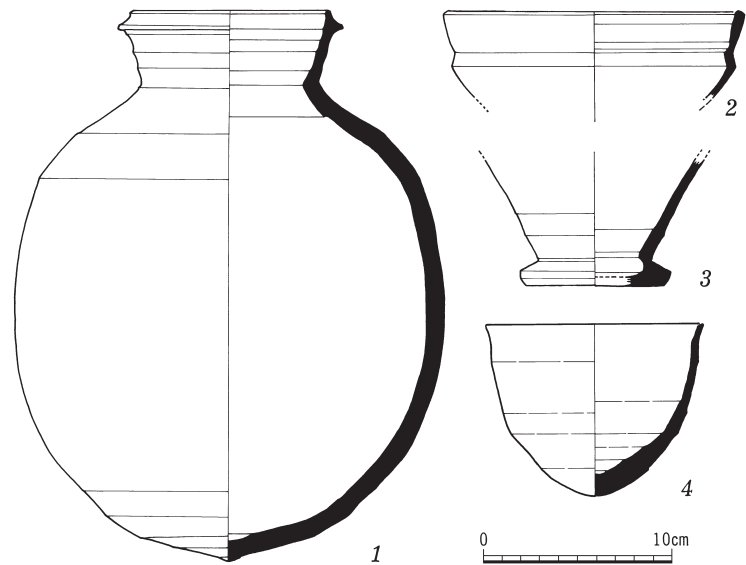
the bluish grey ground. Three eyes, with bluish black eyeballs on apricot stone-shaped white parts, are inlaid, and two ribbons, bluish black and white, cross and surround each eye. Among such kind of existent beads from the South Area, it is eminent in size and workmanship.

No. 6 is a wooden stamp, which is from just under the topsoil in Section 8. The design is composed of a row of sawtooth pattern and two rows of wave pattern. The dimensions are l. 4.94 × w. 2.38 × h. 1.51cm. It is wholly worn away by use. Especially marked abrasion extends from the hole to the top, which leads us to reckon to have been caused by a string.

No. 7 is a stamped mud cap of vessel, which is from the fill under the topsoil in Section 8. It can be made circular in plan whose estimated diameter is 7–8cm, if lost parts are reconstructed. Two oval impressions are preserved on the outside. One, on the center, is complete and the dimensions are 2.7 × 1.9cm, whose design cannot be confirmed because of soft stamping. The other, on the outer, is partially lost and the estimated dimensions are almost the same as the complete one. The design seems to represent some personified god or goddess. The inside part is protruded to receive a vessel rim. The diameter of the rim is 4.86cm, which evidences that the vessel is not large and the rim is narrow such as an ovoid amphora.

No. 8 is a Udjat-eye made of faience, whose dimensions are h. 0.91 × w. 0.79 × thickness (hereinafter referred to as t.) 0.45cm. When House II in the 2008 and 09 areas was cleaned so as to carry out the 3D measurement in 2012, it was unearthed with two similar examples from the surplus soil. No examples, excepting the below-mentioned one, are contained in the 2012 finds.

No. 9 is the goddess Isis or Hathor. Not only the body but the crown are lost. The extant dimensions are h. 1.68 × w. 1.13 × t. 1.09cm. Nos. 10–12 are the god Pataikos. No. 10 is from the fill under the topsoil in the east half of Section 8, whose dimensions are h. 3.64 × w. 1.54 × t. 0.86cm. No. 11 is from the surplus soil of the silos situated in the west part of the 2008 area. The upper half of the head is lost, and the extant dimensions are h. 2.57 × w. 1.60 × t. 0.82cm. No. 12 is from the surplus soil of House II in the 2008 and 09 areas, whose dimensions are h. 1.86 × w. 0.97 × t. 0.55cm. No. 13 is the god Bess. It is from the fill under the topsoil in Section 7, whose dimensions are h. 1.79 × w. 0.80 × t. 0.57cm. No. 14 are grouped amulets of faience, Pataikos five, Sobek two, Bess, Udjat-eye and ankh one respectively and the unidentifiable two. The Udjat-eye set at the upper left in the photograph is 0.67cm in width. These amulets were unearthed together from just under the topsoil in Section 3, and are surmised to have formed a necklace. Another example on the cover is the god Harpocrates, whose material is faience. The



**Fig. 10** Pottery from the excavated area.

dimensions are h.  $3.53 \times$  w.  $1.43 \times$  t.  $1.06\text{cm}$ . The beard and the hairstyle are unusual compared to the ordinary Harpocrates.

Nos. 15 and 16 are papyrus fragments inscribed with hieratic, written in black, which are from the fill under the topsoil in Section 8. No. 15 is  $12.3\text{cm}$  and No. 16 excepting small fragments is  $4.3\text{cm}$  in the extant length. The decipherment is proceeding by Mr. Uchida.

No. 17 is a plank, which was unearthed from the surplus soil of House II in the 2008 and 09 areas. The dimensions are l.  $38.3 \times$  w.  $9.8 \times$  t.  $2.5\text{cm}$  and the material is *Suntwood*, one of the many varieties of *Acacia nilotica*. Two mortises, l.  $3.80 \times$  w.  $1.42\text{cm}$ , are preserved. Seemingly it was used as the side board of coffin.

No. 18 is a pointed spatula made of zoological bone, which is from the disturbed soil under the topsoil in Section 5. The dimensions are l.  $10.84 \times$  w.  $1.52 \times$  t.  $0.23\text{cm}$ . One end has multi-stripped lines incised only into the outside. The striped incisions seem to be for tight binding to something by string. Nos. 19 and 20 are points made of zoological bone. One end is pointed, while the other is the joint of a tang and No. 20 preserves glue on it. The glue must have been used as adhesive to stick the tang to a shaft. No. 19 is round and No. 20 is ovoid in the section along the short axis. The former is l.  $8.55 \times$  d.  $0.64\text{cm}$  and the latter l.  $7.33 \times$  d.  $0.74\text{--}0.62\text{cm}$ . Considering that the both tips of No. 20 are lost, these two pieces are estimated to have the same size. They, together with another three pieces of the same size and shape, were unearthed from the fill of the destructive pit covering Sections 8 and 9. All of them seems to be arrow heads.

No. 21 is a flint blade with sawteeth, which is from just under the topsoil in one of Sections 1–4 and 8. The dimensions are l.  $6.49 \times$  w.  $2.34 \times$  t.  $0.64\text{cm}$ . It falls into the tip of sickle blade.

No. 22 is a clay cobra figurine, which is from the destructive pit in Section 9. The crown and the base are lost, and the extant dimensions are h.  $8.59 \times$  w.  $4.53 \times$  t.  $2.57\text{cm}$ . This type of figurine, including the existent examples from Akoris, has already been examined in detail by Mr. Hanasaka (*Preliminary Report 2011*). No. 23 is a clay human figurine, which is from the surplus soil of Room 5 of House V in the 2009 area. The head part is lost and the extant dimensions are h.  $6.18 \times$  w.  $4.08 \times$  t.  $1.79\text{cm}$ . Given that such kind of human figurine is characteristic of our site and the existent examples bear one or two buttons added to the front, this is unusual in the lack of it (*Tsukuba Archaeological Studies 20*). Another clay figurine on the cover is a female terracotta, which is from the destructive pit in Section 9. The upper half is lost and the extant dimensions are h.  $7.34 \times$  w.  $4.04 \times$  t.  $2.42\text{cm}$ . It bears no modeling of legs, and is thickset as well as well-fleshed. The presentation of pubes is subject to the influence of the Bronze and Iron Age terracottas of the West Asia.

No. 24 is a folded lead plate, which is from just under the topsoil in Section 3 or 8. The dimensions are l.  $2.6 \times$  w.  $1.21 \times$  t.  $1.02\text{cm}$  and the weight is  $15.4\text{g}$ . Several similar examples have been unearthed in the South Area, and they are fishing weights according to Ms. Tsujimura's study (*Preliminary Report 2011*).

No. 25 is a wooden spindle, which is from the fill under the topsoil in Section 7. The dimensions are d.  $5.36\text{--}5.28 \times$  h.  $2.31\text{cm}$ , and the diameter of hole is  $0.94\text{cm}$ .

No. 26 is the left sole of leather footwear, which is from just under the topsoil in Section 4.



It has the trace of repair. The extant dimensions are l. 16.7 × w. 10.6cm (*Preliminary Report 2009*).

No. 27 is the neck of pilgrim flask, which is from the destructive pit in Section 8. The rim, the handle of one side and the body are lost, and the present height is 6.3cm. No. 28 is a kind of flask with tubular body. The estimated diameter of the body is 9.4cm. These belong to the Cypro-Phoenician pottery, judging from the form and the clay paste.

I owed the readings of the inscriptions to Mr. S. Uchida, the member of the mission.

(KAWANISHI)

### 3 FAUNAL REMAINS IN THE SOUTH AREA

In the South Area where we have excavated since 2002, a large quantity of faunal remains have been found. They were distributed in almost all of area congested with houses, silos, workshops and tombs mainly dating to the Third Intermediate Period except for faunal remains dating to the Early Roman and the Early Coptic Periods which were found on the shelf of the north crag. To report on these faunal remains we started an investigation in this season. Therefore, this report does no more than give an outline based on the identification of faunal remains found in 2002–2004 and 2012, without either measuring or detailed observations.

#### Faunal remains in 2012

**Mollusk** A few bivalves and cowries brought from the Red Sea or the Mediterranean were found. These cowries were used as amulets.

**Fish** *Clarias* sp. 5, *Synodontis* sp. 4, *Tilapia* sp. 3, *Lates Niloticus* 2, unidentified 1. Both *Clarias* and *Synodontis* are varieties of catfish.

**Mammals** Almost all bones are those of cattle, caprines (sheep/goats) and pigs. There are many juveniles with infused epiphyses in the bones, particularly in pigs. That means pigs are superior to cattle or caprines in reproduction. Pigs provided meat and fat, lard, for use in cooking. Cattle provided meat, milk, manure and fuel made of their dung. Goats provided not only meat and milk but also pelts for leather sandals or shoes made at a workshop on the north slope of the north crag. In addition, very few dog and ass bones were found.

**Reptiles** A large carapace measuring 32cm × 38cm of soft-shell turtle (*Trionyx tringuis*) was found near a cooking pot. A few small other pieces were unearthed from the excavated area.

**Fowl** A piece of a femur which was possibly a fowl was found.

Though faunal remains in 2003 and 2004 date throughout the TIP compared to faunal remains found in 2012 which were unearthed from the upper layer dating to the latter half of the TIP, the 8–7 centuries B.C.. Most of the mammal species observed in both the upper and lower layers are in common. The majority

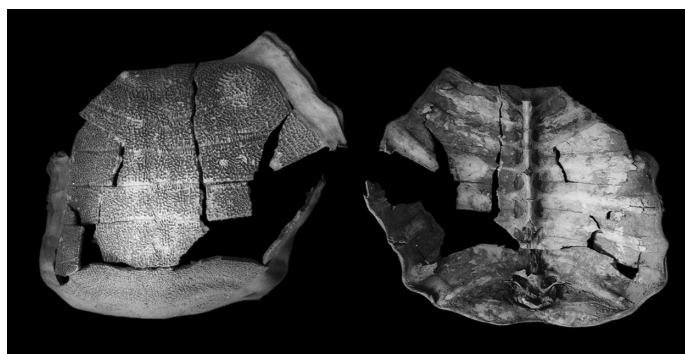


Fig. 11 Turtle from Section 9.

of mammals are cattle, caprines and pigs, with pigs predominating in quantity among them in 2003. There was a burned pig bone found in 2004. In addition, the bone of a hare (?) was among them in 2004. Soft-shell turtle and fowl bones were not found in 2003 and 2004.

The above-mentioned species are almost the same as the faunal remains dating to the Late and Ptolemaic Periods in el-Hibeh<sup>1)</sup>. Redding who investigated the faunal remains pointed out that cattle taking up half the number were more important contributors of meat to the diet than caprines or pigs. On the other hand, the quantity of cattle is not prominent comparing to pigs and caprines in the South Area in Akoris. It indicates that pigs and caprines played a major role as well as cattle in the subsistence economy of the inhabitants of Akoris.

Though gazelle bones identified in el-Hibeh were not found in the South Area, some were buried beside an adult female in the No. 21 tomb in the west necropolis of Akoris (*Preliminary Report 2006*). Both gazelle and soft-shell turtle provide delicate meat, but they were not consistently captured. Moreover, the meat of a soft-shell turtle is a little for its size. If we pay attention to collagen, more is found in the meat and plastron of soft-shell turtles than in tendons or bones of cattle or caprines. It is possible that soft-shell turtles were used to make glue rather than to provide meat.

Fish bones, mainly catfish, were not rare. In addition, many kinds of fishing tackles including harpoons and large fishhooks used by professional fishermen were found. Wilson noted that fowl was as common as fish was the basic animal protein sources for the most Egyptians<sup>2)</sup>. Bird bones unearthed, however, were very few comparing to fish bones in the South Area.

### **Faunal remains in 2002**

Many pieces of faunal remains and charcoal were found concentrated beside some stairs on a shelf at the top of the north slope leading to the crag. The faunal remains are mainly cattle, caprines and pigs, in which juveniles are a majority. In addition, the Early Roman pottery dated to the 1st–2nd centuries, faience vessels and pottery with barbotine, and the early Coptic lamps dated to the 3rd–4th centuries were scattered around the area. Considering the relief of the Roman twin gods Dioscuri leading a horse and their sister Helene or Artemis between them carved on a steep precipice above the stairs, the Egyptians easily accepted the cult of Dioscuri syncretized with Sobek having the same power to control safe navigation. They burned and offered animals to the gods as sacrifices in the same way as the Greek/Roman did.

Though the Egyptian/Roman pagan religion gradually declined by orders forbidding pagan rites accompanied with sacrifices and closing temples after the Edict of Milan was issued in 313, pagans still kept enough influence to cause a riot against Christians in Alexandria in 391. The subsequent worship of the Egyptian/Roman gods/goddesses probably continued until the Abbot Shenute and his monks began a radical religious movement including destructions of temples in middle Egypt, however, the rite accompanied with sacrifice in Akoris became obsolete before the 5th century.

### **Discussion**

According to Herodotus, offering pigs as sacrifices to the Divines was forbidden except for the festival of the Moon Goddess Selene and Dionysus because pigs were supposed to be a defiled animal in the Pharaonic Period<sup>3)</sup>. On the other hand, documental records informed that some New

Kingdom kings offered gifts of a large number of pigs to temples<sup>4)</sup>. Wilson grasped large quantities of pig bones found at Kafun, a town for workmen building the pyramid, and at the workmen's village in Amarna as a major feature in the diet of the working-class<sup>5)</sup>. A pigpen found at the workmen's village strengthens the relation between pigs and the working-class<sup>6)</sup>. But faunal remains in public/elite areas as opposed to in the working-class areas were not specified. Zeder described a similar idea based on hierarchy at Tell Leilan dating to the Bronze Age in the Northern Syria<sup>7)</sup>. Comparing faunal remains between the upper town by public/elites and at the lower town occupied by humble residences in the site, the difference of the ratio of pig in each town is less than 15%. Although pig remains, which were almost all juvenile, found in the upper town were probably taken from the swine production in the lower town residents, pigs and caprines played a significant role in the diet of the elite-class as well as the working-class.

In the Levant, the ratio of pigs far exceeded cattle in faunal remains at sites dating to the Bronze Age but dropped to no more than several percents compared to caprines and cattle which dominated in the Iron Age. Pig finally disappeared, probably due to pork avoidance in the Mosaic ban, during the Iron Age at Aphek-Antipatris<sup>8)</sup>. However, the ratio of pig rapidly increased and reached 30% from the second half of Hellenistic Period onward at Anafa<sup>9)</sup>, 20% in the Byzantine Period at Tel 'Ira<sup>10)</sup>. A similar change in the Levant seems not to have happened in Egypt, but the raising of pig thrived there until the eating of pork was prohibited in the Islamic Period.

(TSUJIMURA)

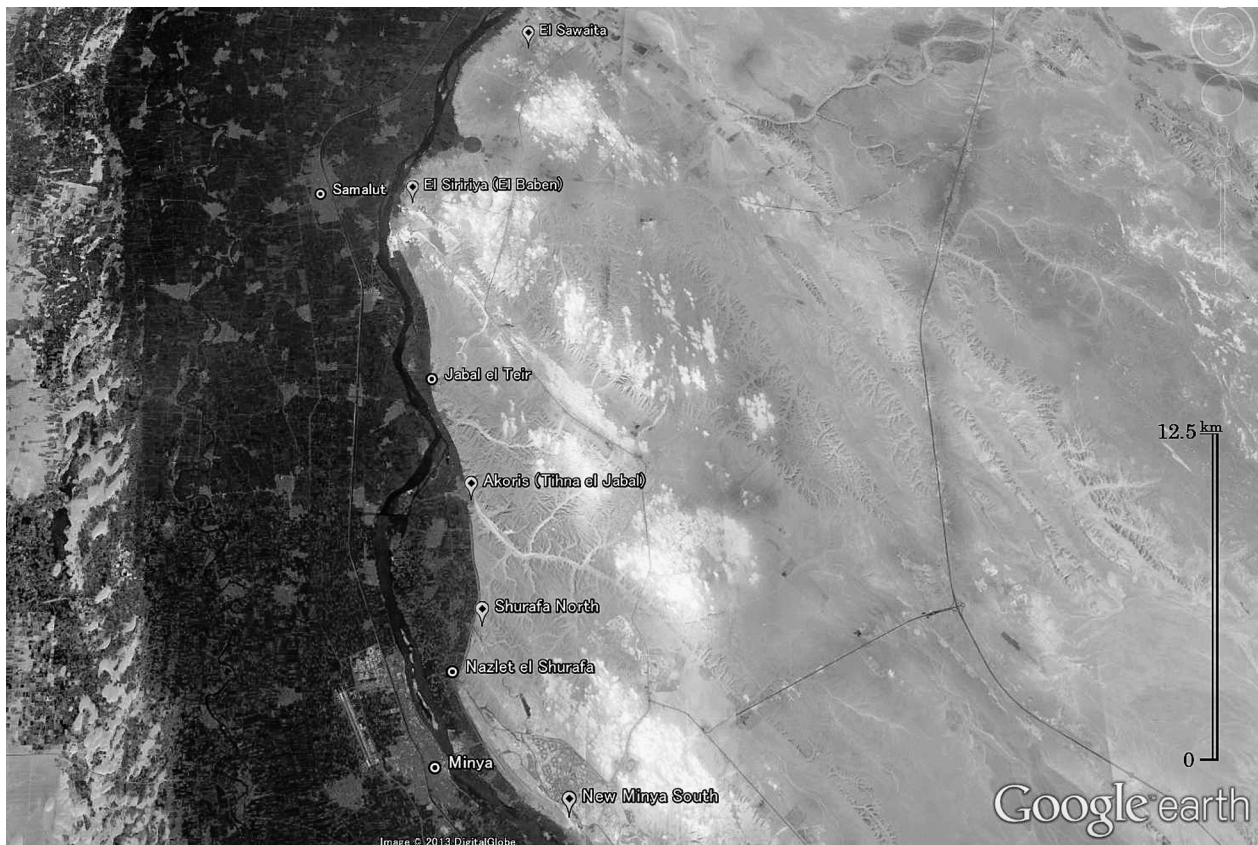
## Notes

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- 2) Wilson H., *Egyptian Food and Drink*, Bucks, 1988. p. 35.
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- 6) Hecker, H. M., Report on the Excavation of Floor [873] of the Outer Hall of Chapel 561/450. In *Amarna Report III*, Kemp, B. J. (ed.), 1986. pp. 80–89; Heiden, L., Report on the 1986 Excavations The completion of the Main Chapel and Further Examination of Animal Pens 300, In *Amarna Report IV*, Kemp, B. J. (ed.), London, 1987. pp. 56–69.
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## 4 FIELD SURVEY OF ANCIENT QUARRIES NEAR AKORIS AND NEW MINYA

A field survey conducted in 2012 has provided valuable information about the distribution and the present state of the ancient quarries located on the east bank of the Nile in the vicinity of Akoris. The following four quarries were briefly investigated: New Minya South quarry, Shurafa North

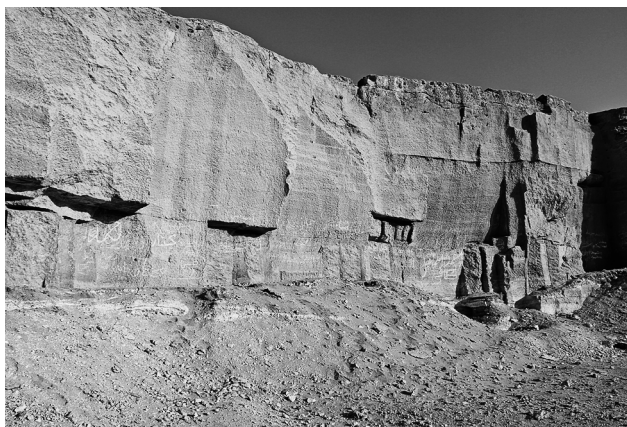




**Fig. 12** Map indicating the surveyed quarries.



**Fig. 13** Incomplete stela at the New Minya South quarry.



**Fig. 14** Wall at the New Minya South quarry.



**Fig. 15** Small holes at the New Minya South quarry.



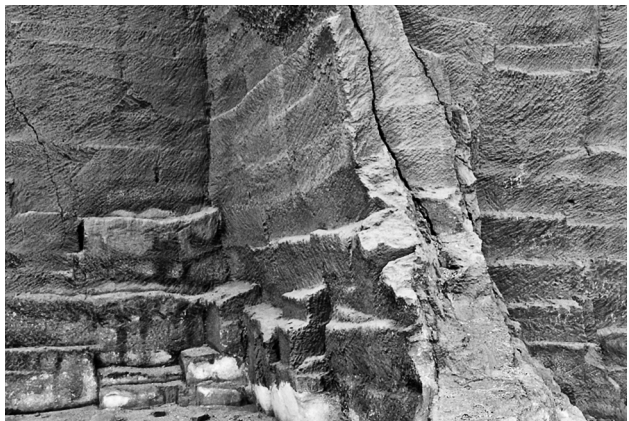
**Fig. 16** Shurafa North quarry.



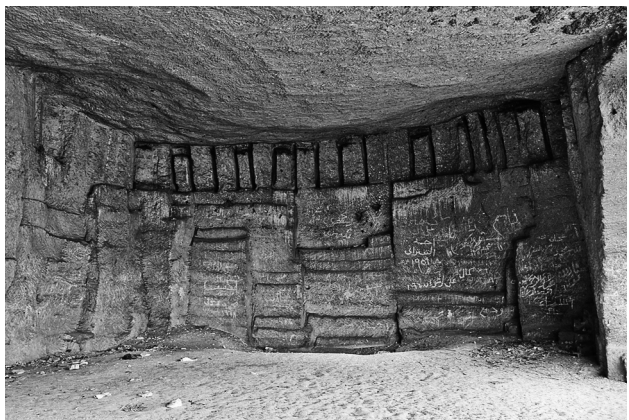
quarry, El Siririya quarry, and El Sawaita quarry (Fig. 12). While some of them have been reported in R. Klemm and D. D. Klemm, *Steine und Steinbrüche im Alten Ägypten* (Berlin, 1992), our survey aims to observe characteristics of the quarries in order to compare them with those of the Akoris and New Minya quarries. A comparison of the manners of quarrying employed in each site shows both similarities and differences. As far as judged by existing remains, it is highly unlikely that all the quarries were operated simultaneously, and it seems that Egyptians in this region concentrated on one or a few quarries at the same time and moved to new quarries once older sites were exhausted. The following is a description of the four quarries and some remarks on them.

The New Minya South quarry is situated 2km southeast of the New Minya quarry, and Klemm and Klemm discuss these two quarries together. The New Minya South quarry was made along a small wadi which flows from northeast to southwest, and the eastern side of the wadi was more extensively quarried than the western side. The existing remains are mainly observed on vertical walls, and an incomplete stela of uncertain date is found on a wall on the eastern side (Fig. 13). There are traces of extraction of small blocks from horizontal galleries, which are also observed in the New Minya quarry (Fig. 14). In general, however, quarrying techniques employed in this site are different from those in New Minya in spite of their spatial proximity. Unique remnants at this quarry are small holes pierced on vertical walls (Fig. 15). Ropes might have been passed through the holes, but they could not be thick because the holes are only a few centimeters in diameter. According to Klemm and Klemm, the quarry was mainly operated during the New Kingdom, but undercut walls belong to the Ptolemaic period and there are Byzantine chisel marks.

The Shurafa North quarry is located 6km south of Akoris. Klemm and Klemm do not refer to this quarry area. The Shurafa North quarry consists of a series of open-air quarries on the north bank of a large wadi running from southeast to northwest. The quarry at the exit of this wadi, which had been investigated in 2003 (Preliminary Report Akoris 2003, 19–23, Fig. 17),



**Fig. 17** El Siririya quarry.



**Fig. 18** Gallery of the El Siririya quarry.



**Fig. 19** El Sawaita quarry.

turned out to be a tiny fraction of this huge quarry complex. The main quarries stretch more than 1,400m along the wadi. There are two branches of the wadi on the north sides and the both sides of the branches have traces of extensive quarrying. Fissures were avoided where stone blocks were to be quarried and they sectioned the vast area into small quarries (Fig. 16). Most vertical walls have horizontal lines or shallow steps with a space of 30 to 50cm (cover). There is no trace of a horizontal gallery.

The El Siririya quarry, situated 14km north of Akoris, is famous for a large stone block named El Baben (the twin gate) left in the quarry, the chapel of Merenptah, and the stela of Rameses III, as Klemm and Klemm report. Vertical walls of the quarry have steps, and fissures are left untouched (Fig. 17). There is a cave-like gallery and it was attempted to extract small blocks from bedrock (Fig. 18). According to Klemm and Klemm, the quarry was operated from the Old to New Kingdoms.

The El Sawaita quarry is located 21km north of Akoris. This large open-air quarry area exists between two wadis, both of which flow from southeast to northwest. The long side of the area parallel to the wadis measures about 1,000m and the short side about 300m. The area is extensively exploited but fissures are avoided (Fig. 19). Like some of the above-mentioned quarries, walls of the quarry have conspicuous horizontal lines and steps. There are a few graphical inscriptions. According to the observation on chisel marks made by Klemm and Klemm, the quarry was operated from the New Kingdom to the Late Period and quarrying became less extensive by the Roman period.

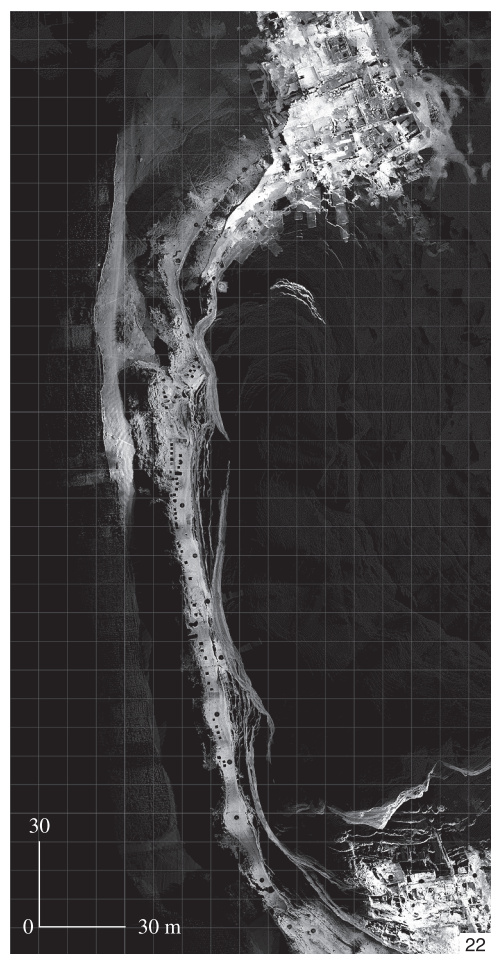
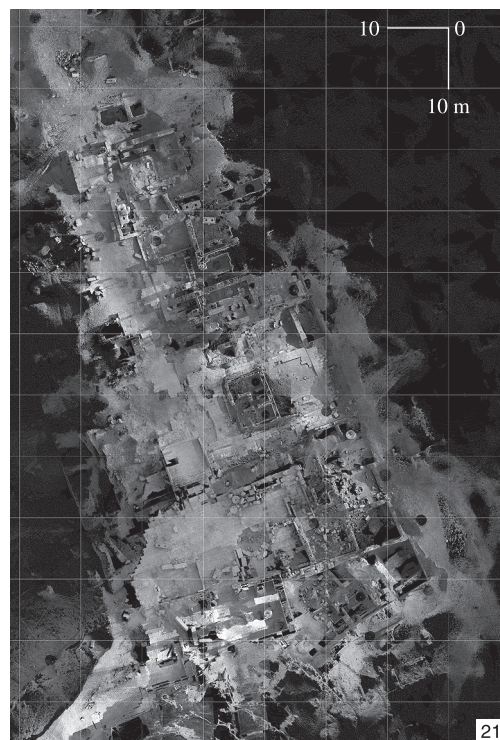
These four quarries have both similarities and differences. All of them and the two quarries of Akoris and New Minya were carefully exploited by avoiding natural fissures. Quarrymen of all the quarries did not waste their time to remove useless stone. When we focus on the differences, however, it is impossible to conclude that homogeneous quarrying methods were applied for all the sites. Some characteristics are not shared by all the quarries. Horizontal galleries made to extract small blocks are found only in the quarries of New Minya South and El Siririya as well as in those of Akoris and New Minya. Walls with conspicuous horizontal lines or steps are observed in the quarries of Shurafa North, El Siririya, and El Sawaita. They are not found in the quarries of Akoris and New Minya, and in only a small part of the quarry of New Minya South. Furthermore, the four quarries surveyed in this season provide no graffiti, which are found in the Akoris and New Minya quarries. All of these differences among the quarries suggest that the quarries near Akoris were not operated simultaneously and employed different methods respectively. (SUTO and TAKAHASHI)

## **5 LASER-SCANNING AT AKORIS**

During three seasons (from 2010 to 2012), the investigation of Akoris and surrounding ancient quarries has been carried out by Prof. Yoshiki HORI, that provided important new evidence for its city fabrics, topographical features, and urban development in the final.

The site Akoris is considered to be one of the best preserved and most notable mud-brick structure in Egypt. To facilitate the management and conservation to ensure its survival for future generations, an accurate record of the site and surrounding landscape including ancient quarries was urgently deemed necessary. Our requirement was to laser-scan the entire archaeological site





**Fig. 20** Plan and elevation of the scanned areas (on 10m by 10m grid). A: Hypostyle Hall and Western Temple area; B: Rock-cut tomb area; C: South Area; D: South Quarry area.

**Fig. 21** Plan of Hypostyle Hall and Western Temple area in *Akoris* 1981–1992 (on 10m by 10m grid).

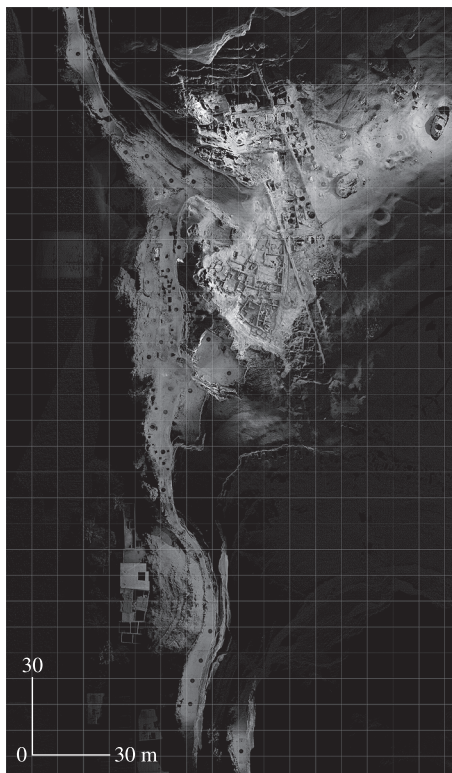
**Fig. 22** Plan of Rock-cut tomb area (on 10m by 10m grid).



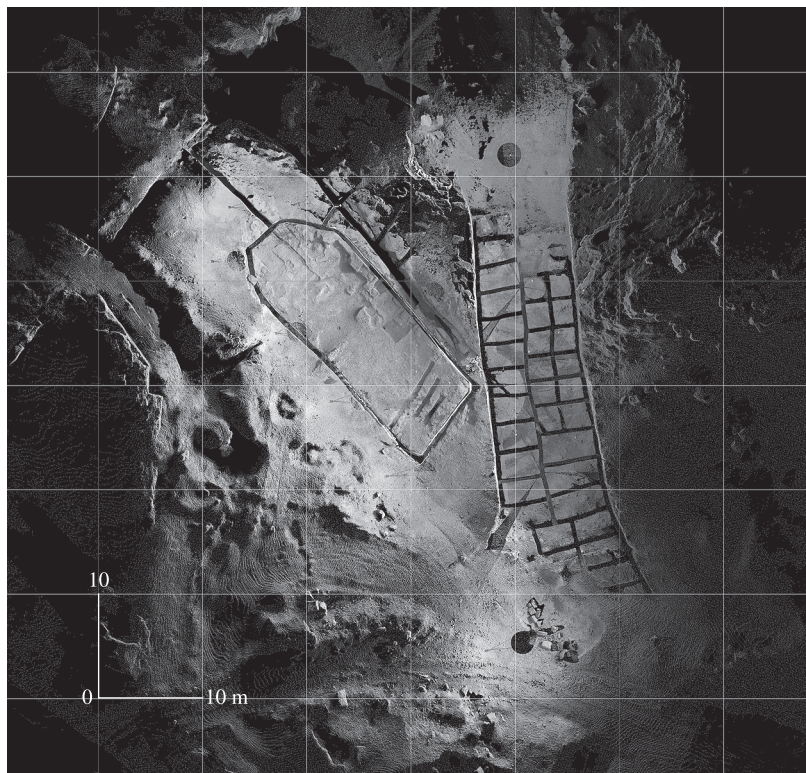
and the surrounding landscape. Laser scanning is best suited to the recording of surface information, rather than to edges and discrete points, although it is increasingly used to generate two dimensional drawings in the form of plans, elevations, and cross-sections (see Figs. 20 to 23, Fig. 31). And laser scanning was considered the most effective method for recording the irregular and exposed surface of that archaeological site mostly covered with mud-brick structure.

We applied two types of laser scanner; long-range (100–300m) and middle-range (2–100m). As a long-range scanner, Iris can record objects over 500m away, but is limited to angle of 40 degrees and only capture 2000 points per second. The resulting image for such a distance is produced in a low resolution, and is thus not suitable for the investigation of buildings or field surveys, but can still be used for geographical surveys, such as the work We undertook in 2011 (Fig. 20). Furthermore other important requirement of the specification was to ensure that a laser scanner can provide measurements to an accuracy of less than 2mm and point densities of around the same scale, so Focus 3D would be ideal for recording of small artefact, such as mud-brick walls. To meet this specification we used a mid-range Focus 3D, which can emits laser lights 3.0mm in diameter and can capture two points maximum 6.0mm apart on an object that is 20m away, chosen for its high point density (maximum 967,000 points per a second) and accuracy of 2mm at 25m away from the machine, as well as for its mobility of 5kg in the weight to scan (Fig. 32).

Laser scanning provides us with a new dimension in archaeology and architectural history. We introduced that technology at Akoris from 2010 to 2012 and a detailed analysis will be made of all the point cloud, which records three-dimensionally its archaeological remains as below.



**Fig. 23** Plan of the South Area (on 10m by 10m grid).



**Fig. 24** South Quarry area (on 10m by 10m grid).



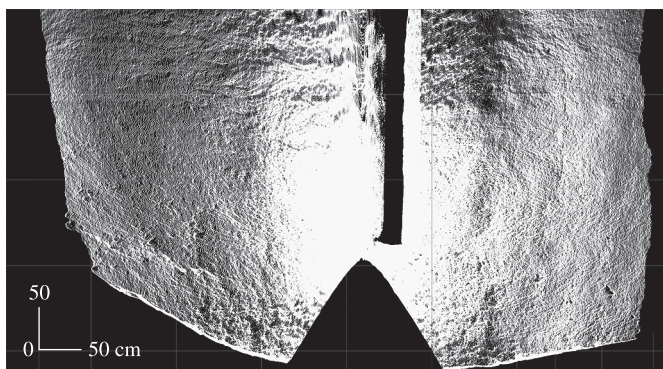
**Revising and expanding a map published in 1992** The walls in the Western Temple area were once completely measured using a plane table on which a detailed map of the area was published in 1992 drawn at a scale of 1:20. In 2002, we started the excavation at the south area, which consists a small platform between mountains flanked to the east by a wadi and to the west by the fertile lands of the Nile Valley and which gently slopes southward on the mountainside facing towards the far-south mountain (Figs. 21 and 39). By 2012, the whole excavated area between the south and far-south mountains had been covered by mud-brick structures. The city of Akoris spread beyond the south mountain, of which the north side provided the hypostyle hall and the western temple altered from rock-cut tombs (Figs. 21 and 22). The map including this main area of the city should be expanded over the south area (Fig. 23).

An ancient quarry approx. 1.5km south from Akoris (Figs. 24 and 33), which is located more specifically according to the need for working labours and space, was a part of the suburban district of Akoris running from hilltops and hillsides into plateau of that city. A secondary goal will be to research and identify measuring methodologies that cannot only be applied to the architectural or archaeological analysis of digital survey data of point clouds, but also to the management of the future heritage site.

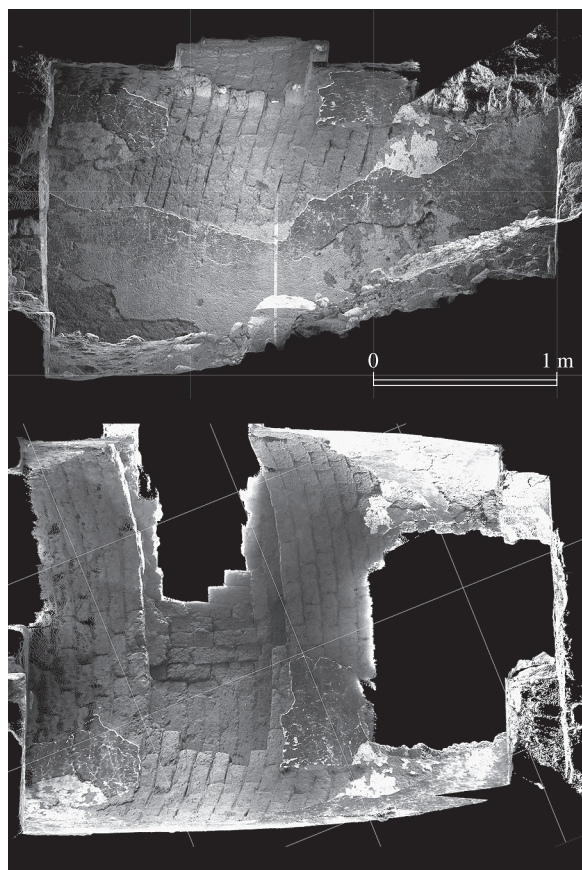
**Recording of chisel marks** In 2001 we set about a investigation of the ancient quarry which was located to the top plateau 300m south from the mountain raising on the southern end of expanded area of the city of Akoris. In this southern quarry area, a stone block for a colossus under the extraction by cutting-trench more than 6m in depth was found. Observing the sectional shapes provided from by the point cloud data, and along with the chisel marks (Figs. 25 and 34), will give us the understanding about the process needed to shave off the stone block into a polygonal section. The project aimed to test the potential of laser scanning to enable the recording of tool marks that survive on the surface of the wall and stone blocks, has been begun in 2012. Probably the recorded tool marks will indicate the introduction of differently shaped tools, such as pointed, flat and saw-toothed chisels.

**Recording of mud-brick (sun-dried brick) structure** In Akoris, all of domestic architecture has been constructed with mud-brick. The bricklayers in the ancient period worked very much as do their modern counterparts, except that instead of mortar, they laid in mud identical with that from which their bricks had been produced, before it was hardened, it united with the adjoining bricks, so that all cohered as an entity. The masonry of the wall was generally rough-faced comparing that of the burnt-brick wall. Fortunately builders in Akoris did not plastered all the face of mud-brick wall (Figs. 26 and 35), which therefore is indicative of joints by a grid, which would actually be too close together to be marked by a tape without falsifying the scale. Probably more productive mud-bricks, cast in rectangular wooden moulds, were, however, used in Akoris for hundreds of years (Fig. 36). The precise measurements of mud bricks tended to become standardised for each area in a given period, the limit on size being the weight readily handled by a bricklayer, as is still the case in the modern period. Ortho views of the wall by laser scanning can provide much information about the dimension of mud-bricks (Fig. 27).

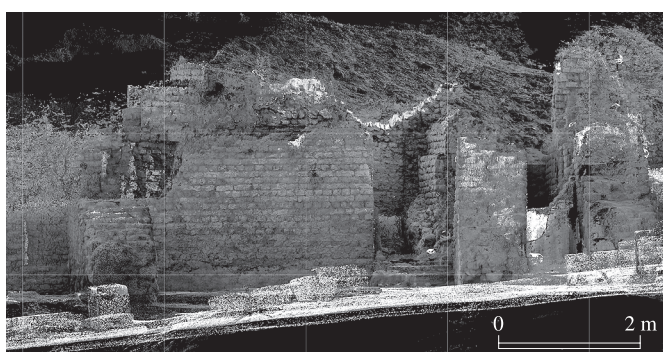
And so long as they relied on uncut mud-bricks to compose an entire wall, they obtained



**Fig. 25** Chisel marks on the surface of the cutting-trench (on 1m by 1m grid).



**Fig. 27** Cross-Sections and Vaulted ceiling of Mud-brick structure in Building 8 in *Akoris* 1981–1992 (on 1m by 1m grid)



**Fig. 26** West Elevation of the Mud-brick structures of Buildings 8 and 9 in Hypostyle Hall and Western Temple area in *Akoris* 1981–1992 (on 2m by 2m grid).



**Fig. 28** Mud-brick structure in the South Area (on 2m by 2m grid).



**Fig. 29** Relieves in Chapel F in *Akoris* 1981–1992 (on 1m by 1m grid).

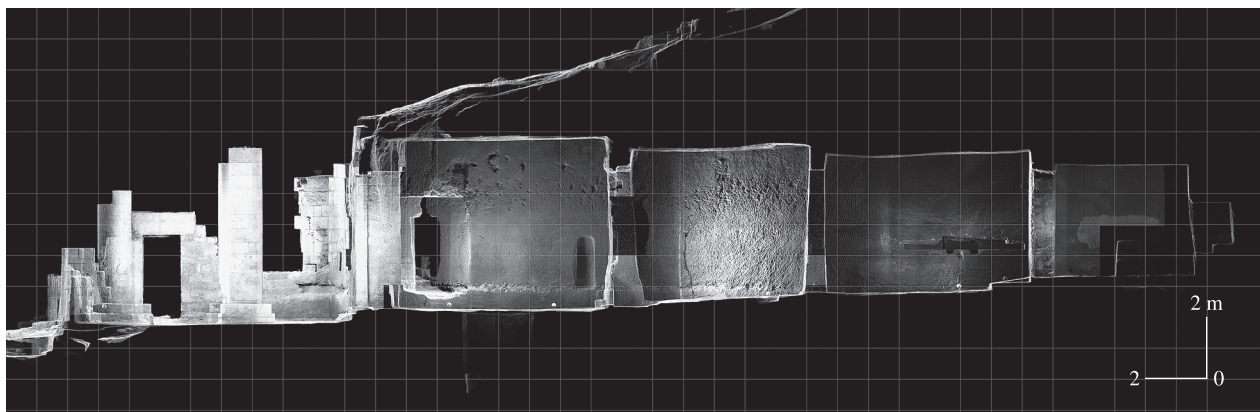


automatic buttressing by means of a sinuous outline, to which overlying brickwork and joining mud could be adjusted without slight difficulty and deliberated plan (Fig. 28).

For simple linear structures, records made by hand with scale plans, cross-sections and levels, which can be used in tandem with the photographic record, will usually suffice. However, for recording complex curvilinear structures, such as vaults, large urban buildings, and detecting subtle variations in a surface, like the mud-brick walls of Akoris (Figs. 26–28 and 37), laser scanning is essential, contributing a detailed three dimensional record in which we can observe structural features that might be overlooked or go unnoticed in alternative forms of recording. Laser scanning is able to show that the phasing and technological data provided by hand-drawn plans is in many cases simply wrong. Unfortunately, 19th and even 20th century publications by some of the finest scholars using the plane table and photos with a scale bar we have known simply cannot be trusted in detailed features of the surfaces, such as chisel marks. But laser scanning can also provide further types of technological and decorative information not visible to hand-drawers and photographers, such as tools marks, relieves (Figs. 29 and 38), mortar traces (Fig. 30), and new ways of viewing walls which take account of micro-elevations, or can see through structures to compare the structural fundamentals of buildings, such as how walls belonging to the different periods align with each other. The great potential of digital data makes many views possible that no human surveyor could ever have achieved.

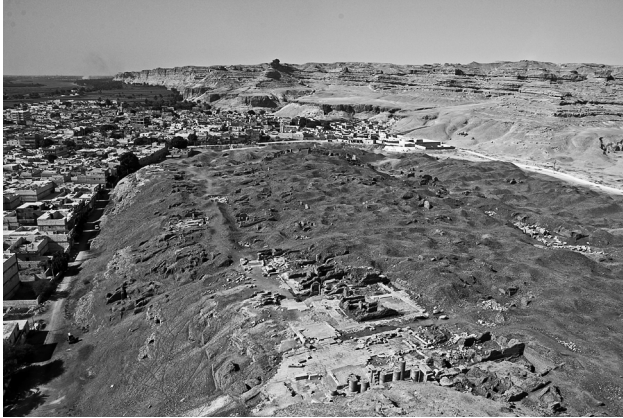
Finally, there is always the danger of over-simplification when identifying and recording features by handheld tapes or even by total station, which would take far too long to use to record anywhere near the required number of points.

However, the ability of laser scanners to accurately record objects in three dimensions, down to their most intricate details, is unlike anything available to archaeologists in the 20th century. From a single object to entire buildings, archaeological material can be reproduced by laser scanning in fascinating, highly detailed digital images that will provide new and exciting avenues of research while giving us a new perspective on the past. While this method has its benefits, and undoubtedly many archaeologists and surveyors take great care in their work and produce very accurate plans, orthographic photos and point clouds can also be implemented in the recording process to great effect.



**Fig. 30** Cross-Section of Chapel A in *Akoris* 1981–1992 (on 1m by 1m grid).





**Fig. 31** General view of the main city zone.



**Fig. 32** 3D laser scanning.



**Fig. 33** South Quarry.



**Fig. 34** Trench around the stone block for colossus.



**Fig. 35** Mud brick structures.



**Fig. 36** Modern mud brick making scene.



**Fig. 37** Vaulted ceiling.



**Fig. 38** Entrance of Chapel F in *Akoris* 1981–1992.





**Fig. 39** General view of the South Area, from north.

We are likely to be missing many of the original cues both because we cannot pick up and interpret every detailed feature, and also simply because of partial and limited recording and preservation of the original structures. Regardless of laser scanner or total station, when detailed measuring takes place, the recording conditions should be noted, hopefully, in the same beautiful state of preservation as when first exposed in the ground. We are facing the risk that the whole mud-brick structure might revert to mud necessitated precautions at every level. A point-cloud record of these objects, which has been collected in 2012 and next several years, will help us preserve the information, so even if the object is no longer available an exact digital replica can be provided for future reference. (HORI)

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