

# A short note on contexts and chronology of the materials from Saidu Sharif, Amluk-dara, Gumbat and Barikot (Swat)

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*opposite page*

**Fig. 6**  
Stucco decoration of  
Stupa 61 (Period II)  
(photo by L. M. Olivieri;  
courtesy ISMEO).

## Abstract

The following note is meant to integrate the data of the materials discussed in three contributions published in this issue of «Restauro Archeologico» (Bona-duce et al., this issue; Festa, Pannuzi, this issue; Rosa et al., this issue; Zamin-ga et al., this issue). The analysed materials were sampled from three Buddhist cultic complexes in the Swat Valley in the outer Gandharan region (nowadays in Pakistan). The three sites are Saidu Sharif I, Amluk-dara, and Gumbat. Other samples were taken from a votive chapel (Shrine 1023) of the urban settlement of Barikot in the Swat Valley. All the samples belong to the same chronological phase (3rd century CE).

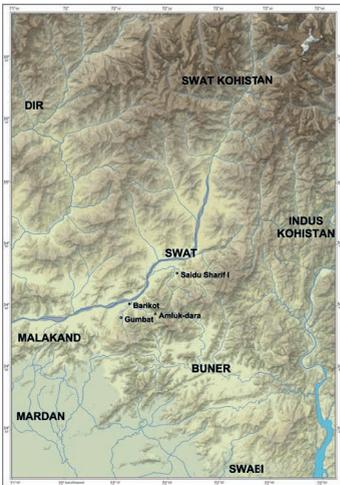
## Introduction

The information here briefly presented, are meant to provide the contexts of the samples analysed in four contributions published in this issue of «Restauro Archeologico». Interestingly, all the samples considered belong to same late Kushan/Kushano-Sasanian acculturation phase (or Macrophase 5; second half of the 3rd century CE).

Three of the four sites described here (Amluk-dara, Gumbat and Barikot), two Buddhist sacred areas and a large settlement, lie at five km distance on the middle stretch of the Swat valley (left bank) (Fig. 1). The fourth site (Saidu Sharif I), a Buddhist sacred area, is located a little bit further N (c. 20 km from Barikot).

Most of the descriptions here presented, as well as the discussion on the technical issues related to the Main Stupa of Amluk-dara, are modified and abridged versions of my previous contributions (Olivieri, 2011 [2015]; Olivieri, 2016; Olivieri, 2018; Olivieri et al., 2014). At the end of the text I have also briefly elaborated on some specific aspects connected to the complex processes of building, decorating and painting Buddhist monuments in Swat.





**Fig. 1**  
Map of Swat (Courtesy ISMEO; Map by K. Kriz an D. Nell, University of Vienna, Department of Geography and Regional Research).



**Saidu Sharif (Fig. 2)**

The Buddhist sanctuary of Saidu Sharif I was excavated between 1963 and 1982 by Domenico Faccenna (1995). Some sectors were left unexcavated in 1982. After 30 years these surviving stratigraphies were nothing but shapeless eroded amount of debris (Olivieri 2016) (Fig. 3). It was therefore decid-



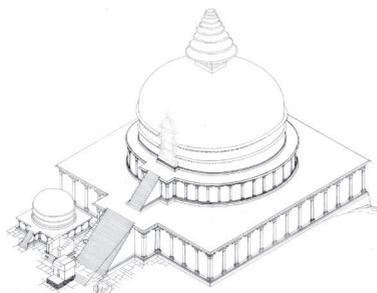
ed to dig them up in order to clear the area and control the stratigraphical deposit of these sectors. One of the areas left unexcavated was immediately to the W side of Vihara 54. The latter is located at the N end of the Stupa Terrace (Faccenna, 1995, pp. 360-368). The two tiny fragments discussed by Zaminga et al. (see *infra* this issue) were recovered in layer (6) between the

**Fig. 2**  
The Stupa Terrace of  
Saidu Sharif I  
(photo by Fazal Khaliq).

**Fig. 3**  
Vihara 54 before the excavation (photo by L. M. Olivieri; courtesy ISMEO).



**Fig. 4**  
Vihara 54 after the excavation (photo by L.M. Olivieri; courtesy ISMEO).



**Fig. 5**  
AKDI sacred area:  
axonometry (from WNW)  
(drawings by F. Martore;  
courtesy ISMEO).

collapse of Structure 82 (Faccenna, 1995, pp. 401-402) and Floor F3R, in a phase corresponding to the end of Period II/beginning of Period III (c. second half of the 3rd century CE) (Faccenna, 1995, p. 426) (Fig. 4). Both fragments can be tentatively reconstructed as parts of a miniature stupa originally housed inside Vihara 54.

#### **Amluk-dara (Fig. 5)**

The Buddhist sanctuary of Amluk-dara has been extensively discussed in recent publications (Olivieri, 2018; Whitfield, 2018). The site has an extension of approx. 25,000 m<sup>2</sup>. Near the SE limit of the area, a cluster of boulders were in ancient times arranged in order to dam up a stream so as to

create an artificial water reservoir. The site is divided into four terraces. The monastery was possibly in the uppermost terrace, while the Main Stupa is located on the westernmost of the three lower terraces. The extension (200 m<sup>2</sup>) of the excavated area, roughly corresponds to 1/6 of the total surface of that terrace. Three ancient quarry areas were found nearby the site (phyllite and granite).

For a review of the site and its role in the ancient pilgrimage's network, see the contribution by S. Whitfield (2018). A revised version of the final excavation report has been recently published (Olivieri, 2018).

### *The Main Stupa* (Rosa et al., this issue)

The monument is a stupa square in plan with a stairway on its N side, with a 2nd stairway with the 2nd storey along the same axis. The monument was more than 30 m high (including the chattravali).

The podium or the 1st storey is 32 m long and 6.5 high. The base is decorated with a low plynth with a torus-type moulding. The cornice is decorated with a series of plain pilasters with Gandharan-Corinthian type capitals supporting modillions. The upper cornice is formed by a row of false brackets (cyme reversa type) supporting projecting slabs. The same decoration (pilasters with Gandharan-Corinthian capitals, modillions, brackets and coping slabs) is used in the first cylindrical body of the stupa (2nd storey). The 3rd and 4th storeys show only a row of false-brackets supporting the coping slabs. The presence of these coping slabs, instead of a simple cornice, may be explained by the fact that the surfaces underneath were not only plastered, but also painted.

The masonry is completely made of isodomic blocks of local granite arranged in ashlar technique, with spaces filled with schist flakes. Pilasters (bases, shafts, capitals), modillions, and brackets are made in kanjur (organogenic limestone, not local); projecting slabs are in schist. The original granite pillars survive in some elements of the 2nd storey. The entire surface of the Main Stupa was plastered (and ample traces of plaster still survive).

**Table 1**  
List of Samples with calibrated dates (CEDAD, Università del Salento).

Source	Description	Code	Radiocarbon Age (BP)	$\delta^{13}C$ (‰)	Calibrated dates (confidence level 2 $\sigma$ )	Calibrated dates (OxCal 4.2.2)	AKD Period
AKD I SU (66)	Charcoal	LTL12769A	1771 ± 45	-19.8 ± 0.4	130AD (95.4%) 390AD		II-III
AKD I SU (116)	Charcoal	LTL12771A	1690 ± 45	-20.0 ± 0.3	230AD (95.4%) 440AD		IV-V
AKD I SU (136)	Charcoal/ animal bones	LTL12770A	1227 ± 40	-18.3 ± 0.6	680AD (95.4%) 890AD	685 - 895cal AD	VI-VII
AKD I SU (110)	Animal bones	LTL12766A	1354 ± 30	-19.3 ± 0.5	620AD (89.4%) 720AD 740AD (6.0%) 770AD		VII
AKD I SU (66)	Animal bones	LTL12773A	1291 ± 35	-15.5 ± 0.5	650AD (94.0%) 780AD 790AD (1.4%) 810AD	660 - 825cal AD	VII
AKD I SU (76)	Animal bones	LTL12767A	1102 ± 35	-21.8 ± 0.5	870AD (95.4%) 1020AD	835 - 1015cal AD	VII (final)

Fig. 7  
Sampling area of sample  
AKD 2: stairway, side E  
(photo by L. M. Olivieri;  
courtesy ISMEO).

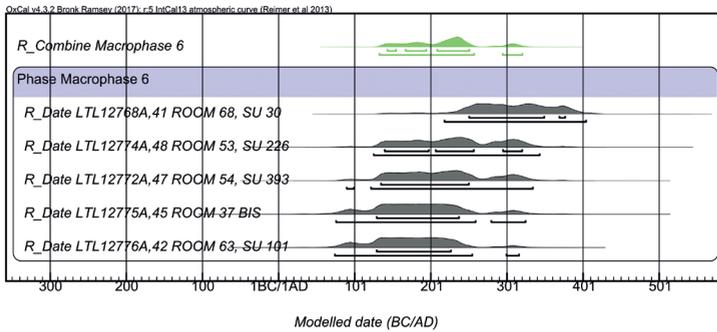
The core of the monument is composed of horizontal courses of stones and horizontal thick courses of mortar (c. 0.10-0.15 t). The mortar is made of compact layers of yellow purified clay with thick inclusions (mostly limestone or *kanjur*).

Sample AKD 2 was sampled from the plastered surface of the E side of the 1st stairway (Figs. 7, 9). From the W side of the same were sampled Samples 4 and 5 (Fig. 8).

*Shrine 60* (Bonaduce at al., this issue; Festa, Pannuzi, this issue; Rosa et al., this issue)

The monument (see Figs. 5 and 9) is coeval to the Main Stupa. “The monument [60] is a square shrine with door opened to NNE. The external surface is practically all covered by a plaster with stuccoed colored surface. It is composed of a podium with base, torus, projecting fillet, reverse sloping fillet, and a band, with a superimposed second torus with cavetto on fillet. The cornice of the podium (lower part) is composed of a band with upper fillet, cyma recta and final band. The upper fillet is decorated with a row of bead-and-reels; the cyma recta, with lattice with oblique fillets and oblique parallel rows (straight and curvilinear, alternating); the fields between the fillets is colored red. The upper part of the cornice is decorated with a row





**Table 2**  
 BKG Period IX = Macrophase 6  
 (modelled by CIRCE/Innova,  
 Università della Campania  
 "Luigi Vanvitelli";  
 data generated by CEDAD,  
 Università del Salento).

of Gandharan-Corinthian S-shaped pillar type brackets supporting a flat band surmounted by a reverse ovolo and a fillet. The fields between the brackets are colored yellow. The base of the body is marked with a band surmounted by torus, fillet and cyma reversa" (Olivieri, 2018, p. 36). Samples AKD 13C and 14C were collected from the S (back) side of Shrine 60 (Fig. 9).

#### *Structural and decorative phases*

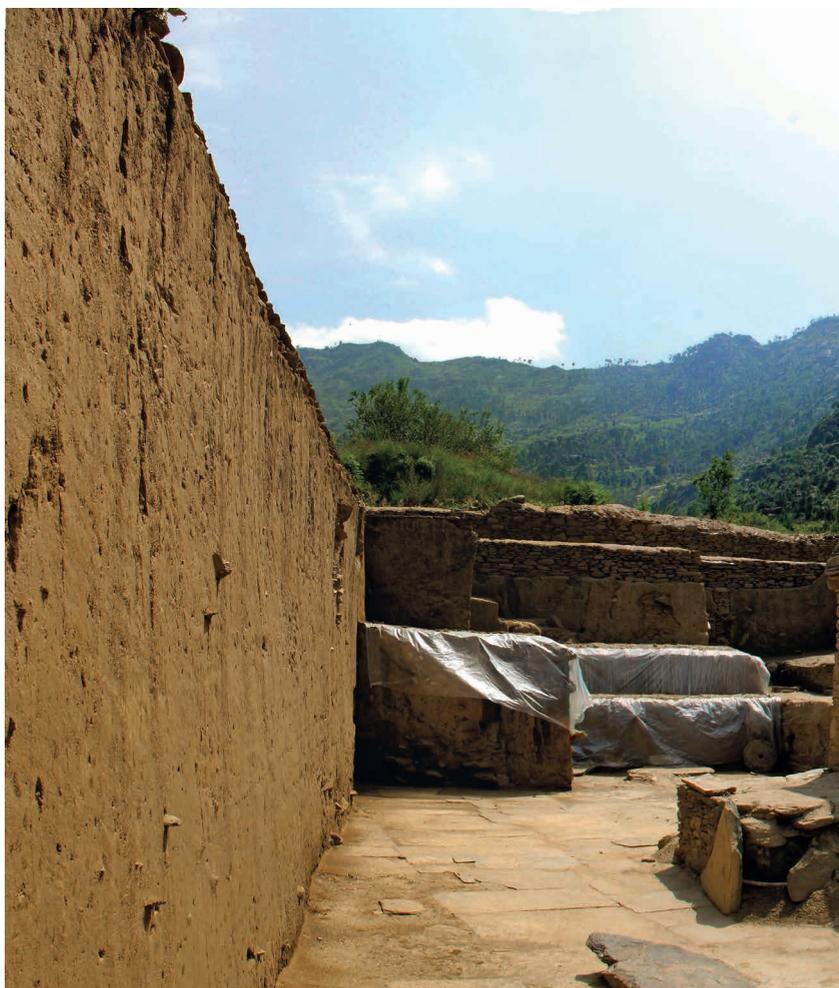
The Main Stupa originally (Period I) had a gray bluish schist decoration, whose fragments were found largely re-used or abandoned (Fig. 10a-b). Most of the decoration found *in situ* is made of *kanjur* and is coeval or posterior to Period II. In Period II the 1st stairway was heavily damaged, perhaps during one of the two earthquakes that hit Barikot in the 3rd century CE. Instead of rebuilding it, the monks simply built a new flight of steps on top of the damaged one, reusing the same material. Consequently, the staircase became higher, therefore longer and with a different inclination. To the same Period II belongs the stucco decoration of the Main Stupa, as well as of Shrine 60 and the other minor monuments (see Figs. 11-13).

All the samples analysed in the three reference studies (Bonaduce et al., this issue; Rosa et al., this issue; Festa, Pannuzi, this issue) therefore belong to a phase coeval or posterior to Period II.

#### **Gumbat and its chronology (Festa and Pannuzi, this issue; Rosa et al., this issue) (Fig. 14)**

The Buddhist sanctuary of Gumbat with its two terraces and monastery, has been recently reassessed (Brancaccio, Olivieri, 2019), and does not need to be here presented anew. The Great Shrine of Gumbat, the only surviving example of double-domed cupola in Gandhara, is located in the centre of the northernmost terrace. The building was studied and restored in 2011-2012, while a portion roughly corresponding to 1/4 of the terrace was excavated in 2011 (Olivieri et al., 2014).

The chronology of the monument is based on the radiocarbon dates of the surviving wooden elements of the architecture (Olivieri et al. 2014: 302; Di Giulio et al., 2018).



**Fig. 8**  
Sampling area of  
samples AKD 4-5:  
stairway, side W  
(photo by E. Loliva;  
courtesy ISMEO).

Based on the available data, it appears that the Great Shrine had two building phases [...]. The Great Shrine and Buildings [3] and [13] (= Period III) were erected in the early-2<sup>nd</sup> century CE as suggested by conventional 14C analysis of the wooden lintel of the upper south clerestory window of the Great Shrine (1840 +/-30 BP = 110 CE). A second phase (= Period V) should have included the reconstruction of the Great Shrine double dome took place in the mid part of the 3<sup>rd</sup> century CE. (Brancaccio, Olivieri, 2019, p. 127)

Information on the sampling area of GBK 17 are missing. However, on the basis of the fieldwork notebook, it seems that it was sampled from the upper dome of the Main Shrine (Fig. 14), or from one of the Period V minor monuments. In any case, the sample GBK 17A (but also GBK 17B; Rosa et al., this issue; Festa, Pannuzi, this issue) is coeval or posterior to Period V of the site.



**Barikot, Unit K, Shrine 1023 (Bonaduce et al., this issue; Festa, Pannuzi, this issue; Zaminga et al., this issue) (Figs. 15, 17)**

Barikot, the ancient urban site of Bazira, is a key site for the reconstruction of the cultural and historical framework of ancient Swat (see ref. in Olivieri, Filigenzi, 2018). The samples analyzed in Bonaduce et al. and Festa, Pannuzi (this issue) were taken from the stucco decoration of a small Buddhist shrine (1023) in Court 107 of the ancient city (BKG Periods VIII and Period VII = Macrophases 5a and 5b = c. 3rd century CE). Shrine 1023 is located at the N side of Court 107 opposite to a small dystyle temple (Temple K) (Fig. 16) (Olivieri et al., 2014).

*Shrine 1023 (Fig. 19)*

The structure in Court 107 is a detached Buddhist chapel (Shrine) (Olivieri, 2011 [2015]). It is rectangular in plan, facing S. It has a high podium with

**Fig. 9**  
Sampling area of samples AKD 13C and 14C, and of AKD 2 (view from SSE of Stupa 61) (photo by L. M. Olivieri; courtesy ISMEO).

flat base and a moulded cornice supported by plain brackets; on the top front of the chapel there was a wooden architrave supported by a row of plain brackets. The cella was closed by two folding wooden leaves hinged to a wooden frame (the iron parts of which have been almost completely recovered).

At least the moulded parts and the brackets were plastered. At the end of the first phase of the Shrine's life (Period VII) an earthquake damaged the building; in front of the monument, where fragments of gilding were found (Zaminga et al., this issue), an entire portion of the roof with a portion of the original stucco decoration and plastering was recovered (and sampled, see Bonaduce et al., this issue). The collapse occurred in two phases: first the roof collapsed, then the rest of the structure (Fig. 18). In the second phase of the Shrine's existence (Period VIII), while the lower part of the podium was covered by debris (leveled but not removed), the cella was modified. A final collapse, caused by another earthquake, resulted in the abandonment of the Shrine (Fig. 19).

Inside the cella in Period VII a votive stupa was housed, the remains of which were partly recovered during the excavations. In Period VIII the cella housed one Buddhist stele.





Fig. 10a, 10b  
Fragments of the Period I schist decoration of the Main Stupa (AKD 24, 61) (photos by E. Loliva; courtesy ISMEO).

*Chronology of abandonment phase of Barikot (Period IX = Macrophase 6)*

Table 2 shows the new calibration made by CIRCE, which confirms the chronology proposed earlier by CEDAD – Università del Salento, Lecce (Olivieri, 2011 [2015]; Cupitò, Olivieri, 2013). “The main chronological range falls within the 3rd century CE. This evidence not only confirms the historical unity of the re-use and re-functionalization phenomenon and its relative short duration, but also indicates how this event significantly took place at the same time as the great expansion of the Sasanian dynasty which, in the mid-3rd century CE, conquered Gandhara, turning it into the Kushanshahr province [more precisely during BKG Period VIII]” (Olivieri et al., 2014, pp. 88).

With the support of the archaeological materials (including coins) we have hypothesized a 3rd century chronology for BKG Periods VII and VIII, and a late-3rd to early-4th century chronology for BKG Period IX.

**Fig. 11a, 11b**  
 Example of stucco  
 decoration from  
 Period II: fragment  
 of statue of Buddha:  
 AKD 100; note the  
 holes for the back  
 assemblage)  
 (photos by E. Loliva;  
 courtesy ISMEO).



### Concluding notes on some technical issues

#### *Orientation (Fig. 20)*

The orientation of the Main Stupa at Amluk-dara shows a slight difference of about  $35^\circ$  with astronomical N. The orientation can be explained if the planning of the stupa was performed at a time of the year after the Autumn Equinox, when the sunrise, at this latitude, is less than  $40^\circ$  to the ESE (Olivieri, 2018, p. 2).

#### *Building process (Fig. 20)*

On the basis of the available data, the dome of the Main Stupa at Amluk-dara was surmounted by a chattravali with at least 7 chattras. The biggest fragment was  $>7.50$  m (diam.) and  $0.34$  m (thickness), the second



Fig. 12a, 12b  
 Example of stucco and  
 stucco/kanjur decoration  
 from Period II: fragment  
 of a spacer of chattravali?:  
 AKD 166; part of the  
 spacer of chattravali of a  
 minor stupa: AKD 177a-b  
 (photos by Aurangzeib  
 Khan; courtesy ISMEO).



biggest – corresponding to a 1/8 sector - was 7.20 m (diam.) and 0.26 m (thickn.). Assuming a possible average specific weight of 25 g/dm<sup>3</sup>, these disks, once assembled, were extremely heavy (the biggest complete chattra (the second last one) (d 4.00 t 0.30) might have had a total weight of 9.5 tons). “Although the calculation is not precise, these figures can give some idea of the real order of magnitude. Even today lifting a large 9 tons piece of stone to a height of more than 30 m would be a challenging operation [...]. It is therefore hard to imagine that these almost impossible operations were performed from the bottom up. We do not have any kind of evidence, either direct or indirect, regarding the existence or the use of engineering machinery *yantra* or *machinae* in Gandhara” (Olivieri, 2018, pp. 13-14).  
 The presence of rocky walls near Buddhist sacred areas (e.g. besides Am-

**Fig. 13**  
Examples of architectural parts in kanjur (stuccoed): spacers, cornices, cyma-reversa false brackets, metopes (photo by L. M. Olivieri; courtesy ISMEO).

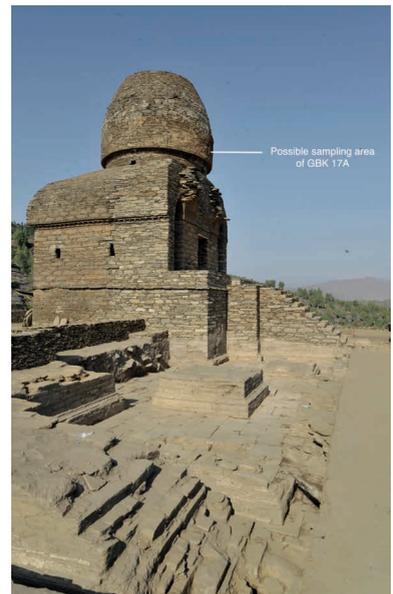
**Fig. 14**  
Possible sampling area of sample GBK 17A: Great Shrine (view from SSE) (photo by E. Loliva; courtesy ISMEO).

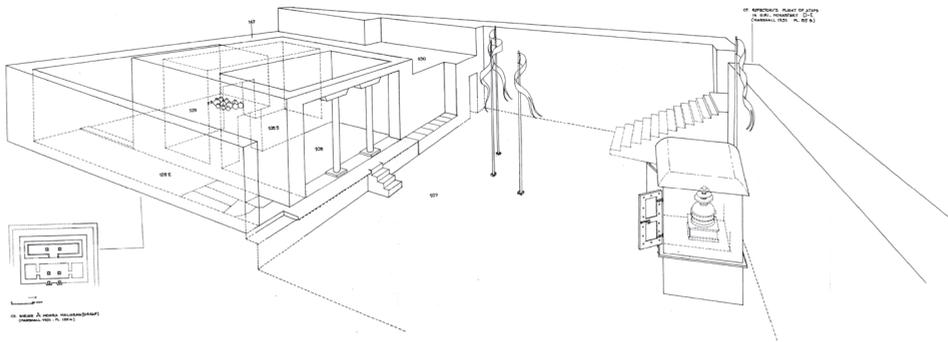
luk-dara, at Tokar-dara and Saidu Sharif I) might have been utilized for the erection of sloping ramps in order to reach the top of the stupa. The chatras could have been more easily dragged up there with a rope-winch. During the construction the rocky walls were quarried to obtain construction material, and the resulting space was used to house new constructions (as it was documented at Saidu Sharif I and Amluk-dara) (Olivieri, 2016).

#### *The role of kanjur (Figs. 12, 13)*

Schist is *the rock* of Swat, its petrographic and artistic signature. It was the main stone material quarried and used for architectural decoration and sculptures in Swat especially in 1st-3rd century CE (see references in Panuzi ed. 2015). On the other hand, *kanjur*, a limestone, is not a local stone. Therefore, we may guess that the shift to *kanjur* which is extensively documented after 3rd century CE at Amluk-dara and in other sites of Swat, implied a major change in the local economy. The appearance of *kanjur* might support the hypothesis that the local schist quarry areas of Swat were working “at an unusually very low pace for their standard, maybe just for the only surviving contemporary production”, i.e. the portable stela that are a typical 3rd century production in Swat (Olivieri, Filigenzi 2018, pp. 85).

*Kanjur* and stucco appear together in Swat. The shift to *kanjur*, for its rough and porous structure, implies a massive use of stucco modelling and finishing. Petrographic analyses of samples of both *kanjur* and stucco from Amluk-dara (Rosa et al., this issue) have proved that the two materials are chemically compatible, thus supporting the hypothesis that the stucco was largely obtained as a by-product of *kanjur* stone workmanship.





**Fig. 15**  
Axonometry of Temple K and Court 107 (seen from NNE; drawings by F. Martore; courtesy ISMEO).

### *Vegetal and protein-based substances*

The analysis presented in this Volume (Bonaduce et al., this issue) have shown that vegetal and protein-based resources were used to produce substances utilized as binder. One of these was collagen (animal glue). It was extracted from animal bones in late autumn (when weather is dry and cold, and it is more favorable for gelatinization). In late spring, after the end of the rainy season, when the weather is mild and dry, stucco was prepared. Various binders were then used to make the stucco and color layers more stable and weather resistant. The presence of egg (but not tragacanth gum, *Astragalus* sp., which grows also in Swat; see e.g. Humayun et al., 2005; Chaudhary et al., 2008) in the final layer of the stucco, suggests the hypothesis that the stucco surface was dry and smooth when color was applied. In this condition pigments needed to be mixed with a strong binder to adhere to the substratum.



**Fig. 16**  
Court 107 and Shrine 1023 seen from ESE, from Temple K (photo by L. M. Olivieri; courtesy ISMEO).

**Fig. 17**

Elevation and plan of Shrine 1023 (drawings by F. Martore; courtesy ISMEO).

**Fig. 18**

Shrine 1023: first collapse (Period VII) (photo by L. M. Olivieri; courtesy ISMEO).

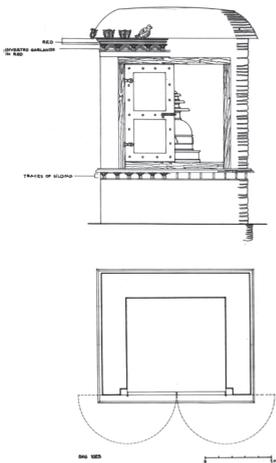
**Fig. 19**

Shrine 1023 in Court 107: final collapse phase (Period VIII) (photo by L.M. Olivieri; courtesy ISMEO).

opposite page

**Fig. 20**

The building phases of the Main Stupa of AKD 1 (drawings by F. Martore; courtesy ISMEO).



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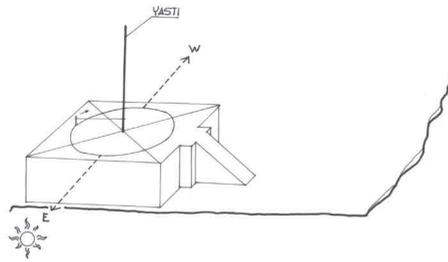
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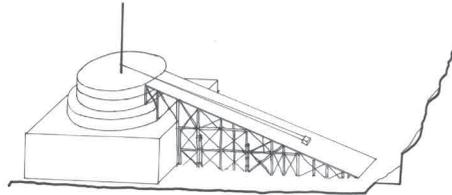
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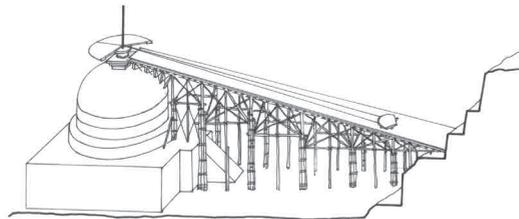




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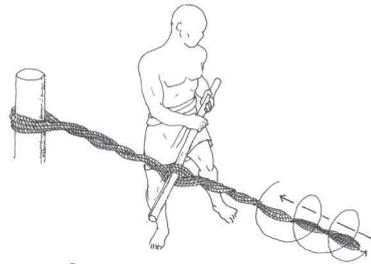


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