

# THE 1999 FINNISH JABAL HĀRŪN PROJECT: A PRELIMINARY REPORT

by

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The Finnish Jabal Hārūn Project (FJHP) has carried out its second fieldwork season between August 1 and September 23, 1999. The project is directed by Prof. Jaakko Frösén, University of Helsinki. The excavation fieldwork was supervised by Dr Zbigniew T. Fiema, Dumbarton Oaks Center, with Dr Mika Lavento, University of Helsinki, being in charge of the survey. In total, 4 archaeologists, 1 architect, and 11 students from the University of Helsinki, and 3 professional cartographers from the Helsinki University of Technology, as well as one Swedish archaeologist have actively participated in the fieldwork. Prof. Ari Siiriäinen, the archaeologist from the University of Helsinki, and Prof. Henrik Haggrén, the cartographer from the Helsinki University of Technology have participated as senior staff members during a part of the project. Two senior conservators-teachers and two students from the Department of Conservation, Espoo-Vantaa Institute of Technology have taken part in the second part of the fieldwork season. The DoA representative for the FJHP was Mr Hani Falahat. Up to 20 local workers were employed.

The FJHP focuses on Jabal an-Nabi Hārūn (the Mountain of the Prophet Aaron) located ca. 5 km to the southwest of Petra, which, according to the Jewish, Christian and Muslim tradition, is the place of burial of Moses' brother Aaron. Currently, the peak of the mountain is occupied by the Muslim shrine (well) which contains a cenotaph believed to contain Aaron's remains. Ca. 70 m below and ca. 150 m to the west of the peak there is an extensive but ruined architectural complex located on a wide plateau of the mountain, at ca. 1250 m a.s.l.

This complex, thought to have been a Byzantine monastery dedicated to St Aaron, is the focal point of the Finnish investigation. The main objectives and methodology of the fieldwork were already presented elsewhere (Frösén *et al.*, 1999). In particular, the excavations concentrated in the area of a large church which was detected in 1998. Simultaneously, the Project's surveying team continued its investigations in the area to the southwest of Jabal Hārūn. Following is a short description of activities carried out in 1999.

## **Cartographic Documentation** (by H. Haggrén, K. Koistinen, J. Latikka, J. Mononen, and A. Söderlund)

The cartographic activities continued the production of a three-dimensional computerized model of the entire Jabal Hārūn mountain and its environs. For this purpose, a variety of activities were necessary including the gathering of topographical and locational information, digital photography, photogrammetry, and actual computer-generated modelling of the excavation site and the survey areas. Even before the fieldwork began, the 3D model and map of the area based on the aerial photographs were enlarged to cover a new survey area (T). After the 1999 season, the 3D model covers the area of ca. 3 km<sup>2</sup>. The cartographers were daily involved in recording all structures, strata, features, and main artifacts which emerged or were noted during the excavation and survey. The basic recording system included the use of a tachymeter (theodolite with EDM), with three-dimensional readings downloaded every afternoon into the project database, as well as the conventional and the digital photography, and the photogrammetry. Digital

photographs were also utilized in the recording of the mosaic floor in Trench H, by creating a photomap of this floor (for details, see Koistinen *et al.*, 1999). The cartographers have also recorded significant topographical features of the surveyed area, which helped to create a detailed map and a computerized 3D model of the area, and which will be instrumental in understanding the relationship between the environment and the human-made agricultural multi-purpose installations located there. The collected imagery will be utilized for further modelling of the structures.

## THE EXCAVATIONS

The purpose of the second season of excavations at the site of a Byzantine church, monastery and the pilgrimage center for the Mountain of Aaron was to expose the selected but representative parts of the church proper and to gain a more extensive knowledge of the general stratigraphy and history of the site. The excavations were conducted in five trenches (D, E, F, G and H) which were fully excavated down to the lowermost stratum (Fig.1). Additionally, a trench (D) located in the northern part of the complex was fully excavated. The area between the western part of the church and the cistern was partially exposed. The recording system followed the methods previously developed and utilized during the first fieldwork season (Frösén *et al.*, 1999).

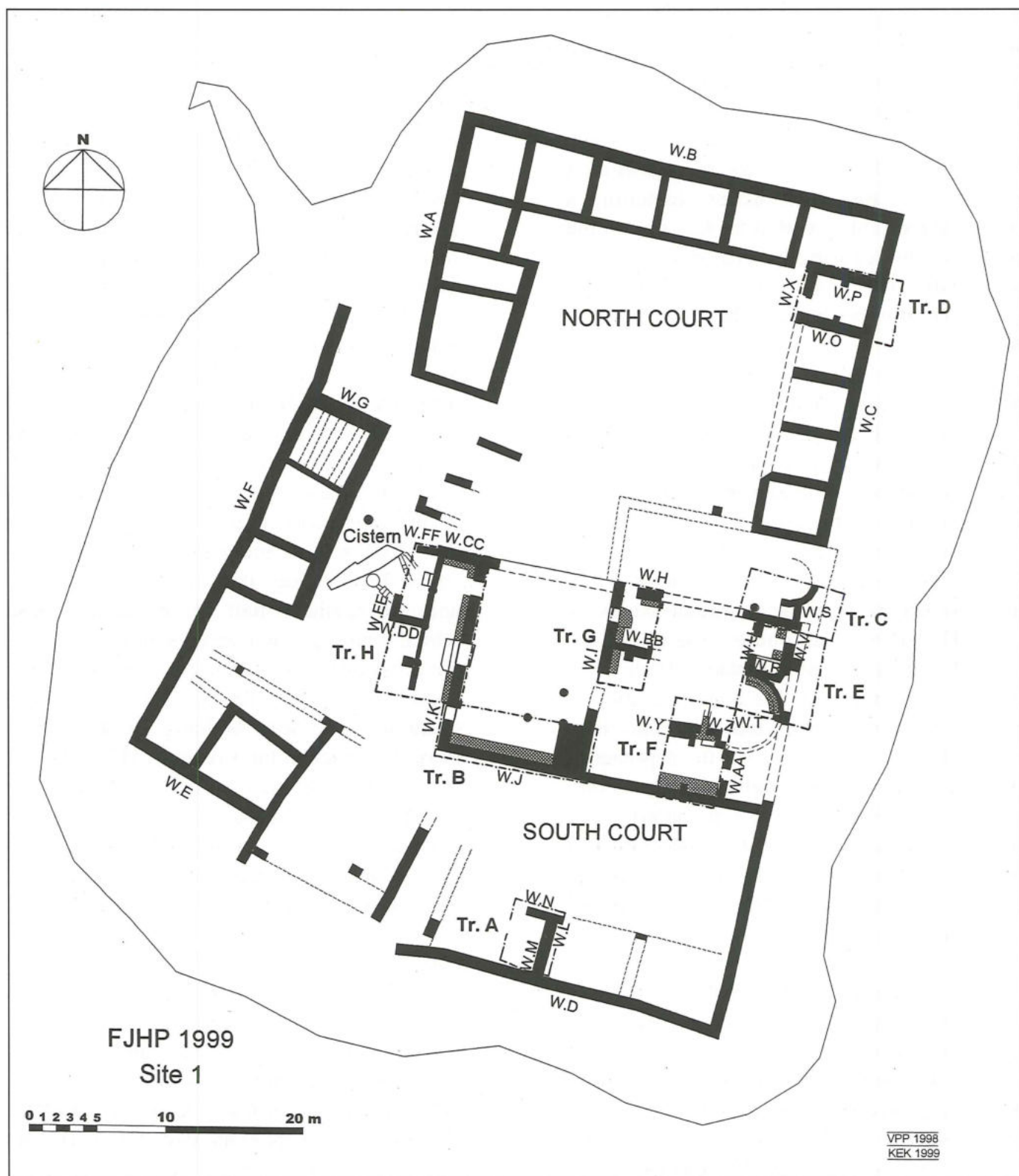
### Trench D (by J. Sipilä and J. Vihonen)

The trench had been set up in the NE corner of the site, in the complex of rooms which surround the so-called North Court. This complex could have served as a pilgrims' hostel. The excavation of the trench had already begun in 1998 with the topmost layers removed.

*Phase 1: Construction and Early Use.* The room consists of four walls. Wall C (locus 5), the eastern wall of the room, is abutted

by both walls running E - W: the northern, Wall P (locus 6) and the southern, Wall O (locus 4). Wall P is in turn abutted by the western wall of the room, Wall X (locus 30w). Inside, there are two corresponding pilasters (loci 14 and 15) which abut the north and south walls. The pilasters, if not dating from an unknown earlier phase, must have supported a single N - S arch which carried a roof over the room. The walls and the pilasters have been built on bedrock with a thin layer of mud mortar in between. The bedrock is undercut under the southern pilaster, in order to facilitate its setting. The relationships and the exact order of construction of the walls and the pilasters in the first phase are not clear and, in fact, may reflect an unknown phase of occupation, characterized by a different spatial organization of the interior. The single doorway in Wall X consists of a sandstone block threshold (locus 34w) and a step (locus 36w). Surviving doorjambs indicate that the door opened inwards. Since the bedrock slopes down from the highest point in the western part of the room, it had been levelled up with a layer of hard packed soil with pebbles, forming a floor bedding. On top of the bedding, a floor of flagstones was laid, the remains of which were found in the eastern end of the room (locus 21).

*Phase 2: Remodelling.* This phase appears to represent a rebuilding after a limited destruction. All walls were rebuilt in a rougher manner from the fifth/sixth course upward. Currently, at least the upper parts of Walls C and P bond as well as the upper parts of Walls O and C. The pilasters were left in place but without any apparent architectural function. Instead, the roof was supported by a new N-S arch, the springers of which are still visible in the top parts of Walls O and P. During this time or later, the flagstone floor was removed (a few stones surviving *in situ* by Wall C) and replaced by a beaten earth floor (locus 18). This locus represents



1. General plan of the monastery and the trenches opened in 1999 (by V. Putkonen and K. Koistinen).

a succession of tightly packed occupational surfaces in which a large number of bones was found, including mammals, chicken and fish. Ceramic material included sherds mainly dated to the 5th century AD but also

numerous sherds dated to the first half of the sixth century AD.

The latter included two African Red Slip Ware rim sherds (ARS form 93; ca. AD 470-540, according to Hayes, in Kuhnen

1989: Textband p. 85, Tafelband p. 18-19, pl. 9,1; and ARS form 104, Var. A/B; ca. AD 530-600 according to Hayes, in Kuhnen: 1989 Textband p. 86, Tafelband p. 18-19, pl. 9,4) and one fragment of a wheel-made lamp. In the NE corner of the room was a pit (locus 19), filled with stones (including a decorative marble), with a broken pot on the top. The few recovered sherds mainly represented the fifth century material, but some could possibly be dated to the early 6th century AD.

*Phase 3: Disuse and Reoccupation.* The room might have been temporarily abandoned and then re-occupied. The structure had possibly lost at least parts of its roof by this time. Locus 17 represents the first sub-phase of the reoccupation, characterized by an extensive deposit of bones, mostly fish and chicken with some mammal bones as well. The second sub-phase - the top of locus 17 - featured the fireplaces (loci 31w, 32w, 16) and the probable makeshift threshold (locus 33w) in the doorway. This new threshold was apparently set in response to the raised occupation level inside the room. The pottery from locus 17 included types dated to the later fifth and the early 6th century AD, but also rim and body types which probably continued into the second half of the sixth century.

*Phase 4: Casual Occupation.* During this phase it appears that the roof and the arch had finally collapsed as a result of an unknown destruction or natural deterioration. The casual, probably temporary, occupation is represented by fish bones, eggshells and chicken bones in locus 13. Ceramics included the sherds from the later fifth and early sixth century AD, with rim sherds of a jar which could probably be dated to the Late Byzantine period (late 6th/early seventh century AD). Later, on top of locus 13, in the doorway, stones were intentionally piled in a haphazard way to provide shelter.

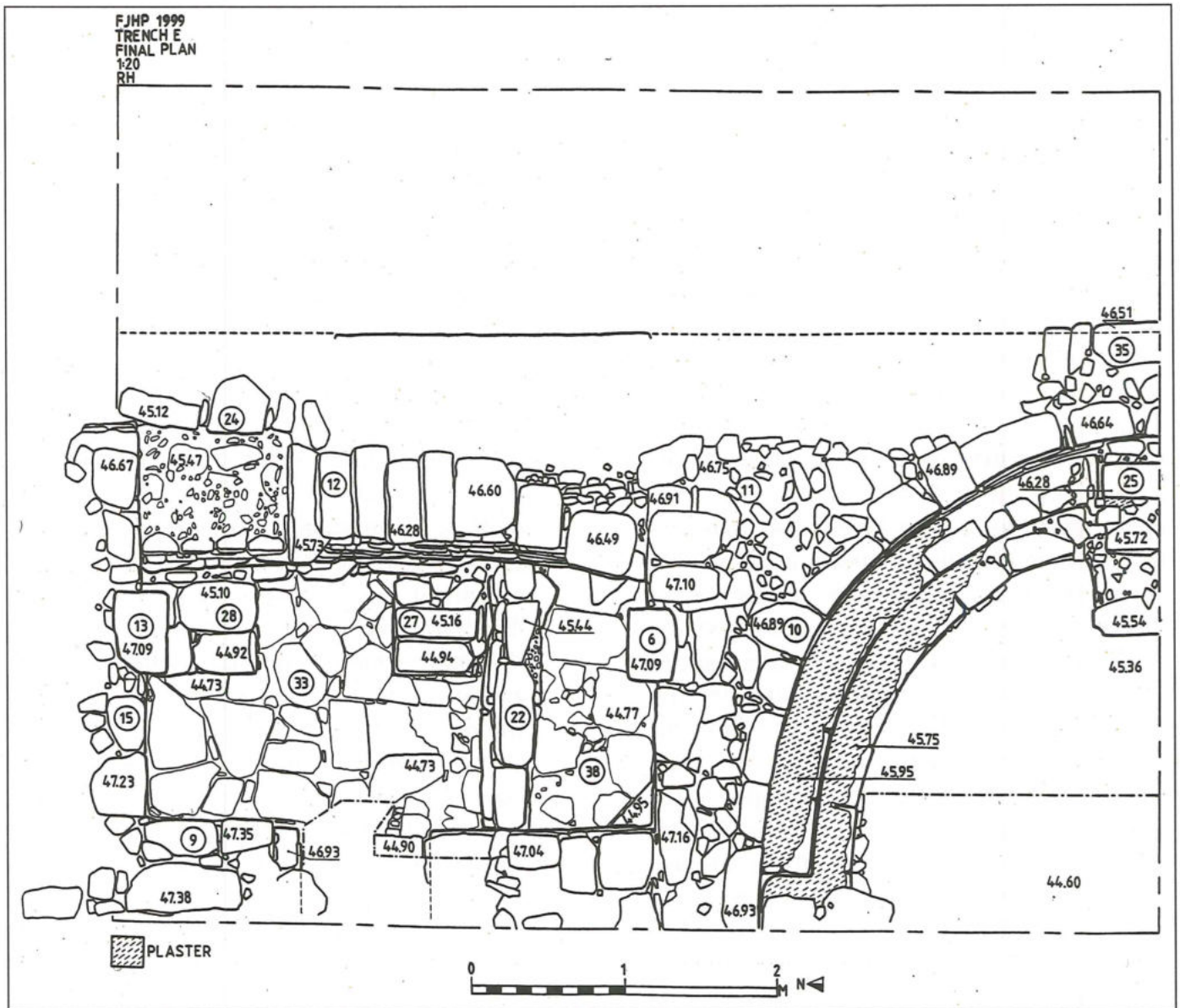
The buttress (locus 8) was also constructed against Wall C, probably from the stones collapsed inside the room.

*Phase 5: Final Destruction and Abandonment.* Extensive upper stone tumbles, (loci 9, 2, 3, 7, 12) must represent a major destruction at the site. Very mixed ceramic material from these strata included the Nabataean pottery from the first century AD, and the sherds dated to the fourth, possibly early fifth century AD.

#### **Trench E** (by N. Heiska and A. Lahelma)

The excavation of Trench E began in 1998 in order to test the hypothesis which postulated the existence of a church adjacent to the previously identified chapel. During the 1999 season the trench was fully excavated revealing the north pastophorion and the northern half of the central apse which features a two-tiered synthronon, with the remains of the ceremonial thronos in the center (Fig. 2). A deep sounding (locus 26) through the mortar bedding of the apse's floor has reached the bedrock. The ceramics from the sounding (loci 26A, C and D) yielded some Nabataean fine and coarse ware from the 1st century AD, and coarse ware from the late fourth - fifth century AD, but not later material.

*Phase 1: The Church.* Almost all of the main structures in the trench belong to this phase, i.e., the four walls of the pastophorion (H and R; loci 15 and 4 and U and C; loci 9 and 35), the apse wall (W. T, locus 10), and the synthronon (loci 19, 20 and 25). This phase also includes two arch springers (loci 6 and 13) in Walls R and H, which supported a single arch which spanned the space of the pastophorion, as well as a few remains of the marble floor (locus 31) in the apse, still *in situ* next to the lower step of the synthronon. The mortar bedding (locus 26A) for the floor was much disturbed, but its contents primarily represented fine and



2. Trench E - final plan (by R. Holmgren).

coarse ware from the first century AD, and ceramics from the fourth-fifth centuries, including one "Petraean Early-Byzantine" lamp, and no later material. The sandstone floor (loci 33 and 38) of the pastophorion was either the original floor, or a stone bedding for a high quality floor of which no traces remain. The threshold (locus 37) of the doorway in Wall U and the shelf-like structure (locus 30) in the corner between Walls R and U might also belong to this phase. Walls R and U show evidence of a reconstruction at some point. These changes might possibly be associated with the early destruction of the original basilica, and its

subsequent rebuilding.

*Phase 2: Transitional Period.* The continuity of the ecclesiastical function of the area in this phase is uncertain, although it cannot be excluded. A partitioning installation (locus 22) running E-W, was built inside the pastophorion. The purpose of the structure is unclear. Further, the marble floor of the apse (locus 31) was removed. A cache of dozens of marble fragments was found piled on the two rows of the synthronon. Fragments of marble slabs were also found inside the partitioning installation, suggesting that it was built before or at the same time as the reuse of

the marble fragments. This phase ended in a destruction, perhaps caused by an earthquake, which seemingly brought down the semidome of the apse and the arch supporting the roof of the pastophorion.

*Phase 3: Dwelling Site.* The structure lay partly in ruins, but was also substantially reconstructed in some places. The stone tumble inside the pastophorion was cleared (no sign of the voussoirs left), but that inside the apse was mostly left in place (locus 16). That tumble, which contained ceramics mainly from the fifth century AD (possibly some from the first half of the sixth century), might have been levelled to some extent, as it appears that a poorly made mosaic floor (?) was built on top of the tumble. As only a small part of this surface, if indeed a floor, was observed in the southern balk of Trench E, the main part of it must be confined to the unexcavated southern half of the apse. Possibly connected with the secondary use of the apse even after the collapse of the semidome, is a stepping stone (locus 36) adjacent to the uppermost stone of the thronos, allowing access from the top of the apse wall to the interior of the apse.

The interior of the pastophorion seems now to have been more intensively used than the apse. The space enclosed by the partitioning installation (locus 22) was filled with soil and a layer of sandstone slabs (locus 23). Then, a staircase (Wall V, locus 12) running N-S, was built against Wall C, leading to the top of the apse wall, and apparently allowing access to its interior. The staircase has a landing in the north; against this landing, small steps (locus 28) were built that lead down to the sandstone floor; a second, symmetrical pair of steps (locus 27) was built leading to the top of the installation, loci 22 and 23. The latter had apparently some purpose for which it was necessary to climb on top of it. A thin and hard soil layer (locus 32) had accumulated on the floor, probably as a result of occupation of

this area after the rebuilding.

*Phase 4: Wind Shelter.* The area was now at least partially abandoned and the structures began to fall into decay. Debris from several fireplaces indicate that the area was open and used as a temporary wind shelter. Inside the pastophorion sand and ash (locus 29) began to accumulate on the floor, which contained a substantial number of bones (mainly fish bones). Later, a layer of burnt sand and some debris (locus 21) had accumulated inside the pastophorion, followed by a thick soil layer (locus 17) with relatively few finds but including the fireplace, built of large stones, together with the associated deposit of ash (locus 18). Locus 21 contained pottery predominantly from the fifth/early sixth century AD, one decorated rim sherd which could date to the Late Byzantine or even Umayyad period, and two fragments of the so-called Abbasid lamps. Ceramics from locus 17, are mainly of the later fifth and sixth century AD including one fragment of a "Petraean Early Byzantine" lamp, and one or two rim sherds which could be Late Byzantine, even Umayyad in date.

*Phase 5: Destruction and Abandonment.* A catastrophic event, possibly an earthquake, destroyed the area, resulting in a massive stone tumble (part of locus 8) inside the pastophorion. Pottery from that locus included the fifth/sixth century types, an African Red Slip Ware rim, and 2-3 rim sherds which could be Late Byzantine or even Umayyad in date, in addition to one so-called Abbasid lamp. Inside the apse, a cache of stone tesserae (locus 7a) witness to scavenger activities while inside the pastophorion crudely made steps (locus 14) inside the doorway indicate an occasional use of the space.

*Phase 6: Latest Natural Deposition.* Natural decay and collapse of stones continued,

adding to the tumbles inside the pastophorion (loci 5 and 2) and the apse (locus 7). Wind-blown sand (loci 1 and 3) formed the surface soil of the trench. Curiously, a large amount of tesserae was found in the uppermost layers of the trench, particularly in the SW corner of the apse.

### **Trench F** (by E. Mikkola and H. Kuisma)

Trench F was opened in the SE part of the church, including a part of the area in front of the apse, and the eastern part of the southern aisle (Fig. 3).

*Phase 1: Early Church.* The following walls were constructed in Phase 1: Wall J (locus 03), the south wall of the church, Wall AA (locus 30), the wall of the south pastophorion, and Wall T (loci 31, 32), being the apse's wall with the corresponding pilaster of the south colonnade. The bema platform (loci 28 and 33), probably two courses high, was built in the front of the apse. Its estimated length (N-S) is ca. 6m, while the width (E-W) is 2m. The bema's construction features sandstone ashlar and thick marble slabs; marble was also used in flanking orthostats. The floor construction (loci 18 and 24) included the main bedding of the large sandstone blocks, followed by smaller cobbles, a mortar layer and finally marble slabs. The slabs differ in size; from ca. 1.04 x 0.58 m to 0.05 x 0.04m, the latter



3. Trench F - general view, with the bema on the left and the secondary bench and pilaster on the right (by M. Mustonen).

most probably being repairs or fill. The southern edge of the floor uniformly ends ca. 0.6 m away from Wall J. A vertical layer of creamy mortar at the edge of the floor probably indicates the existence of a solid stone bench running along and against the wall. The original south colonnade is indirectly evidenced by the pit (locus 34) which preserves the outline of the curvature of a column base, and is lacking the cobblestone bedding. The pit falls in line with the corresponding pilaster at the end of the apse (locus 32). The span between the columns was ca. 2.5 m (as in Trench G) and the distance of the colonnade from the southern wall was ca. 2.8 m.

*Phase 2: Modifications in the Bema Area.* A destruction, which seemingly ended Phase 1, is only indirectly evidenced in this trench by major modifications in the bema area, which can be further divided into three sub-phases.

2a - The colonnade had been removed and replaced by supports, starting from pilaster 06 built on the bema, and continuing west through the free-standing pillar 05B. This line of supports was placed farther to the north than the original colonnade, at a distance of ca. 3.45m from Wall J. The distance between the pillars is estimated at ca. 1.7m, convenient for the use of an architrave, but the voussoirs fallen down in E-W direction suggest narrow-span arches. Pillar 05B was built on the marble floor suggesting that the marble slabs were at least partially rearranged after the removal of the columns. No changes in appearance of the bema in this phase have been detected.

2b - An extension (locus 05J) had been added to the northern face of pillar 05B, and a corresponding structure (locus 05A) abutted pilaster 06. This measure apparently served to reinforce the supports of the arches. The earlier bema was abandoned. A low "coun-

ter"-like wall (05C) was built between 05A and 05B/J, and another one (05H) was built projecting northward from 05C. This L-shaped combination of low walls at least partially isolated the bema from the nave and the aisles. The enclosed area of the bema received a new mortar bedding, but the floor itself is not preserved. Enigmatic post-holes appear in the mortar bedding; possibly for supports of an altar (?). Both "counters" (05C and 05H) feature reused material, e.g., a marl cornice. All these new structures were plastered.

2c - It is probable that the ecclesiastical function of the bema ceased in this sub-phase. Possibly the floor was then removed from the bema, and the latter's area totally isolated from the rest of the building. This was effected by constructing Wall Z (locus 05F) on the bema's floor bedding, directly north of "counter" 05C, while "counter" 05H was raised by the masonry addition 05G. The small opening left between loci 05G and 05J was blocked by stones (locus 05I).

*Phase 3: Latest Modifications.* The main change in this phase was the construction of a N-S arch, supported by the arch springer, locus 05D and a corresponding pilaster, locus 07, built against Wall J. The voussoirs of this arch collapsed domino-like and were found in debris loci 04, 09 and 12. It is unclear whether this addition represents an introduction of an entirely new system of supporting the roof or only the reinforcing of the existent system. Locus 05D was built abutting pillar 05B from the south. Wall Y (locus 05E), which runs E-W, was possibly constructed to counteract the pressure created by this arch. The thickness of the wall (max. N-S 1.20 m) is too excessive to serve only as a divider. A bench (locus 15) was also built along Wall J during this phase, at the same time or later than pilaster 07. The bench is wider than the original bench of Phase 1; the latter must have been removed

sometime during Phase 2. A curving row of stones (locus 19) laid on the floor, was perhaps intended as a fireplace. Two roundish breaks (diam. ca. 0.15 m) in the marble floor are located directly under the line of the arch. Possibly, these indicate an attempt to reinforce the arch by supporting it by vertical poles wedged from below.

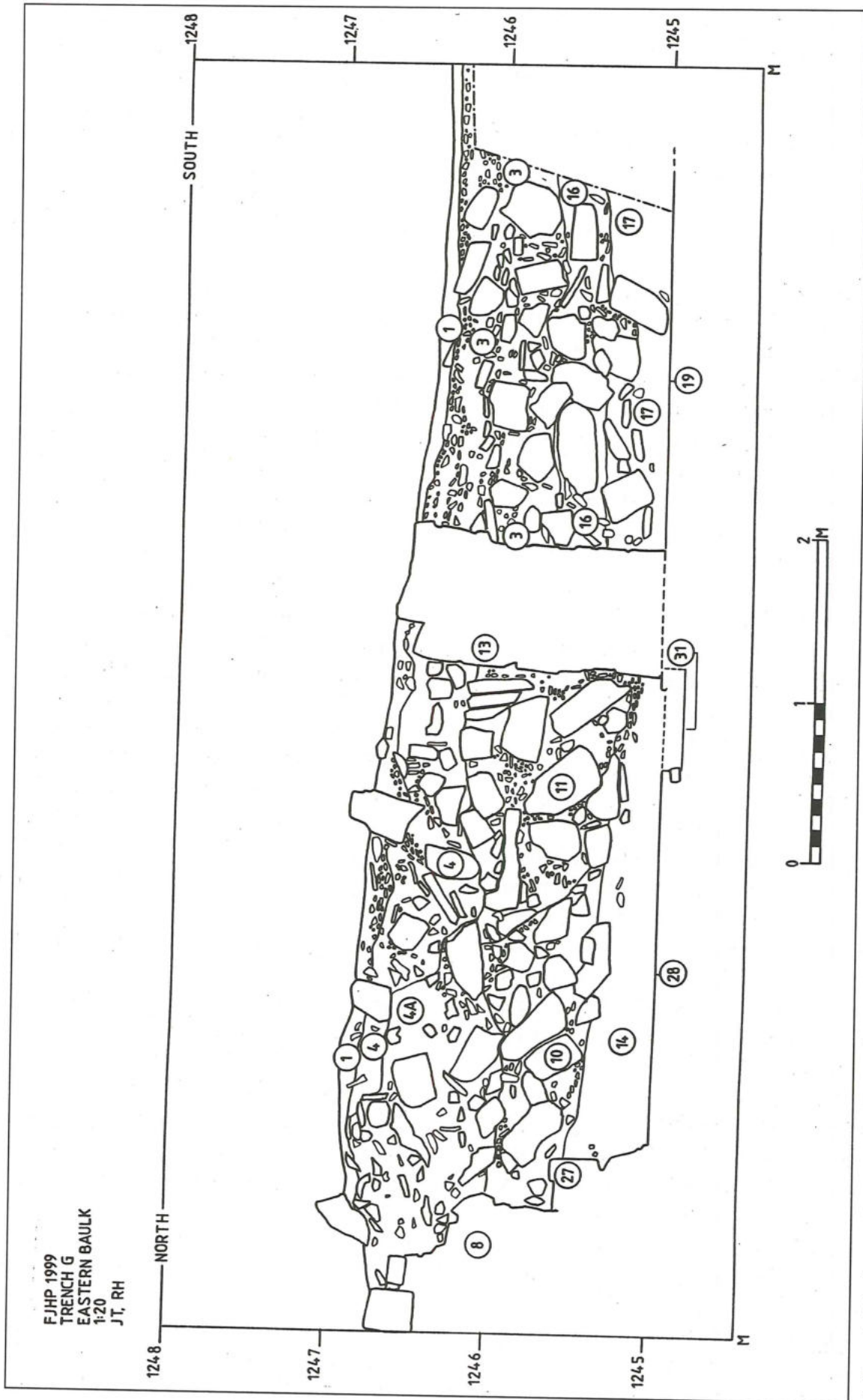
*Phase 4: Final Destruction.* The lack of occupational strata on the marble floor may indicate that the structure was abandoned due to a sudden disaster. The lowermost layers in the south aisle (loci 14 and 17) were clayish with small fragments of charred wood, possibly the remains of the roof construction. Corresponding strata in the bema and the nave (loci 20 and 21) consisted of homogeneous sand which probably filtered down through the tumble strata directly above loci 20 and 21. All architectural elements, including ashlar and voussoirs, were contained within the tumble and sand layers, loci 09, 10, 11, 12, 14, and 17. Ceramics from these strata primarily included types dated to the fourth-fifth centuries but few sixth, even early seventh century AD sherds were also present.

*Phase 5: Latest Natural Deposition.* The uppermost strata, loci 02 and 04, being small stones in the sandy soil, were similar to the topsoil, locus 01. Locus 08 was a mixed layer of soil, stones, mortar and a substantial amount of limestone tesserae. Its location close to the surface may, perhaps, suggest a dump of a relatively late date.

#### **Trench G** (by R. Holmgren and J. Tuominen)

Trench G, situated in the central part of the northern aisle and the nave of the church, was excavated to gain information on the N-S wall which divided the church into eastern and western parts, and on the general stratigraphy in this part of the church (Fig. 4).





4. Trench G - the east balk (by R. Holmgren and J. Tuominen).

*Phase 1: Original Basilica.* The initial phase of the church is represented here by the main north wall of the church, Wall H (locus 8) and the marble floor. Wall H is 1.05m wide, and constructed of carefully fitted ashlar with a fill of reddish sand. The fill contained few sherds (the latest dated to the fourth-first half of fifth century AD) and also medium-sized colored stone tesserae, which suggest the prior existence of an unknown structure in the area. South of the wall, the mortar bedding (locus 28) retained clear impressions of large rectangular marble slabs of the church's floor. In the southern half of the trench, a sounding revealed that the bedding consisted of a layer of large, sandstone slabs followed by sandstone flagstones and mortar, all capped by a marble pavement (loci 18c, b). The northern half of Trench G featured a similar composition and the clear foundation of one of the columns of the north colonnade of the church (locus 31). The phase ended in destruction, probably due to an earthquake.

*Phase 2: Reduced Church.* Upon restoration, the church was shortened by constructing the N-S partitioning Wall I (loci 2 and 9) which runs along the entire western side of the trench. Two of the apparent three new entrances to the church proper are located in Trench G: the northern one (locus 25, width 1.05m) and the central door (locus 30, width 1.15m). The doorjambes in the southwest corner of locus 30 indicate that its doors opened into the church. Locus 30 also has a sandstone threshold, ca. 0.13m above the marble pavement. The central doorway was probably extensively decorated with marble slabs which later fell off the walls. A long pilaster (locus 5), was built against Wall I roughly halfway between the two doorways; it is 0.75m long, and 0.52m wide. Ca. 1.8m east in a straight line is a poorly preserved structure which originally could have been a free-standing pillar (locus 13A). Since the column from Phase 1 was appar-

ently removed, the pilaster and pillar probably served as parts of a new support for the church's roof. The Phase 1 pavement was largely retained in Phase 2 but it shows extensive repairs and rearrangement. It was carefully refitted against the threshold of the southern doorway, the three benches and locus 5. The pavement also included a marble slab (locus 20) which was partly under two later structures, loci 6 and 12. The visible part has extensive chisel-marks, the Greek inscription ]OIKΩNΩ[, a cross, and what may have been space for a metal handle. The slab may have been a tombstone for a grave dug into the floor during Phase 2. The reworking and the orientation of the slab (text reads from the east) indicate that its position is not original.

On both sides of the pilaster, locus 5, two benches were built against Wall I. The benches have frames of large rectangular blocks with flat stones on top of them, and both are plastered. The southern bench, locus 29, is 1.77m long, 0.55m wide and 0.33 - 0.47m high. The bench, locus 23, north of locus 5, is partly obscured by the later locus 24; it is 0.48m wide and 0.27-0.43m high and it must have ended before the northern doorway. The third bench (locus 22) built against Wall H, could date back to Phase 1. Its western end seems to have been cut to make way for a door to the chapel through Wall H, either in this or in the following phase. This door (locus 21), is 0.94m wide. The floor of the doorway is bedrock sloping to the north. A marble chancel screen post (1.06m x 0.18m x 0.14m) was placed horizontally, partly under the doorjambes to serve as a threshold; another post was apparently placed upright in the western corner.

*Phase 3: Later Modifications.* This phase features the separation of the central nave and the northern aisle by Wall BB constructed in several, somewhat unclear, stages, on top of the marble pavement. This wall connects the long pilaster by Wall I with the

free-standing pillar farther east. The pillar itself was slightly enlarged to receive a N-S arch which spanned the north aisle and ended at the north pilaster (locus 27) built atop the bench against Wall H. The collapsed voussoirs of the arch could be seen in the balk. Wall BB also features a pilaster from which an arch extended apparently to the south, across the nave. A blocking (locus 26) was built in the northern doorway (locus 25) up to a height of ca. 1.50m. An enigmatic stone installation, locus 24, was built in front of the blocking and partly on top of the bench and the marble pavement (Fig. 5). Its two lowest courses of ashlar blocks form a kind of a platform, ca. 0.58m high; the upper courses consist of boulders enclosing an empty space in the middle. The entire installation is 1.20m high, 1.35m long and 0.95m wide. The upper interior of the structure contained two levels of thick plaster with a stone bedding, few sherds (probably late fourth-fifth/early sixth century in date), bones, and a mixture of soil, pulverized sandstone and charcoal.

It is unclear whether this part of the church retained the ecclesiastical function in this phase. Brown soil (locus 14), up to ca. 0.7m thick, accumulated in the northern part of the trench. There are localized concentrations of ash and small stones, and some bone. Pottery mainly included the fifth century types, with one rim and body sherd



5. Trench G - the installation, locus 24 in the front, the doorway to the chapel on the right (by J. Viuhonen).

probably from the sixth century AD, as well as one glazed sherd of uncertain date.

*Phase 4: First Destruction.* During this phase, the arches from loci 27 to 13 and from locus 6 to the south collapsed. In the southern part of the trench, the voussoirs from the arch seem to have fallen almost directly onto the marble pavement, breaking many slabs. There were few finds from locus 17, the up to 0.4m thick soil layer that had accumulated on top of the pavement. In the northern part of the trench, the arch fell on top of the soil, locus 14. The southern face of Wall H apparently fell at the same time, and the soil fill poured down to form locus 10. North of Wall BB, a soil locus 11 with charcoal, bones, sherds, and some marble fragments, accumulated on top of loci 14 and 10; the layer was ca. 0.5m thick.

*Phase 5: Second Destruction.* There seems to have been a fire in the area south of Wall BB. Soil locus 16, ca. 0.5m deep, which accumulated on top of locus 17, featured ashy loose soil and burnt marble, especially in the area of the central doorway. A small, hand-made, Mamluk bowl was found in this layer, together with some fifth and sixth century sherds. Farther up, locus 3, was similar except for the large number of partly or heavily burnt roof-tiles found in it, indicating that the roof of the building finally fell down. In the northern part of the trench, locus 4, ca. 0.4m deep and above loci 10 and 11, included a compact stone tumble, apparently the upper courses of Wall BB, which also contained a large amount of marble and roof-tiles. Associated with this locus was a structure, locus 7, two large slabs placed horizontally in the upper part of the northern doorway through Wall I to form a pair of steps leading down. There was a soil layer between these steps and locus 24, so these two were unconnected. The steps suggest that there was activity at the site even after the destruction.

*Phase 6: Final Collapse and Natural Deposition.* The latest phase in this area is represented by locus 1, which consisted of soil and scattered stone debris, a large number of roof-tiles, and wind-blown soil which obscured the lines of Walls H and I and covered Wall BB entirely. The depth of this uppermost layer varied from 0.05 to 0.5m.

**Trench H** (by R. Ylönen and K. Hinkkanen)

Trench H, situated at the western end of the church, was excavated in order to reveal the main entrance of the church and to clarify the stratigraphy in the central court between the church and the cistern. The history of this area is enigmatic, especially during the early phases. Certain structures appear to be late additions, and the relationships between some of these remain unclear.

*Phase 1: Early Narthex (?).* During this phase the western wall of the church, (Wall K, locus 20), and three benches, loci 6b, 21 and 22, were constructed. The southern end of Wall K and the southern entrance were already uncovered in 1998 in Trench B, while the central and the northern doors were exposed in 1999. However, a massive door-blocking (loci 23 and 24) in the central doorway was temporarily left *in situ*, preventing further examination of this doorway. The threshold, locus 27, in the northern door consisted of a stone slab and pavement. Three low benches (loci 6b, 21 and 22) built against the western face of Wall K are made of ashlar and flagstones and are covered with mortar. Because of a mosaic floor laid out against the benches in the following phase, their maximum height is currently only ca. 0.25m above the mosaic level. A sounding opened in a damaged area of the mosaic floor, revealed a flagstone surface (locus 40e), ca 0.15-.18m below the mosaic level. Another sounding opened beside the stylobate exposed a sim-

ilar surface (locus 10f) at a comparable level. It is uncertain whether the flagstone surface represents a formal floor level, a means to level out the uneven ground, or a bedding for the later (mosaic) floor. However, the level of this surface would well correspond to the estimated bottom of the benches, which would then be ca. 0.4m high in Phase 1. Since it seems unlikely that the plastered benches were built outdoors, possibly there was a simple covered entrance porch to the church in this phase. The fully developed narthex, including the colonnaded portico with its stylobate, appears to have been built only in the following phase, but some of its elements, especially the stylobate and the colonnade, might, theoretically, have already been built in this phase.

*Phase 2: Formal Narthex.* Certainly during this phase the narthex of the church was constructed. It consists of the northern antae Wall CC, locus 19, the mosaic floor (locus 39), and the stylobate for the colonnade which closed the narthex on the western side. Wall CC, ca. 3m long, clearly abuts the NW corner of the church. A fourth bench (locus 6a) was built against it. It is similar to the benches built in Phase 1; ca. 0.45m wide but with its top ca. 0.33-.4m above the mosaic floor level. The stylobate (locus 18) must have extended along the entire width of the church. It is constructed of even-sized ashlar (average size 0.40 x 0.4m) well-fitted together. Out of the original four columns in the portico, three column bases were exposed in Trench H; they were well integrated into the structure of the stylobate.

The mosaic floor inside the narthex was made of small limestone tesserae (*infra*). The mosaic covers the entire floor of the narthex; its exposed part is 10.05 m long and 2.30 wide. Outside the narthex, in the area which stretches up to the cistern in the west, a pavement (loci 9 and 31) made of large limestone slabs was laid out. But in the southern end of the trench, instead of slabs

there is a layer of hard-packed, brown soil with cobble-sized stones on the surface (locus 10). Three water channels, loci 33, 34 and 35, which run from the SW part of the church, under the mosaic floor and the pavement in the fore-narthex, to the cistern, were constructed during this phase at the latest. The channels are partially cut in the bedrock; some still feature capstones *in situ*. Two of the channels lead straight to the cistern whereas the southernmost channel ends in a bedrock-cut settling tank, locus 33b, situated on the eastern edge of the cistern. The fill of the tank (locus 33C) contained few late fourth-sixth century AD sherds and one decorated body sherd which could be even later in date.

*Phase 3: Later Narthex.* During this phase, the intercolumnar spaces of the narthex's portico were built up, except for the area between the two central columns, which corresponded to the central entrance to the church. The northernmost section of the stylobate was blocked with irregular boulders and smaller stones (locus 13). The intercolumnium between the northernmost column and the one in the middle was blocked using relatively even-sized boulders placed on the stylobate (locus 17a). Upon this course, a later addition was erected, built of more irregular stones (locus 17b). At the southern end of the stylobate, only four roundish stones (locus 25) are preserved standing on the stylobate. On the western side of the stylobate, there is a low rectangular stone structure (locus 8) built against the southernmost column. Only the lowest course of stones is left, but the size (0.73 x 0.8m) and the position of the structure suggest that it could be the lowest course of a pilaster or a buttress. During this phase, the main entrance of the church was also blocked with tightly placed stones (locus 23d), and in front of this blocking, two steps leading to the top of the blocking were built (loci 23a and 23b). The lower

step, locus 23a, is 0.1m longer than the upper step but the height of both steps is exactly the same - 0.24m. A trapezoid-shaped stone, locus 23c, on the top of the upper step, considering its form and equal height, could be the only remains of a third step. During this phase, or later, the iconoclastic damage to the mosaic floor must have taken place.

*Phase 4: Late Occupation and Additions.* Several structures and soil layers appear over the the mosaic floor and the stone pavement outside the narthex. Neither their relative chronology nor interrelationships are apparent. Inside the narthex, a rectangular, frame-like stone installation, locus 24, was built against the door-blocking and upon the soil layer (loci 26 and 28) covering the mosaic floor. This installation could have been used as a storage bin. The clearance of the interior of this installation yielded two body sherds from the fifth century AD and one rim sherd from the 6th/early seventh century, or even the Umayyad period. The northern doorway appears to have been partially filled with small stones and sand (locus 4, lower part). Sandy locus 26 was slightly harder packed just above the mosaic floor. The locus contained sherds mainly from the fifth-sixth centuries AD and three body sherds from a storage jar probably dated to the seventh century AD.

Several structures outside the narthex could be contemporary with the blocking of the narthex or these represent later, more casual occupation. Wall FF (locus 36), ca. 1.75m long, was built as a continuation of Wall CC. On the southern side of this wall there is a low rectangular stone installation, locus 37, which consists of some boulders and cobbles but mostly of sand and small flagstones; it could have been a foundation or a bedding for a bench. The northern half of the fore-narthex had been partially enclosed by new walls - Wall DD, locus 11, and Wall EE, locus 16, which form an L-

shaped enclosure. Both walls are built directly on the stone pavement (loci 9 and 31) of Phase 2. The space within this enclosure is "paved" with loose-fitting but relatively large ashlar, boulders and sand fill (all as locus 14). The fill contained a few sherds from the fifth/sixth century AD one fragment of a "Petraean Early Byzantine" lamp, and one spout of a vessel from the sixth century AD or even the Umayyad period. The pavement is ca 0.2m high and it could have served as a kind of platform.

On the northern side of locus 14, there was a thin soil layer (locus 32) containing ashy, very dark greyish brown sand, small pieces of charcoal and a lot of pottery and bones. The pottery dated to the fifth-sixth century, with a possible extension into the 7th century AD. Another soil layer, locus 15, accumulated between loci 14, 17, 13 and 36, in the area bordered by the platform locus 14, the blockings of the stylobate and Wall FF in the north. Ceramics from locus 15 included types which might be dated mainly to the sixth or seventh century. Soil layer, locus 12 covered the platform-like structure (locus 14) and the steps of locus 13, both of which must have gone out of use by then. Again, the sherds from this locus mainly dated to the fifth-sixth centuries, with a probable extension into the seventh century AD. On the southern side of Wall DD there was a rectangular, bank-like, natural or intentional deposition of sand and small flagstones (locus 7); it could have been used as a temporary bench. Locus 7 yielded four sherds, probably fourth/fifth century in date, and one fragment of a lamp which could possibly be dated to the seventh/eighth century AD.

*Phase 5: Destruction.* This phase features the collapse of Wall K, most probably caused by an earthquake. The resulting stone tumble, locus 2, contained ashlar, column drums and doorjambs. Four doorjambs were found collapsed in a line west-

wards from the northern doorway. The northern door opening was filled with cobbles and sand (locus 4). Outside the narthex there was only a thin layer of wind-blown sand (locus 5).

*Phase 6: Latest Activities and Natural Deposition.* The area had been abandoned and the stone tumble covered by windblown sand (locus 1) which yielded very mixed pottery material, including some 6th and probably 7th century sherds. At the northern end of the trench there was an enigmatic circular stone structure (locus 3) upon the stone tumble indicating temporary activity on the site.

*Mosaic Floor.* Originally, the mosaic featured an almost symmetrical arrangement of designs on both sides of the central door to the church proper. The northern half featured a man (or two men) standing in front of a horse, fighting a wild boar (?) with a spear (Fig. 6). Farther south was a representation of a standing lion followed by a round medallion which occupied the central position in the narthex floor, and consisted of colorful bundles and squares intertwined into intricate geometric designs. That was followed by another lion, and another hunting scene featuring a hunting dog (or panther?) attacking a gazelle which, in turn, was assaulted by another human with a spear. In the inset of the northern doorway to the church, there is a representation of two birds flanking a geometric symbol. The entire mosaic has a colorful border band of three intertwined bundles or chevrons. Except for the preserved chevron pattern, the birds, a half of a horse, small fragments of lions heads and mouths, a large part of the dog, and occasional feet, tails, hunters' spears and a shield, and the medallion, the mosaic is heavily altered by the later iconoclastic activities. The damage is evident in seven discrete areas. Tesserae which formed the images of humans and animals were either



6. Trench H - the mosaic floor, westernmost section (by M. Mustonen).

carefully removed and equally carefully replaced by larger bluish grey tesserae filling the empty spaces, or the original colorful tesserae were removed and then reinserted into the same image but in a scrambled fashion. However, while the tesserae reinsertion was done carefully, the removal was not complete, thus the preserved details allow for an overall reconstruction.

#### **Observations on the 1999 Pottery (Y. Gerber)**

The repertoire of the pottery types found during the 1999 excavations shows a much greater variety than that from the 1998 campaign. However, the chronology of the Jabal Hārūn pottery is still not firmly and fully established. Several coarse ware rim forms, already well known from the previous campaign, were found in 1999, for example, the cooking casserole with sharply drawn grooves on its exterior. Still, there are no other parallels for this particular casserole as

well as for some specific jar types, neither in Petra, nor farther south in al-Ḥumayma, and also not in the north of Jordan. If these types were not produced in the same workshops as the Byzantine pottery from Petra, although the fabric seems to be the same, then where do these come from? The other side of Wādī 'Arabah, as the production center for these types, seems unlikely. The chronology of the Jabal Hārūn pottery is certainly closely related to the chronology of the church and its ecclesiastical vs. non-ecclesiastical phases of occupation. What remains without satisfying explanation and what was already emphasized in the 1998 campaign report, is the fact that almost all pottery is Byzantine (late fourth century - sixth/early seventh century AD) in date, but that in the same layers a few of the so-called Abbasid lamps were also found (eighth-ninth centuries AD in date, according to published studies). Several major issues need to be addressed here:

1. It is almost impossible to note a difference between body sherds (especially of cooking pots) from the Byzantine period and those from the Umayyad period, and the main part of the Jabal Hārūn ceramic corpus is composed of jar and cooking pot body sherds. Unless rim forms or thick storage jar body sherds with an orange color and a grainy tempering are found, a more precise chronological determination is not possible. Having seen Umayyad sherds from al-Ḥumayma, Umm ar-Raṣāṣ and from Jarash, the author can say that there is only a slight chance that few a sherds from Jabal Hārūn could be dated to the Umayyad period.
2. The same observation holds true for body sherds with incised wavy lines. The tradition of incised wavy lines, known on jars and basins, was known since the Early Byzantine period (Fellmann Brogli 1996: 242; Fig. 728f.; 253; Fig. 764; 256; Fig. 768; 260; Fig. 790) and it continued up to the Umayyad period. As long as there are no diagnostic rim forms with incised wavy lines among the material, their date will remain uncertain.
3. The total absence of painted pottery at Jabal Hārūn is puzzling. In the known Umayyad and Abbasid pottery assemblages (e.g., al-Ḥumayma, Mādabā, Mount Nebo, Jarash etc.), painted sherds are always present, while not a single such sherd was found at Jabal Hārūn. Since some Abbasid lamps were found there, painted sherds should be expected.
4. Facing such a situation, one may pose a question whether Jabal Hārūn was only occasionally visited during the Umayyad-Abbasid periods, and the only visible sign of such visits were visitors' lamps left behind. One may also wonder whether the chronology of the so-called Abbasid lamps needs to be re-evaluated.

Trench D - probably a pilgrims' hostel room - features the most complete stratigraphic sequence and it yielded more pottery types than all other trenches. This sequence and ceramic corpus from there will certainly be essential for the understanding of the history of the entire site. Some of the new ceramic types from Trench D have close parallels to those found in the Early Byzantine houses at az-Zantūr (Swiss excavations, fourth century - first half of the fifth century AD), and in the shops on the Roman Street in Petra (ACOR excavation, fifth - sixth centuries AD). Other forms find no comparison with the published Petra types, but their fabric, still a bright red clay, calls for a date in the Byzantine period. In almost all layers of Trench D, the local pottery was found together with imported fine ware, mainly the African Red Slip Ware. If we consider the African Red Slip Ware as a *terminus ad quem*, and if it is stressed that no single fragment of a so-called Abbasid lamp was found in this trench, then there is a strong reason to suggest that the pottery sequence from Trench D is Byzantine in date, and not later.

In all other trenches opened within the area of the church, no real stratigraphic sequence has been achieved. Instead, there are curiously mixed deposits such as Trench E, locus 21, which contained pottery predominantly from the fifth/earlier sixth century AD, a decorated rim sherd whose date is not certain (Late Byzantine or Umayyad?), and two fragments of the so-called Abbasid lamps. Locus 17, a thick soil layer above it, again yielded pottery from predominantly the later fifth and sixth century AD, 1-2 rim sherds which could be very cautiously called Late Byzantine or Umayyad, and one fragment of a so-called 'Petraean Early-Byzantine' lamp which is usually dated to the fourth-sixth centuries AD, but not later. First, the lower layer contains an element which, according to the present literature, is to be dated as late as eighth/



ninth century AD. And in the upper layer is a lamp which was, up until now, never found together with Abbasid lamps and which normally represents the Byzantine period. Secondly, the pottery (repertoire and fabric) from Locus 17 did not differ from the material which was found in Locus 21. Whereas the material from Locus 17 seems to be more or less homogeneous Byzantine, irregularities occur in Locus 21. It seems now, that the stratigraphy within the church is not yet fully functional for the establishment of a pottery sequence for Jabal Hārūn Byzantine and probably Umayyad periods. Generally, the transitional period from Byzantine to Umayyad times is still a challenge for scholars. The future excavations at Jabal Hārūn may yield more information for this still poorly known transition.

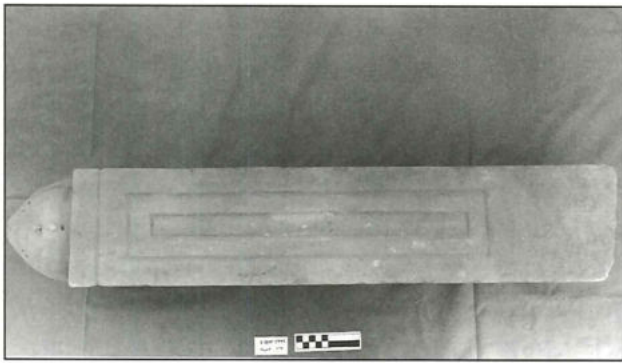
### Inscriptions (by J. Frösén)

Several fragments of Greek inscriptions were found, most of them in Trench G. A fragment of the right upper edge of a white marble orthostat (Reg. No. 81), probably a chancel screen with a panel and a frame, features an abbreviation of two letters BO (without any mark of abbreviation) with a cross in the line below. The most probable interpretation is the word βο(ηθός) 'Helper', mostly used of God and Christ, or a corresponding verb. Another inscription had been carved on the horizontal top of a chancel screen. The fragment of this white marble orthostat (Reg. No. 124) preserves the beginning of an inscription which would have been readable from the side of the bema. The text reads ]ΑΓΙΕΓΕ[, most probably ] 'Άγιε Γε[ώργιε 'Saint George' (in vocative). The continuation could be something like ἐλέησον 'please have pity' or βοήθει/ βοήθεισον 'please help'. The name may refer to St. George or to St. George, the Martyr. The latter was very popular in Byzantine Palestine, and is mentioned in the Nessana papyri, as well as in many inscriptions (e.g. Meimarīs 1986: 123–128). A

squarish marble slab was found *in situ* on the floor of the trench. It is only partly visible because the left half of it is under a secondary wall. The inscription once contained several lines of a Greek text, only partly preserved now, because most of the central part of the slab has been chiselled away in order to form a frame at the edges of the slab. In the upper part, the last letter of the first line a ]N is visible on the frame. In the middle part, the end of one line is still visible. It reads ]ΟΙΚΩΝΩ[N], most probably ] οἴκων ω[v] 'of the houses of which', but the exact meaning remains unclear. On the last line, there is a cross. There is a circular hole in the middle of the slab, probably carved for attaching a metal ring (not preserved) to the slab. The slab seems to have been, at least originally, a tombstone but apparently not in an original position, or at least it had been fixed to the floor upside down, because the text is readable from the east direction, and not from the west as is usual to facilitate reading by people entering the church. A small fragment of a wall fresco (Reg. No. 121) with red painting on white plaster containing the cursive letters ]δε[ or ]δβ[ was also found in the same trench. In Trench H, only one fragment of Greek marble inscription was found (Reg. No. 161). It reads ] X (ριτό)ε ! [. A small fragment of plaster in Trench D contains the abbreviated end of a Greek word written in cursive letters, ]γικ( ).

### Other Finds (by J. Lindblom)

Altogether, 137 objects were registered from among the finds of the 1999 excavations. The largest group consisted of decorated marble fragments, especially from Trench G. Besides fragments of chancel screens, one almost complete chancel screen post was found (Fig. 7) and parts of other posts. All belong to a very well-known type with a bulbous, sharp-pointed finial, such as were found in the Petra church (Fiema, forthcoming). Parts of marble colonettes



7. The marble chancel post recovered from Trench G (by M. Mustonen).

were also found and the base of a small column. A reused marble lintel was recovered from Trench H. Among other objects were several parts belonging to a round marble patten, which shows similarity to that found at the North Church at Shivta/Sobata (Margalit 1987: 106, Figs. 3-4) and in the Petra church (Fiema, forthcoming; see also Bagatti 1984: 264)

Besides marble, other plentiful groups of finds included fine fragments of *opus sectile* tiles (especially from Trench E), and great quantities of light creamy-grey stone tesserae. Fifteen coins were found, all in poor condition. Their conservation and reading are not completed yet. Among metal objects, four badly worn but almost complete copper alloy spoons or spatulas, found in Trench D, are of particular interest. From the same trench also came a half of an ivory ring and a small coral heart, the latter probably an inlay or a gem. The glass finds were comparable to those from the 1998 season. Of special interest was a piece of a shallow bowl with an engraved image, similar to pieces found in Trench C. More fragments of turquoise mould blown glass vessels were also found and numerous small handles and rim fragments of Byzantine glass lamps.

#### **On-site Conservation** (by T. von Konow)

The limited restoration work done in 1999 was carried out using a special mortar developed for the Jabal Hārūn excavations, which, while reflecting the composition of

ancient mortar, was sufficiently resistant to weather conditions. Initially, Finnish ready-mixed lime mortar was used, which was modified on site with fine aggregate and hydraulic binder. Using ready-mixed and well-known mortars enabled the target aggregate grain size distribution to be achieved. A pure lime mortar was used for small cracks. Large cracks and gaps (also in the marble pavement) were filled with lime mortar to which a small amount of white cement was added. Addition of cement was crucial for increasing the strength of the mortar in the structures constantly subjected to erosive sandstorms, high nighttime moisture and cold winters. A finer sand was used for small cracks and a coarser one for fixing the marble slabs and filling large cracks. Any loose material and sand in the gaps were brushed away, and then surfaces were moistened with water to wash out most of the soil and to improve adhesion. Plaster surfaces were consolidated with lime water sprayed several times; it was also sprayed into the cracks before jointing them. The restoration mortar was very easy to handle and showed excellent adhesion to the original plaster, including inner layers, and to the marble slabs. The moistening of the restored masonry was very important because of the hot temperatures during the repair work, and was continued for 7 days after the completion of the work. So far, the restoration work was experimental in terms of the procedures applied. Additionally, small sections of masonry were built, each with one variation of the restoration mortar and local stone. These sections will be studied and tested next summer, after a year of exposure on the excavation site.

#### **Preliminary Assessment** (by Z. T. Fiema and R. Holmgren)

While the relative chronology of the construction, use and destruction or abandonment periods at the site is well established, the dating of these periods will become ap-

parent only after the ceramic, numismatic and glass material is fully analyzed. The pre-Byzantine period at the site is known only from ceramics and a few architectural stones which were later reused in the construction of the church. These, however, imply that there probably existed a Nabataean-Roman period structure at the site. Whether it was a fortification, rural residence or a cultic structure is unknown but the latter is a particularly attractive hypothesis. Limestone lintels with elaborate mouldings reused in the church construction might have belonged to such building. Incidentally, a Nabataean shrine dedicated to Isis is located on the route to Jabal Hārūn, and the terrace with the Isis relief faces the mountain (Lindner 1997: 286-92). Whether the church was one of the first Byzantine structures at the site is still uncertain but it must probably have been built during the mid to later 5th century AD. Internally, the church is ca. 22.6m long and ca. 13.2m wide, i.e., only slightly smaller than the mosaic-decorated Petra church dated to the later fifth century. Both churches feature the ratio of the inner length to inner width, being exactly 3 : 2 in the case of the Petra church, and very close to that by the Jabal Hārūn church. This ratio is considered typical for earlier, monoapsidal churches in Palestine of the fourth-fifth century (Crowfoot 1941: 54, 61). The 5th century date for the Jabal Hārūn church is also supported by the ceramic material recovered from the inner fill of the main walls of the church, which was nowhere dated later than the mid-fifth century.

In its early phase, the Jabal Hārūn church was a monoapsidal basilica internally supported by two rows of columns, with seven columns each. The single apse is ca. 5.6m long at the chord, flanked by two lateral paterae. A marble floor was laid out throughout the church. The church may or may not have been preceded by a simple narthex. The early bema was unusually narrow but fully contained within the nave, as

in the Petra church. Generally, the type of bema does not constitute any significant chronological marker (Rosenthal-Heginbottom 1982: 149, 151). The apse had a two-tiered synthronon installation, which shows affinities with the five-tiered synthronon of the Petra church (Fiema, forthcoming) rather than with those from the churches in the Negev (Rosenthal-Heginbottom 1982: 157-158). On the other hand, the clearly preserved remains of the bishop's (or abbot's?) throne in the Jabal Hārūn church were apparently accessed by the centrally positioned set of steps which superimposed the synthronon tiers, as in the Central Church at Rehovot (Tsafir 1988: 14, ill. 22). The Jabal Hārūn synthronon is clearly an original installation, and not added later, as in the case of the Petra church. As opposed to the more common one-to-three tier types, the multitiered installations are generally considered to be better attested in the 6th century. This observation would also support the fifth century date for the Jabal Hārūn church.

This early phase was seemingly ended by a disaster, probably of a seismic nature. The church was restored but also subdivided into the eastern and western parts. The eastern part, ca. 12.6m long (internally) retained its ecclesiastical function but the columns were removed and replaced with free-standing pillars probably supporting E-W arches rather than architraves. Throughout this phase numerous changes and modifications took place in the bema area. It appears that the bema was raised and laterally enclosed by two "counter-like" low walls, somewhat similar to those in Petra church in Phase V (Fiema, forthcoming), or in the sanctuary of the monastic church at Dayr 'Ayn 'Abāṭā (Politis 1993: 507, Fig. 6). The western part of the original church, ca. 9.5m long, appears to have been turned into an open court (atrium), most probably with a peristyle portico on all four sides. The three channels which run under the narthex from the south-

western part of the atrium might have served to collect water from the roofs of the portico. The mosaic floor which was laid out in the narthex, over the channels, does not appear to be earlier than the sixth century. Hunting scenes are well known from the mosaics of that century, e.g., the mosaics at the Hippolytus Hall (Piccirillo 1993: 23-24; 58-59; sixth century), or at the Old Diakonikon-Baptistery in the Memorial of Moses on Mount Nebo (Piccirillo 1993: 135, 146; AD 530). The central medallion of the Jabal Hārūn mosaic - a complex geometric design of interlacing squares and ribbons - is strikingly similar to the central panel of the narthex mosaic in the church at Gharandal, which seems to be dated to the sixth century (Ricklefs 1997: 501-3, Fig.5). During the same phase, the original floor in the atrium had been superseded by the extant sandstone floor which also features marble fragments. It is less certain whether this phase was also ended by a disaster but this remains a distinct possibility.

Resulting changes in the eastern part of the original church included the replacement of the pillars as roof support by pilasters and the N-S arches which spanned the spaces of the nave and side aisles. Additionally, the spaces between the free-standing pillars were walled up. A massive buttress was built on the atrium's side against the partitioning wall. Secondary walls built directly on the pavements of the north pastophorion and in the area in front of the narthex may belong to this or even later phases. Such secondary barriers and partitions are well-known from other Palestinian churches in the Umayyad period. In the church of St. Mary at Rihāb, and in the Upper Church at al-Quwaysma, a secondary wall which connected the columns, effectively separated the nave from the north aisle (Piccirillo 1984: 338). A similar wall connected the pillars of the north row in the church of St. John the Baptist (# 95) at Khirbat as-Samrā' (Humbert and Desreumaux 1990: 261). Par-

tioning walls were built in the nave and the aisles at the Anchor Church (the Abbasid phase) at Tiberias, which effectively divided the interior into several rooms or compartments (Hirschfeld 1994: 126, 132).

It is uncertain which parts of the entire structure still retained their ecclesiastical function during this phase or later on, but it seems that during that period the damage was done to the mosaic floor. The damaged areas appear as the result of a careful obliteration rather than a wanton destruction. Notably, this damage relates to the images of animals and ordinary people, in opposition to the eighth century Byzantine iconoclasm which specifically targeted sacred images. Probably, this kind of deliberate yet careful damage, generally dated to the 8th century (late Umayyad-early Abbasid period), could have been carried out by the Christians who lived in Palestine under Muslim rule, yet they "camouflaged" the images as to preserve the mosaic floors in their entirety (Schick 1999: 46-7). However, the perpetrators cannot be easily identified since the destruction phenomenon is also present in some Jewish synagogues in the area (Piccirillo 1993: 42). Particularly notable deliberate but not complete damage can be observed at the Church of the Lions in Umm ar-Raṣāṣ (Piccirillo 1993: 211) but other examples of Palestinian churches with such damage are also easily forthcoming (e.g., Piccirillo and Alliata 1998: 372-389). At any rate, evidence of careful mosaic obliteration, as at Jabal Hārūn, should indicate that by the eighth century such a church would have been still partially functioning in ecclesiastical capacity during the era of iconoclasm (Piccirillo 1993: 42). The Umayyad-Abbasid finds from the FJHP excavations are scarce, yet the presence of the seventh century -Umayyad ceramics as well as lamps commonly interpreted as Abbasid, also confirm the continuing occupation within the complex. Finally, it seems that some spaces within the church were tem-

porarily or casually occupied during later periods, a fact exemplified by ashy spots, fireplaces and the abundance of bone in strata above the original marble floor. Substantial stone tumbles, including the collapsed arches, were documented in every square. These episodes had definitely terminated the occupation in the church area.

**Archaeological Survey** (by A. Siiriäinen, M. Lavento, H. Jansson, S. Silvonen, M. Huotari, P. Kouki, A. Eklund, and A. Lahelma)

Following the 1998 season (Frösén *et al.*, 1999), an intensive archaeological survey was continued in 1999 on the western and southwestern side of the Jabal Hārūn mountain, between Wādī as-Saddat and Wādī al-Maḥaṭṭah, and south of Area C investigated in 1998 (Fig. 8). This zone has been subdivided into Areas K, T and U. Most of the structures recorded during the 1999 survey were long terrace walls and barrages built across the main Wadis and their tributaries, which served to slow down runoff water and to keep the fertile surface soil in small-scale terrace fields. Similar installations were investigated by M. Lindner in the area of Sabra (Lindner 1986: 137-8). The information gathered during the 1998-1999 surveys helped to create a computerized model of the hydraulic installations in the environment of Jabal Hārūn (Lavento *et al.*, forthcoming). The tracts surveyed in the 1999 season were larger than in the previous year, reaching the average size of ca. 200 x 60m. In some cases, tracts were further subdivided when the amount of surface finds was excessive. In these cases, all surface finds were collected. In total, ca. 235,000 square meters of the survey area were covered. A total of 19 tracts and 20 major sites were recorded, including ca. 120 barrages and terrace walls. The documentation methods followed the techniques used in 1998.

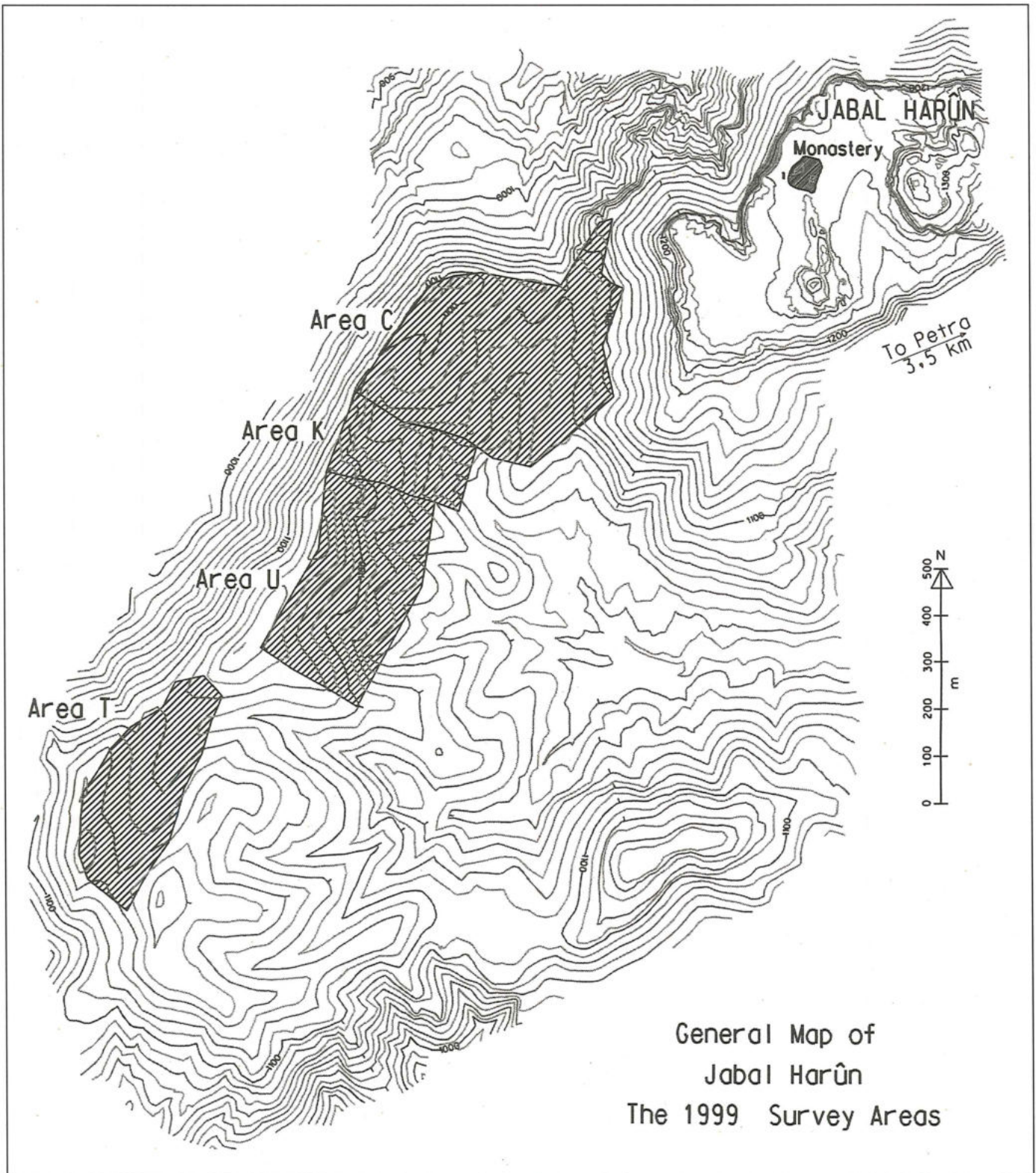
The bedrock in the 1999 survey area is limestone, usually yellowish brown in color.

Late Cretaceous Wādī as-Sir Limestone predominates in the area, in addition there are small formations of Wādī Umm Ghudrān Limestone, which is stratigraphically more recent. Resulting from the climatic conditions and rough relief, erosion in the area is generally heavy (Press and Siever 1985: 138-139). Physical erosion by water and wind is common, but chemical erosion of bedrock is also significant. Accumulation of eroded material has occurred on more even ground, especially where barrages slowed down the water flow. Heavy erosion is also the reason for the poor soil formation in the survey area. Deposition of colluvial and alluvial sediments is often difficult to distinguish (Moorman 1959: 11), which further complicates geomorphological interpretations.

#### *Area T*

This large area (see Fig. 2), ca. 76,232m<sup>2</sup>, is a small valley in the southwestern corner of the plateau around the foot of Jabal Hārūn (Fig. 9). The remains of palaeocurrents are clearly visible, particularly on the western slopes of the valley, which helps to interpret the location of finds' concentrations on sites. Archaeological material was mostly found tumbled down from steep slopes or at the foots of hills, which indicates that the "living floor" effect (Shea 1999: 195-205) is of central importance in the area. The prehistoric sites are situated on small saddle plateaus between hills. Proper assessment of the depositional history of the sites is therefore important in understanding the context of finds (Schiffer 1972: 159-164; 1987: 199-234).

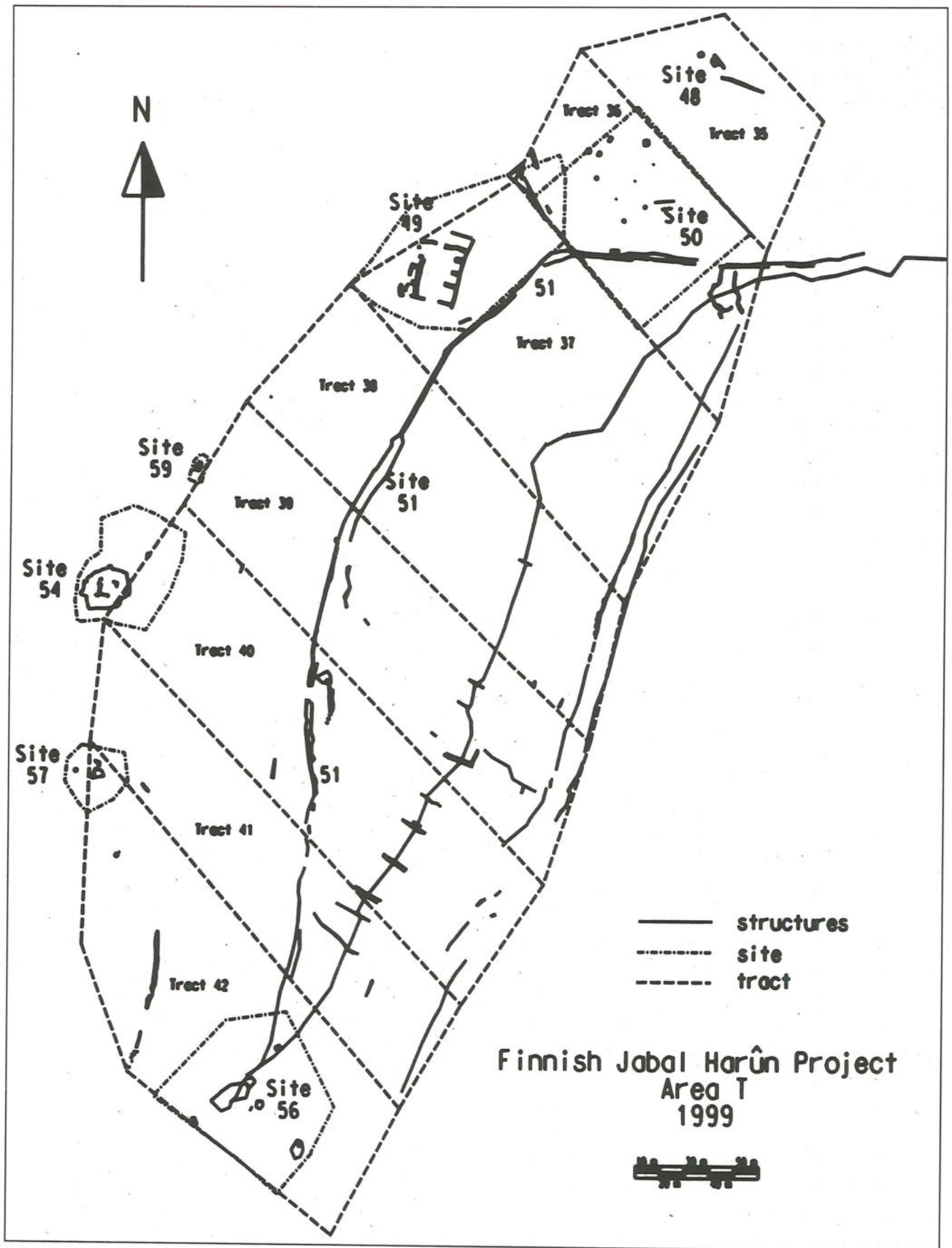
Initially, it was thought that Area T could be very rich in lithic material. Despite this, only Sites 50 and 56 were unambiguously defined as archaeological sites. On both sites, scatters of lithics were observed, concentrated on the parts of the slope on which temporary water currents are also present. Site 50 had originally been located on a sad-



8. The map of the environs of Jabal Hârûn with the 1999 survey areas marked (by K. Koistinen).

dle-like formation and Site 56 on a westward directed slope. The same types of sites have also been found 35 km south of Area T, but situated at a lower elevation (Schyle and Uepmann 1988: 39). Two test pits were opened at Site 50. In both pits, weathered

bedrock was reached at 10-15 cm below the surface. The structure of sediments above the bedrock was chaotic. A concentration of lithics was observed below Site 57, which probably originated from the saddle-like formation at Site 57, although lithics



9. The tachymeter map of Area T (by K. Koistinen).

were scarce at the site itself. Changes in the topography due to erosion have also influenced the position of the finds. An Epipalaeolithic site (59) was situated on the top of a peak between Sites 50 and 54. Lithics were found in pockets carved out of the bedrock. This material contains many microblades and tools, and differs thus from the other lithics collected in Area T. Possibly, the material is still located quite close to its original deposition area. Altogether about 8,500 lithic artefacts were collected in Area T, most of which date to the Middle and Upper Palaeolithic.

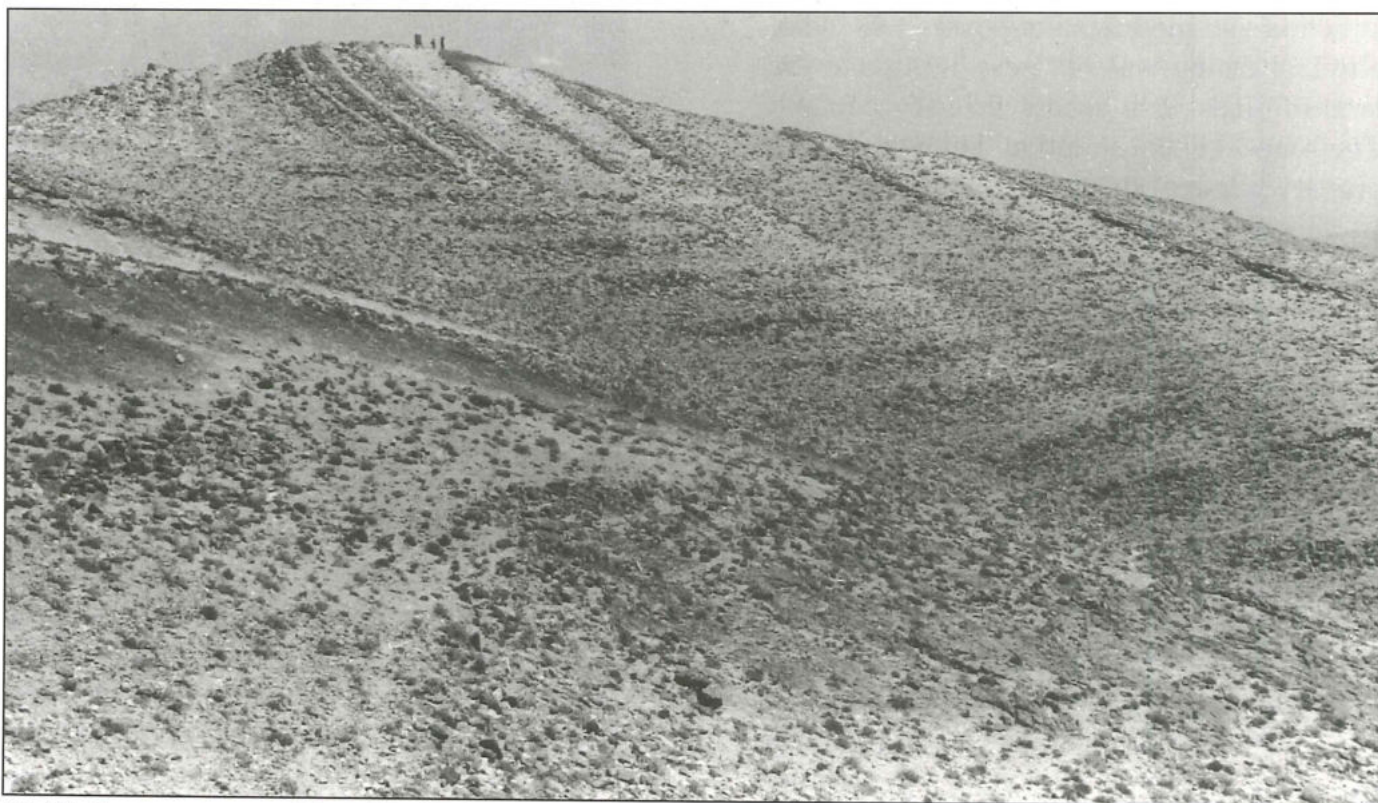
Area T contains the ruins of a building (Site 49) and a watchtower (Site 54). Site 49 consists of three parts - A, B and C. Structure A is the remains of a large building (20 x 30 m) located on top of a small hill. The rectangular structure contains walls forming a series of rooms that surround an inner courtyard. A dense scatter of predominantly Nabataean sherds was found inside the structure. Structures B and C are probably related to the large building. They consist of small and very poorly preserved stone walls. The size and form of structure A, as well as its location near the route from Wādī 'Arabah to Petra, suggest that Site 49 may have been a caravanserai or a fortlet, but other possibilities must also be taken into account. After all, numerous isolated structures, dated from the Edomite through the Late Islamic period, have been investigated in the hinterland of Petra (e.g., Lindner *et al.*, 1998). Site 54 is the remains of a square (ca. 7 x 7 m) watchtower located southwest of Site 49, on a hilltop overlooking Wādī 'Arabah, and with a good view of Jabal Hārūn to the northeast. The walls of the structure are ca. 1.25 m wide and built of large, well-hewn stones; particularly the corners of the tower, with bossed stones, are well preserved. The size of the entire site is estimated at 30 x 40 m, based on the density of surface find scatter. Most of the pottery from the watchtower is Byzantine, but it is likely that the struc-

ture was already in use during the Nabataean period. The watchtower has already been briefly described by F. Zayadine (1992: 225-226, Pl. V, 1). A long, low wall-like stone structure (Site 51) begins at the pass at the southwestern end of Area T and follows the course of the wadi to the northeast. It could be the remains of a road (or the embankment of a road) coming up from the pass and continuing on to Petra, or a wall to prevent soil on the northern slope from sliding into the wadi. The western part of the structure, which is formed by two well-built parallel rows of stones, could also have functioned as some kind of water channel or guide, but this is much less likely.

#### *Area U*

This area, between Areas K and T, contains noticeable formations of siliceous stone, probably 'Amman Silicified Limestone, which dates to the Late Cretaceous. (GS 1992: lithological map.) Flint and chert nodules also occur here in the limestone, as in Areas T and K. Particularly striking in Area U are the curved basaltic escarpments. Deep ravines and bare rocks with practically no soil on the bedrock dominate the physical geology of Area U. For this reason, the number of barrages is smaller here than in Area C. The steep topography and the location of Area U on the upper slope of the mountain make the area an unlikely terrain for camp or dwelling sites. During the survey, remains of hydraulic installations were located in all tributaries, but they were poorly preserved because of the heavy erosion. Exceptions were Sites 67 and 68 with installations as long as 60 m (Fig. 10). They were built on a steep slope, with a distance of about 10-20 m between individual structures. As barrages, they slowed down the flow of runoff water; as terrace walls, they kept the soil on terraces, making cultivation possible. They form an impressive complex. In comparison with other areas, the number of surface finds from Area U - 339 lithics





10. The barrage system of Area U -sites 67 and 68 (by H. Jansson) .

and 350 sherds - was relatively small.

#### Area K

This area can be considered as a continuation of Area C from both the geological and archaeological points of view. Most structures in Area K are barrages built in tributaries (Sites 61, 62 and 63), and they can be connected with the large irrigation system of Area C. Altogether about 70 lithics and 667 ceramic sherds were found. Site 64, located on a flat hilltop, was defined by a concentration of mostly Nabataean and Early Roman pottery. There are also remains of several hearths, and the site was probably used as a campsite for many years.

#### Area C

Test trenches were opened in places already investigated in 1998 (Frösén *et al.*, 1999): at a possible cultic site and at two barrages. Site 33e, barrage 108 (Fig. 11), was chosen because it contains a step-like installation running perpendicularly through the barrage. It served not only as steps for



11. Site 33e, barrage 108 (by H. Jansson).

passage, but also as a water drop structure (Evenari *et al.*, 1971: 104) that was used to irrigate cultivation terraces in a controlled way. A trench on each side of the steps was opened, and a third one at the eastern end of the barrage, a total of approximately 24 m<sup>2</sup>. The investigations concentrated on the relationship between the step-like construction and the barrage itself, the building phases of the barrage, and the relationship of this barrage to another one which runs perpendicularly to the east.

Although a relative chronology of con-

struction and modification phases was clear, absolute dating was not possible due to the lack of finds in a secure primary context. The step-like construction belongs to the primary phase of the barrage system in Area C, and had clearly been built concurrently with and as a functional part of it. The steps have been raised later, and a sixth step constructed. Similarly, at least the upper wall on the western side of the steps had been raised and its direction had been changed. It now forms a curve before it bonds with the addition to the steps. The connection to the perpendicular barrage was not found, because the eastern end of the barrage had collapsed and probably a large part of it had been washed away. This destruction resulted in a slope of rubble and stones against the barrage, on top of which, a wall connected to the steps had later been built. Unlike the main barrage, this double-faced wall features mortar binding and a different construction technique. This wall, too, had been raised by two rows of stones at a later time. Site 41, similar to Site 33e in its location and size, is in a tributary wadi on the western slope of Jabal Hārūn. The excavated barrage (no. 128) bonds with a terrace wall belonging to a hydraulic system that runs along the western slope of the mountain. As in Site 33e, small steps running perpendicularly through the barrage were uncovered. A second steplike structure was exposed in the terrace wall ca. 5 m above the first one. These steps run perpendicular through the terrace wall from east to west and must have the same function as those in barrage 108.

Site 37, an enigmatic and unique stone structure or a “Nymphaeum” (Fig. 12) is located at the northern end of Area C, at the bottom of a tributary wadi running down the slope of Jabal Hārūn. To the south, there is a pass through which an old caravan route went from Petra to the Wādī ‘Arabah. The structure is ca. 10 m (N-S) and 6 m (E-W), with a rounded “well” in the center, and the



12. Site 37, the so-called “Nymphaeum” (by M. Mustonen).

whole is surrounded by a semicircular wall. The “well” could not hold water, and the masonry supports did not feature waterproof mortar. Test excavation included small soundings and a general clearance. The latter, conducted between the “well” and the semicircular wall, exposed a row of steps leading to a small platform-like structure. It is also possible that there was a row of stones leaning on the semicircular wall, which could have served as seats. A floor made of sandstone slabs was found (Soundings 1 and 4) in the area between the “well” and the semicircular wall, perhaps a buildup for the seats. A water channel (ca. 0.5 m wide) was found ca. 0.7 m to the east of the southeastern part of the semicircular wall. The function of the channel remains elusive; its lower end is eroded, and the upper part buried under a thick layer of sand. Other soundings - between the water channel and the semicircular wall, and in the badly eroded southeastern part of the site - did not yield any recognizable remains. Some Nabataean pottery found might be *in situ* or re-deposited. Additionally, limestone building material (slabs and one curved ashlar) was found inside the “well” and around the structure. The exact function of the structure is unclear, but it might have been a cultic place. A “Pond Temple” recently investigated near Petra (Lindner and Gunsam 1995) resembles the “Nymphaeum” in Area C in some respect: they are both located

along caravan routes, they are associated with water, and seem to be connected with a holy place up on a mountain top.

During the 1998 survey, four stone structures were encountered in Area C forming Site 35 in the middle of the main wadi. Due to their uncertain function, two of them were test-excavated. Structure A, ca. 1 x 2 m in size, is built of stone slabs forming a small rectangular enclosure collapsed on the eastern side. The excavations yielded only a few pieces of coarse Nabataean pottery. No traces of bones or charcoal were found to support the grave hypothesis. Stones, reaching a depth of 5-10 cm, revealed no traces of cracks, although most probably the structure had been a hearth. Structure C consisted of loosely fitted stones that formed a circle about 2.5 m in diameter. No traces of fire or remains of charcoal were found inside. The structure could have served as a storage place, probably recent. Among other stone enclosures, one (Site 29) was test-excavated. Nabataean coarse ware sherds were found and macrofossil samples were taken from inside the structure, but evidence for a burial was negative. The site could be associated with a Bedouin camp or other dwelling activities. Stone circles similar to Site 29 are found occasionally throughout Jordan, and they most likely functioned as the foundations of a thorn-made enclosure for animals (Banning and Köhler-Rollefson 1983: 379, Pl. XXVII). Site 18 on the northern border of Area C was also thought to contain burials. Here a test excavation was also conducted with negative results.

Site 24, a lime kiln, is a large circular stone structure (5.2 x 3.5 m), which was cleared inside. On the southern side, a vaulted opening (0.40 x 0.60 m), nowadays closed by large blocks, probably served as an air channel needed for burning. Of particular interest was a "secondary" wall (0.50 m) made of piled limestone blocks inside the enclosure. Inside was also an oven-like structure made of 3 large limestone blocks,

which had probably served as a fireplace. Neither prehistoric nor recent artefacts were found inside the circular structure, which supports the idea that the structure functioned recently as a lime kiln. The last firing of the piled limestone blocks was apparently never carried out.

### **Finds and Conclusions**

Altogether about 8,500 lithic artifacts were collected in Area T - the richest in lithic finds. Most of this material dates to the Middle and Upper Palaeolithic. Sites 50 and 56 are dominated by Upper Palaeolithic material but Middle Palaeolithic material, such as Levallois cores and classical Levallois points, also occur at both sites. The finds from Site 59 appear to be more of an Epipalaeolithic type. In general, the material is heavily damaged by erosion, and in many cases retouched tools can be very difficult to distinguish. Chert is abundant in the area and samples were taken for raw material analysis in the future.

The total amount of pottery sherds collected during the 1999 survey was almost 10,000 (total weight 38.7 kg), ca. 2,500 being diagnostic (total weight 16.7 kg). The majority are Nabataean common and fine ware, as in the 1998 season. A preliminary analysis dates most of the 1999 material to the late first and early second century AD again similarly to the 1998 ceramics. This dating might also apply to approximate a dating for the massive hydraulic installations in the area. Hydraulic installations of similar description are known to have been built and used in the Middle East since the Iron Age (Oleson 1995: 709). However, it was postulated that in the Negev desert, the Nabataeans began constructing large-scale irrigation systems, including dams and barrages, as late as AD 80, during the reign of Rabbel II (Negev 1986: 28). This date also suits the finds from the FJHP survey area. In addition to Nabataean pottery, other types were also found,

but in very insignificant quantities. These include Byzantine pottery, and coarse ware that might be Iron Age in date. There was also one Hellenistic stamped amphora handle, the only piece of Hellenistic pottery found.

Samples for macrofossil and soil phosphorus analyses were mostly collected inside various structures where old soil layers could have survived the intensive erosion in the area. The aim of the soil phosphorus analysis will be to test whether the method is applicable in the natural and climatic conditions prevailing in the survey area for locating earlier anthropogenic enrichment of phosphorus in the soil. The samples will be analysed using the method applied in the Kurban Hüyük area, Turkey, where the enrichment of soil phosphates related to human occupation was noted (Wilkinson, 1988: 103-111.)

The 1999 survey increased the number of barrage-terrace installations from 120 to 233. Especially Area U revealed long terrace-barrages not found before by the FJHP survey. A large number of lithics, especially from Area T, indicates that the area was already occupied during the Middle and Late Palaeolithic. Despite the large number of finds, no dwelling site was found which would produce evidence for long-term occupation. As for the barrages and terraces, al-

though their dating remains elusive, the Late Nabataean period appears most consistent with what is historically known of the development of Nabataean water management.

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