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# Archaeology in Jordan

BERT DE VRIES AND PIERRE BIKAI

This installment of the annual newsletter on archaeology in Jordan reports comprehensively on current activities. These activities include not only fieldwork conducted last year (December 1991 to October 1992), but also new laboratory and interpretive work on projects previously in the field. The 1993 edition of the newsletter is fully representative of the archaeological research conducted in the Hashemite Kingdom by scholars from North America, Europe, Australia, and Jordan itself. Publication of "Archaeology in Jordan" in *AJA* has been funded in part this year, as last year, by generous matching subventions from the Jordan Society in Washington, D.C., and the Endowment for Biblical Research, Boston.

This newsletter includes 44 reports on research involving 39 sites (fig. 1). It includes 37 projects that were active in the field during the first nine months of 1992. This high number testifies in part to the normal business of archaeology in Jordan. The number is unusually high, however, because several projects delayed by war in the Gulf took 1992 as the first opportunity for rescheduling.

As before, the archaeologists who have done the fieldwork, usually project directors or codirectors, report herein on their own work. We thank all the contributors for taking the time to write and send us their essays, and editorial assistant Jane Haney for the countless hours spent on the manuscript.

These reports, though technical in nature, are intended as news items, and do not replace the more elaborate scholarly reporting in the *Annual of the Department of Antiquities of Jordan (ADAJ)* and the journals of the various national societies. Regular reports on fieldwork in Jordan also appear in the *ACOR Newsletter* and *Ancient Jordan*, the newsletter of the Jordanian Friends of Archaeology Society. For multi-season projects with a research history prior to 1990, bibliography and comprehensive field reports may be found in *Archaeology of Jordan*, prepared by D. Homès-Fredericq and J.B. Hennessy in supplements III, VII, and VIII of *Akkadica*.

In order to convey a historical overview, the reports are arranged in chronological order. Reports on multiperiod sites are placed with the period where the project appears to be making its greatest contribution currently. We accept full responsibility for faulty judgments here! In the section on the Hellenistic to Medieval periods, however, the arrangement is geographical because there is generally too much

chronological overlap to achieve a ranking. All eras from the Palaeolithic to the 20th century are well represented.

Several institutions are cited frequently below and are abbreviated as follows: American Center of Oriental Research (ACOR), American Schools of Oriental Research (ASOR), British Institute at Amman for Archaeology and History (BIAAH), the Cultural Resource Management division of ACOR (CRM), the Department of Antiquities of Jordan (DAJ), and the United States Agency for International Development (USAID).

## PALAEOLITHIC, NEOLITHIC, CHALCOLITHIC

**Wadi Ḥasa.** G.A. Clark, Department of Anthropology, Arizona State University, reports:

The third season of excavation and survey of the Wadi Ḥasa Palaeolithic Project (WHPP) took place between 11 February and 8 April 1992 and was directed by G.A. Clark. There were three major aspects of the work: 1) continued excavation of the 'Ain Difla rockshelter (WHS 634) in the Wadi Ali, 2) horizontal expansion of the 44 m trench (WHS 1065) at el-Ḥasa, and 3) initiation of a multiseason survey program on the north bank of the Wadi Ḥasa, the Wadi Ḥasa North Bank Survey (WHNBS). The survey is intended to complement Burton MacDonald's Wadi Ḥasa Survey (WHS), which was restricted to the south bank.

The 'Ain Difla rockshelter (fig. 2) was located by the Wadi Ḥasa Survey in 1982 and tested previously by Clark in 1984 and by Clark and G. Rollefson in 1986. The earlier excavations produced some 8,000 artifacts pertaining to a Tabun Type D, elongated Levallois Mousterian assemblage, but did not penetrate below 1 m from the surface of the deposits (which was variable because of irregularities on the original floor of the rockshelter). Burnt flint samples from the 1986 excavations produced a thermoluminescence (TL) date of  $105,000 \pm 15,000$  B.P. (Oxford University Laboratory for Isotope Geochemistry). It should be noted that this date is at the *top* of the deposit and can be considered to date only the latest phases of Mousterian occupation. No archaeological remains later than the Mousterian (Middle Palaeolithic) are preserved at the site.

The 1992 excavations extended tests begun in 1984 and 1986 to a depth of nearly 3 m and uncovered the remains of dozens of small hearths and firepits, which

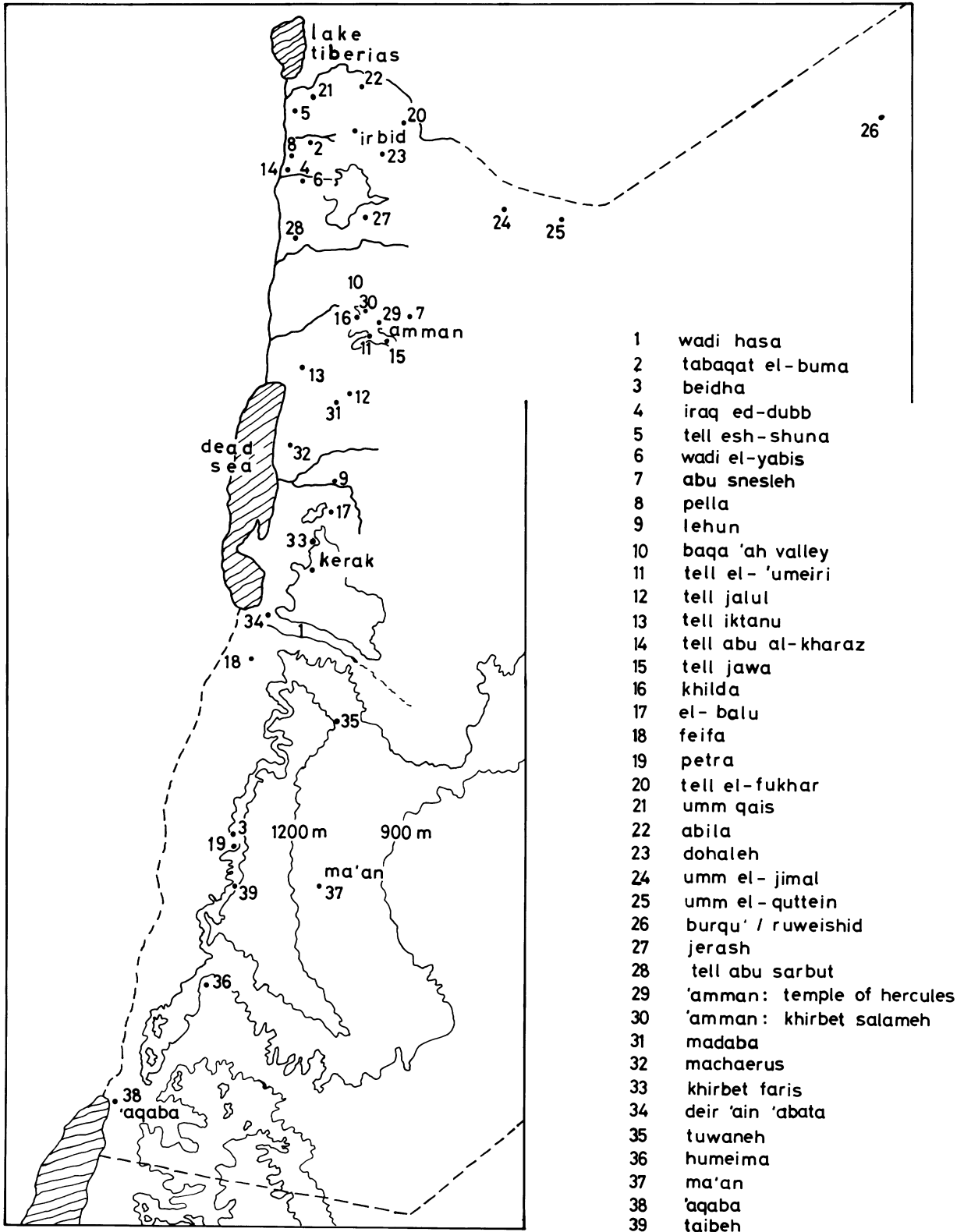


Fig. 1. Sketch map of archaeological sites in Jordan referred to in the text. Not to scale.



Fig. 2. Ain Difla rockshelter (WHS 634). Viewed from the 27 m high terrace of the Wadi Ali system, looking northwest.

should yield more dates from what is Jordan's earliest Palaeolithic site. Thousands of artifacts were recovered along with poorly preserved animal bone. Many of the artifacts showed signs of having been burned in fires—certain evidence of the systematic use of fire by these early, pre-modern humans. Some 3–4 m of archaeological deposit still remain to be sampled, with the exciting prospect of uncovering stratified evidence of early humans extending back 250,000 years or more. The site is located on top of an ancient river terrace, one of three preserved in the valley, and is in close proximity to an enormous fossil spring, which can also be dated using uranium series methods. The aim of the research is to shed light on early Middle Palaeolithic adaptations prior to the emergence of modern man.

We also expanded earlier tests at WHS 1065, an 800 m<sup>2</sup> Epipalaeolithic site associated with a fossil lake in the eastern part of the Wadi Ḥasa. This site had been tested in 1984 by a series of eight 5 m and one 4 m step trenches that bisected the site and ran from the marls below it to the collapsed rockshelter and fossil spring with which it is associated. These excavations produced enormous quantities of stone tools and animal bones dated by five radiocarbon deter-

minations to about 16,000 years ago. The overall objective of the research was to get a picture of human life in the waning millennia of the Pleistocene in the interval just prior to the appearance of the earliest domesticated plants and animals. The aim of the 1992 excavation was to open up some horizontal areas of the site, with the possibility of identifying living surfaces or structural remains. Additional excavation might also enable us to isolate discrete phases of Epipalaeolithic occupation. Kebaran and Natufian components were identified by means of *fossiles directeurs* in the 1984 tests.

Our objectives were only partially met. We were unable to identify unequivocal living surfaces or architecture, but a Kebaran component may have been isolated in the complex occupation sequence at the site, which evidently “moved” up and down the slope over the long term probably in response to changes in the level of the lake. We also noted differences in lithic technology, which should be further elucidated by laboratory analysis at Arizona State University during the summer and fall of 1992. If these stand up to further scrutiny, they could have a substantial impact on the traditional notions of the Kebaran and of Epipalaeolithic industries in general.

Finally, since human adaptations are regional phenomena, isolated sites can provide only "snapshots" of the panorama of human adjustment to a series of changing Upper and Post-Pleistocene environments. In order to develop a more adequate regional picture of these adaptations, we initiated an intensive (ca. 100%) survey of the north bank of the Wadi Hasa beginning at its eastern terminus just west of the Desert Highway. Our intention was to survey completely a 16 km<sup>2</sup> area extending westward some 8 km from the road and north at least 2 km. This effort revealed seven sites dominated by Stone Age material. Only 18 sites (23%) produced ceramics and/or had distinctive architectural remains. These were dominated by Late Byzantine/Early Islamic sites (7 sites, 39% of ceramic total) and a scattering of Roman (2, 11%), Nabataean (1, 5%), Ayyubid/Mamluk (5, 28%), and Ottoman (3, 17%) sites. Many sites with and without architecture had more than one component.

The remaining 60 sites (67%), as well as some of those with ceramics, yielded collections of lithic artifacts ranging in time from the Lower Palaeolithic (Acheulean) to the Metal Ages. Of considerable interest is a respectable number of Upper Palaeolithic sites (25, 27%), which were not reported in Jordan until MacDonald's 1979–1983 survey but which have subsequently been shown to be well represented in the Hasa drainage and in the Wadi Hisma (southwest Jordan). The Stone Age sites are generally found on top of alluvial fans extending down from the southern slopes of the Jebel el'Misq, although they sometimes occur eroding out of the lacustrine marls formed by Pleistocene Lake Ḥasa, which appears to have reached a maximum elevation of ca. 815 masl, probably at some point early in its formation. The lake is thought to have been in existence between ca. 70,000 and 12,000 B.P. and was essentially contemporaneous with the Lisan Lake. Like the Lisan Lake it was alkaline throughout much of its existence and evidently became more alkaline over time. Its end was different than that of Lisan, however, since it was probably breached and drained by headward erosion of the developing Wadi Ḥasa at some point about 15,000–12,000 B.P. Its disappearance was likely to have been more of an "event" than a "process," and drainage could have occurred fairly rapidly, possibly aided by faulting (a number of shear faults can be observed in the eastern end of the wadi in what would have been the northeastern corner of the lake). Although ancient stone artifacts sometimes occur on alluvial fans at elevations below 815 m, sites with some degree of compositional integrity appear to be found *only at or above* that elevation. Moreover, those tested in 1984

do not postdate the Natufian (ca. 12,500–10,000 B.P.). The high elevations of the Jebel el'Misq are covered in a flint-rich gravel scree in which there is a continuous light scatter of deflated, heavily patinated, wind-polished artifacts. These tend to be ancient (i.e., Lower and Middle Palaeolithic, sometimes Upper Palaeolithic), and were associated with vanished land surfaces that existed some 10–20 m above those of the present day.

This research is supported by the National Science Foundation, the National Geographic Society, Arizona State University, and the Chase Bank of Arizona, with the logistical assistance of ACOR and under the aegis of ASOR's Committee on Archaeological Policy (CAP) and the DAJ.

**Tabaqat al-Buma, Wadi Ziqlab.** E.B. Banning, Department of Anthropology, University of Toronto, reports:

The third season of excavations at Tabaqat al-Buma (WZ 200) was funded by the Social Sciences and Humanities Research Council of Canada and took place from May to July 1992. The work concentrated mainly on the Neolithic occupation of the site, to complete excavation of a structure that was partially exposed in 1990 (Banning, *AJA* 96 [1992] 506–507) and to test for the presence of other structures (fig. 3). There was also work on Kebaran deposits in areas E34 and F34, and a small excavation at nearby site WZ 310. Previous (uncalibrated) radiocarbon dates on the site have ranged from 14,850 ± 160 B.P. to 11,170 ± 100 B.P. for the Kebaran deposits (four dates), 7800 ± 70 B.P. to 5740 ± 110 B.P. for the Neolithic occupation (four dates), and 1680 ± 60 B.P. (calibrated age, A.D. 254–299 or A.D. 322–421) for a camping episode on the site associated with fourth-century pottery.

Work in areas G34, G35, H34, and H35 revealed the remainder of a large Late Neolithic structure, 4 m wide and 8 m long, with its northeastern wall missing. Its interior floor had a large, circular, plaster-lined hearth, and a burial of two individuals had been placed and covered by stones in the south corner after the room's abandonment, much like a similar burial found in the west corner in 1990. The neighboring areas G35 and H35 also contained a later parallel wall, almost 1.5 m thick; pits had been dug into both it and the southeastern wall of the large structure after abandonment of the room. In one case, a carefully slab-lined pit contained a child burial.

Two structures, one in areas E33, F33, and D31, the other in areas D32 and E32, date near the very end of the Late Neolithic in the fifth millennium B.C. The earlier eastern room during its last use had a

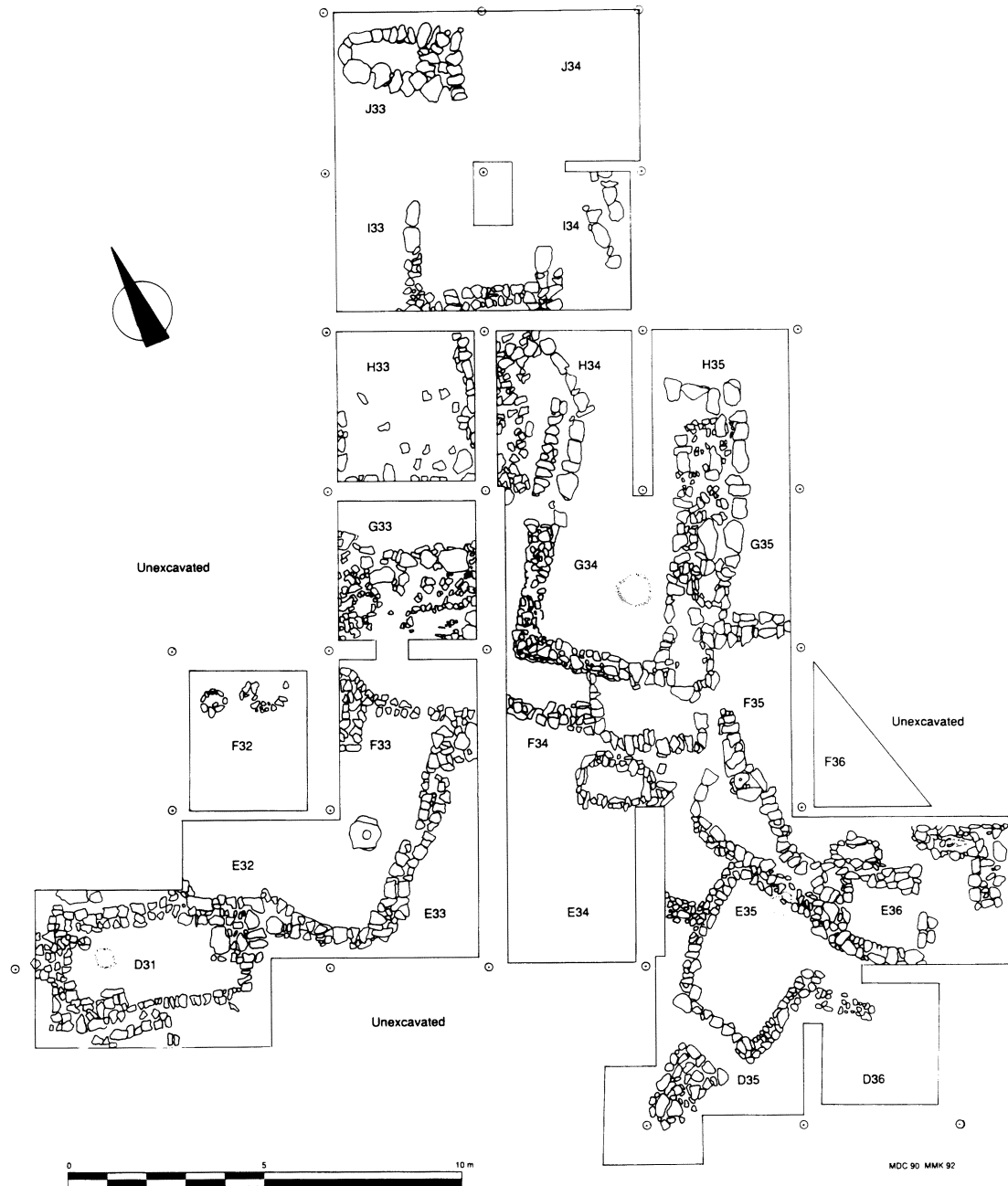


Fig. 3. Tabaqat al-Buma, Wadi Ziqlab. Late Neolithic architecture, excavated areas, 1992.

cobble floor associated with an extremely large stone mortar. Like the earlier room to the northeast, it appears to have measured some  $4 \times 7$  m, possibly with a similar placement of the hearth. An earlier plaster floor or feature within this room seems to be associated with an earlier demolished structure in this area. The smaller later structure had an unusual feature in one corner that incorporated a large ceramic plaque and a cracked basalt quern. The pottery associated with these structures and some of the later

deposits in other excavation areas includes a hard black-burnished ware with occasional combed decoration (fig. 4). It seems to be identical to much of the ceramic repertoire of site WZ 310, some 600 m away, and has parallels in "Wadi Rabah" sites.

A stone feature in area F34 proved to be another large slab-lined and slab-covered cist grave, very similar to the one excavated in 1987 (Banning, *AJA* 95 [1991] 257–58). Inside were the skeletal remains of a 15-year-old and a six-month-old child wearing a den-

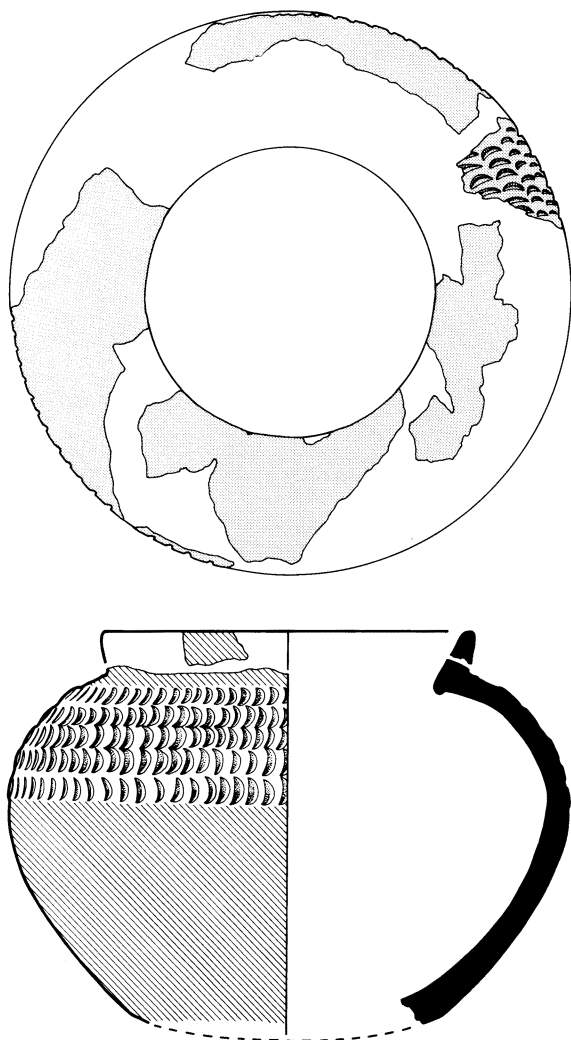


Fig. 4. Tabaqat al-Buma, Wadi Ziqlab. Late Neolithic bur-nished and impressed pot. (J. Pfaff)

talium-shell necklace when interred. The grave appears to belong to the earliest Neolithic phase identified so far at the site but awaits radiocarbon determination for an absolute date. Unfortunately no pottery occurred as grave goods.

It now appears that we have at least three major phases of the Late Neolithic at the site, each with distinctive architecture, pottery, and lithics. The lowest phase, with single-leaf walls built of massive squared limestone blocks, remains exposed only in a few areas, and we have little material to associate with the architecture, which appears to be fragments of three or four structures. A single small sherd with typical "Yarmoukian" incised decoration, if it is not intrusive, may belong to this phase. The next phase, with predominantly friable salmon-colored ceramics and expedient lithics, has at least two structures, one

with two rooms, built with smaller chert blocks and wadi cobbles. Their walls, which often incorporate earlier walls into parts of their foundations, themselves show considerable alteration, rebuilding, and reuse in later times along the northeast edge of the site. The last major Neolithic phase of occupation on the site has three well-built rectangular rooms, typically with cobbled floors, associated with dark-burnished pottery and incised, combed, or impressed decoration. This pottery also appears at nearby site WZ 310.

**Beidha.** Brian F. Byrd, San Diego, California, reports:

The second volume of *Excavations at Beidha: The Neolithic Village of Beidha: Architecture, Occupation History and Spatial Organization*, by Brian Byrd, is now complete and in press. It is part of the Beidha Publication Project, a cooperative venture by Diana Kirkbride (director of the excavations), Peder Mortensen (director of the Forhistorisk Museum, Moesgaard, Denmark), and Brian Byrd, with four volumes projected. The first volume, also by Byrd, is entitled *The Natufian Encampment at Beidha: Late Pleistocene Adaptation in the Southern Levant* (Aarhus 1989). This project is only possible due to the extensive and substantial nature of Kirkbride's eight seasons of field research. Her excavations, over 2,200 m<sup>2</sup> in area and up to 3 m in depth, uncovered over 65 buildings within a long sequence of Pre-Pottery Neolithic B (PPNB) habitation dating to the seventh millennium B.C.

*Beidha 2* examines the stratigraphic history, the character and distinctiveness of the built environment, and the nature of community organization during the Early Neolithic. The Neolithic settlement appears to have been continuously occupied, during which time an indigenous architectural progression took place from clusters of oval post-houses, through individual oval and subrectangular buildings, and ultimately to full rectangular buildings complete with two stories. The village history is modeled stratigraphically by distinguishing three major phases: A, B, and C (with two spatially restricted subphases during phases A and C). The tell is considered to have built up steadily, albeit unevenly, and in certain instances there may have been overlap in the habitation span of individual buildings between subphases and possibly phases (particularly between phases B and C). There is no evidence to suggest that the village was ever abandoned for any period of time and then reoccupied.

The settlement grew and spread during each sub-phase and phase by the founding of new structures

and the decay and desertion of old ones. Both multiple and individual construction events were prevalent, and considerable variability in habitation pattern exists between phases. Trends in individual building abandonment also vary greatly between phases. Throughout the settlement's history its organization appears to have been relatively unplanned, with only a series of limiting rules affecting the random spread and distribution of dwellings. No formal or planned village community emerges, but changes are discernible in the elaboration and refinement of private and public space. The distribution of structures becomes more compacted and public space more spatially restricted either to the margins of the settlement or to an elongated east-west central area. Individual dwellings become less open in plan and more restricted in access. Furthermore, the entrances to adjacent buildings become more spatially discrete over time.

I have hypothesized that small, individual households (perhaps best considered nuclear families) constituted the primary residential and economic unit throughout the occupation of Beidha. This inference is based on rigorous comparative analysis of patterns in interior floor area, the distribution and range of features, and the nature of in situ floor artifact assemblages. In addition, significantly larger corporate structures, with a distinct set of attributes, coexist with the domestic units throughout most of the settlement's history (except possibly during the earliest subphase). Over time their size increases along with the domestic units, as does their structural elaboration. These non-domestic units are inferred to have been the venue of supra-household decision-making and related ceremonial activities. Over time there appears to have been an increased distinction between private and public space, along with greater evidence of production activities within individual households. This is particularly true with respect to the probable location of household storage and production areas.

The Neolithic settlement of Beidha is significant for its sequence of changes in architectural style and technique and the organization and layout of the community. These developments provide considerable insights into how one small community attempted to embrace the social and economic changes taking place with the establishment of sedentary food-producing communities throughout southwest Asia.

**‘Iraq ed-Dubb.** Ian Kuijt, Harvard University, reports:

As part of the wider survey and excavation program centered on the Wadi el-Yabis under the direction of G. Palumbo and J. Mabry, the 1991 excavations at the Early Neolithic (PPNA) cave of ‘Iraq ed-Dubb were

focused on expanding areas excavated in 1989 and 1990. Funded by the National Science Foundation, the Department of Anthropology at Harvard University, the Peabody Museum, the Social Sciences and Humanities Research Council of Canada, ASOR, and the Sigma Xi Foundation, the ongoing excavations at ‘Iraq ed-Dubb (Cave of the Bear) have provided evidence for the year-round Early Neolithic occupation of this cave and the use of forested upland areas above the Jordan Valley.

With the 1991 field season, excavations have now led to the identification of three oval stone structures, multiple pit features, four fire hearths, and several subfloor burials, all situated within cultural deposits of less than 1.5 m in depth and on top of bedrock. These stone structures, some 4 m or greater in size, were constructed with upright stone walls and had plastered mud floors. In the two fully excavated structures, evidence was recovered for multiple floor-plastering events (structure 1), an internal fire hearth (structure 1), large grinding and anvil stones set into the floor with a stone collar foundation (structure 2), and a central 10–15 cm circular mud platform (structure 2). Also uncovered were several adult and adolescent burials located in extramural areas. Typical of the Early Neolithic period, these burials lacked grave goods and the deceased had had their crania removed (fig. 5).

Despite the restricted size of the excavations at ‘Iraq ed-Dubb (less than 36 m<sup>2</sup>), large quantities of faunal, archaeobotanical, and lithic materials were recovered. Preservation of archaeozoological and palaeobotanical materials was excellent and, with the completion of laboratory analysis, these will provide us with one of the most comprehensive overviews of subsistence and economic practices for the Early Neolithic period. Among the other materials recovered were over 50,000 pieces of chipped stone, some 30 items of ground stone, some 30 pieces of ground and polished bone, over 25 complete or partial seashells, and several clay objects. Conventional and accelerator radiocarbon dates from the site indicate that the majority of the cultural deposits, and all of the structures, date to the Early Neolithic period (10,500–9300 B.P.), and that deposits below this level date to the terminal stages of the Late Natufian period (12,800–10,500 B.P.). In light of the paucity of known Early Neolithic sites in the Levant, let alone small, single-component cave sites located in the highlands, this site provides an important, if not unique, opportunity to focus on several largely unresolved aspects of Early Neolithic palaeoeconomy, settlement systems, and subsistence practices in the Levant.



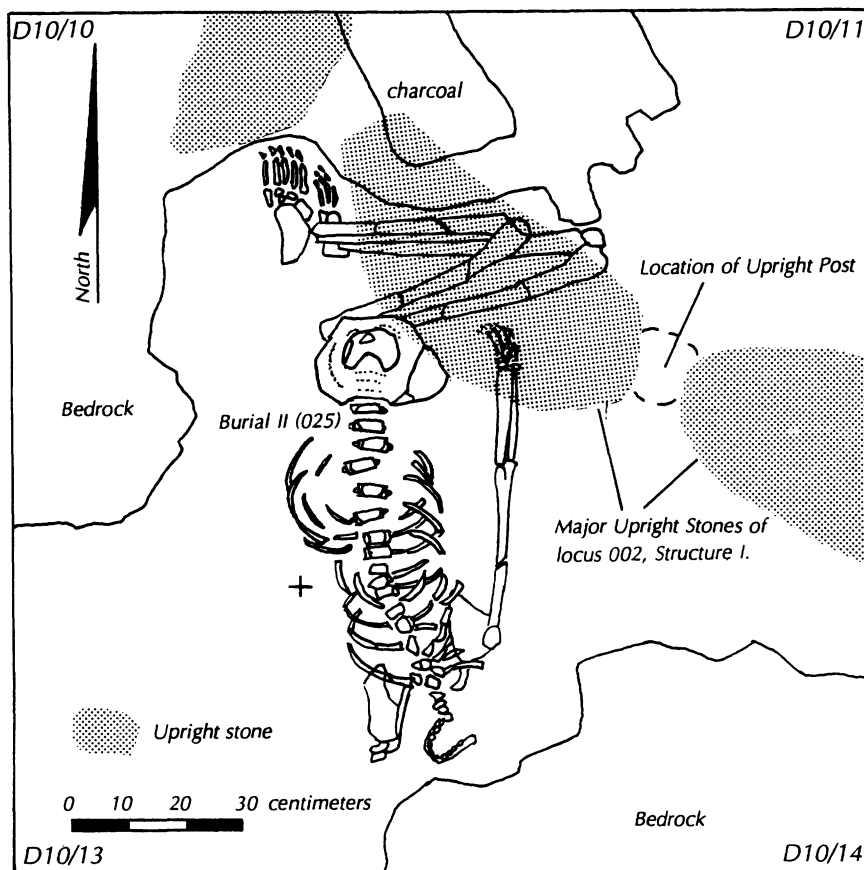


Fig. 5. Iraq ed-Dubb. Plan of burial II and stone wall of structure II. Charcoal to the north yielded radiocarbon date of  $10,785 \pm 285$  B.P. (GX-17399).

**Wadi el-Yabis.** Gaetano Palumbo, Università di Roma, and Jonathan Mabry, University of Arizona, report:

A fourth season of fieldwork was conducted between June and July 1992 in the area of Wadi el-Yabis, north of Ajlun, by a team of archaeologists led by Gaetano Palumbo and Jonathan Mabry. This work was financed by grants from the Italian Ministry of Foreign Affairs and the Italian National Research Council (CNR).

Four projects were conducted during this year's fieldwork. Soundings were conducted at Tell el-Meqbreh in the Jordan Valley, where excavations revealed almost 5 m of archaeological layers characterized by domestic structures with well-preserved walls, floors, and hearths, dated between the 12th and ninth centuries B.C. (Iron Age I to Iron Age II). The site was fortified, as evidenced by a wide stone wall exposed on the north side of the tell. The long sequence of Iron Age occupation was quite unexpected, considering that the nearby large site of Tell Abu el-Kharaz does not show a similar occupational history.

The second sounding was conducted at the Neolithic village site of er-Rahib, near 'Irjan. This village is dated by the materials found to the late PPNB period, approximately 8500–8000 B.P. The corner and side wall of a house with a thick plastered floor were found during the excavations. In a possible "garbage dump" found outside of the house, many animal bones and chipped flint tools were recovered. Among the retouched stone tools, Byblos, Jericho, and Helwan projectile point types were represented. Four pieces of obsidian were also found.

The third project was the intensive survey of three areas in the Wadi el-Yabis basin, which led to the discovery of 61 new archaeological sites. Most of them date to the Middle Palaeolithic period (50,000–30,000 B.P.), while other sites found date to the Roman, Byzantine, Islamic, or Ottoman periods. A Roman fort was located on a hill near the village of Ba'un. It probably controlled the road from Pella to Gerasa. A large Early Bronze Age cemetery was found on the hills above the Ghor. A survey was also conducted to identify the 19th-century water mills between the vil-

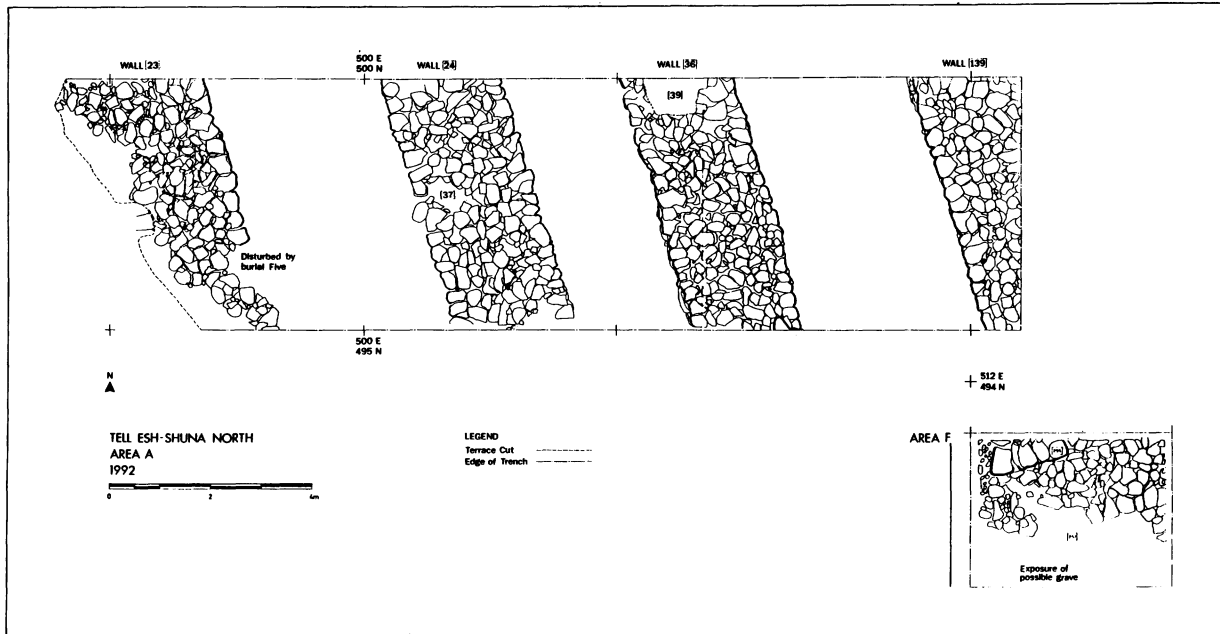


Fig. 6. Tell esh-Shuna North. Areas A and F.

lages of Rasun and Judeitta, along 8 km of the Wadi el-Yabis stream.

The fourth project has been the architectural and ethnographic survey of the village of Kurkuma, near the Jordan Valley; a small traditional village mostly abandoned today, but still used by the villagers of the nearby village of Hashemiya in the winter crop season. The village is characterized by different types of traditional rural houses, from the common arched house to the more rare pillared house, with pillars reused from the Roman-Byzantine ruins still preserved under part of the modern village. As part of the project the village was mapped, and some houses were selected for detailed plans and elevations. Ethnographic research included interviews with families still using the village, and research into the agricultural practices of the area.

#### BRONZE AGE, IRON AGE

**Tell esh-Shuna.** Graham Philip, Institute of Archaeology, London, and Douglas Baird, Edinburgh University, report:

The present report covers the second season of excavation at Tell esh-Shuna in March-May 1992. A third season is planned for February-May 1993. The overall aim of the project is to reach an understanding of the development of major centers from the fifth to the third millennium B.C. (calibrated).

*Upper Tell.* Area A was extended 5 m to the east this season (now 18 × 5 m). A fourth large stone wall,

at least 2.3 m wide (wall 139), was uncovered to the east of and parallel to the three large stone walls (23, 24, and 36) exposed in 1991. The resulting symmetrical arrangement (fig. 6) suggests that the walls form part of a large building, measuring at least 18 m east-west. The construction of this edifice cannot yet be securely dated. The deep fills between the walls have produced no pottery postdating the EB I period. Two plaster floors, however, were found running up to a vertical plaster face abutting a rubble and mud superstructure on wall 139. These overlay the various fills between the walls, and were 1.1-1.2 m above their base. Both floors are cut by at least one Late Hellenistic grave. A small, isolated fragment of one of the plaster floors (most likely the upper one) runs up the lip of a large, dressed limestone block sitting on wall 36 (slab 39), which seals another Hellenistic grave. Therefore, the surface itself must be of Hellenistic date. The slabs and the plaster floor may belong to the same phase of use. Given their symmetrical arrangement on what is now seen to be the central pair of walls, the three slabs may well have done double duty as roof supports and grave markers.

Areas E (8 × 5 m) and F (4 × 3 m) were opened in an attempt to follow these walls to the north and south, respectively. A possible robber trench was noted on the correct alignment for a northerly continuation of wall 36. The upper plaster floor continued right into the north section of area E, along the east side of this robber trench, a total length of 11 m.

The walls did not continue directly into area F, which will require more excavation before it can be understood. This area produced EB III pottery including Khirbet Kerak ware, the first such found in the central area of Shuna. It may be significant that no EB III pottery was found in the fills between the four large stone walls.

There were no convincing occupation surfaces associated with the bottoms of the walls because it remains uncertain whether we are dealing with the foundation of a Hellenistic building sitting in a large cut with derived EB I fills between the walls, or if the walls are originally of EBA date, partly reused in the Hellenistic period.

In the western part of area A, walls 23 and 24 were removed. Immediately below were a series of largely featureless fills ca. 0.6–0.8 m in depth. These layers produced no pottery later than late EB I. Below these lay parts of two EB I structures, one stone-built, building 2; the other with mudbrick walls around 1.0 m in width, building 3. A large black-polished (Cracked ware) platter-bowl with upturned horned handles lay immediately to the outside of building 3. To the east of these buildings lay a rich midden deposit, which produced a ceramic vessel with traces of copper adhering to the walls, fragments of ostrich eggshell, and several restorable vessel profiles.

*Area D.* Area D at the base of a modern cut was expanded (6 × 4 m) and excavated to greater depth. A series of fills similar to those excavated in 1991 were removed. Below these the area was heavily pocked with pits, evidence of its use as an outdoor working area. Two infant burials placed below fragments of broken pots belong to this phase. Below this phase but cut by the bottoms of the later pits were found parts of at least two rectilinear structures on the same alignment and built of bun-shaped mudbricks. Patches of plaster surface were associated with these structures. The pits and overlying fills are probably of Chalcolithic date. The pottery associated with the earlier structures has not yet been analyzed.

Two reports are currently in press: the first season in *ADAJ* 1992 and the second in *Levant* 1993.

**Abu Snesleh.** Susanne Kerner, German Protestant Institute for Archaeology, Amman, reports:

The site is on the confluence of Wadi Qattar and Wadi Irmedan, some 30 km east of Amman. The second season in Abu Snesleh took place in June 1992 with two weeks of documentation work. Permission was kindly given by the DAJ.

The work continued mainly in the areas where we had started in 1990. We excavated in five squares—E12, F12, G11, G13, and H13—and at the dam. The

aim of the 1992 season was to uncover more details about the Middle Bronze Age and Chalcolithic settlements, the connection between both occupations, and the dating and layout of the dam.

*E12.* Only one trench was laid out in the square. An already existing section, cut by the modern road, was cleaned and further excavated. The trench was laid out between the western and eastern wall of a house (probably dating to the MBA). The floor was found and beneath the floor three more walls, which seem to date to the Chalcolithic period. These buildings were heavily disturbed by the road.

*F12.* This square revealed a large courtyard in 1990 and had been chosen for the stratigraphical trench this year. In 3.5 m of occupational layers were found artifacts from the MBA, Chalcolithic, Neolithic, and Epipalaeolithic periods. Sterile soil was not reached.

*G11.* In 1990 work was begun on a huge structure in this square. In this season it became clear that it is a large double-stone curved wall with a tower on the outside. We found only the lowest courses of this wall, with some lining on the inner side. The construction seems to date to the MBA.

*G13.* The main work was done on a Chalcolithic house (house 2). We found all four walls and the entrance. The entrance was decorated with prominent pilasters. The walls are very evenly set with well-hewn stones. On the floor of the house was a complete tool-kit of stone tools and pottery. The roof construction was revealed by many long, slim, stone slabs, which had probably been used for corbeling. The house is 1.90 × 3.20 m and the walls are standing up to 1.10 m. Other parts of the square were excavated around the house; the surrounding area seems to be Chalcolithic as well and showed an outdoor area associated with house 2.

*H13.* In the squares G12, G13, H12, and H13 is a large MBA house (house 1). The northern, southern, and eastern walls are nearly completely excavated. The house was 13.20 m long and 4.20 m wide, and had been divided into (at least) two rooms. The easternmost room was very small and contained several human skulls and long bones with a few grave goods (such as beads and pottery). The large room had two high upright stones (1.30 m over floor level), which most probably supported the ceiling (fig. 7). Nothing else is known about the roof construction. The wall between the rooms had spaced large upstanding stones, while the intervals were filled by smaller stones, which gave a “window-like” impression. The entrance to the south has also been excavated.

*Dam.* A dam is situated some 100 m to the east of the site of Abu Snesleh, which closes the exit of a



Fig. 7. Abu Snesleh. Area H13, house 1.

small wadi toward Wadi Irmedan. A trench on the inside of the dam revealed only one course of stones. The material is still in the process of examination.

The combined evidence suggests an MBA village with long, narrow houses around an open space on top of a not much smaller Chalcolithic village of smaller houses. Underneath at least one part of the Chalcolithic village are several layers of earlier occupation.

**Pella.** Stephen J. Bourke, Department of Archaeology, University of Sydney, reports:

The 14th season of excavation at Pella took place during January and February 1992. Excavations concentrated on three areas (fig. 8) situated along the southern edge of the main tell of Khirbet Faḥl (areas III, XXVIII, and XXXII) and in the MB/LB cemetery (area XI) situated on the north face of Tell Husn.

In trench IIIC/IIID two main issues were investigated. The first centered on the date of the massive mudbrick city wall that encircled Canaanite Pella. We have been investigating this fortification for some 10 years now, and this season in a small sondage (2 × 2 m) we reached the bottom of the wall and confirmed its MB IIA (ca. 1950 B.C.) construction date. The

second derived from the unexpected discovery of an earlier north-south fortification wall, dating to EB I/II (ca. 2900 B.C.), slightly below and to the west of the MBA levels reached at the end of the 1990 season. This earlier fortification wall, rebuilt at least once during its lifetime, is likely to delineate the eastern margins of the EBA city. Below this two-phase wall the trenches reached natural soil.

Upslope and to the west of trench IIIC, in trench IIIN/IIIS, the southern half of a large LBA palatial residence was uncovered. This structure was first detected in trench IIIC in 1980, and the nearly complete plan has been gradually uncovered over the last 10 years. The complex, approximately 15 × 15 m in extent, finds similarly dated close parallels in the "Governor's Residence" type of administration building. Our example, the earliest of its type uncovered in Jordan, resembles that from Beit Shean closely, although not exactly.

A new 4 × 6 m trench, XXXIID, was opened some 10 m to the west of the previous western limits of area XXXII and an EB IB/II (ca. 3000 B.C.) residence/fortress was uncovered slightly below the tell surface. Beneath this EBA material a series of Late Chalco-

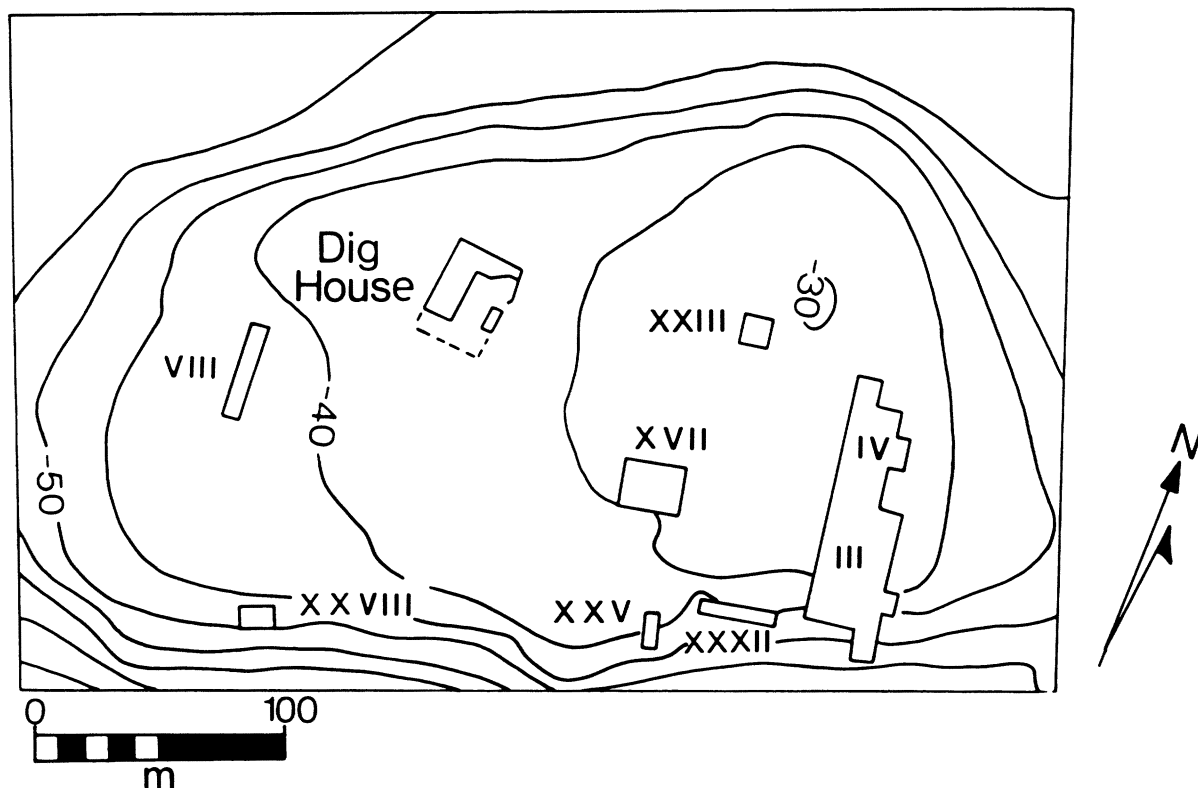


Fig. 8. Pella. Plan of Khirbet Fahl showing locations of excavated areas.

lithic (ca. 3500–3300 B.C.) pits and large storage vessels were uncovered, cut into the natural soil of the tell; the material culture is close to that represented in Hanbury-Tenison's area XIV excavations. Slight indications of architecture were uncovered in the northern balk of the trench.

In trench XXVIII A the northeastern corner of a very large MBA building was uncovered. This three-phase construction represents one of the most monumental of our MBA residences. It dates to MB IIB (ca. 1700 B.C.). Two intramural burials, adding to the three previously discovered, positioned beneath later dividing walls within the complex, produced storage jars, small carinated bowls and juglets, and the complete skeleton of a canine as well as the bodies of two small children.

In the MB/LB cemetery, area XI, situated on the north face of Tell Husn, work continued in the entrance dromos of tomb 106 where the "Shackled Man" was discovered in 1990. This year's work confirmed the LB IIA date (ca. 1350–1300 B.C.) of the tomb and resulted in the recovery of important alabaster, metal, and ceramic finds.

The University of Sydney excavations at Pella in 1992 were funded by the Australian Research Council, the Australian National Gallery, the University of Sydney, and a substantial private donation. The ex-

cavations are undertaken in cooperation with the DAJ. We extend our thanks to Safwan Tell, Director-General of DAJ, and his staff, particularly our two Antiquities representatives, Sultan Shraideh and Wa-jeeth Karasnah, for their active support in what was the coldest, wettest winter in recent Jordanian history.

**El-Lehun.** D. Homès-Fredericq, Royal Museums of Art and History, Free University, Brussels, reports:

The Lehun excavation is a long-term project, studying the environment and agricultural settlement of a Moabite village in the neighborhood of the "King's Highway." The project is sponsored jointly by the Belgian Committee of Excavations in Jordan. The excavation was codirected by P. Naster between 1977 and 1984, and D. Homès-Fredericq from 1977 until the present, in collaboration with the DAJ. It is planned that the dighouse will become a local museum in the year 2000.

Lehun is located on the northern plateau of the Wadi Mujib (Arnon of the Bible). It lies 7 km east of Dhiban (the capital of the Moabite King Mesha) and, respectively, 4 km and 3 km east of the archaeological sites of Aqraba and Ara'ir (the Aroer fortress of King Mesha), along an antique track, following the southern border of the plateau.

The site is 1,100 m north-south by 600 m east-west (fig. 9). The altitude ranges from 719–748 masl. The

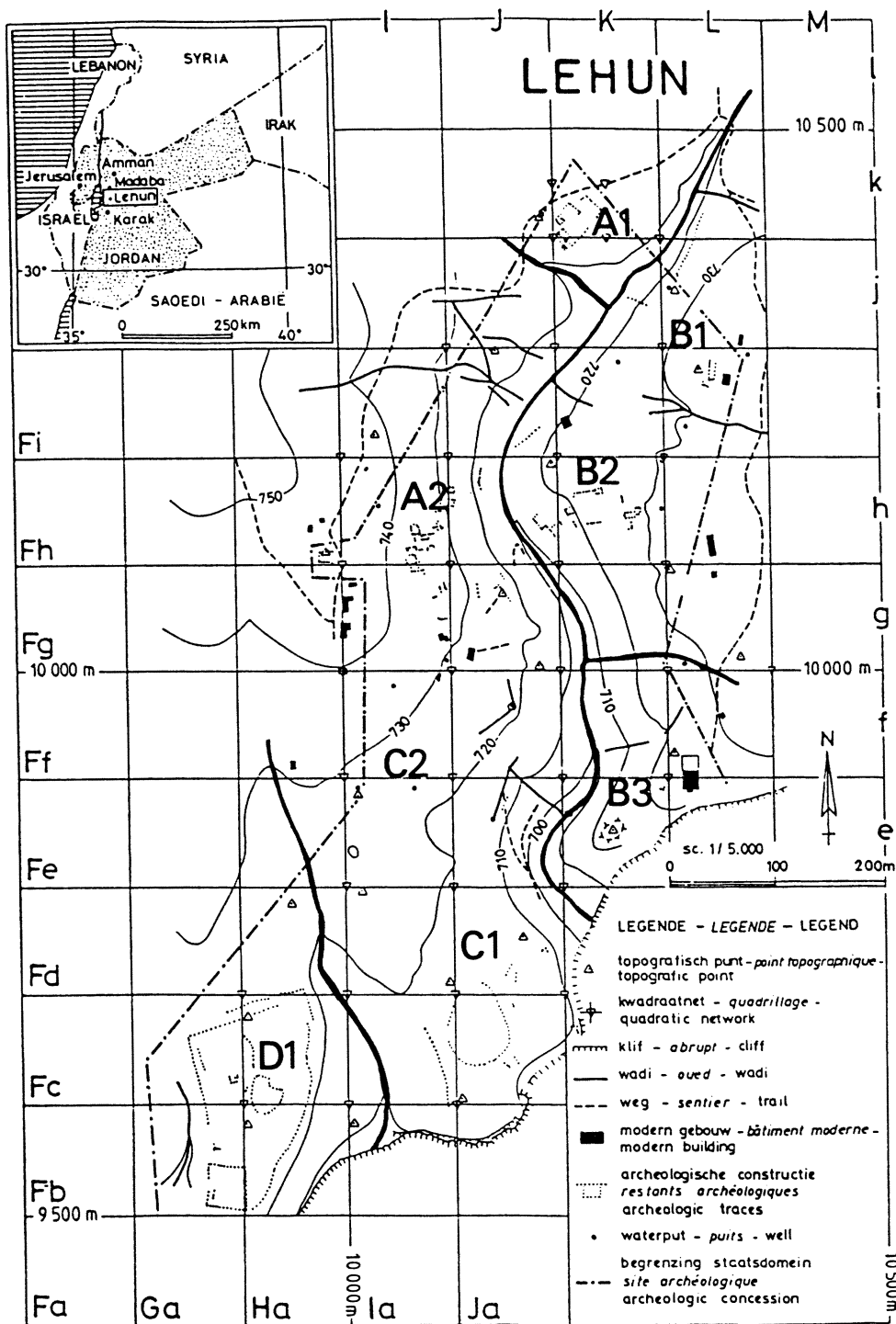


Fig. 9. Lehun. General map of the site.

Wadi Lehun and various seasonal rivers divide the hilly landscape north-south and east-west, into natural areas (sectors A-D) that influenced the ancient settlements: on the northern part are Nabataean (sector A1, B1-B2), Roman, Byzantine (?), and Islamic remains (sector A2). On the southern part are the Early Bronze (sector C2) and Late Bronze/Iron Age

settlements (sector C-D). In sector E, surface flints of prehistoric periods were found. (For a complete plan of the site [1978-1986] see the topographical map, scale 1:1,000, Louvain 1988).

*Palaeolithic.* G.O. Rollefson and G. Funkhauser undertook a lithic survey of the whole site in 1980. From an area of 225,000 m<sup>2</sup> they collected nearly 1,000

samples from the Lower and Middle Palaeolithic and the Bronze Age, but none from the Neolithic period. The oldest examples go back 150,000 to 80,000 years. A wide range of tools has been assembled: racloirs, burins, scrapers, flakes (some typical Levallois flakes), nuclei, and core fragments.

*Neolithic and Chalcolithic.* These remains are represented by a number of surface flints and a few ceramics, some of which have typical mat impressions.

*Early Bronze Age.* A very eroded EB IA–B tomb was discovered in 1982. It was delimited in the south by the deep cliffs of the Wadi Mujib and in the west by the Wadi Lehun. More than 130 specimens of (often undamaged) ceramics were found in a 40–60 cm thick layer above the bedrock: large jars with ledge handles, middle-sized jars, amphoriskoi, jugs with high vertical handles (with some stamp-seal impressions), cups, and miniature “thumb bowls” were offered to the four deceased (two women, two children). The ceramics can be dated by comparison with those of Bab edh-Dhra'. A study of the pottery's technical background by H. Franken shows that despite basic similarities in manufacture, shape, and decoration, the examples of Lehun originate from a local village tradition.

*Late Bronze–Iron Age Transitional Period.* The 1986 sector D excavation suggested that the Iron Age fortress had been built in its northern and eastern part above Late Bronze houses (dated by typical sherds of cooking pots included in its foundation walls). The 1987 work showed that at the end of the LBA, an extensive village was located in area D. It followed the contours of the plateau; four houses with clay ovens, silos, grinding stones, cooking pots, and storage jars were excavated. A scarab of the XXth Dynasty (1186–1070 B.C.) in faience was found north of a large stone bench. The base of the seal shows a sphinx with a ram's head, and *atef-crown* before a poised *ureus* and an open lotus-flower (?). The design is also completed with inverse hieroglyphic signs, spelling poorly the name of the god Amen-Re. The scarab belongs to the same transitional Late Bronze/Iron Age period as the ceramics found in the house.

In the southern part of the plateau, chosen for its strategic position, overlooking the Arnon valley to the Dead Sea, the LB houses were leveled to a height of 45–55 cm and reused as foundation walls at the beginning of the Iron Age.

*Iron Age.* A fortress, with a large central courtyard, was partially excavated from 1980 to 1986. Its walls rested directly on the bedrock or above the LB walls. The western and southern outer faces of the precinct wall had been carefully plastered to protect them from

the rain and wind blowing from the Dead Sea valley. The Iron Age fortress (33–37 m east–west by 43 m north–south) was probably built at the same time as the settlements of el-Balu', Ader, and Medeniyeh. The need of the Moabite kings to protect their territories from the invasions mentioned in the Bible and from the nomad tribes from the Eastern Desert explains the choice of this location. On the other hand, Lehun was also probably selected for its fertile soil and its excellent weather at the intersection of Mediterranean and semiarid climates.

To date, very few fortresses of this period have been investigated in Jordan. They often show the same architectural characteristics for defensive purposes: a strategic location overlooking a valley (the Wadi Mujib at Lehun); and fortification walls following the contour line of a hill (in sector D) with reinforcement of the weaker sections (here, a northern and eastern double wall, corner towers, and facade tower). The strengthening of the corner with watch towers built inside the precinct wall at Lehun appears to be peculiar to the site and can be explained by the natural topography. The slope at this point was too steep to construct *extra muros* as was traditionally done.

The long and narrow rooms of the LB houses were reused in the southern and western parts of the stronghold to become part of a defensive system of casemates in the event of attack. They were used as living rooms in the meantime: kilns, grain silos, and ovens have been excavated inside, but the northern casemate rooms were once filled with large stones in wartime to make a good defensive wall. Breaks in the eastern precinct wall attest to different attacks of the stronghold. The wheelmade pottery found in the stronghold is typical of the period. The huge storage jars suggest an agricultural function. For both periods (Late Bronze and Iron Age) we have an assemblage of cooking pots, storage jars, bowls, and jugs. A few painted pots with geometric motifs (represented by sherds) seem to have been imported during LB II and are comparable to Mycenaean painted wares. Other potsherds of the Iron I and II assemblage belong to a local tradition known as Moabite (alternatively labeled “Ammonite” or “Cypro-Phoenician”). The large number of jars suggests that the fortress had been conceived as a storage building for grain, possibly to supply Ara'ir, the Aroer garrison of King Mesha. It should therefore have the same function as the examples found in the Negev region.

A New Year's bottle fragment of the Saite Dynasty (seventh/sixth century B.C.) was found in the fortress. It was imported from Egypt like other examples

found all over the Mediterranean basin and the Near East (Palestine, Phoenicia, Anatolia, and Mesopotamia) and is another example of the trade contacts among these different regions.

*Nabataean Period.* Lehun seems to have been an agricultural market village during the Nabataean period, located on a byroad of the "King's Highway" passing through Ara'ir, Mesheirfe, Jumeil, Salijeh, and Museitba. Thus, it may have been a caravan halt for trade and for religious purposes. A small sanctuary in area B2 supports this suggestion. A tomb of the same period has been found in sector D.

The small square temple (6.25 × 6.25 m) was constructed in local embossed limestone blocks. Its foundation rested on the bedrock and a monolithic door threshold stepped down to the cella. Its quite elementary plan (just one room with an altar on the eastern side) corresponds to the single-chambered Nabataean sanctuaries of Oriental origin. Its ceramic fragments date back to the first century A.C. and are representative of the smooth or ribbed common pottery, together with some sherds of beautifully painted fineware.

The temple was restored in the 1988 season to a height of 3.40 m. It was impossible to reconstruct the sanctuary to its original height (presumed height: 4.30 m) because many stones were lost or reused in modern times by the villagers.

An intrusive Nabataean grave was found in a house of area D. It was dated by the pottery (a cooking pot and a juglet), a necklace, a bronze fibula, earrings, and bracelets. The skeleton of a woman was badly disturbed by collapsed stones.

*Byzantine (?) Period.* A Byzantine or Early Islamic bell-shaped cistern was discovered near an Islamic settlement in area C1, but has not yet been cleaned.

*Islamic Period.* The Islamic remains of Lehun (sector C1) were examined by D. Whitcomb during the 1985 and 1987 seasons. We reproduce here part of his report:

The main excavation was concentrated on the mosque on the west slope of the Wadi Lehun identified in 1985. Previous work had uncovered the exterior construction of the mihrab, the interior of the mihrab down to the flagstone paving, and the threshold of the doorway in the north wall. While the Muslim religious purpose of this building was confirmed, there remained the possibility that the building was a tomb shrine rather than a mosque.

The purpose of the further excavation was to uncover more than half of the mosque, checking for the existence of a sarcophagus or other evidence of a tomb and, secondarily, to gather a larger collection of

artifactual remains that would help to date the building. Thus, the eastern half of the mosque was excavated to a line from the western jamb of the door to the western edge of the mihrab niche.

Artifacts from the mosque confirm the preliminary indications from 1985. The majority of sherds were handmade, painted wares, often called "Arab-geometric." Though this style begins in the Late Fatimid and continues into the Ottoman period, it is likely that the present assemblage dates to the 15th century. The slow accumulation of those secondary deposits occurred necessarily after the use of the mosque. A burned floor deposit, from soon after the use of the building as a mosque, contained a small bronze coin that apparently dates to Late Mamluk and gives a terminus post quem for the mosque of the late 14th century. Thus, the structure may be considered a small, rural mosque of the Late Mamluk period, one of the only such structures excavated in this region.

Four houses across a small road west of the mosque are presumed to belong to the Islamic village. This part of area C1 should be excavated in the future. In sector A1 an agricultural settlement, with mixed sherds dating from the Umayyad to the Ayyubid periods, has been recognized and partially excavated.

*Later Periods.* Remains of Late Islamic walls and Ottoman houses and pipes show that Lehun has been continually occupied until now. Three collapsed houses in area C2 were built probably at the end of the 19th or beginning of the 20th century. The main room is always constructed in a cave, probably cut out in antiquity. These houses correspond to a type described by A. Khammash in the Sumia region. If restored they would represent good examples of the recent village architecture of the region.

The region seems to have been fertile in antiquity, as attested by ancient literary sources, the storage jars, and the numerous grinding stones found during the excavations. Today, since irrigation has been introduced, the village has developed into an agricultural center with farming and herding of sheep and goats.

**Baq'ah Valley.** Patrick E. McGovern, Museum Applied Science Center for Archaeology (MASCA), University Museum of Archaeology and Anthropology, University of Pennsylvania, reports:

The Baq'ah Valley, a fertile and well-watered depression 15 km northwest of Amman, has been the focus of a University Museum expedition since 1977, continuing up to the present. The project is directed by P.E. McGovern, and has been funded by the Museum and MASCA, the National Geographic Society, the Jordanian Ministry of Tourism and DAJ, ASOR/ACOR, and several private foundations.





Fig. 10. Khirbet Umm ad-Dananir. Excavation of middle terrace, looking northwest. The Wadi Umm ad-Dananir is visible in the background. (Photo P. McGovern)

The goal of recovering a stratified sequence of occupation at Khirbet Umm ad-Dananir and a link between this settlement and Late Bronze–Early Iron Age cemeteries on nearby Jebel al-Hawayah and Jebel al-Qesir was achieved during the most recent seasons in 1981 and 1987. The occupation site (fig. 10), which also has later Iron IIC/Persian, Hellenistic, Early Roman, and Mamluk levels, is strategically located on a cliff overlooking the pass into the Baq'ah through the southern branch of the Wadi Umm ad-Dananir. Work was concentrated on seven  $4 \times 4$  m squares on a middle terrace of the site. Approximately 4 m below

the surface, a building dating to LB IB–II (approximately 1450–1200 B.C.) was partly uncovered. Its ground plan and construction are very similar to those of the contemporaneous Amman airport building 15 km to the southeast, with its narrow 2 m wide side-room defined by walls over 1 m thick and a room with a massive centrally located column comprised of three drums, the upper two measuring  $1.0 \times 1.0 \times 0.7$  m and the lowest one a hewn 1 m outcrop of bedrock. The three doorways leading from the northern side-room into the central room are spaced almost the same distance apart (4.5 and 2.5 m) as those between

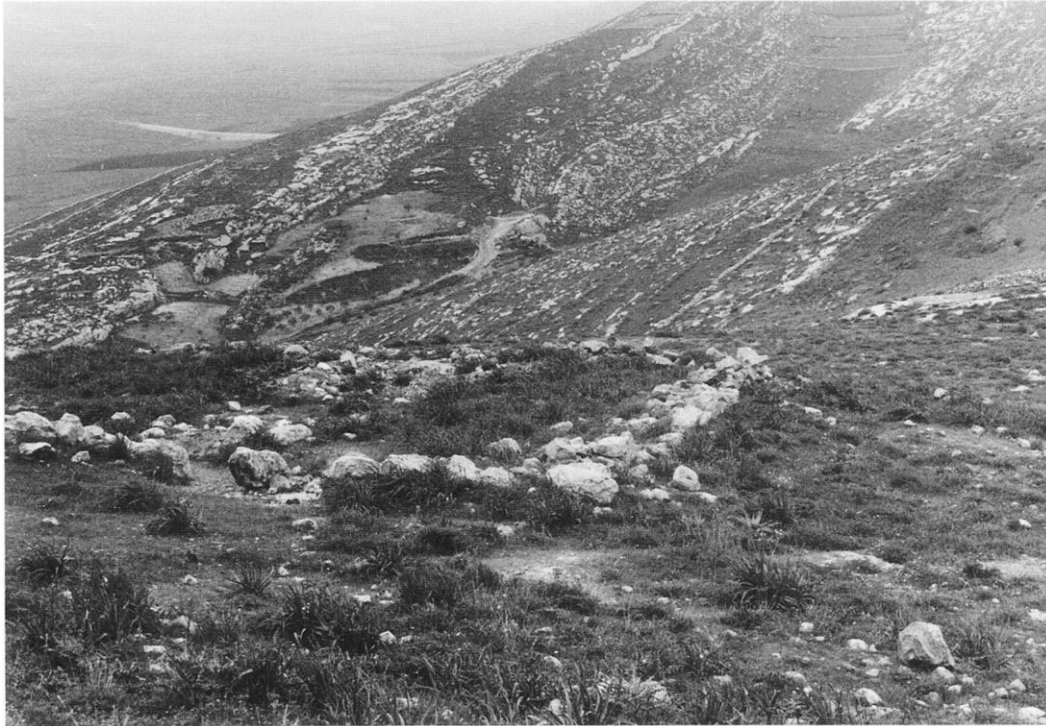


Fig. 11. Al-Qesir. An EB II–III *Breitbau* building is exposed on the surface. The Baq'ah Valley can be seen in the background. Looking south. (Photo P. McGovern)

the corresponding rooms in the airport building. The Amman airport building belongs to the *Quadratbau* architectural type, which, as the name implies, has a square layout with a central unit (“courtyard”) surrounded by outer rooms.

Like the airport building, the Umm ad-Dananir structure was not an ordinary residence, since special artifacts and masses of burnt and unburnt animal bones and whole body parts had been deposited in a “dedicatory fill” beneath the plaster floor of the building, as well as in the foundation trenches of the building. The latter had been dug into the animal bone fill, which lay directly over bedrock (like the outer walls of the airport building). The special artifacts included miniature pottery vessels (for example, an imitation Cypriot black-shaved juglet) and jewelry (glass, Egyptian blue frit, carnelian beads, and a red slate pendant). Among the animal bones were cattle, sheep/goat, and donkey, together with carnivores and herbivores no longer living in the region. A probable altar, a  $0.60 \times 0.60 \times 0.60$  m freestanding feature with a limestone capstone, was found near the center of the building, also built on bedrock. Between the altar and the column was a fireplace, predating the building, which was probably used to roast the animals that went into the fill.

The walls of the structure are preserved 2 m high. Carbonized roof beams were found on the floor of the building—an upper group with squared-off beams  $0.20 \times 0.20$  m in section, and mortise joints still visible, and a smaller lower group ran parallel to each other between the two walls. The building was destroyed sometime in LB II, since pits of the latter period, containing LB II pottery, animal bones of the same species as those in the “dedicatory fill” and foundation trenches, and some special artifacts (for example, a ceramic bull rhyton similar to that from an LBA burial cave on Jebel al-Hawayah), had been dug into the destruction debris. Only about a quarter of the building has thus far been excavated. Since the Amman airport building has no evidence of upper walls and roofing and has now been demolished, complete excavation of the Umm ad-Dananir structure provides a unique opportunity to understand better this architectural type and its function.

The 1987 season also shed more light on the beginnings of urban settlement in the region. At least by EB II (ca. 2900 B.C.), the settlement of al-Qesir (“the fortress”) had been partly constructed on the 12 ha summit of the hill of the same name, uphill from Khirbet Umm ad-Dananir and 200 m above the valley floor. An encircling stone fortification wall further

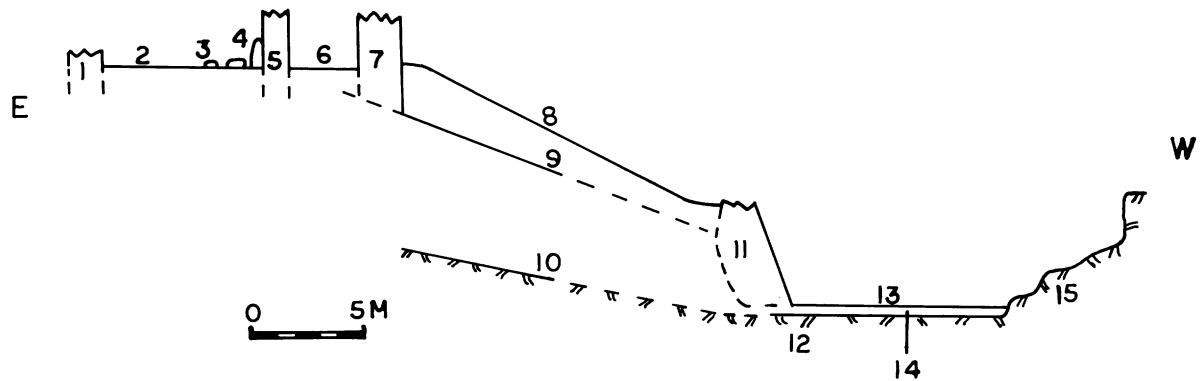


Fig. 12. Tell el-'Umeiri. Sketch of a section of the Early Iron Age I remains from field B, looking south, including the fortification system and domestic buildings to the east.

enhanced the site's defensive position. Al-Qesir is one of a number of large hilltop Early Bronze settlements in central Transjordan, and the first to be excavated.

Aerial photography revealed the ground plans of many circular stone features and rectangular buildings (fig. 11). Cisterns up to several hundred meters in diameter, which were hewn out of the bedrock, were located on the sides of the summit. Systematic sherding of the area within the walls showed that the site had been most intensively settled during EB II–III. A marked decrease in occupation occurred in the subsequent transitional period of EB IV, after which the site was abandoned.

Excavation of one of the medium-sized (approximately 8 m diameter) circular stone features or "hill-ocks," under the direction of Elene Nicholas of William Smith College, eliminated the possibility that it was a "beehive house," because no walls were discovered. Rather, it proved to be a mound of earth and stones. A concentration of large boulders toward the center covered smashed and whole vessels of EB II–III types and grinding stones and pounders, near a large solution cavity in the bedrock. A sounding in a rectangular room near what appears to be the main gateway to the site went down through 2 m of fill, alongside an inner wall, without reaching a surface or bedrock.

**Madaba Plains.** Lawrence T. Geraty, Atlantic Union College, Larry G. Herr, Canadian Union College, Øystein S. LaBianca, Andrews University, and Randall W. Younker, Andrews University, report:

The fourth season of excavation of the Madaba Plains Project took place from 16 June to 31 July 1992 and consisted of three subprojects: excavations at Tell el-'Umeiri, 15 km south of Amman; a regional survey in a 5 km radius around 'Umeiri; and new excavations at Tell Jalul, ca. 5 km east of Madaba. The project was sponsored by Andrews University in consortium

with Atlantic Union College, Canadian Union College, and Walla Walla College.

*Tell el-'Umeiri.* Previous seasons uncovered a complex of domestic structures from the EB III on the southern shelf. This season, the objective was to excavate beneath the houses to expose possible EB II and earlier remains. Bedrock was reached in all four excavation units, and two new phases of domestic architecture were uncovered. While diagnostic EB II pottery appeared in higher quantities in these lower phases, a small amount of EB III pottery continued to be found, including two fragments of Khirbet Kerak ware. We have, therefore, a total of six EB III phases. The first four reused the walls of the first phase, but always with new alignments. They were not simply rebuilt versions of the same structure. These phases included a small storage cave dug out of bedrock. The last two phases, from near the end of EB III, were represented by sparse remains from settlements in abatement. A few EB I sherds were also found, but were not connected with in situ remains.

On the western slope where the fortification system is being tested, the MB IIC rampart (or "glacis," no. 9 in fig. 12) was excavated to bedrock (no. 10). The rampart was constructed of a series of thin, wedge-shaped layers of dark earth, gradually steepening to 30° and ca. 3 m above bedrock. The top of the rampart was coated with a thin layer of crushed limestone. At the base of the slope was a flat-bottomed dry moat (no. 12) dug out of the bedrock ridge that adjoined the site to the west (no. 15). The bottom of the moat was at least 5 m wide but the eastern edge has not yet been found.

The most extensive remains excavated this season were from the Early Iron I period, the 12th century B.C. They included one of the most coherent Iron I fortification systems in Palestine. Immediately above the MB IIC rampart (no. 9 in fig. 12), another rampart

(no. 8), 1.5 m thick, was constructed against a casemate wall (nos. 5 and 7). At the bottom of the rampart, ca. 16 m to the west of and below the outer casemate wall (no. 7), the MB IIC dry moat (no. 13) was reused with a thin layer of MB IIC debris remaining at the bottom (no. 14). The moat was separated from the rampart above by a sloping retaining wall ca. 5 m high (no. 11). The western side of the moat was not sheer, but stepped (no. 15). It seems the moat was not intended to restrict entrance but to make climbing the slope to the city more difficult.

Inside the casemate wall, portions of two domestic houses were uncovered (fig. 12, nos. 1–5). In one, a row of pillar bases (no. 3, running perpendicular to the sketch) separated a cobbled floor lying against the inner casemate wall (no. 5) from an earth surface (courtyard?), which included a stone bin and a hearth. In the cobbled room, leaning against the inner casemate wall was a carefully made standing stone (no. 4). No inscription or image was visible. Lying flat on the cobbles in front of the standing stone was another flat, but thicker, stone. To the north, across a wall that reached almost 2.5 m high (not visible in fig. 12), was the second house with only one room so far discovered. The room was paved with flagstones and the mudbrick destruction debris from the upper floors contained over 20 crates of pottery, mostly from large, collared-rim storejars. The destruction debris from this town was found in two other locations on the site, covering beaten-earth floors.

The site was only slightly reoccupied in the ninth century for a short span. A much more serious settlement was constructed, probably to serve the administrative needs of the Ammonite central government, in the seventh century. Three large public buildings were discovered on the western edge of the site in previous seasons, while this year two rooms from another large building (possibly a “four-room house”) with cobbled floors was found on the eastern side, near the probable gateway to the site. This seventh-century occupation continued into the Persian period, perhaps as late as the end of the fifth century, suggested by the presence of two Attic potsherds. Two Aramaic seal impressions of the Persian provincial government from ca. 500 B.C. contained the name of an official (Shuba) and the name of the province of “Ammon.” This is the first solid evidence for the existence of a Persian province of Ammon.

*Regional Survey.* This was the final season for the survey in the Tell el-‘Umeiri vicinity (5 km radius). During subsequent seasons, the survey will move to the Tell Jalul region. As in previous seasons, several different survey operations were conducted. One

team visited all occupational sites discovered in previous seasons to update the data to a more detailed recording system. A second team conducted ethnoarchaeological research among the villagers regarding water use and seasonal occupation in caves. One sensational discovery of this team was a monumental Safaitic/Thammudic (and, to a lesser extent, Nabataean) inscription of over 1,000 large letters chiseled into the cement lining of an ancient cistern within a black-painted panel ca. 1.5 m high encircling the cistern. Situated about 2 km south of Tell Jawa, the inscription seems to contain names and symbols of tribes and dates to the Roman period. This is one of the largest such inscriptions known, and is located much farther west than expected, a fact that may lead scholars to reconsider how closely nomadic tribes interacted with the settled Greek-language civilization in Jordan. The cave complex in which the inscription was found may have served as a tribal meeting place. Plans are to publish high-quality photographs of the inscription in full by the time this *AJA* report appears.

A third survey team excavated selected small agricultural features, while a fourth team began the excavation of an EB IV cemetery ca. 2 km south of Tell el-‘Umeiri. Three shaft tombs were excavated, and one robbed tomb was cleared. Two of the tombs had been reused in MB IIA and contained pottery from both periods. A fifth team used ground-penetrating radar to search for underground features at Tell el-‘Umeiri and the EB IV cemetery.

*Tell Jalul.* Because of our diachronic focus on the social, cultural, and political evolution of the inhabitants of this region, one of our first objectives for the new excavations at Jalul was to establish a chronological framework for the occupation of the site. Therefore, it was decided to open a trench at the northeast corner of the tell (field A) where it was obvious that a considerable amount of occupational debris had accumulated and where the incline of the slope was great enough that an excavation trench could quickly expose a vertical section through the occupational levels. A second field was opened on the eastern side of the tell (field B) where surface remains pointed to the possible presence of a monumental gateway.

Eight phases of occupation were uncovered in field A. Phase 1 was a recent accumulation of topsoil and subsurface debris. Phase 2 comprised a series of graves that locals believed to be of Beni Sakr slaves from the 19th century. The remains of the burials were reinterred on the acropolis to the west in the modern cemetery. Phase 3 was a plastered threshing floor (?) of uncertain date—later than Iron Age II (and III), but stratigraphically predating the ceme-

tery. Phase 4 was a Late Iron II pit (seventh/sixth centuries B.C.). Several bone spatulas, a bone pendant shaped like a hammer, and a ceramic figurine head of a horse came from this pit. Phase 5 was an Iron II destruction/abandonment phase. Phase 6 contained the upper portion of an Iron II wall (ninth/eighth centuries B.C.), while phase 7 included the lower (all pottery from the foundation trench was Iron I, but we suspect it may ultimately date to Early Iron II—ninth century B.C.). Phase 8 was a series of ashy layers containing Iron I sherds, including collared-rim storejars and carinated bowls. Some LB pottery was also found in these layers.

Field B produced evidence of seven phases. Phase 1 was the topsoil and subsurface layers, and phase 2 consisted of graves from the same period as those in field A. Phase 3 contained abandonment/destruction debris dating to the middle of Iron II (eighth century B.C.). Phase 4 was an extensive Iron II pavement consisting of large flagstones. It extends upslope at a north/northeast–south/southwest angle and appears to be part of a paved approach to a city gate. Parallels can be found to the west at sites such as Tel Beersheba and Tel Dan. A retaining wall for the ramp on its western side (upslope) was found. Phase 5 comprised another abandonment/destruction layer from earlier Iron II (probably the ninth century B.C.). Phase 6 was a second paved approach, possibly to an earlier gate. It dated from Early Iron II (early ninth century B.C.). Phase 7 included ash lenses identical to those found in field A. The lenses ran under the lower and earlier pavement and contained Iron I and LBA sherds, including collared-rim storejars, carinated bowls, and conical vessels. The presence of identical ash layers in both fields suggests a massive destruction sometime during the Late Iron I period, but no definite occupational levels from this city have yet been detected.

**Tell Iktanu.** Kay Prag, Manchester, reports:

Two brief field seasons in the vicinity of Iktanu in the south Jordan Valley were completed in March and April 1992, under the auspices of the BIAAH. The preceding cold and wet winter produced ideal conditions for a survey of the flora in the vicinity of the site, including the adjacent Wadi Hisban, Wadi Kafraïn, and Wadi Shu'aib, a varied geographical zone representative of the modern economic catchment area. The survey relates to the analysis of the plant remains retrieved from soil samples collected during the 1987–1990 excavation seasons at Iktanu and Hammam. U. Thanheiser (palaeobotanist) and J. Walter (botanist), Vienna, who conducted the survey, report as follows:

The aim to reconstruct crop husbandry practices in ancient Tell Iktanu and Tell al-Hammam made it necessary to monitor the present-day segetal, ruderal, and pastureland flora in the area.

Most astonishing is the fact that fields contain hardly any weeds at all. In areas where dry field agriculture is practiced, weeds occur only in those stony places within the fields where no cereals or legumes were sown. Dominant weeds here are *Anagallis arvensis*, *Filago pyramidate*, *Anthemis parviflora*, *Urospermum picroides*, *Crepis* cf. *sancta*, *Centaurea* cf. *hyalolepis*, *Hypocoum imberbe*, *Trigonella stellata*, *Emex spinosa*, *Schismus* cf. *arabicus*, and *Lophochloa* cf. *berlythea*. Limiting factors for weed growth here are undoubtedly the lack of water and the very effective alternate plowing and grazing system widely practiced in Jordan (the drab-bur system, W. Lancaster, personal communication).

All these species also occur (in somewhat different frequency) on the surrounding hills, where seasonal grazing is practiced. In addition, south-facing slopes are rich in *Asphodelus tenuifolius*, *Matthiola parviflora*, *Salvia horminum* and *Lamarckia aurea*, while on north-facing slopes *Anemone coronaria*, *Chaetosciadium trichospermum* and *Herniaria hirsuta* are dominant.

On the alluvium, fields are so densely sown with cereals that weeds seem to have no chance. On these nutrient-rich soils nitrogen-loving plants like *Chenopodium murale*, *Sonchus oleraceus*, *Eruca sativa*, *Malva parviflora*, *Sinapis arvenis* and *Diplotaxis erucifolius* are dominant on waste ground.

Ethnoarchaeological work was pursued during April, with the assistance of A. McQuitty, Oxford, who carried out a brief survey of the vernacular architecture in the nearby village of Rawda. The construction techniques of simple rectangular houses in traditional styles, using locally available materials, have been superseded in the town by the building of concrete structures. A number of traditional houses that have been abandoned in recent years were recorded, including details of their collapse patterns. Several different traditions were indicated. Demographic and dynamic trends, based on statistics, town planning and air photographs, including the enclosure of yards, the development of roads, and the tendency for older mudbrick houses to be abandoned or reused as stables for donkeys, cattle, and goats, were also briefly recorded. The sudden establishment and rapid growth of Rawda and other unfortified villages in the vicinity of Iktanu offers rich sources of comparative study for the late third-millennium village at Iktanu.



Fig. 13. Tell Abu al-Kharaz. Area 2/1991. Early Bronze Age II destruction layer.

**Tell Abu al-Kharaz.** Peter M. Fischer, Göteborg University, Sweden, reports:

Tell Abu al-Kharaz is situated north of Wadi Yabis and about 4 km east of the Jordan River. According to the Palestine Grid Coordinate System the coordinates of the summit are, to an accuracy of ca. 100 m, 206.2 E and 200.6 N. Two seasons of excavation in 1989 and 1991 have been completed by the Swedish Jordan Expedition.

Although a series of surface surveys had been previously carried out, the trial soundings of 1989, the first at Tell Abu al-Kharaz, established to a certain extent the chronological sequences in two areas (area 1, upper part of the tell, and area 2, lower part).

*Early Bronze Age.* Mudbrick walls on stone foundations were exposed in both areas. EB I/II pottery is well represented in all strata. Stratified pottery from both areas consisted of mainly the Grain-wash/Bandslip ware and burnished and net-painted wares.

*Middle Bronze Age.* No architectural remains but unstratified sherds could be ascribed to MB I (possibly transitional EB IV/MB I) and II.

*Late Bronze Age.* Massive stone constructions in area 1 and a large room in area 2 belong to the LBA. In area 1 two walls with diverging orientations belong to

different phases of the LB period. The dimensions of the uppermost wall (W 9) may point to a function other than merely the wall of a building, perhaps an upper town wall. It was tentatively dated to the transition between LB I and II. The lower wall (W 19) was probably the corner of a building, and together with the opposite corner of another building to the south it can be dated within LB I. Within area 2 (possibly outside a contemporary town wall) was a large room (room 5) with a variety of fine pottery, including a stand with four rectangular windows. Vessels with monochrome or bichrome decorations often in the metope style were uncovered. Cypriot imported wares consisted of a complete White Slip II "milk" bowl, with a possible Kalavassos provenance, and Base Ring I ware. Room 5 seems to have had a sacral function. A probable date is the very beginning of LB II. Chocolate-on-White ware was the most frequently found ware in the following stratum, which does not contain any interpretable architectural features. An LB I date is plausible.

*Iron Age.* The soundings in the southwest corner of the upper part of the tell (area 1) exposed a wall (W 4), which may have encircled the entire upper tell. The date of the wall has been proven to be the end

of the Iron Age II period. In connection with the above wall several rooms containing objects of daily life were found. A blue faience scarab has been shown to be from Naukratis, Egypt. No structures could, with any certainty, be ascribed to the beginning of the Iron Age, although some loose sherds may derive from this period.

The 1991 excavations at Tell Abu al-Kharaz conducted on the lower western part of the tell (area 2) confirmed the results from the 1989 trial soundings. Additional finds from the Chalcolithic and Late Roman period were made but no MBA features were found.

*Chalcolithic Period.* The period is represented by stray sherds but no architectural remains so far.

*Early Bronze Age.* The well-stratified settlement layers make different periods distinguishable. The EB II period is represented by the bulk of findings excavated during the 1991 campaign. Squatter occupations cover an ashy, thick destruction layer (fig. 13), both dated within EB II. Within the destruction layer a rich repertoire of vessels was excavated in a number of storerooms bordered by mudbrick walls with stone foundations. Many of the walls were carefully plastered. Approximately 1 m<sup>3</sup> of grain was found both in situ within storage vessels and in a wooden container. There is no break between this and the preceding EB I period. The distinction between the two periods is based on the presence of different Abydos shapes including the Metallic Burnished ware in the latter period. The Band-slip and Grain-wash wares were found in both periods and could consequently not be used as indicators of the former period.

*Late Bronze Age.* The temple from the very beginning of LB IIA was further excavated. The repertoire of the excavated pottery from 1991 does not change the preliminary dating done in 1989. The preceding LB I period is well represented by pottery but only by scanty architectural remains. An ash layer manifests the end of LB I.

*Iron Age.* Eight subphases were found stretching from the transition of Iron Age IIB/C throughout IIC. The number of subphases points to an intensive occupation. The architectural remains include two water channels, an outflow and a channel for the water supply, which leads to a possible cistern lower down the slope.

*Late Roman.* This two-phased period is represented by scattered walls and typical pottery. It seems that the area was occupied by squatters.

During the next season we plan to open an area on the upper part of the tell west of the summit in order to establish the chronological sequences there.

**Tell Jawa.** P.M. Michèle Daviau, Wilfrid Laurier University, reports:

In 1992, the third season of excavation at Tell Jawa produced a new understanding of the Iron Age casemate wall system and an outstanding collection of painted Umayyad pottery. Six weeks of fieldwork, under the direction of P.M. Michèle Daviau, took place from 19 June to 28 July. The excavations, previously affiliated with the Madaba Plains Project, were sponsored by Wilfrid Laurier University and funded by a grant from the Social Sciences and Humanities Research Council of Canada.

The tell, located 10 km south of Amman, was occupied periodically from the Middle Bronze Age to the Early Islamic period. During the 1992 season, investigation centered on the Iron Age casemate wall system that is visible at ground level. The wall was sampled in four areas on the south (fields B, C), west (field B), and north sides (field E) of the tell. While three well-preserved casemate rooms were exposed in fields B south, C west, and E, there was no evidence for a room on the west side. Instead, the outer wall was strengthened by a tower that was built of unusually large boulders and plastered on all sides. Between the tower and the west wall, 28 iron arrowheads were found embedded in earthen layers underneath the wall collapse. Unfortunately, it was not possible to determine whether the points were those of the defenders of the town or of its enemy because no connecting wall has yet been found that would establish the relationship of these structures to each other.

A similar situation existed on the south where a second tower was located beyond the limits of the casemate system. This second tower consisted of two units; the outer unit was a buttress two rows thick and preserved to five courses high, which leaned against the tower, while the foundation of the tower proper was also two rows thick and 15.3 m long. Both units were plastered on their outer faces.

Between the south tower and the casemate wall was a well-built four-room house with at least one row of limestone pillars that supported the roof. High-status artifacts and black-burnished ceramic vessels, recovered from the flagstone floor of the southernmost parallel room, constituted a food preparation assemblage. In front of the house was an entryway that contained a stone-carved basin with a drain hole. The precise function of the basin is uncertain because of the limits of excavation.

A second domestic area located inside the fortifications on the north (field E) was exposed in a limited area. Here a room contained a shelf/bench set parallel to the inner casemate wall. On the shelf was a very

fine collection of Middle Iron Age II ceramic vessels and ground stone tools. Some of these tools were almost miniature while others were full size. The broken base of a pillar figurine was among the finds. Outside the fortification system was a complete roof-roller apparently fallen from the casemate room above. The roller was embedded in the plaster glacis that sloped away from the wall.

The date of the final Iron Age occupation at Tell Jawa, whose ancient name remains unknown, can only be determined by additional study of the ceramic corpus. While an initial study suggested the end of the ninth century B.C. as a likely chronological position for the red-slipped bowls and juglets and the bag-shaped storejars, additional exposure this season of the four-room house produced a large amount of black-burnished pottery, which has been thought to date to the seventh century B.C. Included within this Iron Age matrix was a fine example of a Thutmosis III scarab recovered among the stones of the casemate wall.

Additional work in the Late Byzantine–Early Islamic building (field D) revealed a basement-level room with a cooking area, considerable painted pottery, bones, charcoal, and smashed glass vessels. In a neighboring room, over 500 tesserae were recovered probably from a destroyed floor. In modern times, both rooms had been filled with terra rosa soil to the level of the upper thresholds. In a third room, the collapsed vaulting stones were still in place. The plan of the building continues to suggest a courtyard or atrium-style house surrounded by rooms on three sides. In order to complete the plan of this building, additional excavation will continue next season.

The most unusual find from the field D building was an Umayyad ostracon (fig. 14) that bore an incised prayer for forgiveness from Ahmed bin Muqled. Sev-

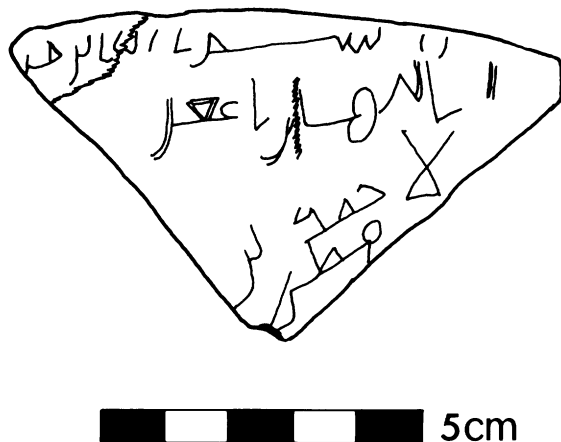


Fig. 14. Tell Jawa. Early Umayyad ostracon.

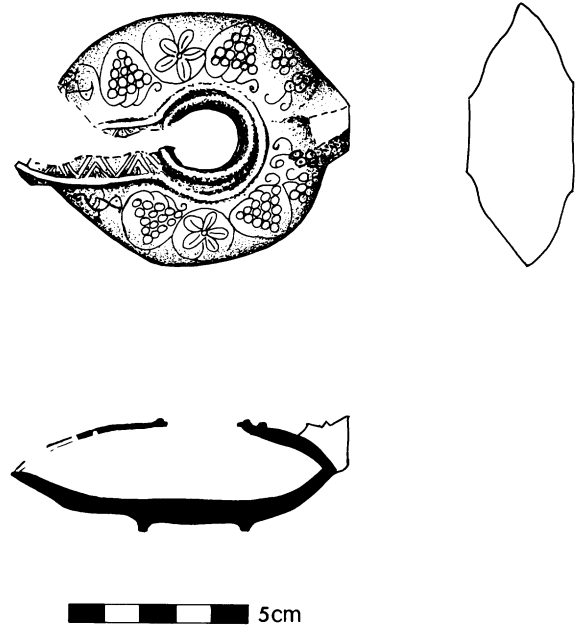


Fig. 15. Tell Jawa. Late Umayyad–Early Abbasid lamp from field D.

eral lamps with grape leaf and cluster design appear to date to the Late Umayyad or Early Abbasid period (fig. 15). These lamps correlate well with the unslipped, red-painted sherds recovered in large number. In fact, the finds from this building seem to suggest usage over a considerable period of time during the seventh–eighth centuries A.C.

**Khilda, Amman.** Mohammad Najjar, DAJ, reports:

*Architecture.* The small complex consists of two joined structures: one circular and 10 m in diameter, the other square, 10 × 10 m (fig. 16). Each structure has a central hall with four rooms of different sizes and heights up to 3 m. The rooms were partitioned by thin walls extending from the external walls. The rooms have doorways made of roughly cut stone. The complex has been entirely exposed, and it is clear that it consisted of at least two stories. The level of the upper story was marked by a number of stones corbeled from the walls. The corbels were intended to support limestone slabs, a very common technique in Jordan during the Roman period. The construction technique consisted of blocks laid in rough courses. To make them even, smaller stones were used in between. Lumps of plaster were found inside the circular structure, which may indicate that the interior of the external wall was plastered. Exposed to the bedrock from the outside, the lower two courses of the external wall revealed well-preserved plaster in situ. No evidence of foundation trenches could be



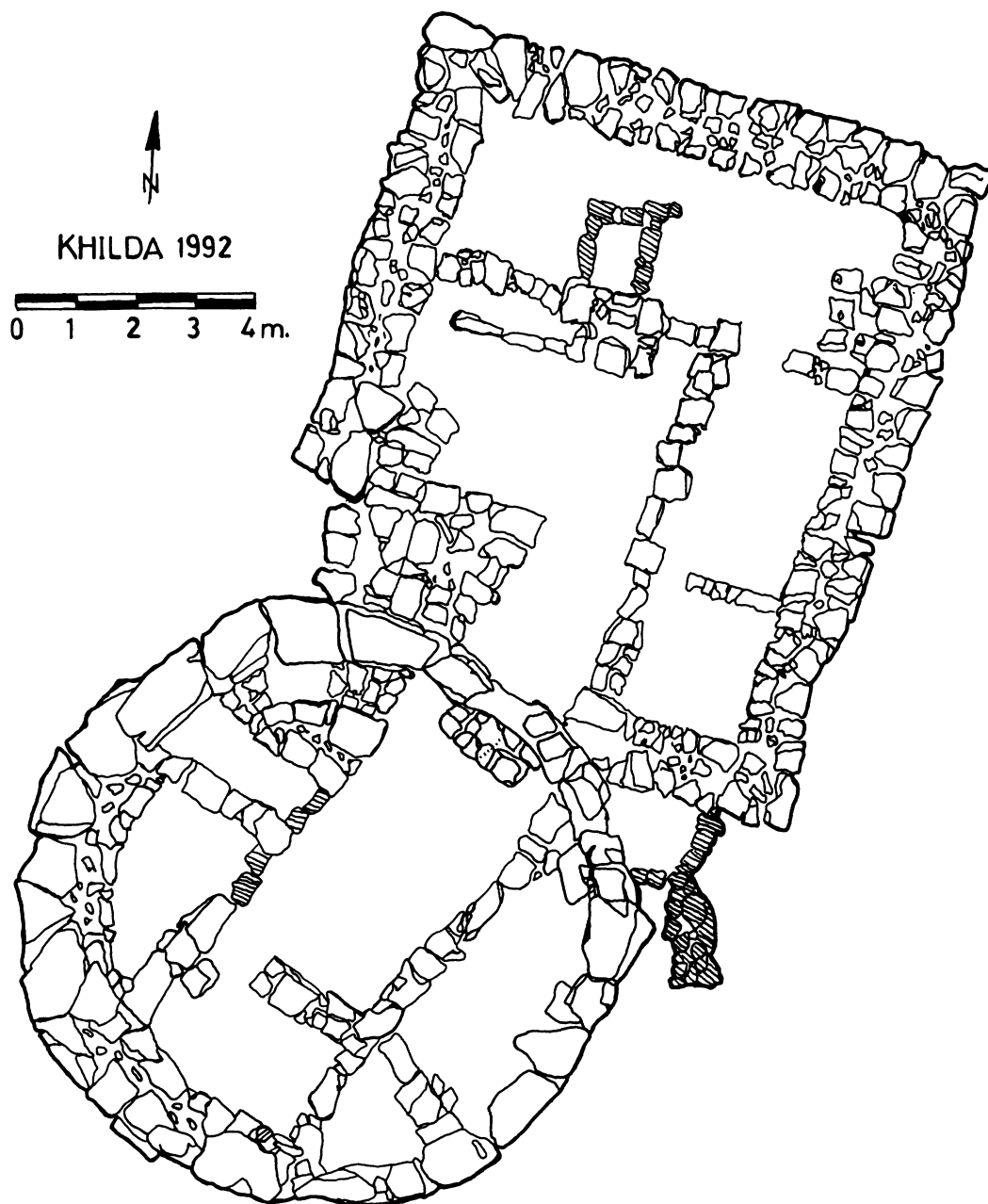


Fig. 16. Khilda. Sketch of architecture.

detected for either the square or the adjacent round structure indicating that both were set on bedrock.

The central hall of the square building was definitely used for storage in view of the large amount of storage pottery found. Although there need not be a fixed relationship between architectural layout and function, it is of interest to note that the thickness of the walls exceeded 1 m in many cases. This fact may indicate that storage was not the sole function. Most probably, farmers used the structures primarily for storage and for refuge in times of danger.

The building material seems to have come from the immediate vicinity. It is commonly limestone, but flint blocks are also present.

*History of Occupation.* The 1992 excavations of Khilda have shown that it was first occupied in the seventh century B.C. This phase of occupation was attested by a cave, and many shallow pits and channels cut in the bedrock, but no traces of building activity were found. During the second phase of occupation, which was dated to the seventh–sixth centuries B.C., the circular and square buildings were built. Later in

this phase, some of the entrances to the rooms were blocked, and small storage rooms were added.

The last phase of occupation was Roman and is represented by a big pit filled with debris. The debris comprised a mixture of very loose or lightly packed brown soil that had fallen around pieces of chert and limestone of varying sizes. The bottom of the pit was severely burnt, but the fire did not reach the bedrock, which was covered by a 1 m layer of soil revealing pure Iron Age II pottery.

**El-Balu'.** Udo Worschech, Darmstadt, reports:

The site of el-Balu' is located south of the Wadi el-Mujib and about 5 km east of Jebel Shihan, which is the highest elevation in the Ard el-Kerak of Central Jordan. The excavation at el-Balu' owes its importance to the fact that it is the largest Iron Age ruin in Central Jordan, covering almost all the periods of occupation from the Early Bronze to Mamluk times. With the exception of the EB and MB periods, however, as well as the Iron Age occupation when the city was at its prime, the Classical epochs are poorly represented at el-Balu'. Evidence of this only comes from pottery, especially in the southwestern quarters of the *hirbe*, where there are also the remains of the large Mamluk village that was called Shihan by medieval Arab travelers.

A surface survey of el-Balu' in 1986 revealed that the older part of the city is the area immediately east and west of the impressive *qasr*, which may have seen some rebuilding activities in Nabataean or Early Roman times. Here also Late Bronze and Early Iron Age sherds were picked up. The city had a defense wall of the casemate type with a small gate toward the east. During the Iron IA–B period the city limits were extended eastward and another defense wall was built that enlarged the city by about 200 m. The entire east–west extension of the city was about 450–500 m in the Iron II period.

In area C1 there is an "Assyro-Babylonian courtyard-house." The pottery found in the hitherto excavated rooms (rooms 1–4) is of the Iron IIB–C period, thus linking the house type with the Assyrian or Babylonian presence in Palestine in the eighth to sixth centuries B.C.

In the so-called "reception hall" a bulla was found with the motif of a man-eating lion. On the back of the lion there are Egyptian hieroglyphics reading *mn-k<sup>2</sup>-r<sup>2</sup>* (Menkare), the name of a pharaoh of the IVth Dynasty. This name became popular again between 750 and 525 B.C. as can be demonstrated by bullae from Phoenicia and Egypt. The room in which this bulla has been found is about 8 m long and about 4 m wide. A door leads into the unexcavated court.

Beside this entrance a small *tabūn* (oven) was found. There were only a few objects in this room: loomweights, one kohl-stick, and a possible phallic symbol.

In the "kitchen," which lies north of the "reception room," loomweights, spindle whorls, sherds of storage jars and kraters, as well as a bin and a *tabūn* indicate that this room was primarily used as a working area. A flat stone table and a triangularly shaped weight of 7.5 kg with a hole may hint at an olive press installation. A door leads from this room into the courtyard or into another room north of the court.

In room 3 two large grinding stones were found. But this room also contained sherds of the finer Moabite and Samarian wares. Room 3 could be entered through a door whose lintel is still in situ. From the smaller objects found here (a bracelet, two small mortars for the preparation of cosmetics, a spatula) it appears that this may have been the women's quarter.

The northern defense wall of el-Balu' can be followed westward from the house complex. Although this casemate wall has not been excavated entirely its dimensions are impressive. Especially the eastern storage area is worthy of note because here the casemate room seems to have been used to house big storage jars and kraters. An abundance of sherds has come to light, but unfortunately no complete vessel. This room was destroyed by fire as shown by the thick layer of ashy debris on the floor.

Of special interest is the find of three collared-rim jars in the debris. Since this type of jar is thought to have originated in western Palestine and spread into the Ammonite territory as far as Sahab, it is remarkable that this type of jar also appeared south of the Wadi el-Mujib, and in an Iron II context.

In 1986 and 1987 a wall was uncovered that extends from below the inner-city wall to the eastern quarters of the Iron IIC extension of el-Balu'. This wall has been excavated to a length of 10 m. In the area north of the wall, however, a substantial amount of sherds (Iron I–IIC), several lamp fragments, grinders and mortars, and a *t-m-l-k* inscription on the rim of a mortar (for cosmetics?) have come to light. Unfortunately, only half of the mortar has been found. The inscription cannot be reconstructed entirely. It has been suggested that the wall and the room to the west are part of a forum- or market-like area since there are no traceable wall lines in the near vicinity. Market areas like these in front of city walls and gates were not uncommon in ancient times. This observation is further substantiated by the gateway, leading into the older part of the city.

Area AI (the farmhouse) is located west of the *qasr* of el-Balu'. Here the same situation has been encoun-



Fig. 17. Feifa. Typical Iron II jug rims and handles from Feifa (above), similar in form to the complete example from Tell el-Kheleifeh (below).

tered as in areas CI–III: the walls of the building complexes are still standing to a height of about 1.80 m. Basalt stones filled the rooms. There is no stratigraphy in the accumulated sand fill.

The excavated complex was part of a farmhouse. One room, two chambers, and the courtyard represent the most recent occupational stratum. In the large room (about 16 m<sup>2</sup>), the east wall of which is in the balk, no specific objects have been found that would allow determination of function. In the courtyard area, however, the v-shaped enclosure was apparently for keeping goats and sheep during the night. A *ṭabūn* was located in the yard where two chambers were also built adjacent to the north wall of the house. The chamber to the east contained many work stones, one grinder, and one trough. The chamber to the west was empty. It could have served as a storage area.

In conclusion, it can be said that the verdict that W.F. Crowfoot passed upon the site of el-Balu<sup>ʿ</sup> in 1933—“for future excavations Balu<sup>ʿ</sup>ah does not appear to the writer to be attractive . . . the prospects of important finds are not obviously promising”—certainly does not hold true and has already been disproved. It is hoped that excavations adding to our knowledge of the Iron Age period in ancient Moabitis can be continued at el-Balu<sup>ʿ</sup> in the near future.

**Feifa.** Nancy Lapp, Pittsburgh Theological Seminary, reports:

The surveys of Rast and Schaub (1974), Glueck (1935), and MacDonald (1987) in the southern Ghor area of the Dead Sea Plain indicated occupation of Feifa during the Early Bronze, Iron, and Roman periods. Besides the numerous sherds picked up in the area, a wall around the natural hillock can be traced, including a tower and ramp or roadway to an entrance on the north.

In the final season of the present series of excavations of the Expedition to the Dead Sea Plain (1990–1991), the walled site of Feifa was investigated and the EB cemetery that stretched to its east was excavated. The most recent surveys suggested that the visible structures of the walled site belonged to the Iron Age or Roman period. It was hoped that a small sounding could date the encompassing wall and determine the nature of the town settlement.

An area was chosen near the southeast corner of the town wall. The Roman and even Byzantine occupation seemed to be concentrated toward the west where there are remnants of the tower; on the east, earlier occupation might be indicated fairly near the surface. Two-meter wide squares were excavated to varying levels from 3 m west of the wall to 4 m east of it.

The principal feature in the 2 m wide trench was the perimeter town wall, plastered on the exterior. Rock tumble was present everywhere on the surface along with mudbrick debris to a depth of about 1.25 m. The surface layers contained Iron II pottery and a few Roman and Byzantine sherds. The latest pottery in the brick and sandy layers below, some silt layers outside the wall, and brick-like material inside the town wall date to Iron II. At about 1.60 m below the surface, fairly flat levels with a few diagnostic Iron II sherds were reached on both sides of the town wall. There is little doubt that the wall was constructed during the Iron Age, probably the seventh century B.C. (see below).

Early Bronze sherds had begun to appear in the upper levels as excavation continued below the packed levels. Although no more Iron II pottery appeared, EB sherds, some from domestic wares were also uncovered. Parts of three EB tombs appeared in the small excavated area. Further excavation might also indicate Early Bronze domestic structures.

Although the area excavated is small, about 40 diagnostic Iron II sherds make it possible to give a tentative date to the Iron Age occupation and town wall. These sherds show strong affinity to the other excavated Iron II sites of Edom, Buseirah, Tawilan,



Fig. 18. Kh. Mu'allaq. The ruin field with the mountains south of Petra in background.

and Um el-Biyara, all of which have been dated by inscriptions and parallel material to primarily the seventh and early sixth centuries B.C. The most common form, and the most helpful chronologically, comes from a jug now known in southern Transjordan (fig. 17). The rim is sometimes described as "rectangular." It is thickened and slightly grooved on the outside, rather similar in form to the typical Late Iron II cooking pot. From the rim the neck is rather straight and only slightly outslipping. The flattened handle goes from the rim to the shoulder. A whole jug of this type is published from Tell el-Kheleifeh. This was the most common "jar" form at Kheleifeh, and most examples have a Qaws'anal stamp on the handle.

The small sounding witnesses the first known Edomite settlement in the southern Ghor. It shows important links with larger Edomite towns and probably indicates some direct communication with Khel-eifeh on the Gulf of 'Aqaba.

**Petra, Kh. Mu'allaq.** Manfred Lindner, Naturhistorische Gesellschaft, Nuremberg, reports:

The archaeological work of the Naturhistorische Gesellschaft started in Jordan in 1970 with exhibitions

of Nabataean pottery in Munich and Nuremberg, a primer for subsequent exhibitions all over the world. Since 1973 German and Austrian teams of the Naturhistorische Gesellschaft have explored and excavated in the Petra region. The results have been published in several books and in *ADAJ* and other journals. Among the salient discoveries were two Iron II (Edomite) sites (Ba'ja, Umm el-Ala), three Early Bronze sites (Sabra 5, Sabra N/Ras Dakhilallah, es-Sadeh), and a Nabataean temple site (Sahir al-Baggar). Several Nabataean-Roman sites were more thoroughly examined (Abu Khusheiba, es-Sadeh, ed-Deir, Sabra). Eventually, the Atargatis eye idol, originally described and sketched by J. Euting, was rediscovered in the Siyagh gorge of Petra.

Two archaeological projects are underway at present. First, the continued excavation of dwelling houses and shaft tombs below the Urn Tomb in Petra together with a new assessment of the architectural remains of temples in the ancient city and at Sabra under the direction of J.P. Zeitler; second, a survey at the esh-Shera escarpment with a limited excavation in the ruin field of Kh. Mu'allaq between Wadi Musa



Fig. 19. Kh. Mu'allaq. Fragments of platters from area A.

and et-Taiyiba (fig. 18). There, Lindner found Iron II (Edomite) pottery and examples of a ware that somewhat resembles Early Bronze material but is obviously of a later origin (figs. 19–20). Because no exact parallels are yet known, it is preliminarily called “Mu'allaq ware.” It is hoped that one of *AJA*'s readers

will be able to bring to our attention similar finds from elsewhere in Jordan.

**Tell el-Fukhar.** John Strange, University of Copenhagen, reports:

The Scandinavian Expedition to Tell el-Fukhar in the Wadi esh-Shellale carried out its third season from

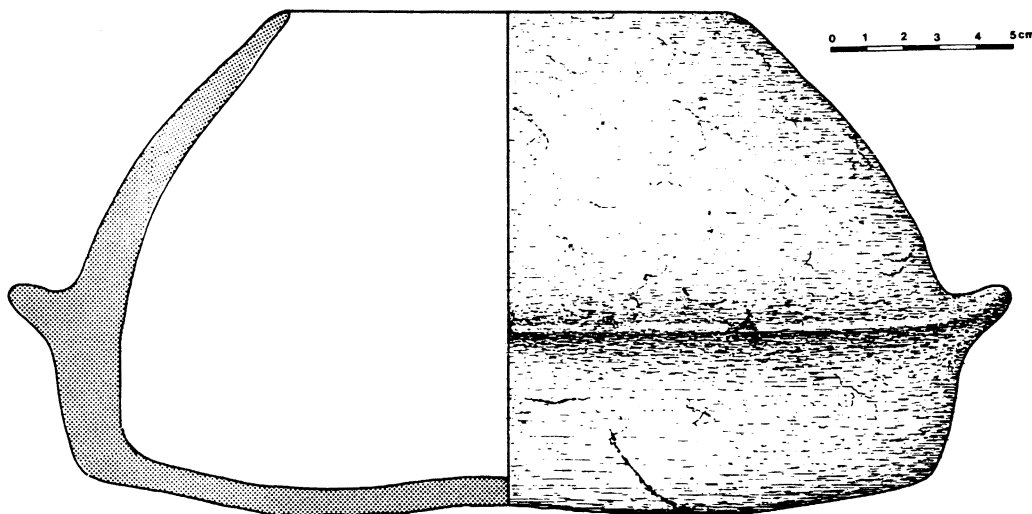


Fig. 20. Kh. Mu'allaq. Cooking pot from area A.

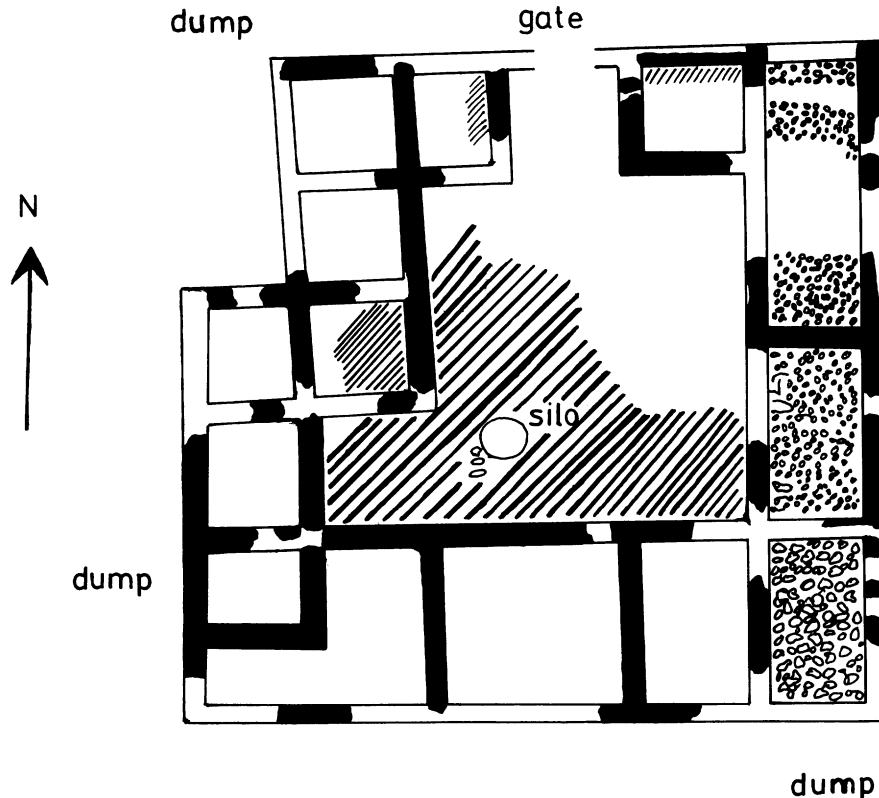


Fig. 21. Tell el-Fukhar. Provisional plan of Hellenistic villa. Not to scale.

25 July to 24 August 1992. A Danish team under the direction of John Strange concentrated their work in areas C and D at the top of the tell, where part of a Hellenistic villa had been uncovered together with some parallel walls. Numerous Hellenistic imported ceramic vessels, primarily dinnerware (e.g., plates, platters, and jugs), together with a silver tetradrachm of Ptolemy III Euergetes (246–211 B.C.), date the building to the late third century B.C.

The main object of this year's campaign was to find the connection between the walls and the villa. Based on the existing walls, Patrick E. McGovern, the pottery specialist of the team, suggested that we would find a square structure of approximately 22 m<sup>2</sup>, with 4 m and 6 m wide rooms around a courtyard. In effect the building at the end of the dig turned out to measure 22 × 23 m and has 14 rooms around a courtyard. As may be seen on the plan (fig. 21), the building is not quite regular at its northwestern part. This is probably because the builders in this part of the building took advantage of earlier walls from the Persian period, which are slightly askew to the other walls in the building. In the eastern part of the building a number of floors made of cobbled stones with a clay surface were found, and one room even with fine

flat stones. The walls were heavily robbed, probably in the Early Roman period, and disturbed by later Muslim burials and had to a large extent to be reconstructed from the robbers' trenches. The existence of a probable Persian–Hellenistic wall around the top of the tell, encircling approximately 10 dunams, and Hellenistic walls in other trenches, uncovered earlier, suggests that more Hellenistic buildings remain to be discovered. An important find is the coexistence of Iron IIC pottery together with imported Hellenistic pottery in the same stratum. This association indicates the need to revise the dates for at least a number of Iron IIC types.

A deep sounding confirmed the major phases of occupation revealed in the previous seasons: Early Bronze, Late Bronze/Early Iron, Persian (silos), and Hellenistic periods. A particularly noteworthy find in the LB levels was part of a crucible containing iron metallurgical debris, probably from refining the metal. The crucible was found in connection with a fine ashlar and boulder wall in the makeup for a thick plaster floor, possibly a courtyard of a temple or palace. The find has important implications for placing the beginnings of iron/steel metallurgy in Transjordan among the earliest iron industries in the world.



Fig. 22. Gadara. Monumental Gate from the west, 1991.

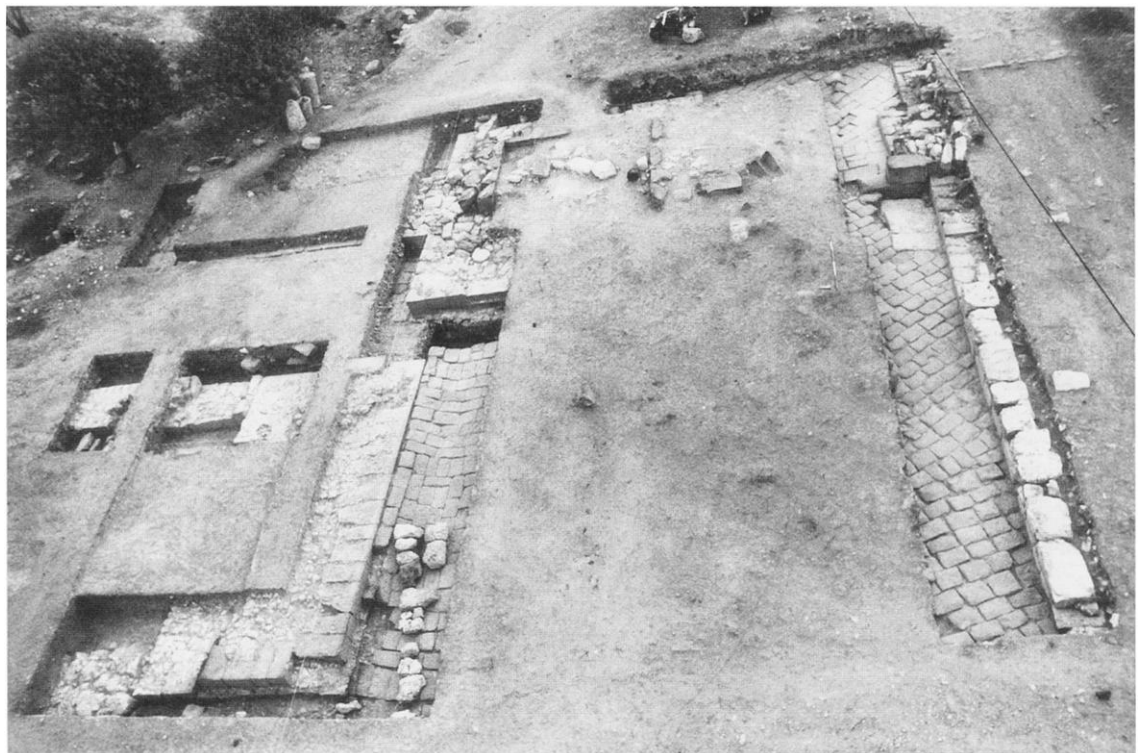


Fig. 23. Gadara. Western gate and foundations of demolished tomb buildings from the west, 1991.

Above the wall there was a destruction layer 1.5 m thick with fallen mudbrick walls and carbonized roof beams from the Late Bronze/Early Iron transitional period, a time of major upheaval in the Near East.

#### HELLENISTIC, ROMAN, MEDIEVAL

**Umm Qeis/Gadara.** Adolf Hoffmann, Deutsches Archäologisches Institut, Berlin, reports:

Four seasons of excavation at the Monumental Gate (fig. 22) *extra muros* of Gadara (modern Umm Qeis) were completed in 1991. The building is preserved to a maximum height of nearly 4 m. Unfortunately, due to its poor building technique the gate is in rather bad shape. Nevertheless, a large number of building blocks of basalt (mainly for the walls) and limestone (mainly for the decorated parts) enable a hypothetical reconstruction. The central part of this triple-arched monument follows the type of Roman triumphal arches with facades of colossal columns on high pedestals. It was flanked by semicircular towers protruding on the outer side. On the other hand, it is evident that no adjoining city wall existed. Thus the Monumental Gate had the character of a fortification building, although it had no defensive function. The gate may be dated to the beginning of the third century A.C. on the basis of stylistic analysis of the decorative components (e.g., the Corinthian capitals). No inscription has been found.

A few remnants of a paved road that passes the Monumental Gate and links the town with the Jordan Valley can be discerned. Along this road, between the Monumental Gate and the city's western gate, the remains of a hippodrome are visible. Actually, only two layers of the substructure walls of its northern tribune are preserved. It seems that this building was never finished since the construction of its southern tribune was never started. The foundation walls at its eastern part, however, point to a plan similar to that of the hippodrome at Gerasa.

Further investigations were carried out at the western gate (fig. 23) of Gadara. Here various tomb buildings existed but only their foundation walls have been preserved, since they had been demolished for the construction of the gate. The latter was a simple building of basalt with square towers and a narrow gateway, which probably once stood as a freestanding building too. Later, a city wall of limestone ashlar was attached to it. The three gate buildings excavated to date (the third—the "Tiberias-Gate" of the first century A.C.—was excavated during the last few years by T. Weber of the German Protestant Institute for Archaeology, Amman) give a good impression of the city's gradual enlargement in the Roman Imperial period. The

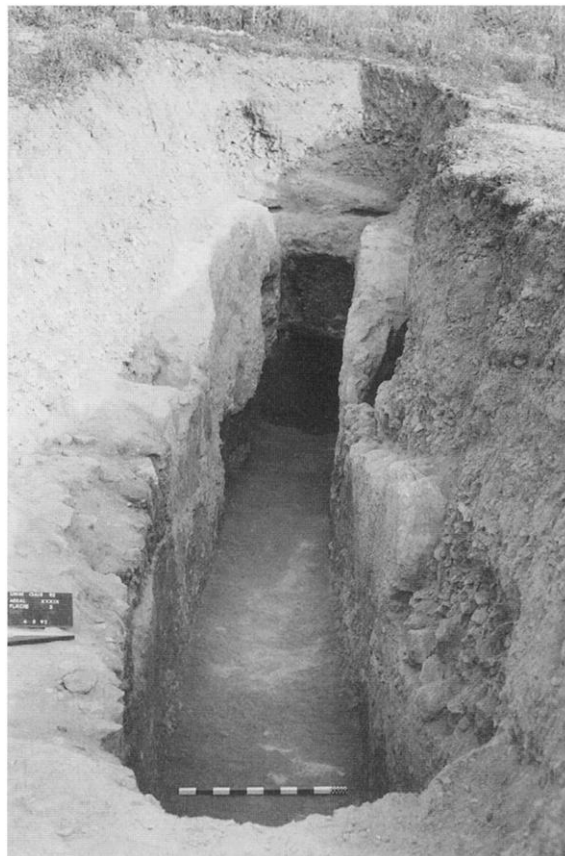


Fig. 24. Gadara. Qanawāt al-Phar'oun, the water supply system.

main colonnade of Gadara running east–west was the backbone of this development (and is still used for modern traffic).

Excavations on the southern slope of the city's acropolis carried out in 1989 revealed a big dump area outside the city wall dating to the Late Hellenistic period.

Susanne Kerner, German Protestant Institute for Archaeology, Amman, reports further on Umm Qeis/Gadara:

The excavation work was planned to reveal parts of the urban structure of Gadara, especially the domestic quarters of the earlier periods of the city and the water system. Permission for fieldwork was kindly granted by the DAJ.

The Qanawāt al-Phar'oun, the water supply system for the area, had been found in 1989 by Weber and was briefly discussed in last year's newsletter (*AJA* 96 [1992] 536). In 1992 the eastern end of the tunnel was cleaned and further excavation to the east conducted. At this point the natural hill slopes down and the tunnel changes into an open channel, cut out of the bedrock. The open channel continues for 15 m



toward the east, cut into the bedrock and sometimes supported and repaired by walls (fig. 24). It is not yet clear where the tunnel leads and what its shape is after the end of the hill. This will be clarified in the next campaign. The eastern entrance to the tunnel is completely man-made. The tunnel crosses through a natural cave and the walls and floor are built of stones and concrete. The concrete plaster along the natural bedrock continues for ca. 50 m to the west. The whole tunnel was surveyed and intensively investigated. The western end is also an outlet of the tunnel at the slope of the natural hill. A carefully hewn entrance with a little tunnel at the bottom of the *qanawāt* was revealed. The system of water distribution from the *qanawāt* toward the city needs further clarification, because it was hidden under a modern building. The water tunnel was probably not finished, because the floor was not leveled and the walls and floor were not sufficiently prepared to retain water. While a crossing channel is completely plastered and has even a small conduit in the middle, the main channel shows no sign of these. The finds in the *qanawāt* include a great deal of pottery (some of it very well made, such as West-slope ware and pieces of Megarian bowls), glass, and amphora handles, which makes it probable that the system was constructed during the Roman period.

The excavations in the town itself were at the city wall (area XL) and in the domestic quarters (area XLIV). In area XL we have worked since 1989 slightly north of a Hellenistic rubbish dump from the third or second century B.C. The old city wall is at the edge of the acropolis hill at that point and was heavily used by the Ottoman villagers as the foundation for their buildings. A building was excavated, which is more probably a tower of the city wall, although the connection with the wall is not yet clear because the tower has been robbed out in later times on two sides. The excavated parts of the tower now stand to a height of 3 m, six stones deep, but the foundations have not yet been reached. On the surface around the tower are frequent signs of use in later times. The finds in the area include pottery (Hellenistic–Roman), glass, some terracottas, and a few coins.

Area XLIV starts at a section cut by the modern road into the old settlement at the bottom of the acropolis. A large terrace wall (4 m high and 10 m long) was revealed, which seems to have been the back wall of some rooms in an early phase. These rooms have walls (partly stone walls, partly cut into the bedrock) that were plastered and painted (sometimes with ornamental motifs). In one of these walls an opening to draw water from a large cistern underneath the building had been installed. The cistern is 17 × 6 m and partly plastered to hold the water.

Abundant pottery, glass, some marble fragments, and terracottas were found in area XLIV. All the buildings found so far are oriented in accordance with the street system, although we are at the edge of ancient Gadara and cannot yet link them directly with the road pattern.

**Abila.** W. Harold Mare, Covenant Theological Seminary, reports:

The seventh season of excavation at Abila of the Decapolis (modern Quailibah), in northern Jordan, was conducted from 14 June to 1 August 1992, under the direction of W. Harold Mare, and with the gracious permission and assistance of the DAJ and Safwan Tell, Director-General. Mare was joined in the excavation by an American staff of 30 and a hired crew of 45 local workmen.

The staff conducted excavation on all parts of the site (ca. one mile long and half a mile wide)—on the north and south tells, in the saddle depression between the two tells, and in the extensive cemetery located along the slopes of the Wadi Quailibah (fig. 25). The main objectives for the season were 1) to salvage tomb materials; and 2) to study cultural materials found on various parts of the site.

*The North Tell: Tell Abila.* On Tell Abila, we concentrated on the sixth-century A.C. basilica located on the acropolis and on the deep trenches to the east and north of the basilica. In the sixth-century basilica (area A) new squares (A37–A45) were opened in the atrium to the west of the basilica's monumental stairway; excavation in a number of these squares exposed additional areas of mosaic floors of red, black, and white in diamond motif and crosses in the center. In the west sector of the atrium the mosaic was cut through, seemingly for building of additional walls and other structures. In the midst of some secondary walls built on the mosaic floor (A39) a whole Byzantine jar and a whole Byzantine glass juglet were found. Out near the west edge of the acropolis other secondary walls were probed, but there was no evidence found of a monumental stairway leading to the atrium nor any evidence pointing to a connection between the atrium and the *cardo maximus*, which ran north–south along the west edge of the tell. The fact that there were no *opus sectile* floors found in the atrium led to the conclusion that *opus sectile* floors were reserved in both this basilica and the area D basilica on the south tell for the nave and side aisles, and that floor mosaics were reserved for auxiliary rooms, the porch/narthex and the atrium. Probing at the acropolis wall (area A46) to the south of the atrium revealed that this wall was comparable in size to the segment on the north of the tell (the area F wall, excavated in 1988 and 1990); this A46 wall was 1.80 m wide and,

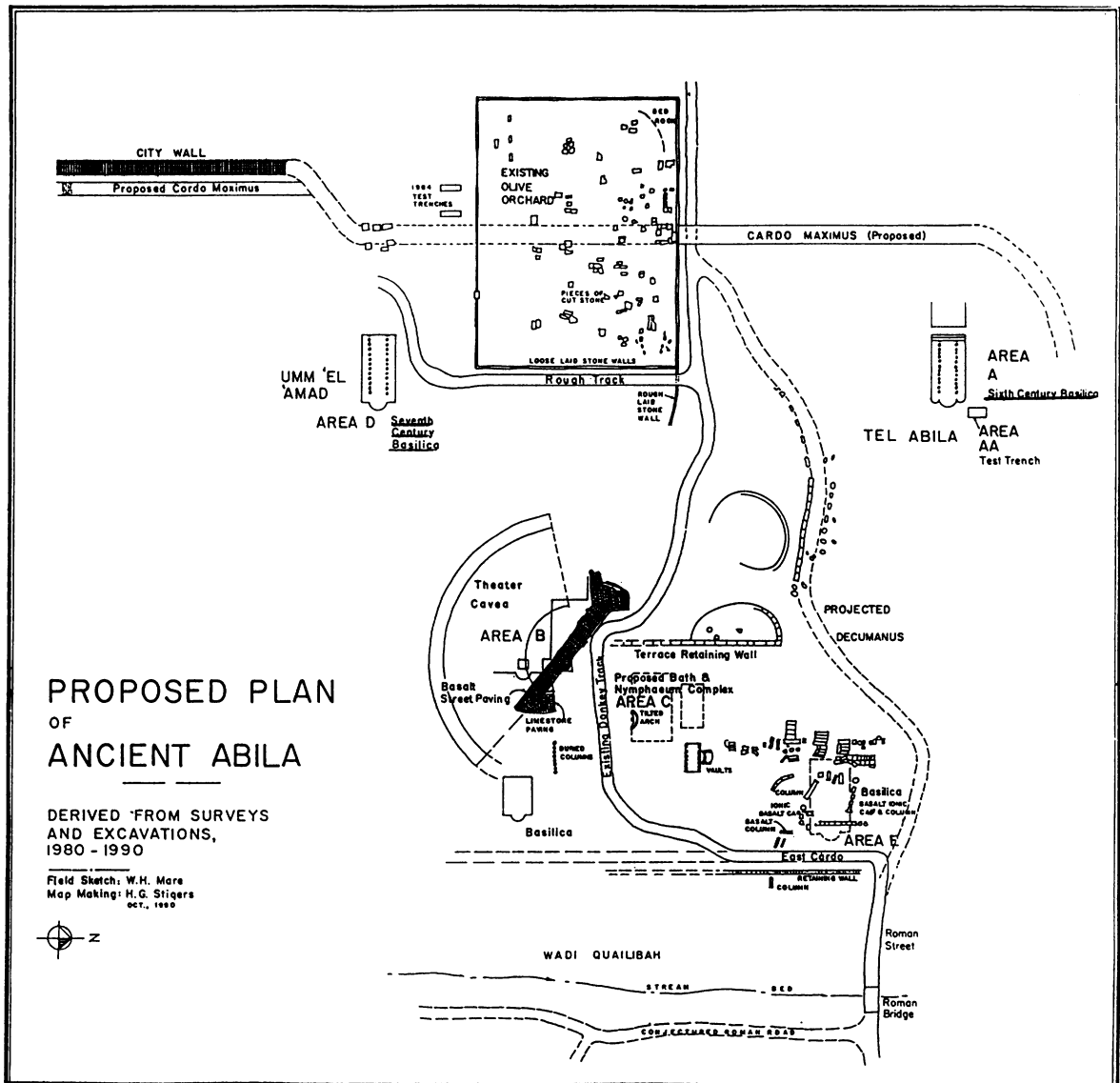


Fig. 25. Abila. Plan based on work from 1980 to 1990.

in preliminary estimate, 5 m high, the same dimensions as the north wall. In addition to the limestone bases, column drums, and capitals already found in the area A basilica, an additional number of basalt bases and capitals were unearthed in 1992, suggesting that the north and south stylobates supported rows of alternating limestone and basalt columns, similar in arrangement to the rows of columns in the Umm el-'Amad area D basilica on the south tell.

Excavation in area AA, east and north of the area A basilica, produced continued evidence of earlier Roman, Hellenistic, Iron Age, and Bronze Age pottery and building structures. In the area AA1 deep probe (12 m deep), pure EB I material was found, and a domestic living area was encountered ca. 7 m beneath the surface to complete the EB I-IV sequence

(we now have domestic architecture in EB I and IV). North of the EB wall in AA1, further probing produced an MBA domestic floor surface with a second-phase mudbrick layer, and a white crushed limestone surface (with large quantities of EB IV pottery) below the mudbrick floor, indicating a third phase of occupation. Farther to the east in area AA, the Byzantine water channel in AA8 was abruptly interrupted by installations from four phases of Byzantine occupation.

*The Saddle Depression and Areas B, C, and E.* At the theater cavea (area B), located on the northeast slope of the south tell, Umm el-'Amad, the 1992 excavation uncovered more evidence of Roman and Byzantine occupation and of the extensive Umayyad building that also had later Abassid and Ayyubid/Mamluk

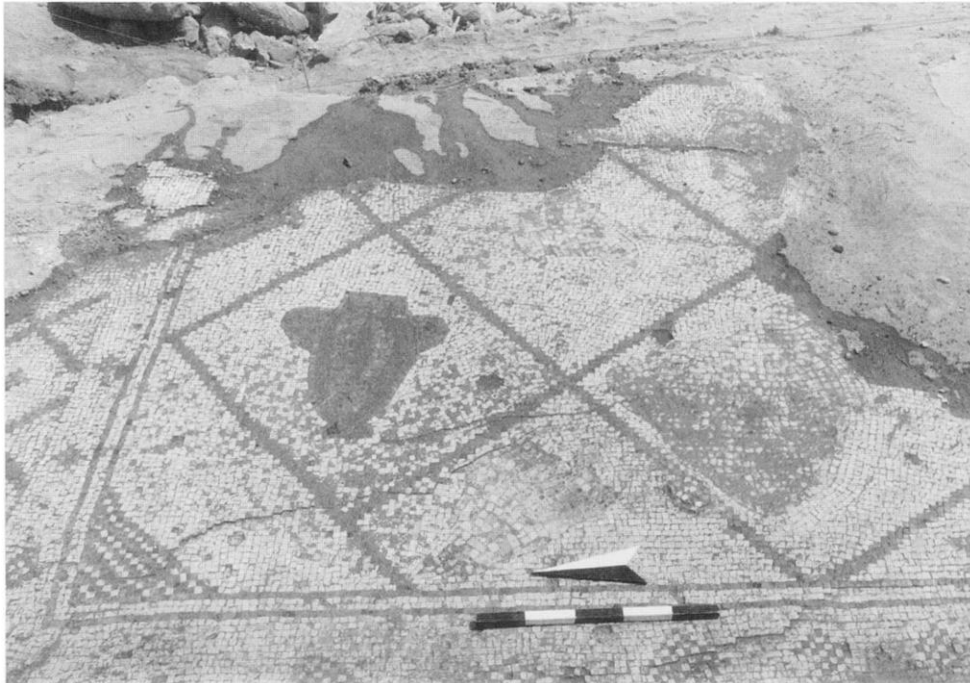


Fig. 26. Doḥaleh. Portion of church floor with mosaic.

reuse. At the western edge of the Umayyad building we uncovered a finely cut corner stairway for which there is at present no architectural context. Just to the north of the Umayyad building, excavation at the Byzantine street, which was extensively explored in 1990, showed that it continues northwest at its west end and then proceeds north across the terraced depression to meet the east–west decumanus, which ran along the south foot of Tell Abila. At its east excavated end, near the earlier Roman road/plaza over which the Byzantine basalt street runs, the street makes a 50° left turn at the corner of the Roman wall and column that border the east side of the earlier Roman street/plaza. In light of this new evidence we project that the Byzantine street continues to run east of the theater cavea along the foot of the small hill upon which the ruins of a small Christian church are to be seen.

Further investigation of the Abila road system shows that the decumanus descends from the east slope of Wadi Quailibah, over the Roman bridge, on past the north side of the area D basilica (there are stubs of columns visible along the street here), and continues along the foot of Tell Abila until it exits under the vault of the *cardo maximus*, which runs south from the acropolis of Tell Abila on to the south tell, about 100 m west of the area D basilica (fig. 25).

In area C, the bath/nymphaeum complex north of the theater cavea, further investigation of the subsur-

face water channel indicated that it extended south to the corner of the bath/nymphaeum and then turned east and continued along the south of the structure until it emptied through a sluice into large vaults there; the presence of sluices opening into the south face of one of these vaults suggests that these were orifices through which water from the Umm el-ʿAmad underground aqueducts and other auxiliary aqueducts emptied into the vaults. Probing along the east wall of the bath/nymphaeum revealed a complex of walls, and also a domed underground vault.

In 1992 we excavated more of the ruins of the large Christian basilica in area E, which incorporated basalt columns and Ionic capitals in its construction. Pier column drums and two Ionic capitals had been uncovered in 1990, and we uncovered several more of each in 1992. We excavated the single apse on the east and the foundation structure of the church's iconostasis. We also found a number of north and south stylobate plinth blocks together with column bases in situ in two rows on either side of the nave; this evidence indicates that the structure was a five-aisle basilica. We were able to excavate a significant part of the east section of the church, and near the end of the 1992 season we erected all of the columns and capitals excavated to date.

*The South Tell: Umm el-ʿAmad.* In excavating the seventh-century A.C. basilica on Umm el-ʿAmad (area D), we continued to uncover the remains of the opus

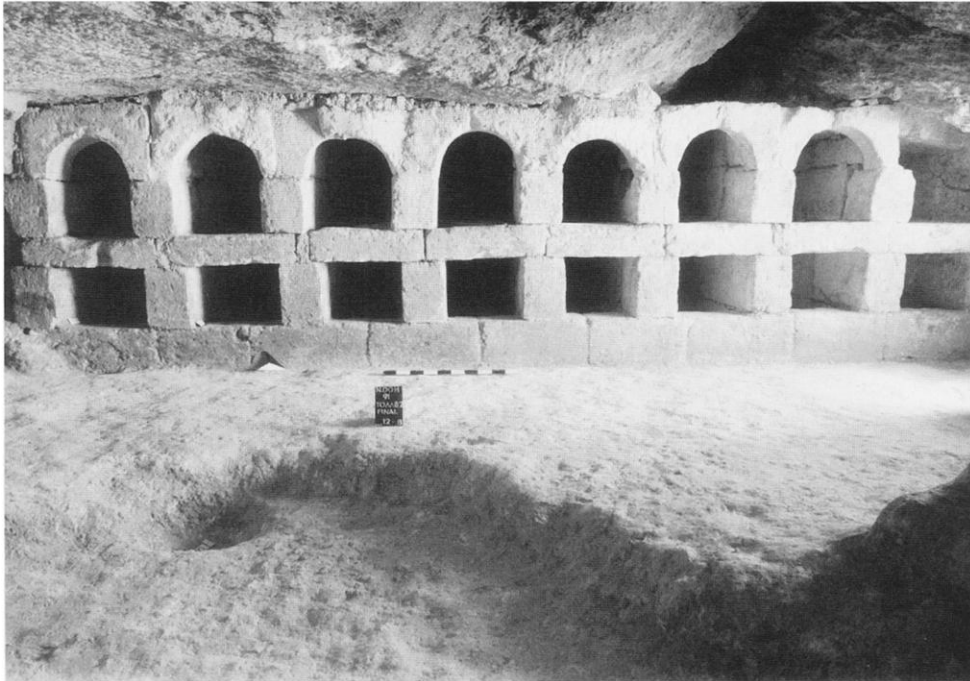


Fig. 27. Dohaleh. Byzantine rock-cut tomb.

sectile floor in the north aisle of the church and also found another threshold opening from the north into this aisle and an additional threshold leading from the narthex on the west into this north aisle; all of the evidence thus far shows that the basilica had three entrances on the west and at least two each on the side aisles. Excavation across the modern dirt road to the west of the porch and of the four monumental columns did not bring to light any evidence of a monumental stairway but did produce another series of walls with an embedded Roman–Byzantine clay drainpipe and, on a lower level, another apse with a mosaic floor of geometric design and to the south of it another section of mosaic of similar design. Excavation outside the south wall of the Umm el-ʿAmad basilica produced a large mosaic floor of floral and animal design. Near the end of the season, with the help of the DAJ crane, we were able to erect at the entrance of the porch of the basilica the remaining excavated monumental column drums and the remaining capital.

*Tomb Excavations.* Work concentrated mainly on the tombs and graves found in area H, located on the ledges along the east bank of Wadi Quailibah, just to the northeast of Tell Abila. Besides excavating 10 Roman–Byzantine tombs and graves here (some robbed and some undisturbed), the team also uncovered two terrace enclosure walls connected with the tombs, and a Roman–Byzantine pottery kiln (H36),

the first ancient kiln to be found at Abila. The tombs excavated were of the standard type, usually equipped with central chambers and radiating loculi; the graves were shaft graves.

**Dohaleh.** Salih Kh. Sari, Institute of Archaeology and Anthropology, Yarmouk University, reports:

Dohaleh, an agricultural settlement, is located in northern Jordan ca. 25 km southeast of the city Irbid and ca. 4 km to the west of the town of Nuʿaymeh. A survey of the area by S. Mittmann in 1989 revealed several features such as wells, burial caves, and architectural remains on the western and eastern slopes of the site. This launched a long-term project directed by Salih Sari and sponsored by Yarmouk University. Three campaigns have already been conducted in cooperation with the DAJ since the summer of 1990.

Although the area had been surveyed, the site of Dohaleh itself was not recognized until 1990. At present the collected data indicate a continuous occupational sequence from the Early Roman period to the Ottoman period.

A mosaic floor, unearthed in the 1990 season, was notable for the intensive destruction of its iconography (fig. 26). It is believed that the floor belonged to a small Christian church under the Umayyads. The mosaic style of the floor is almost fully geometrical including the figure of a decorative vase. Adjacent to the floor on the east, several walls were found to have two architectural phases. The earlier probably related

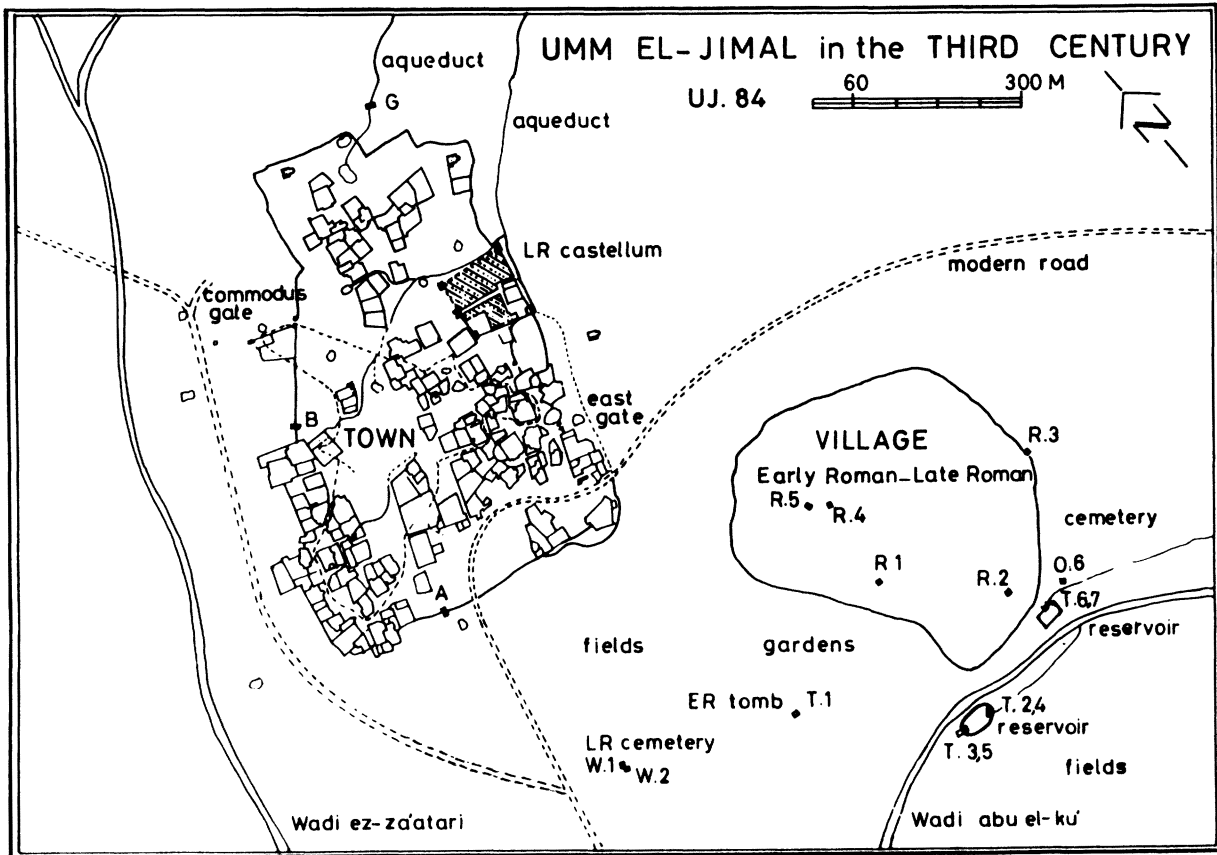


Fig. 28. Umm el-Jimal. Map of village and town. (B. de Vries and R. Sayegh)

to the Byzantine period. The reconstruction of these walls was for residential reuse during the Islamic period, mainly the Ayyubid/Mamluk.

Further research in 1991 brought to light the remains of an Umayyad mosque measuring  $11.50 \times 4.00$  m, constructed of regular and well-dressed limestone blocks. In the deliberate mass destruction of the mosque, the eastern wall was entirely demolished. A part of the southern wall connecting the mihrab with the eastern wall was also destroyed, but one course of well-cut stones from another section survives. The *Bayt al-Salat* (Prayer Hall) and the concave mihrab are still partially standing. The mihrab was presumably located at the center of the southern "Qiblah Wall." Work in the mosque area is still going on.

An Islamic tomb to the west of the mosque was also uncovered. Artifacts including bracelets of glass and debased metals, beads, rings, and pierced coins were abundant and found associated with the skeletons. Since this is an unusual phenomenon in Islam, the graves may have contained the remains of immigrants from foreign ethnic groups who arrived in Bilad ash-Sham during the Mongol invasion.

On the eastern side of the site, three tombs from a large rock-cut necropolis have been excavated. Each

tomb is different from the others in terms of disposition and interior decoration. The tombs also vary in the number of chambers present, ranging from three to 16 units cut in the wall or in the ground of the cave. The clearance of the tombs allowed the collection of important material: pottery, glassware, perfumed vessels, and metal artifacts, mainly decorative feminine material dating back to the Early Roman and Byzantine periods.

The graves (loculi) were constructed with well-dressed limestone blocks (fig. 27) and oriented south-north and/or east-west. The tombs were heavily plundered and the graves were destroyed. Many of the smashed bones were widely scattered on the floor.

**Umm el-Jimal.** Bert de Vries, Calvin College, reports:

From 15 June to 10 July 1992 Bert de Vries conducted fieldwork at Umm el-Jimal with a staff of 12 specialists in architecture, surveying, and photography. Deepest appreciation goes to the Ambassador Foundation and the Calvin College Alumni Association for financial support and the DAJ for logistical support and cooperation.

The season's goals included precise mapping, architectural drawing of selected buildings, extensive

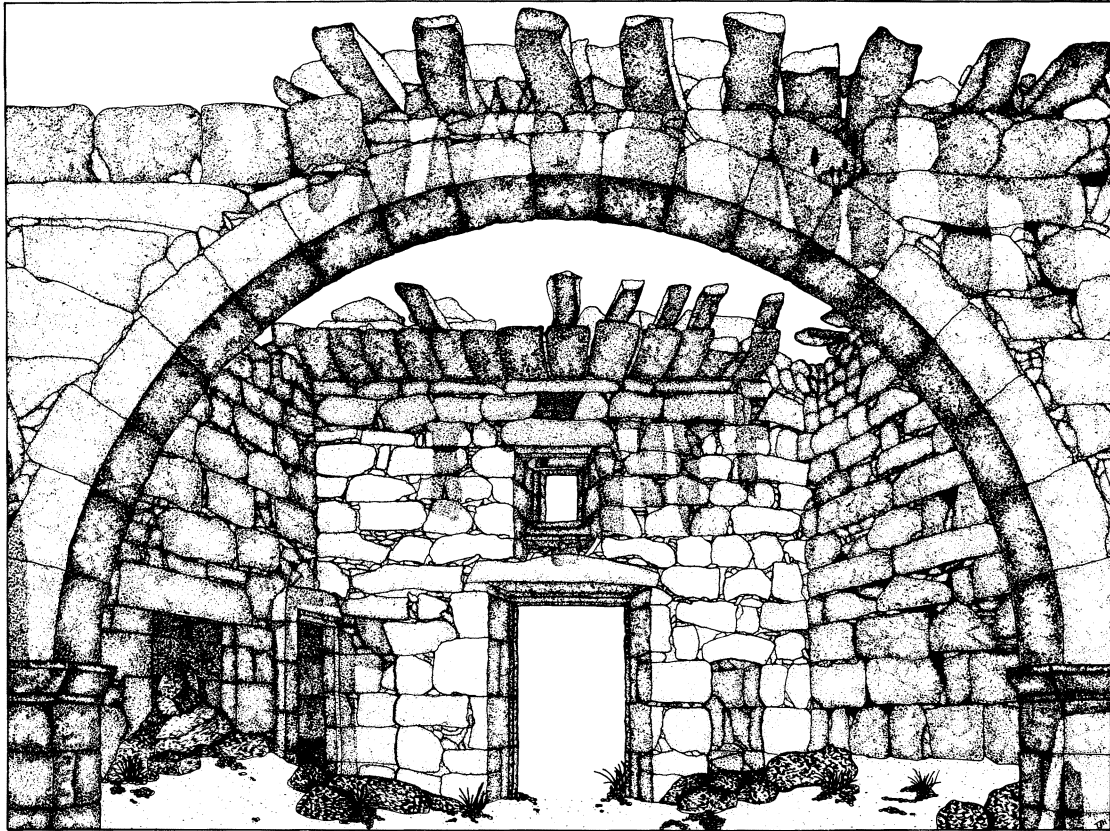


Fig. 29. Umm el-Jimal. Interior of great room in house 35, looking north. (Tania Hobbs)

photography on the ground, and low-level aerial photography with cameras suspended from a balloon. These recording activities were intended to provide illustrations for the publication of previous fieldwork, as well as detailed plans and maps for a major excavation seasons to take place in 1993 and 1994.

The surveyors made precise control measurements on the Late Roman fort using an electronic distance meter. This fort, a structure approximately  $90 \times 100$  m located on the east side of Umm el-Jimal, was built ca. A.D. 300 and already lay in ruins when the Byzantine town was flourishing in the fifth/sixth centuries. They also laid out a triangulation grid for mapping controls in the Early Roman–Late Roman village discovered in the 1984 season, a site about  $300 \times 500$  m in size, just to the east of the standing Byzantine ruins (fig. 28).

The architects studied four building complexes, including house 119, a simple domestic structure with two well-preserved stables with interesting rows of mangers. This house is located at the entry to Umm el-Jimal and is an ideal candidate for conversion into a visitors' center and site museum.

House 49, which includes the so-called Nabataean Temple, cleared by the DAJ, was also carefully measured and drawn. It is important not only because it

incorporated an earlier public building into this domestic environment, but also because it contains an L-shaped stable arrangement with a plan that provided the standard structural core for several other Byzantine houses on the site. The larger room was used to house untethered animals; it has a cubicle-like bathroom stall built into its northeast corner. The other room is long and narrow with a row of mangers running down the side connecting it to the first room. Here, animals could be tethered one per stall. The whole arrangement indicates that careful attention was given to the sheltering of animals. The doors of the rooms opened onto a central courtyard, from which exterior stairs give access to upper rooms where animal fodder was stored and human residents slept.

House 35, located in the same quarter, was studied to compare the building methods of the fifth/sixth century Byzantine inhabitants to those of their Druze successors ca. 1925. The great room of this house (fig. 29) is preserved to ceiling level. Its corbelled roof was supported on a wonderfully finished central arch that allowed the ceiling to soar over 5 m above the floor. A second room had an intact ceiling supported on the walls and an arch built by the Druze. This arch was relatively low-slung and constructed of reused building blocks of various sizes, aligned on the entry-side



Fig. 30. Umm el-Jimal. Balloon aerial photograph of southwest third of the Byzantine town. The praetorium is at the upper right, house 49 at the center, house 35 left of center, and house 119 at the lower right. (Photo Wilson and Eleanor Myers)

of the room. Although the makeup of this arch and the associated corbel-beam roofing system was much more irregular than its Byzantine predecessor, it is clear that the Druze of the 20th century had adopted the Roman–Byzantine building system with great expertise. Thanks to them, many houses at Umm el-Jimal have been preserved remarkably in their ancient style.

The highest wall of the Praetorium with a bit of remaining gable roof at the southwest corner of the atrium has long been in extremely precarious condition. While the DAJ cleared previously excavated rooms, the project team systematically numbered all the stones in the walls that are threatened by collapse.

All threatened walls were then drawn and photographed. As soon as a crane and other equipment become available, the affected masonry can be dismantled and reconstructed by master stonemasons under the supervision of a restoration architect.

A highlight of the season was the aerial balloon photography undertaken by Wilson and Eleanor Myers. Low-altitude aerial photographs were taken by suspending cameras from a balloon, with the shutter trigger and film advance operated by remote radio control. At the site of the earlier village, photographs were taken from heights of 100 and 225 m. From these heights the photographs show every stone of this badly destroyed area. Because the surveyors'

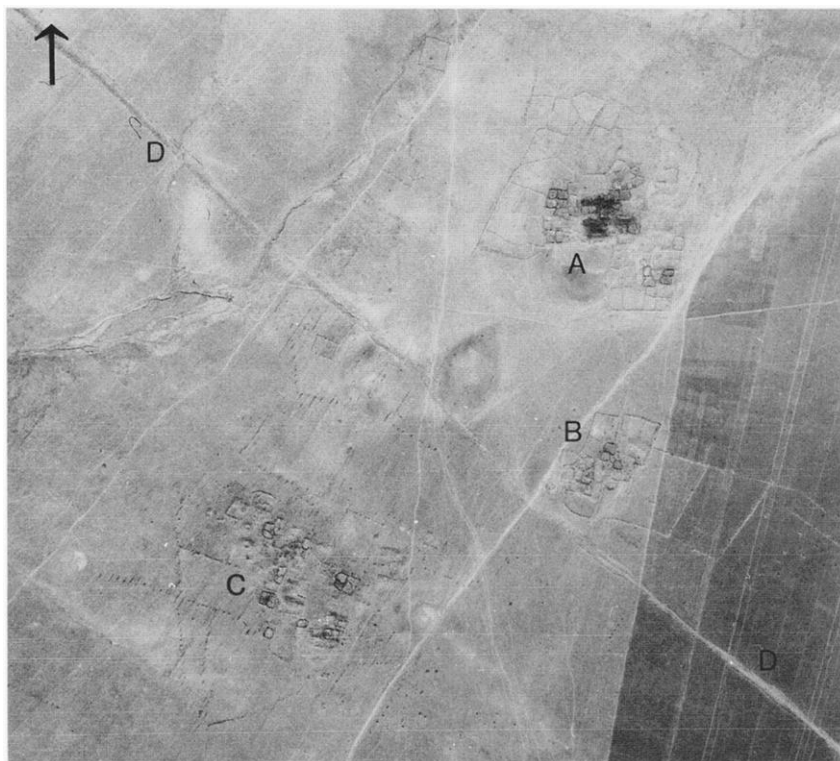


Fig. 31. Southern Hauran. Aerial photograph (1953). A is site 11 (Khirbet es-Saada), B is site 10, C is site 12, and D is the Roman road from Quttein to Bostra. (Photo Hunting Surveys 61.077)

triangulation grid can be located on the photographs, it will be possible to produce scale maps of distinguishable features, such as exposed wall lines, in preparation for the coming excavation. The Late Roman castellum was photographed at 300 m in order to have the entire structure appear in a single photograph from which a scale plan may be produced using the ground control measurements.

The tall buildings of Byzantine Umm el-Jimal were photographed in five sections from a height of 300 m (fig. 30). Then a Hasselblad camera with a wide-angle lens was raised to 600 and 700 m to take the whole site in a single photograph.

This is the first time that balloon photography has been used in Jordan. It is expected that this method of remote sensing will add significant data to those gathered on the ground and from airplanes and satellites. The photographic and map data are being entered into a Geographic Information System for spatial and quantitative analysis of the archaeological data.

Both the clearing by the DAJ and the close examination of specific buildings resulted in the discovery of a number of inscriptions and decorative stones.

Recording these was a major component of the project. Over 50 inscriptions and five decorative fragments were drawn and photographed. Most of these inscriptions were tombstones in Greek using the following formula: X (son or daughter) of Y of the age Z. Two were Nabataean.

All the buildings studied were photographed in detail, and illustrative sketches were made to supplement precise plans and elevations. The results of this season's work will greatly aid the publication of previous fieldwork and major restoration and excavation planned for the next several years.

**Umm el-Quttein, Southern Hauran.** David Kennedy, University of Western Australia, reports:

The region encompassed by the Southern Hauran Survey includes a rich variety of archaeological material. Even after a single season (1985) it was clear that most broad periods in prehistory and history were represented. The survey was enormously assisted by the employment of air photographs; many of the sites recorded in and around Umm el-Quttein, the focus of our attention at that time, were discovered or at least illuminated by scrutiny of the aerial coverage.



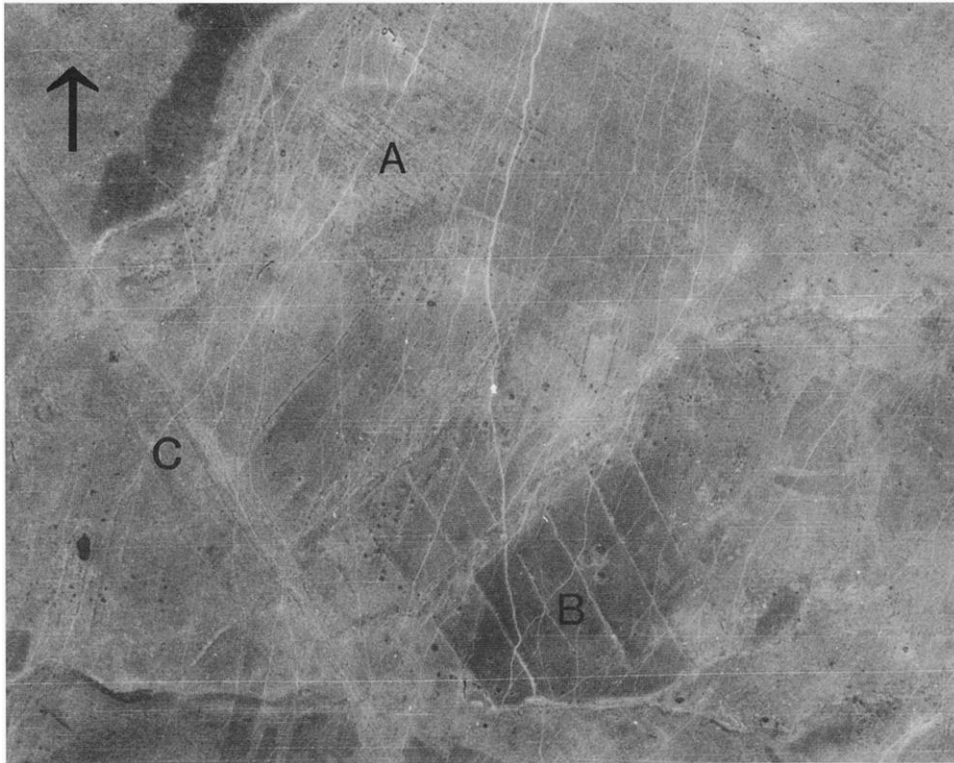


Fig. 32. Southern Hauran. Aerial photograph (1953). A and B are areas of fossilized field boundaries, and C is the Roman road just northwest of Qutṭein. (Photo Hunting Surveys 61.130)

The modern village of Umm el-Qutṭein itself overlies the extensive but now very battered and reduced traces of the Roman–Byzantine town seen by the Princeton University Expedition to Syria at the turn of the century. The tall towers are no longer standing, but most of the religious and other buildings noted by them can still be discerned; in the case of the “Monastery,” the location was rediscovered amid the modern buildings by means of an air photograph of 1953. Also visible on the same photograph—a new discovery—is the outline of what seems to be a Roman fort. Scattered throughout the town are deep cisterns attached to ancient houses, and the northern part of the town includes two square reservoirs, one with a capacity of some 20,000 m<sup>3</sup>.

The fourth–seventh century date implied by the churches is complemented and extended by the evidence of numerous inscriptions, mainly tombstones, in both Greek and Nabataean; one provides the provincial date of 160 (A.D. 265/6). Other inscriptions from beyond the town attest to the Roman presence; a military building inscription naming a detachment of the Legio III Cyrenaica was recovered from beside a ruin on the volcanic peak to the southwest, and part of an early fourth-century milestone was found north-

west of the town in situ beside the Roman road whose clear trace can now be followed for 2 km toward the provincial capital of Bostra (see fig. 31, D; fig. 32, C).

Numerous other smaller sites of various periods were recorded in the vicinity of Umm el-Qutṭein, including sites 10, 11, and 12, some 4 km northwest of Qutṭein, close to the Syrian border. Abundant pottery from site 10, studied by Rob Faulkner, spanned the period from the first to eighth centuries and included several fragments of Eastern Sigillata. Unexpectedly, the tally also included a seventh (?) century Sassano-Islamic sherd, thought to originate on the Tigris. At site 11 (Khirbet es-Saada), surface pottery included first- and second-century Nabataean and Eastern Sigillata wares from amid the ruins of well-built structures, as well as a sixth–eighth century Jerash-type lamp from nearby. At site 12 the identifiable pottery was mainly third century with a medieval “presence.” Most striking and exciting, however, is the extensive trace of fossilized field boundaries. Once again it is on old (1953) air photographs that a range of systems of differing shapes and sizes appear, some seemingly overlying others (fig. 31). Despite the current farming in the region, some of these boundaries can still be discovered on the ground.

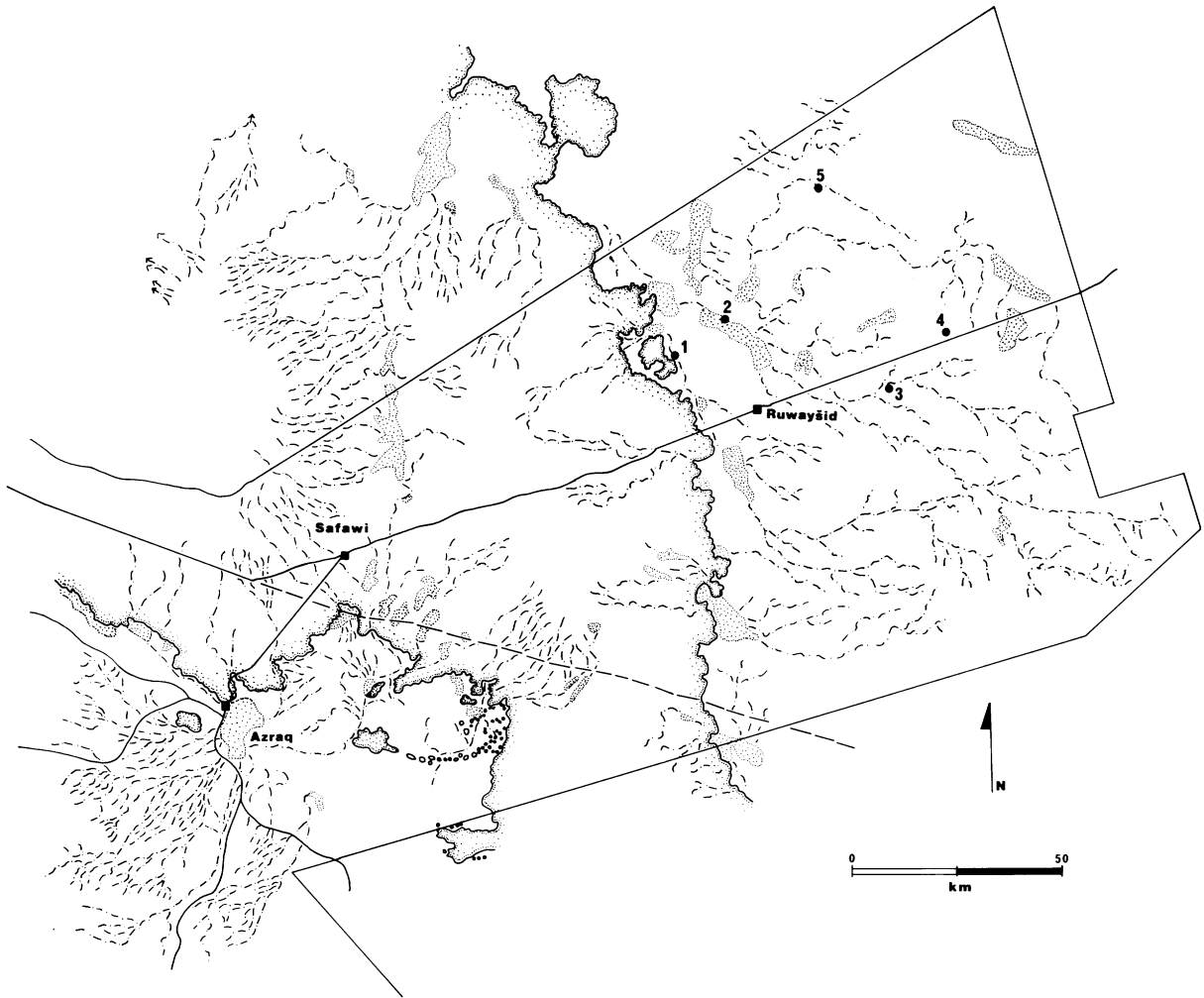


Fig. 33. Map of the Ruwayshid area

In general, the period most frequently attested is the Nabataean–Roman–Byzantine. In terms of scale, too, the structures, roads, and inscriptions of the same period all suggest that the peak period of human activity in the region was between the first and seventh centuries.

The renewed fieldwork in 1992 (codirected with Philip Freeman) will include some test-trenching in Umm el-Qutṭein. The active survey area will be extended and more use made of the aerial coverage and of satellite imagery.

**Burquf/Ruwayshid.** Alison Betts, University of Sydney, reports:

The third and final season of the Burquf/Ruwayshid Project took place in September and October 1991. The project is jointly sponsored by BIAAH and Edinburgh University. Fieldwork is conducted by kind permission of the DAJ. The aim of the project is to examine land use through time in the semiarid re-

gions of North Arabia through detailed study of a sample area in eastern Jordan.

In the first two seasons, work was concentrated on excavation of sites around the lake at Burquf (fig. 33, no. 1). In these first seasons, we also carried out survey work in the areas east and south of Burquf. In 1991 we looked in more detail at the regions beyond the Burquf lake. Work included soundings and intensive survey in a number of selected areas.

Our main priority this season was to study *mahāfir*, water catchment systems, of which several groups have been found in the Ruwayshid area. The largest of these is Mahafir al-Shahami, just north of the Baghdad highway. The complex is on a small internal drainage system and consists of 10 artificially excavated pools. The pools are reinforced by roughly laid stone walls, and their downstream sides, although now largely washed out, appear originally to have been low enough to permit surplus water to flow over the

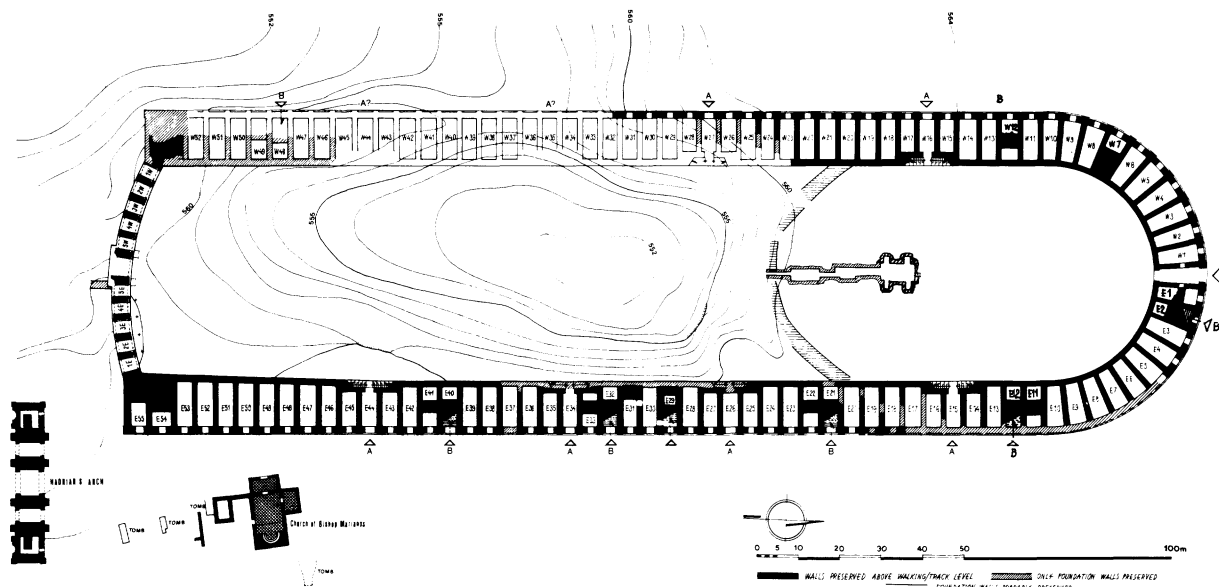


Fig. 34. Gerasa. Ground plan of the hippodrome.

top and into the next pool. There are two multi-roomed courtyard houses on the southeast side of the complex, which appear to have been associated with its use. A limited amount of pottery was recovered from the site and from ancient campsites nearby. On the basis of comparisons with nearby al-Risha, it is likely that Mahafir al-Shahami is dated sometime during the seventh to ninth centuries.

A second water catchment system was investigated near the settlement of upper al-Risha. The site, Mahafir al-Rishat Anwar, is located in a small upland drainage basin and comprises one rectangular multi-roomed structure overlooking a small wadi system and mudflat. Preliminary analysis suggests that this system too may have been constructed during the Early Islamic period.

A second focus of work in 1991 was the investigation of prehistoric sites in the open plains east of the *harra*. Excavations were conducted at the site of Mahfur al-Ruwayshid, about 10 km northeast of Burqu<sup>6</sup>. The site is one of a series of stone corrals strung out in a limestone outcrop within the bed of the Wadi al-Ruwayshid. The site has seen at least two periods of use. There was evidence for an initial settlement with hearths, occupation levels, and stone walls, followed by the construction of a subcircular stone enclosure. Finds from the site included flint implements, basalt grinding tools, and some bone. The flint assemblage is comparable to material from sites at Burqu<sup>6</sup> and suggests that the original foundation of the site was in the Late Neolithic period. The site in both phases may have been used as a spring camp for hunter/

herders exploiting the spring growth of annual vegetation in the Wadi Ruwayshid.

In addition to excavation, surveys were carried out in the wadi systems of the Ruwaysdat south of the Baghdad Highway. Two areas were selected and field-walked intensively. All sites within the areas were mapped, surface material was collected, and soundings were made at two locations. The first sounding involved clearance of a tumulus. The structure of the tumulus and the enclosed chamber were preserved, but the tomb had been robbed in antiquity, and no remains of skeletal material or artifacts were recovered. The second sounding was in a complex of ancient corrals, but excavation failed to produce any evidence for the date of the site.

The Burqu<sup>6</sup>/Ruwayshid Project is now complete. The results will provide an analysis of the nature of land use in the region from the Neolithic to the present day. It will also provide detailed studies of particular periods, specifically the Neolithic/Chalcolithic and the Late Antique/Early Islamic periods. Integration of ethnographic data with archaeological evidence will provide a fresh perspective on the significance of the North Arabian *badiya* in ancient times.

**Gerasa, Hippodrome.** Antoni A. Ostrasz, Warsaw University, reports:

The excavation and restoration of the hippodrome at Gerasa (modern Jerash), sponsored by the DAJ, has been carried out almost year-round since January 1985 (fig. 34). The aim is to expose all extant remains of the building, to recover material pertaining to its history, and to display the restored monument both

to scholars and laymen. The restoration will take more time, but the first two goals may be reached by the end of 1993.

The excavation (preceded by excavations of 1933 and 1982–1983) revealed most of the extant parts of the building. What has been exposed shows that this monument is one of the few very well preserved Roman circuses (along with Lepcis Magna, Tyre, Merida, and the Circus of Maxentius in Rome) among the 40 examples known. Although the smallest circus on record (arena only 245 m long), this hippodrome displays evidence for all relevant architectural features of this building type. The evidence for the *carceres* is unique in that the architecture of the structure is restorable in detail.

The material recovered (inscriptions, coins, ceramics) provides solid evidence for tracing the history of the monument. The hippodrome was built between the middle of the second century and A.D. 209–212. The building ceased to serve the primary purpose after only about 100 years because of the disintegration of a large part of its masonry and of the arena. The disintegration was caused by the extremely poor foundations of the structure.

Beginning in the late third/early fourth century, the building and its site were reoccupied for mainly industrial purposes, producing ceramics, a gypsum-like substance (calcium carbonate), lime, and possibly glass. Architectural remains or traces of seven kilns inside the building and three kilns outside and close to it have been found. A large lime kiln was revealed in the southwest part of the former arena. Many chambers of the building were used as places for dumping misfired pottery and lamps. Others were adapted for dwellings.

The industrial activity continued throughout the Byzantine period and possibly into the early decades of Umayyad times. There is no evidence for continuous occupancy of the building in the following centuries.

The building was affected by earthquakes. There is circumstantial evidence for the earthquake of 551, not firmly attested at Gerasa, and for the earthquake of 659/60, attested at other sites. The most disastrous for the hippodrome seems to have been the earthquake of 747/8. This earthquake destroyed the *carceres* and the southeast part of the building.

After 747 the building was occupied only intermittently. One such instance of occupancy is evidenced by finds in chamber W2. Human skeletal remains of a dozen individuals were found between tumbled stones of the roofing of the chamber. The collapse of the roofing that killed them was evidently caused by

an earthquake. The fact that the bodies of the deceased had not been recovered from the debris for proper burial suggests a lack of communal organization at the site of Gerasa at the time of the occurrence. As there was considerable organization in the Early Abbasid period, the event must have taken place at a later date. Several Mamluk sherds were found in the tumble close to one lot of the skeletal remains. The sherds may point to the time of the disaster. The excavation has not yet reached the level of occupancy of the chamber. Finds at this level may confirm, or disprove, the suggested date of the occurrence. Results of the study of the skeletal remains will be published by Stephen Bourke of Sydney University.

While the excavation yielded rich material pertaining to the architecture and history of the monument itself, it also proved exceptionally rewarding in larger aspects of the archaeology of the area. The building of the hippodrome emerged as the main (perhaps the only) center of ceramic production at Gerasa from the end of the Roman throughout the Byzantine period. The misfired artifacts, deliberately crushed (only a few survived intact) and dumped, form a huge deposit representing all types of pottery and lamps produced at the site over a period of more than three centuries. The whole body of material consisted of separate deposits accumulated in particular chambers. Some of these deposits are datable to a level of accuracy within decades. The following selected examples illustrate the point.

The dump of misfired pottery in chamber E2 contained two small hoards of coins—one hoard of five coins of Constantine I (307–337), one coin minted in or shortly after 307/8, and another hoard of six coins of Licinius I (308–324). The coins firmly date the pottery found in the chamber to the first decades of the fourth century.

Remains of a kiln and a dump of misfired pottery and lamps accumulated around the kiln were found in chamber E8. This deposit contained tens of thousands of potsherds, 809 lamp handles (each handle representing one misfired lamp), thousands of fragments of the upper and lower body of lamps, and three complete lamps. Seventy-eight coins were found within the deposit, among which were one hoard of 15 and another of 36 coins. Upon preliminary examination, the coins of the hoards and some of the 27 others appear to have been minted in the reign of Constantius II (337–361), seemingly in the post-reform period (346–361). The coins date the pottery and lamps found in the dump to the later part of the first half and into the early part of the second half of the fourth century.

Traces of a kiln and a very large dump of misfired pottery representing all kinds of vessels were revealed in chamber E32. The variety of vessels and the quantity of sherds show that the deposit must have accumulated over a relatively long period, but the whole is datable to the fifth century.

In many chambers the uppermost stratum of the fill (directly under the tumble of masonry) consisted of a dump of misfired ceramics dating from the sixth century. In some chambers (e.g., E8) this dump lay on top of the dump of earlier periods.

The ceramics of the fourth and fifth centuries are particularly important. Contrary to the types known at Gerasa and reliably dated to the first centuries A.C. and from the sixth century on, the dating of the pottery and lamp types allegedly produced in those two centuries is rather vague and requires much stricter temporal definition. It may be noted that the ceramics of that period are usually referred to as belonging to the "fourth/fifth" centuries. The finds from the hippodrome provided abundant material for a much stricter dating.

Finally, yet another discovery must be reported. Within the dump of misfired pottery and lamps in chamber E8 were found two fired clay molds of fourth-century lamps and 34 molds (and scores of fragments of molds) for the same type of lamps but made of a gypsum-like substance that was produced at the site (cf. above). Fired lamp molds are common finds, but the gypsum lamp molds seem to be unique. These molds are probably transitional products of the technology developed for producing the clay molds ultimately used for the production of lamps. The ceramic material is being recorded and studied, and will be published by Ina Kehrberg of the hippodrome team.

**Gerasa, Town Plan.** Roberto Parapetti, Centro Scavo di Torino, Rome, reports:

Since 1977, the Centro Scavo di Torino has been active in Jordan with the objective of clarifying the nature of architecture and town planning in the Roman East. Architects and planners of the Seleucid tradition are thought to have played a determining role in the development of Roman Imperial achievements. The revolutionary contribution of Apollodorus of Damascus to Trajanic building policy in Rome and the work of Syrian architects and builders under Septimius Severus in replanning the civic center at Lepcis Magna support this thesis. Due to its exceptional preservation, Gerasa attracted our attention. There, public building from the beginning of the second to the middle of the fourth century involved

planning solutions that considerably broaden our understanding of the history of architecture of that epoch.

From 1978 to 1981 a new topographic survey of the entire city was carried out with particular attention to the colonnaded streets and sanctuary of Artemis. The position of the sanctuary was a determining factor in the redesigning of the city layout under Trajan and later developed by Hadrian and the Antonines (fig. 35).

Colonnaded streets, which from the second century represent the most characteristic feature of Roman cities, assume a peculiar form in Gerasa: the entablature of the order is reduced to the architrave only. This reduction suggests the absence of porticoes. The colonnades can be considered as a kind of screen lining the street, which is thus transformed from an open to an "enveloped space," and therefore planned as an autonomous architectural entity. The temple of Zeus and the temple of Artemis, both rebuilt in Antonine times, are visible from the North Gate and the Triumphal Arch, respectively (fig. 35). The layout of the quarters east of the wadi is aligned with this second axis. The development of Gerasa can thus be seen as a synoikistic blending of two distinct settlements related to the temples. Gerasa was not walled in as a single settlement until the fourth century.

Excavations in the area of the sanctuary of Artemis have brought to light the remains of a Byzantine religious complex in the thick earth fill in the southern part of the intermediate terrace. In the area in front of the temple, an industrial installation for the production of domestic pottery was excavated, dating from the fifth to the eighth century.

Since 1984, also with the support of the Italian government, we have undertaken restoration work, beginning with the Artemis sanctuary. The reconstruction of the transverse walls supporting the retaining wall of the intermediate terrace will soon be completed. This will enable the consolidation of the remains at the north and south sides of the Propylaeum. These were first restored in the 1930s, causing misinterpretation of the original design; the relieving arch above the doors of the rooms at the sides of the Propylaeum should have been a flat arch instead. The gigantic columns in front of the same monument were incorrectly reassembled in the 1960s. The spring of 1992 was devoted to their dismantling for a new anastylosis of the remaining parts of entablature and pediment. In 1981 the detached columns of the Propylaeum's east front were incorrectly reerected by inserting steel bars down to the foundations. Their

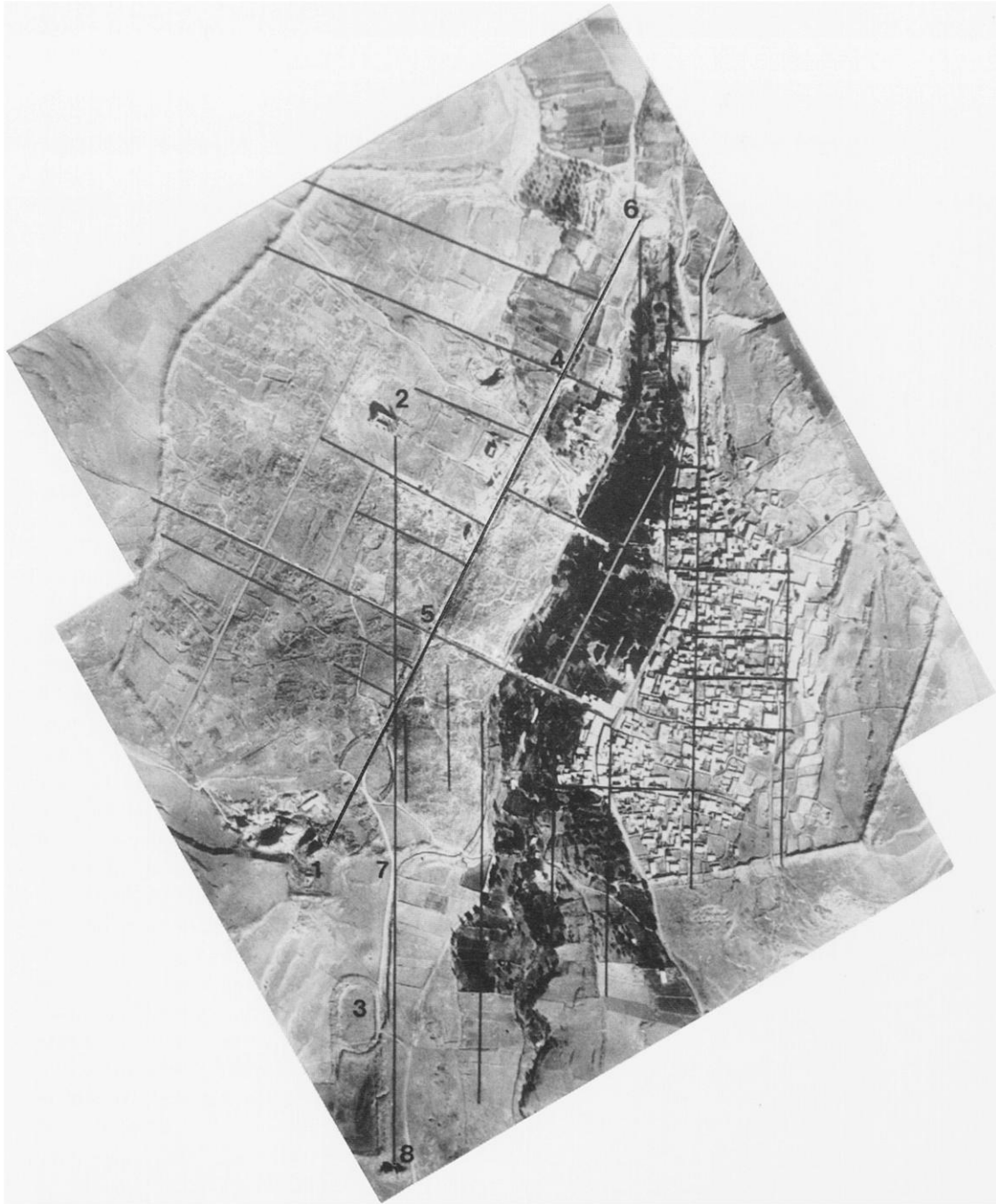


Fig. 35. Gerasa. Aerial photograph, R.A.F. 1926. 1) Temple of Zeus, 2) Artemis temple, 3) hippodrome, 4) north tetrapylon, 5) south tetrapylon, 6) north gate, 7) south gate, and 8) triumphal arch.

dismantling, even though technically difficult, will be next year's task, permitting the recovery of an outstanding example of Roman architecture.

**Tell Abu Šarbut.** H.E. LaGro, Netherlands Institute for the Near East, and M.L. Steiner, Leiden University, report:

Tell Abu Šarbut is located in the Central Jordan Valley, Jordan, about 1.5 km west/northwest from Tell Deir 'Alla. It is located amid agricultural fields, which are irrigated by the Ghor Canal. The tell measures about 250 m east–west by 125 m north–south. From 1988 to 1992 four seasons of excavations were carried



Fig. 36. Tell Abu Şarbut. Entrance to factory formed by ashlar stones; measuring rod rests on pavement of sugar-pot sherds.

out by a Dutch team under the direction of H.E. LaGro, M.L. Steiner, and H. de Haas. Funding was provided by the Tell Abu Şarbut Foundation and the Netherlands Organization for Scientific Research. The purpose of the project was to conduct a small-scale excavation in order to determine the ceramic sequence and types for the Islamic periods.

The earliest occupation layers were found in a trench in which parts of burnt and collapsed rooms were excavated. The rooms contained a number of complete pots, which could be dated preliminarily to the third/fourth centuries. Occupation in that period was concentrated on the east and the south of the tell. The extent to which the tell was occupied during the Umayyad and Abbasid periods is unclear. A small amount of sherds from these periods was found, but no occupation layers could be ascribed to them. A reason for this could be the large-scale leveling of the tell carried out in the Ayyubid period. This leveling went well into the Roman layers and obliterated all possible remains of Early Islamic occupation. The area cleared measured at least 50 × 50 m and was used for the building of a sugar-production plant.

Only part of this complex is excavated (fig. 36). It consists of several large rooms, which were rebuilt at least three times. From the most recent phase of the complex a thick wall with an ashlar stone foundation and a paved entry were excavated. One room contained a number of conical sugar pots into which sugar syrup was probably poured. The pots were still embedded in a plastered bench. Connected with the complex are thick layers of burnt vegetable matter, alternating with yellow clay, which at some time must have covered large areas of the tell.

The pottery from these phases consists nearly exclusively of sugar pots. No traces of houses or living quarters for the workers in the factory were found, and we assume that they lived in nearby villages. After the factory fell into disuse, the surface was leveled again, this time to build houses, which can be dated to the Mamluk period. Apart from the normal household repertoire, sugar pots were still used during this period, suggesting that the inhabitants continued to cultivate sugarcane and produce sugar. This production could have taken place at a site 2 km to the east where the remnants of a sugar mill were found.

Remarkable finds are the many fragments of glass bracelets and a dozen ostraca, which come from the sugar factory but do not, unfortunately, contain complete messages.

**Amman, Temple of Hercules.** Chryssanthos Kanellopoulos, ACOR, reports:

Excavations at the Temple of Hercules were continued into January of 1992 by Mohammad Najjar of the DAJ and the late Kenneth Russell of ACOR, funded by a grant from USAID. The excavations are currently in publication phase. The Temple of Hercules Restoration Project commenced in July 1991 under the direction of Chryssanthos Kanellopoulos and Mohammad Tayyem of ACOR, again with the aid of funds provided by USAID.

The first component of the project was a detailed compilation of information regarding the scattered architectural elements of the temple. According to the architrave inscription, the temple dates from the term of the Roman governor of the Province of Arabia, P. Julius Geminius Marcianus (A.D. 161–166), during the reign of Marcus Aurelius and Lucius Verus. The restored ground plan of the temple has been proposed on the basis of the dimensions of the podium, the interaxial spaces between the columns, and the ancient remains (in particular, the length of the inscription as deduced from the existing architrave fragments and information obtained from the architrave backings). The proposed width of the architrave suggests the existence of six columns along the width

of the podium. Detailed calculations of the length of the podium relative to the interaxial spaces between the columns, together with a significant absence of original material, preclude the possibility of a colonnade along the length of the podium. Thus, the restoration proposes a hexastyle prothesis without a pteroma, i.e., a T-shaped plan consisting of a cella with a front portico of six columns.

The first phase of the restoration project consisted of the anastylosis of the northwest corner of the podium. This has been achieved by the use of as much ancient material as possible. Where necessary, new stone has been used after careful selection, in order to ensure that it is geologically sound and aesthetically suitable in relation to the original material. Care has been taken to match the dressing and finishing of the new stone blocks to the ancient craftsmanship; in this regard, tools were fabricated according to Roman design and the masons were taught ancient masonry techniques. This approach has not, however, excluded the use of modern technology; a bridge crane has been constructed over the northwest corner of the podium and a mobile crane has been employed for the removal, transport, and placement of the stone blocks.

Concurrent with the reconstruction of the northwest corner of the podium has been the development of a detailed seismic analysis, using an earthquake simulation computer program. This projects the behavior of the columns during a major earthquake. On the basis of that analysis, only those restoration techniques will be employed that would enable the structure to withstand the enormous stresses that are likely to develop during a major seismic event. While the restoration of the podium has been in progress, seven column drums were recovered from the Abbasid fortification wall, following its destruction during the storms of 1991–1992. These column drums, together with those already scattered on site, were carefully measured in order to determine their original placement. A fortuitous discovery has been that of a fairly complete numbering system of alphabetical characters carved on the upper surfaces of most column drums. This identification system has proved to be extremely useful in verifying the fit of successive column drums based on their dimensions and eroded profiles. Based on the matching of the column drums, tested on site with the aid of a crane, it will be possible to restore three columns of the portico to their full height with the minimal use of new material. Prior to any work being undertaken on the reerection of the columns, the foundation of the prothesis will be stabilized by structural supports. The restoration of the

Temple of Hercules is being carried out in accordance with the spirit and guidelines embodied in the Charter of Venice. As such, the principles of minimal intervention and reversibility are considered integral aspects of the restoration. The restoration project will be concluded in August 1993.

**Khirbet Salameh.** Pierre Bikai, ACOR, reports:

Khirbet Salameh is located in greater Amman ca. 15 km from the city center (Palestine Grid 252.2 E; 147.5 N). The site is situated at the center of a gentle slope overlooking a shallow valley and is included in an area of agricultural land. The elevation is 1020 masl and yearly rainfall averages 600 mm. The site is ca. 500 m from the spring of 'Ain el-Beida, which is at present dry in summer. Before excavation the outlines of a rectangular structure measuring 22.75 m north–south by 23.50 m east–west were visible. The facade of the eastern wall could be seen to consist of roughly cut stones of various sizes with an opening at the center, indicating a possible doorway (fig. 37).

The site was selected for the location of a field school by Nabil Khairy, chairman of the Department of Archaeology at the University of Jordan. The class consisted of 25 B.A. students and six M.A. students, who acted as trench supervisors. The foreman was 'Ayesb Abou Hilal, who began work in archaeology with Kathleen Kenyon at Jericho.

Khirbet Salameh was apparently unknown to the early explorers. In 1976, however, M. Muheisen surveyed the site. In 1983–1984, C.J. Lenzen and A.M. McQuitty conducted a salvage excavation immediately to the east of the rectangular structure, an area that would thereafter be covered by the ACOR building; they also made two probes into the structure itself.

The 1992 field school began with a survey of the areas around the structure, and in the subsequent excavation, 13 squares were opened, almost all within the perimeter of the structure. In six of the squares, a soft calcareous bedrock was reached at an average depth of 1.75 m below the present surface. The debris above bedrock consisted mainly of small stones, interpreted as the collapse of a vaulted superstructure.

Three cisterns were found just outside of the rectangular structure. Within the structure, four bins were found cut into bedrock; one of them contained a Hellenistic coin. Walls of a later period were found built across some of the bins, confirming at least two phases of use. Other evidence points to further phases: in one small area (1 × 1.5 m), debris of the Iron Age was found. Two architectural phases in the structure itself can now be discerned. The first is a phase of usage (if not of construction) during the Byzantine period in which the walls are of rough





Fig. 37. Khirbet Salameh. View of excavation looking southwest.

calcareous stones with ashlar blocks around the doorways and in bases that are thought to have been for arches supporting the roof. Three doorways were found leading to a courtyard at the center of the structure. The rooms around the courtyard vary in size and apparently in function. In one room, two spindle whorls and a loomweight were found; in another room, seven storage jars were found leaning against the wall.

A later phase of use dated to the Ayyubid/Mamluk period. In this phase, parts of the Byzantine walls were used as foundations, but the architecture has been mostly destroyed by agricultural disturbance. There will be further excavations in the summer of 1993.

**Madaba.** C.J. Lenzen, ACOR, reports:

As of June 1992, the Ministry of Tourism and Antiquities of Jordan started a long-term project for the economic development of Madaba through archaeological excavation and research. The project has several facets and is funded by the Jordanian government and several other agencies. This brief report concerns one aspect: the archaeological excavation of an approximately two-block area west of the Church of the Virgin. Following the assumed line of the excavated portion of the decumanus to the south of the Church of the Virgin, excavations were started in June. The goal of this project is the creation of an

archaeological park that has as its focal point the Roman street system; however, all of the occupational periods evidenced in the excavation will ultimately be represented in the park.

Several years ago, during the construction of a modern office building, approximately 23 m of the decumanus were exposed to the west of the main modern road, to the north of the Church of El-Khadir, and to the southwest of the "burnt palace." The present excavations were started here. The current excavations represent the first time that the social history of the site is being researched and a determination based on archaeological data made concerning the ancient city plan.

To date, another section, approximately 20 m long, of the decumanus has been excavated. There is a 40° shift in the angle of the patterning of the stones, indicating perhaps either a plaza or an intersection. Further excavation will determine which is the case. The road is constructed of large, hard limestone blocks with considerable variations in size. The patterning of the blocks differs from that of contemporary streets at other Jordanian sites. Between the southern stylobate and the Church of El-Khadir, a probe was excavated in order to determine the relationship between the church and the road. The results, although preliminary in nature, have shown that 1) part of the pavement of the road was removed in

order to create space for the church; 2) the stylobate stones were reset, with the effect that the street became narrower; 3) the church was constructed earlier than previously reported, i.e., at the end of the fifth century; 4) architectural elements of the earlier city were used in the foundation for the north wall of the church; and 5) the constructional techniques for the church differ from those reported at other contemporary churches. This Byzantine period realignment of the city has also been found to the south of the road; at the time of writing, however, it remains unclear whether or not buildings other than the so-called burnt palace were constructed.

From the present data, it would appear that during the Umayyad period the same alignment of this part of the ancient city was used. It was not until the Mamluk period that the integrity of the plan was lost. Although pottery from all of the historical periods following the eighth century has been found, and pottery from pre-Roman occupational periods as well, only the Mamluk and Ottoman periods are associated with architectural remains.

Standing within the project area are Late Ottoman houses built within the last 100 years. These have been or are being excavated stratigraphically. Construction techniques do not seem to vary considerably from other Late Ottoman structures studied in Jordan. The buildings consist primarily of rooms with double archs supporting a roof of beams, reeds, and mud. Storage niches are placed along the walls and a large courtyard area is in front. As expected, architectural elements from the Roman/Byzantine/Early Islamic city have been found in these houses.

To the east of the modern road and part of the complex surrounding the Church of the Virgin is the Church of the Prophet Elijah with the famous crypt dedicated to Elianos. Although the crypt has remained in good repair since its excavation at the end of the last century, the church itself was reused several times, most recently as the site of a concrete block factory. During this first phase of the project, excavations have been started in the church. To date, a fragment of the north aisle mosaic has been found with an animal represented. Although the church was dated by inscriptional data, it is anticipated that other dating evidence will be acquired through these excavations.

**Machaerus.** Luigi Marino, Università degli Studi, Florence, reports:

A plan for restoring and maintaining the site of Machaerus and developing it for tourism was formulated in July 1991 and implementation began six months later. The plan is a collaboration between the Jordanian Ministry of Tourism and Archaeology, the

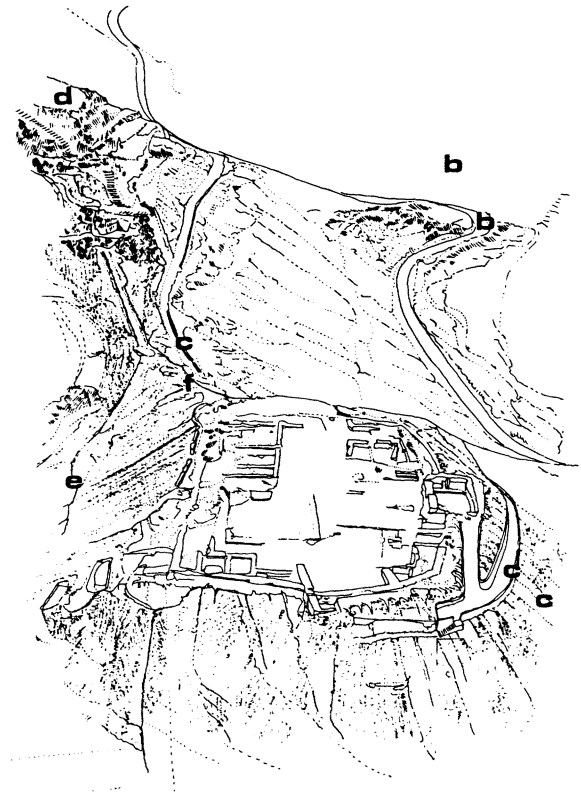


Fig. 38. Machaerus. Plan for restoration, maintenance, and tourist development.

Studium Biblicum Franciscanum, and the University of Florence. It involves not only the fort (fig. 38) but also the village of Meqawer where a rich building complex including the church of the Bishop Alexius has been brought to light. The state of conservation is not good, typical of sites left for a long period without any form of protection. In an open-air archaeological area like Machaerus the degree of degradation varies greatly. The aspects of ruination thus far found and studied are 1) widespread cracking due to natural aging of the materials and ancient building errors; 2) localized damage with recognizable cracking; 3) landslides and potential landslides; 4) walls in danger of collapse; 5) breaking up due to thermal changes helped by wind action; 6) pooling of rainwater; 7) disruptive roots of vegetation; and 8) human acts of vandalism.

An intervention plan has been drawn up to act on several fronts. Building site operations have been set up to solve the particularly serious aspects of the degradation with the care and caution required by the archaeological context. As a matter of principle, intervention using modern materials has been rejected in favor of local traditional procedures. The operations on stratified layers are in no case to be



Fig. 39. Khirbet Fāris. Overhead view of a 13th-century building reusing earlier walls.

irreversible. One of the most important aspects of the plan is Machaerus's role as an educational building site for local technicians and workers who will be trained for future employment in other restoration projects.

**Khirbet Fāris.** Alison McQuitty, St. Antony's College, Oxford, reports:

The Fāris Project is a multidisciplinary study of the settlement strategy and land exploitation of the Kerak Plateau in general and in particular one rural settlement, Khirbet Fāris, since Byzantine times. The project is sponsored by the BIAAH and the Oriental Institute, Oxford University, and directed by J. Johns and A. McQuitty.

Khirbet Fāris is situated about 25 km northeast of Kerak near the ancient King's Highway and the Nabataean site of al-Qasr. The site lies on the edge of a wadi, Wadi ibn Hammad, on a plateau of rich arable land within the 300 mm isohyet. The site itself is about 200 m east–west by 300 m north–south with a considerable spread of structural remains and occupational debris disturbed by cultivation on the north, south, and west slopes. Two standing farmhouses of 19th-century date and a Classical vaulted building survive in the center of the city. In the southeast corner is a

small Muslim cemetery including the tomb of Fāris Majāli after whom the site is named and who died at the beginning of this century. Various architectural fragments, for example a Roman capital and Roman milestones, are scattered on the site or have been reused for cistern heads and drinking troughs.

Excavations have taken place since 1988 in conjunction with a survey of the oral history and ethnoarchaeology of the area (conducted by W. and F. Lancaster) and a study of the recent 19th- and 20th-century vernacular architecture of the surrounding villages (directed by M. Biewers, R. Kana'an, and A. McQuitty). Detailed reports on the results of past seasons can be found in *Levant* 21 (1989) and 25 (1993) but a brief summary is given below.

Khirbet Fāris has been occupied since at least the MBA. The excavations have concentrated on the later sequences and have revealed the buildings of a rural settlement that was thriving in the Nabataean, Byzantine, and Early/Middle to Later Islamic periods. The buildings of the Classical period are arched with paving floors and show considerable reuse (fig. 39). A nucleus of barrel-vaulted buildings was built on the western edge of the site, probably in the Mamluk period, although it too was substantially reused in



Fig. 40. Deir 'Ain 'Abaṭa. Basilica church and cave of St. Lot from northwest. (Photo K.D. Politis)

later times. The material culture remains include fine Nabataean and Byzantine ceramics, and glass tesserae and marble wall-cladding, which suggest the presence of a Byzantine church. From the post-Abbasid levels the domestic, mixed-farming nature of the community is reflected in the material culture. The pottery is handmade and shows great variety with very few imported or glazed examples. Although this pottery is traditionally interpreted as Ayyubid/Mamluk, it occurs much later. Numerous unglazed lamps, tobacco pipes, grinding stones, and metal artifacts associated with farming occur (e.g., a sickle-blade, a horseshoe). The farming nature of the community is also reflected in the faunal and botanical evidence—bones of camel, cattle, and sheep/goat, and large amounts of material from crop-processing.

Excavation will continue in 1993 while study and analysis of the material continues in both Britain and Jordan.

**Deir 'Ain 'Abaṭa.** Konstantinos D. Politis, Department of Medieval and Later Antiquities, British Museum, London, reports:

Following the discovery of Deir 'Ain 'Abaṭa in 1986, excavations were carried out in 1988 and 1990–1992 by K.D. Politis, sponsored by the British Museum.

The latest work brought to light a triple-apsed basilican church built around the cave associated with

the biblical story of Lot and his two daughters after their flight from the destruction of Sodom (Gen. 19). The east end of the building survives to the full height of the walls and in places above the cornice where a vaulted roof was evident (fig. 40).

Three mosaic floors were uncovered that were adorned by geometric, floral, and animal depictions (fig. 41). Each had a Byzantine-Greek inscription. The one in the chancel had the words *ΤΕΛΟΣ ΚΑΛΟΝ* (literally, Good End) within a cross just below the altar. This wish, which may be translated as a wish for our last days on earth to be good ones, is unique. The second inscription in the nave is six lines long and lists names of officials associated with the church, ending with the date of construction, May A.D. 691. The last inscription is found in front of the entrance to the cave in the northern aisle. It is enclosed by a *tabula ansata* and is four lines long, naming the bishop and abbot of the time and dated April A.D. 606.

The material found below the mosaic floors belonged to the fifth and sixth centuries. This evidence, along with a number of reused architectural blocks, some with inscriptions (including one mentioning Lot himself), lead to the conclusion that there was an earlier building on the same spot. This would have been the church depicted on the sixth-century mosaic map at Madaba. The latest occupation at Deir 'Ain

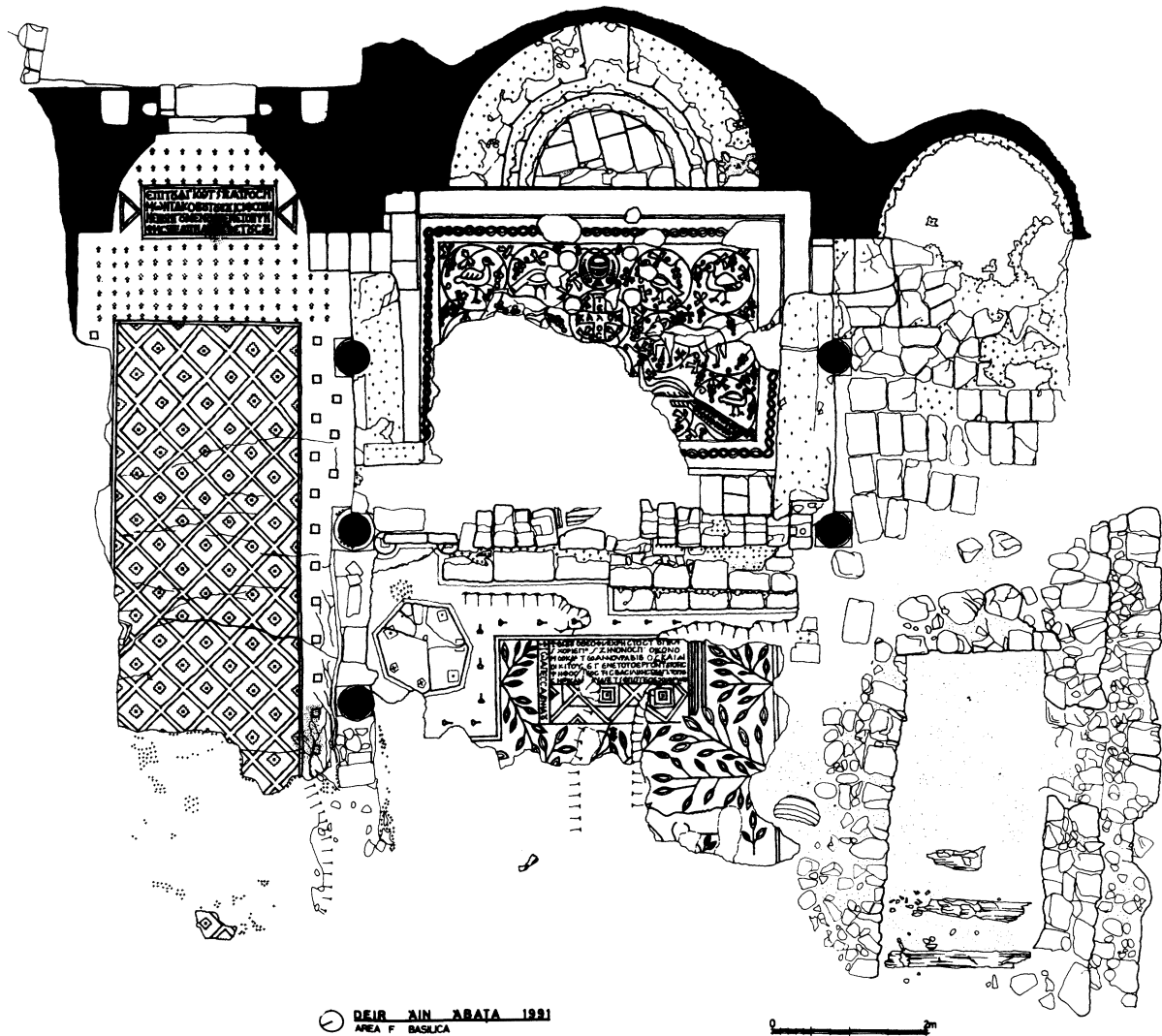


Fig. 41. Deir 'Ain 'Abata. Basilica floor mosaic.

'Abata, in the late eighth century, was only in the church and adjacent reservoir, which also showed evidence of repair and rebuilding.

During the final season of work on the site in 1992, excavations were conducted in the cave where the tomb lies, in a larger domestic area north of the church and in the late MBA cairn tombs. Conservation and preservation work was also carried out, including the removal of some of the mosaic pavements. A permanent exhibition of the finds was also set up in the Kerak Museum.

**Petra, Temple of the Winged Lions.** Philip C. Hammond, University of Utah, and David J. Johnson, Brigham Young University, report:

The American Expedition to Petra arrived on site on 18 June 1992 for the 15th season of excavation of the Temple of the Winged Lions and departed on 4 August 1992. Acknowledgment of facilitation of the work of the Expedition is gratefully made to the

Director-General of Antiquities of Jordan, the Director of ACOR, the Director of the Middle East Center, and the Inspector of Ma'an District.

In addition to the layout of new site areas, field preparation included the cleanup of damage from the 1991 flood and 1992 spring rains and of disturbance (a doorway and several walls) from vandalism. All displaced ashlar blocks were either replaced or stacked for future restoration. Excavation continued on sites II.7, V.9, V.6, and VII.7; new excavation was begun at the eastern wall of the temple proper, in squares designated site VI.1 and site VI.4.

*Site II.7.* This square had been excavated to the A.D. 363 earthquake destruction level in 1990, and initial effort was expended in that square in the removal of the heavy fallen debris, down to the next archaeological soil stratum.

The western sector of site II.7 produced one of the major architectural finds of the season. A small, orig-

inally arched room appears to have been a shrine, with a well-built podium surmounted by an oblong plaster object. The plaster object retained some traces of paint, but the collapse of the roof after the earthquake had resulted in complete obliteration of the original design and painting of the object itself. The "shrine" area was subdivided from the main part of room 5 by outset impostes for the arching. This feature, although reported from other Nabataean sites, is unique in the temple architecture thus far recovered.

Excavation was continued below the floors of rooms 5 and 6 to investigate the dirt floor construction and the nature of the original fill. The same Early Nabataean fine, thin, red-painted ware appeared in that fill as in soundings made below floor strata elsewhere in the temple complex. This suggests the contemporaneity of construction of the site II.7 rooms and their use from ca. A.D. 25 until the destruction of 363. The pottery vessels from those strata were mainly domestic, including the usual cooking pots, jars, storejars, and lamps. Registered items from this site included 43 objects and 10 coins. The ceramic materials were generally in fragmentary condition as a result of the earthquake destruction. The American Expedition excavated 41.97 m<sup>2</sup> this season.

*Sites V.9/V.6.* Excavation was resumed in the "liwan" area on the southwestern side of the temple complex, where massive earthquake fall from the walls and arches continued to be uncovered. This clearance continued the exposure of more impostes of the arching, over an area of 130 m<sup>2</sup>.

*Sites VI.1/VI.4.* Excavation east of wall 3, outside the temple's cella and pronaos areas, uncovered a paved corridor running between the east temple wall and a newly excavated wall parallel to it. A drainage canal under the pavement ran under both walls and drained to the east, though no spout was found. The faces of both walls were well dressed, and cement outlines preserved the pavement pattern in plan.

*Site VII.7.* Dump material from previous excavations was removed from the southeast end of the newly found corridor in a partial sector of site VII.7, in order to define the east wall of the pronaos. This also clarified the design of the pronaos, since cement traces along the east side of wall 3 east indicated that the corridor floor apparently ended in a rubble-filled platform, and rose to the floor level of the pronaos, which was paved with thick rectangular paving slabs. Excavation in this area opened 24 m<sup>2</sup>.

*Stabilization and Reconstruction Activities.* Pending initiation of total reconstruction of the temple complex, preliminary stabilization of wall tops, pointing of wall faces, and reconstruction of the major dam-

aged walls and other stone structures were undertaken. The tops of the exposed walls in the residential areas were covered with dry cement and watered, so that cement could penetrate between blocks. Several loose blocks were also cemented in place.

The arches in the "liwan" area were also stabilized by the insertion of small stones and cement covering. In the slots originally containing ancient wooden beams for earthquake protection this cement and stone will be removed and preserved wooden beams again inserted. Numerous column drums were measured and ashlar blocks laid out in organized fashion in preparation for future excavation activity.

**Petra, Byzantine Church.** Zbigniew T. Fiema, ACOR, reports:

Petra Church Project fieldwork began in late May 1992, sponsored by ACOR under a grant from USAID. The object of the excavation is a Byzantine church that was discovered in 1990 by Kenneth W. Russell, the first director of the project. His untimely death on 10 May 1992 was a shock to the scholarly community in Jordan and he is much grieved by all who knew him. Subsequently, leadership of the project was assumed by Pierre Bikai, with Zbigniew T. Fiema, Khairieh 'Amr, and Robert Schick serving as codirectors in the field. This report covers the results of the fieldwork in Petra between late May and late September 1992. During that time, the church, which is located on a ridge to the southeast of Jabal Qabr Jumay'ah and overlooks the main colonnaded street in Petra, was surveyed, mapped, and excavated in 16 5 m<sup>2</sup> trenches. The following is a short description of discoveries to date.

The church is a tripartite structure, 26.1 m long (internal) and 15.2 m wide (internal), and has three apses inscribed in its eastern wall with the corresponding nave and two side aisles. This internal division is created by two parallel rows of columns topped with Corinthian, Composite, and Doric capitals, most of which had been robbed from Classical-period structures in Petra. The southern and northern walls of the church are relatively well preserved, in some parts up to 3.5 m above the lowermost foundation courses. Access to the church proper was effected by three doors in the western wall, corresponding to the tripartite internal division. Clearance of the southern door revealed a swinging-door system with bronze hinges still in situ. The doorway consists of a charred wooden threshold and a marble pavement. The central entrance is flanked, at least on its northern side, by two cornerstones beautifully decorated with crosses, floral motifs, and five medallions containing human heads *en face*, all in low relief, evidently reused from a Classical building in Petra. Three side doors

in the northern wall allow access to the area north of the church proper.

On the western end there is an atrium, probably a partially open court paved with stone slabs, and with a colonnade to the interior on at least three sides, probably supporting a roof along the sides of the atrium. The atrium is at least 13.14 m long (east–west), and probably 15.2 m wide. On the western side of the atrium a large arched building is being excavated; its relationship to the atrium and the church proper is still being investigated.

The internal decoration of the church, as found to date, supports the initial assessment made by Kenneth Russell. The mosaics, found in the side aisles, were made of multicolored tesserae, and are of both geometric and figural designs. A fragment uncovered in one square portrays a man with a basket on his back, a bird on his shoulder, and a staff in his hand, perhaps a personification of Autumn. Although the uncovering of the rest of the mosaics awaits completion of excavations in the church's interior, it seems that the mosaics are in a good state of preservation.

The arches between the columns of the interior, and/or the ceiling, were probably decorated with mosaics, made entirely of glass tesserae (some gilded) or of mixed glass and stone/marble cubes. A particularly dense scatter of glass mosaic cubes was found in the area immediately in front of the central apse, probably resulting from the collapse of a semi-dome decorated with mosaics. The central and lower parts of the church walls were covered with light grayish-cream wall plaster. Although all plaster fragments found to date in situ are unpainted, numerous fragments painted in red, blue, brown, and yellow were found in the collapse fill of the church interior.

At least some parts of the nave floor were originally paved with rectangular marble slabs. In one of the squares, however, which includes the northern side of the central nave, the pavement had been robbed out, perhaps immediately after the initial destruction of the church, although the marble stylobate of the row of columns separating the nave from the northern aisle is still in situ. Immediately above the level of the mortar bedding for the marble slabs, which had been robbed out, is a layer of ashy deposit mixed with fragments of mortar, chunks of the mosaics that must have fallen from the ceiling or from arches between the columns, and fragments of charred wood.

Although dates for the church's construction and destruction and/or abandonment require full analysis of the excavated material, it is already clear that a major remodeling took place during the church's his-

tory at least in the area of the central apse. It is probable that in its first phase the central apse was a wide semicircle paved with a mosaic floor, an arrangement that was later substantially modified by the addition of a stepped bench (*synthronon*) and the raising of the floor in the front of the apse. That second-phase floor was paved with marble slabs in opus sectile, which is also mostly robbed out. Almost all of the upper part of the northern half of the *synthronon* was removed after the church's destruction.

The structure suffered a violent end, possibly destroyed by one of the earthquakes that occurred during the fourth through seventh centuries A.C. The interior of the church and its atrium are filled with collapse material, including column drums, capitals, ashlar blocks, rooftiles, and charred wooden members of the ceiling and roof superstructure. In some areas, however, the stone tumble and the associated soil matrix seem to continue all the way from the surface down to the floor level, while in other areas the tumble can be easily divided into two layers separated by a thick sand layer. The atrium is almost entirely devoid of charred wood or ash. Similarly, the deposition of rooftiles and charred wooden beams suggests a different collapse scenario from one part of the structure to another. It is probable that in some parts of the church the initial destruction effected a partial collapse of the wooden superstructure and associated rooftiles, and of the columns and upper parts of the walls. In other places, the abundance of rooftiles is notable throughout the entire depth of collapse, and the tiles are surprisingly close to the modern surface level. It is possible that after the initial destruction the church was left derelict, with a partial skeleton of the superstructure still above the walls; a subsequent disaster and/or a gradual process of natural decay brought down the remaining roof and ceiling parts together with the walls of the church. The differential deposition of the material inside the church proper may be associated with extensive subsequent scavenging for reusable materials.

There may have been a limited squatter occupation of the church after the initial collapse, especially along the southern wall of the southern aisle. Notable are several large storage vessels, the remains of which were found against the wall, ca. 30 cm above the floor level; these are either an original part of the church endowment or evidence of subsequent squatter occupation. The presence of four horizontal holes through the surface of the southern wall in one area, which could have had horizontal supports inserted, as well as the existence of charred wooden material

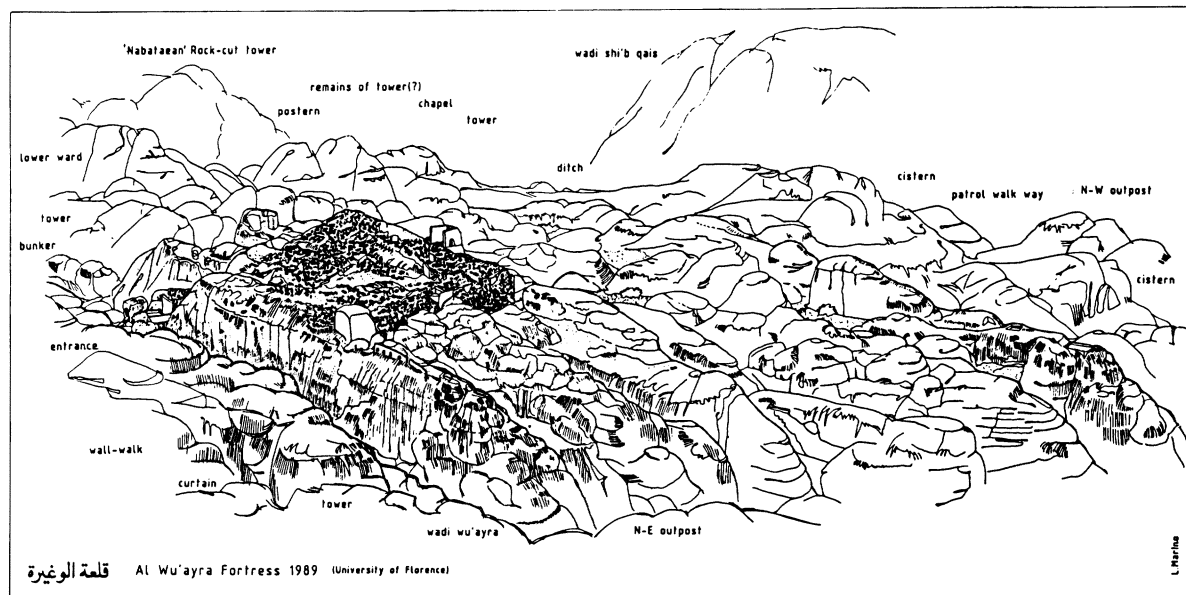


Fig. 42. Wu'eira. Perspective view of fortress.

(planks rather than beams or trusses?) directly over the mosaic floor in the squares of the southern aisle, may point to some sort of benches or shelves initially built alongside the southern wall of the church.

The small finds, to date, include at least 40 coins, hundreds of iron nails, some of them still joined to pieces of wood, numerous metal objects, and many fragments of glass flasks and window panes. An outstanding find from the area south of the church wall is an engraved amethyst portraying a bearded head (of a deity?) in profile, accompanied by an abbreviated inscription. Large numbers of marble fragments, including several of a large panel decorated with clasifying motifs in low relief, were also collected.

Excavations in squares south of the southern wall of the structure have revealed evidence of extensive occupation of the site prior to the construction of the church; there are well-defined floors and walls associated with painted Nabataean pottery of the first through third centuries. Below those, and on the same level as the church's lowermost foundation courses, an occupational surface is associated with Late Hellenistic imported wares. The area immediately to the north of the church is occupied by an enormous stone tumble within which upper courses of walls can be recognized. The excavation of that area should provide evidence of structures either associated with the church or preceding it in date.

**Petra, Wu'eira.** Luigi Marino, Università degli Studi, Florence, reports:

The project was started in 1987, sponsored by the universities of Florence, Bari, and Urbino, and in-

volves a historian (F. Cardini), archaeologist (G. Vannini), petrologist (R. Franchi), and architect (L. Marino).

The fortress was analyzed from the point of view of the various specialists working together as a team. The site's topography is characterized by calcareous cliffs of varying height, which provided a naturally defensive location attractive to settlers even before Crusader times (fig. 42). Although the internal functional relationships of the elements of the fortress remain to some extent still uncertain, it is possible to identify some of the settlement's characteristics and particularly trace its military layout.

Topographical surveys have been carried out also on other forts in the area. Analysis of the morphological features of the sites by recording the relationships between the natural rock outcrops and the settlement structures has demonstrated sophisticated and efficacious solutions to the requirements of military strategy. An important aspect of investigation in the field was the systematic surveying and recording of the surviving standing structures (towers, fortress walls, chapel ruins, service rooms), of those cut directly out of the rock (walkways and flat areas, cut ditches and barriers, bunkers, canals and reservoirs), and the traces that emerged during excavation. The general plan, not yet complete, differs from the plans of Musil and of Savignac and highlights the creative design of the settlement system and its adaptation to the local terrain.

The fortress of Wu'eira presents an elaborate case study of water systems (collection, transport, and stor-



age), which must have represented a great challenge to the inhabitants, given the nature of the site. We have found and surveyed very interesting traces of an aqueduct hewn out of the cliffside, collection wells (sometimes with a sophisticated overflow system), sediment tanks for rainwater, cisterns wholly or partially hewn out of the rock, and tanks used for urban and agricultural distribution of water.

Of primary importance is the recording of the various phenomena of deterioration and the numerous instances of structural degeneration. Such investigations will serve to formulate conservation and site development plans for the ruins of the fortress.

**Tuwaneh.** Zbigniew T. Fiema, ACOR, reports:

Between January and June 1992, the author, as the ACOR Senior Fellow, conducted archaeological research in Jordan, funded through a USIA grant. The explicit goals of the research were to assess the spatial and temporal occupation at Tuwaneh, a Nabataean through Byzantine-period site in southern Jordan, to analyze architectural remains on the site, to survey the local road network, and to interpret the finds within a broad framework of the culture history of southern Jordan during the Classical period.

Despite its impressive appearance, Tuwaneh has received only a few scholarly visits and brief descriptions, namely by Brunnow and Domaszewski, A. Musil, N. Glueck, and S. Hart. The settlement is generally identified with Thana/Thoana of Ptolemy, and with Thornia of the *Tabula Peutingeriana*, as the major Roman highway in Jordan, the *Via Nova Traiana*, passes through the site. Thana/Thornia was not mentioned by either the *Notitia Dignitatum* or the *Bir es-Saba Edict*. The early Arab historians do not mention Tuwaneh in their post-seventh century accounts of Syria-Palestine.

The site of Tuwaneh is located ca. 5 km south of the road between Tafila and Jurf ed-Darawish, on the slopes of two hills separated by the Wadi et-Tuwaneh. Although no natural springs were located during the site survey, numerous cisterns on the site imply extensive water conservation methods employed by the inhabitants of ancient Thana. No modern housing construction exists on the site, yet great damage was done by the construction of a new road leading south, toward Gharandal, with a total disregard for archaeological remains.

An interesting feature is an almost complete lack of architectural pieces at Tuwaneh, which so often "litter" surfaces of Classical settlements. Only three column drums, an architrave part and several door jambs (in addition to those in situ) were noticed. The architecture of the site is almost entirely of stone—from

irregular basalt boulders to roughly hewn stones and well-made ashlar lime- and sandstone blocks. The site measures roughly 800 m (east–west) by 450 m (north–south), and thus belongs to the group of largest sites in Jordan. The whole area has been divided into "complexes," i.e., distinguishable intra-site units or isolated structures (46 in total). Each complex has been described, photographed, and the surface ceramics collected (1,238 sherds in total). The most important complexes include C14/15, probably a large caravanserai previously identified as a "temple"; C16, a Roman bathhouse; C36, a city quarter occupied by several monumental structures; and C2, which contains a superbly preserved subterranean multichambered tomb.

Tuwaneh and its environs were already frequented or inhabited during prehistoric times. Several samples of Middle Palaeolithic (ca. 40,000 B.P.) through Neolithic-period stone implements have been collected from the surface. The site shows little pre-Hellenistic urban evidence, and Iron Age pottery collected is much less than 1% of the total sample. The urbanistic beginnings of Tuwaneh can probably be dated to the first century B.C., and the prosperity of the settlement could have indeed been a result of its location and the inhabitants' participation in long-distance trade, further enhanced by the construction of the *Via Nova Traiana*. Numerous Nabataean painted ware sherds of that century were found in lower deposits exposed by the road construction and bulldozer slope-cuts. Fine examples of the first- through fourth-century A.C. Nabataean painted and plain wares are also abundant. Imported wares include Eastern terra sigillata A and B, Western terra sigillata (Arezzo ware), and Late Roman Red ware.

The settlement prospered in the Byzantine period, although Late Byzantine wares are very few, and transitional types into the Umayyad period are practically non-existent. Although the final demise of the Classical town cannot be fully understood without excavation, it is highly probable that the settlement considerably declined or ceased to exist toward the end of the Late Byzantine period. The evidence of Ayyubid–Mamluk pottery on the site indicates that some parts of the Classical town had been reinhabited and some ruins consolidated. The later periods are poorly attested on the site.

*Via Nova Traiana Survey.* The surveyed section of the Roman road is one of the best preserved in Jordan. Yet, the road and archaeological remains along it face almost certain extinction through modern human activities. Many sections of the road were exposed unexpectedly through bulldozing, and mile-

stones displaced and overturned. At least in two cases the author was able to record more milestones on the ground than the German scholars did at the turn of the century.

To ensure a full junction with the area surveyed by the Wadi el-Ḥasa Project, which had tracked the Via Nova down to ca. 10 km south of the Wadi el-Ḥasa, several sites already visited by B. MacDonald were resurveyed. The survey was completed at a point ca. 5 km south of Tuwaneh, in the area of Jebel Daba. The total length of the Via Nova surveyed by our team was ca. 21 km, with still ca. 10 km of the Roman road to be surveyed in the future, all the way to Dosak to the south. All sites located within ca. 100 m of either side of the road were described and photographed, and surface material (including lithics) was collected.

The ancient engineers clearly preferred straight sections; the road has a more northerly course than the modern track that closely follows it, yet all facilitating terrain features were skillfully utilized. In many places the width of the road is clearly marked by its curbstones and varies from 5.90 to 6.20 m. The central ridge line and/or the original pavement, consisting of flat basalt or limestone boulders, is often well preserved too.

In total, 42 sites were recorded. Besides Tuwaneh and three larger forts, the majority (14) were small structures (watchtowers). Also, 49 milestones were recorded, in association with 21 shaft fragments. Most of the milestone inscriptions were badly weathered and illegible. An interesting find was a painted milestone, dated to Constantine, thus probably the latest in the whole area. The letters of the inscription were directly painted on the surface instead of being chiseled out first and painted over, as was the usual practice.

The pottery collected is predominantly Nabataean through Late Byzantine. Numerous sherds date to the first century A.C., indicating that this route was already used prior to the construction of Trajan's road (i.e., well before A.D. 106–114). The Late Roman and Early Byzantine periods are best represented. Although Late Byzantine sherds were also found, their frequency seems to decrease with increasing distance from the main settlement of the area (Tuwaneh). The watchtowers located farthest north and south of Tuwaneh, within the survey area, did not produce any Late Byzantine sherds.

*Conclusions.* The results of the survey of Tuwaneh and the Via Nova Traiana in the area generally support the author's prior theoretical assumptions. The area experienced relative prosperity from the Naba-

taean through Late Roman period (first century B.C.–late third century A.C.), associated with an intensive long-distance commercial traffic and reflected in the urban growth of Tuwaneh, with evidence of imports and the well-maintained and guarded road system. The Early Byzantine period (fourth/fifth century) was also marked by well-developed settlement patterns, reflecting the unparalleled expansion into marginal lands and intensive agricultural production as well as the continuity of interregional trade. During the later Byzantine period (fifth/seventh century), however, southern Jordan experienced an economic decline marked by a gradual decline in urbanism, growing isolation of settlement clusters, the abandonment of military infrastructure, and a gradual disappearance of interregional means of communication. Some sections of Trajan's road had probably become defunct, while others (closer to the still existing larger settlements like Tuwaneh) were still used in traffic, maintained and guarded by attendant military structures. Future studies to be conducted by the author on the site and in the environs of Tuwaneh are expected to strengthen these conclusions.

**Humeima.** John P. Oleson, University of Victoria, Khairieh 'Amr, DAJ, and Robert Schick, ACOR, report:

The second season of the Humeima Excavation Project took place from 20 June through 30 July 1992. The project was once again funded by the Social Sciences and Humanities Research Council of Canada, and support for excavation of the church was provided by Dumbarton Oaks. The project director was John P. Oleson, and codirectors were Khairieh 'Amr and Robert Schick.

Excavation in field B100 in 1991 had uncovered the eastern end of a large Early Islamic complex centered around an earlier apse. Further excavation and surface clearing in 1992 revealed a great many more details of the plan of the complex and provided information concerning chronology. It now seems likely that the apse in room E formed part of a Byzantine church, one of the nave piers of which is visible in room F. This structure was cleared out in the Umayyad period and subdivided into a large structure with a south-facing courtyard, 20 m wide by 30 m long. At some later date, this complex was extended 10 m to the west, and two more rooms were added along the north wall. Later still, another room was added outside the west wall. All the construction subsequent to the Byzantine period seems to be Umayyad or Abbasid in date, although there is some ceramic evidence that parts of the complex were occupied as late as Ottoman times. The function of this complex

remains uncertain, although the numerous small rooms, the large amount of mammal and fish bones, and the recovery of coarse wares and *tabūn* ovens suggest domestic habitation.

The question still remains of the character of the structures that formed the core of the mound at the east end of the B100 complex. Probes in room B in 1991 and in room G in 1992 revealed the presence of very substantial walls deep below the surface, possibly Byzantine in date, but extending into Nabataean levels. In addition, excavation through the Islamic levels in the apse exposed a Nabataean level with a zigzag mudbrick wall, adjacent to an enigmatic cross-shaped feature built of well-cut but reused blocks. The function of the structures to which these walls belonged is still to be determined. It is hoped that excavation in 1993 will answer some of these questions.

Excavation in the church (C101) in 1992 provided a great deal of new information about that structure. The nave has now been entirely cleared, the foundation has been probed in the Northeast Room (sacristy?), and the entrance room along the north side wall has been opened up. It is now clear that there was an important upper story made accessible by stairs immediately adjacent to the north door, and at the southwest corner of the south nave. In addition, probes through the pavement in the nave revealed that the six crosses carved on several floor slabs indicated the presence of burials. Five undisturbed sixth-century burials were recovered—including a very tall and heavily built male in a wooden coffin, and a young girl buried with her ivory doll and other toys. A shrunken but otherwise well-preserved brain was found within the skull of one of the interments. The human and cultural remains will provide valuable information on the character of the Christian population of Auara (ancient Ḥumeima) in the sixth century. This year's excavations also revealed the presence of a series of rooms built along the south flank of the church at a period subsequent to the original construction. These rooms seem to have been used for non-ecclesiastical functions such as tool storage and animal barns. Excavation in 1993 will focus on defining the character of the entrance room on the north of the church and of the other rooms around the periphery of the structure.

In field F102, this season's excavation has revealed further details of the complicated construction and occupation history of the large, Early Islamic dwelling. The interior of the structure underwent extensive subdivision and rebuilding in the later phases of occupation, including some renovations as late as the Ottoman period. Penetration to the lower levels of occupation revealed several unexpected burials of the

Byzantine period and provided evidence for intensive occupation even of this peripheral area of Auara in the Middle Nabataean period. It is hoped that further excavation in 1993 will reveal the character of this earlier occupation and the relationship between the later structure and the cistern to the east.

The clearing of the surface of the so-called "Caravanserai" in F103, and three probes in the structure yielded very unexpected information. The structure is much larger than first thought (approximately 46 × 61 m, instead of ca. 45 × 45 m), with several rows of small rooms organized around a central courtyard. In addition, the complex now appears to be Umayyad or Abbasid in date, and the presence of painted wall plaster suggests that it may not have been purely utilitarian in character. It is at least possible that this structure—located on a very prominent ridge above the settlement center, close to the hypothetical path of the Via Nova—may be the Abbasid palace known from texts to have been located at Ḥumeima. A major effort will be made in 1993 to elucidate the character and phasing of this building, which at the very least was one of the larger at Early Islamic Auara.

Although excavation in the habitation area has not uncovered any well-defined Nabataean structures other than the cisterns, aqueduct, and reservoirs, the sampling of the rock-cut tombs carried out in 1992 revealed that there was indeed occupation at the site in the first century B.C. and A.C., as the literary texts suggest. No undisturbed burials were found, but rich samples of ceramics and other burial goods—including the first Nabataean coin found in the Ḥumeima excavations—provided useful evidence for the chronology of the tombs. Some distinctions can already be made between Early Nabataean and Late Byzantine tomb design, but further sampling in 1993 should elucidate the chronological development of tomb design and burial habits, and the evolution of the necropolis.

Finally, Wil and Ellie Myers visited the site for a week and made aerial photographs with their tethered balloon system. The photographs have provided data invaluable for the production of a detailed plan of the site and of the structures visible on the surface. A third season of excavation is planned for 1993.

**'Aqaba-Ma'an Survey.** William Jobling, University of Sydney, reports:

Research and analysis of the 10 years of fieldwork completed in the 'Aqaba-Ma'an Archaeological and Epigraphic Survey have continued at the University of Sydney. Analysis of the Pre-pottery Neolithic site of Jebel Umm el-Muqur has produced a preliminary study of a blade-based assemblage, which indicates that the site is similar to PPN sites from other arid



Fig. 43. 'Aqaba-Ma'an survey. Thamudic inscription.

regions in the Sinai and Negev. The analysis of finds at Jebel Umm el-Muqur, which is situated to the south of Wadi Ramm, shows that it is similar to the documented site of 'Ain Abu Nekheileh in Wadi Ramm, and to 20 other small stone-circle sites datable to the PPN. It also compares favorably with a large PPN stone-circle site at Jebel Rabigh to the north of Wadi Ramm described by Vianello.

Further work has been done on the lithic technology of the area, specifically ethnoarchaeological analysis of grinding stones. The repertoire of grinding stones recorded throughout the area was studied in the light of the range of types of grinders and their respective uses by the modern Howeitat Bedouin of the Hisma basin. These domestic artifacts play an important part in the preparation of cereals for animal consumption and indirectly shed light on the discussions of the history of the ecology of the area. Information gathered indicates a significant variation in the types of grinding stones and their uses. Patterns of use and discard of grinding stones in such pastoral societies appear to be quite complex. This study will present the details of this aspect of human subsistence strategies in the marginal desert areas of southern Jordan.

Research into the North Arabian-Thamudic (fig. 43) and Nabataean epigraphic remains of the area has continued with the aid of the 'Aqaba-Ma'an Video Archive (1980–1988). These archives preserve new lexical and onomastic items that shed considerable

light on the occupation of the Hisma in the Roman through Early Islamic periods. In conjunction with the Video Archive, a preliminary version of a font suitable for recording Thamudic inscriptions for use on Macintosh computers has been created.

As a tool for the study of Nabataean inscriptions of the Hisma and at neighboring Petra, a provisional lexicon of Nabataean Aramaic was compiled. The lexicon is based on the pioneering work of Cantineau (1930–1932) and other glossaries of Nabataean published since then. This computer-based study, entitled *Nablex*, is now in draft form.

The preparation of inscriptions recorded during the decade of fieldwork resulted in the discovery of a new addition to the list of divine names of the pre-Islamic North Arabian pantheon. At least 23 inscriptions are addressed to the deity RB SQM, "Rab Saqm." These inscriptions follow what appears to be an established formulaic pattern. An example of this is the following:

رب سقم سر رب متمعن خطط كال  
RB . SQM . SRR . B . MTMN . HTT . KLL

A tentative translation of this inscription is: Lord SQM gladden MTMN, he engraved it all. Of the 23 inscriptions recorded nearly all follow the formulaic pattern RB SQM SRR B. . . . A couple of inscriptions vary the formula with the insertion of PN before the verb form. The title RB is well attested in North Arabian and Nabataean inscriptions. The root SQM,



Fig. 44. 'Ayla. Area F, looking to the southeast. Room A is in the foreground.

however, still eludes a definite identification. It is possibly a plural form of the Semitic root SWQ, which means “leg” or “shank,” as well as “street” or “marketplace.” Because all these inscriptions have been found on the walls or screens around the *inselbergs* of the *Hisma*, it could be a geographical term for the passages between them. A tentative translation may be “Lord of the narrow places.” This may suggest that the title RB SQM was a desert sobriquet for Dushara.

#### EARLY MODERN, MODERN

**'Aqaba/'Ayla.** Donald Whitcomb, The Oriental Institute, University of Chicago, reports:

One of the results of the 1987 excavations on the site of Early Islamic 'Ayla was a city plan that included four gates. The northeast, or Syrian, gate was posited to lie beneath the modern street and sidewalk of the Corniche Road. The 'Ayla Orientation Center will be constructed almost on the exact location of the ruins of the original Syrian Gate. It is to be a replica of the gate and two flanking towers and will introduce the visitor to the history and archaeology of 'Aqaba. In preparation for its construction the DAJ and ACOR began archaeological investigations in the fall of 1990. The need to complete these prompted the 1992 excavations reported on here.

The trenches reveal the complexities introduced by modern disturbances. The recent fence marks the edge of the sidewalk and street. About 2 m from the fence is a modern pipeline (ca. 80 cm wide and 1–1.2 m deep); antecedent to the pipeline was a broad ditch, again running parallel to the street. Both features contained thoroughly modern artifacts.

The 1992 season excavated a 10 × 20 m trench from late April into May (fig. 44). The team consisted of five students from the University of Jordan and Yarmouk University and Romel Greyb as DAJ representative. This small season could not have been accomplished without the active assistance of Safwan Tell of the DAJ, Pierre and Patricia Bikai of ACOR, and Bassam Kakish and Bassam Noueiran of the 'Aqaba Region Authority. Funding was provided under a USAID grant.

The 1992 excavations produced detailed stratigraphic information in the context of an important architectural sector of the city of Early Islamic 'Ayla. The chronological framework for this occupation is from ca. 650 to the early 12th century (ca. 1116). A historical reconstruction is possible due to the detailed studies of the ceramics from earlier seasons. It should be emphasized that other artifacts, particularly some 40 coins, possibly non-auric, remain to be analyzed.

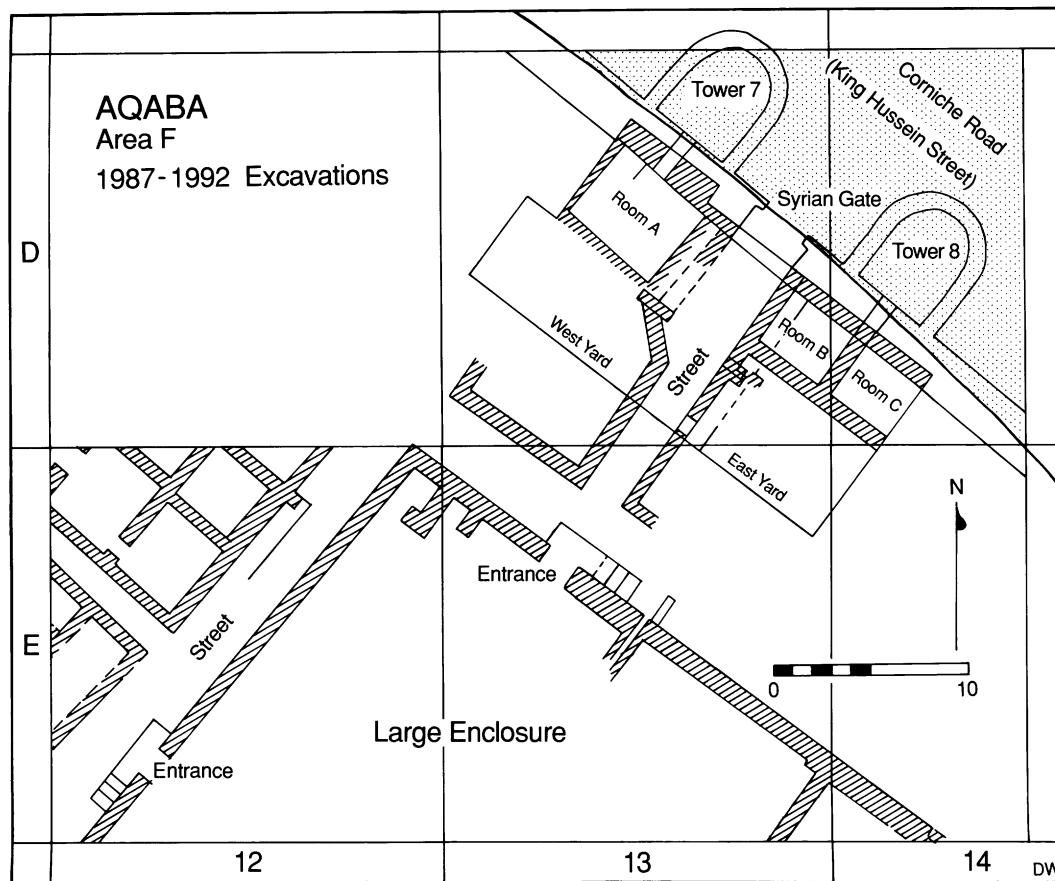


Fig. 45. Ayla. Area F, plan of excavations.

*Phase A (650–750/Rashidun and Umayyad).* Excavation uncovered the inner face of the doorway and flanking tower entrances of the Syrian Gate just inside the north balk of the trenches (figs. 44–45). Although this leaves most of the gate and tower covered under the modern sidewalk and streets, numerous parallels with other gates allow an increasingly detailed reconstruction. Most dramatically, the line of the inner face of the city wall is now known. Furthermore, its construction details correspond to the city wall elsewhere, particularly the wide footing of the foundation. The arch of the doorway into tower 7 gives, for the first time, the height of the passageway (surprisingly low, ca. 1.5 m). The jamb indicates the precise positioning of the Syrian Gate.

The Syrian street was limited by a stone wall to either side and behind each tower was a large room. An interior arch may have provided a transition from a vestibule into the town itself (an architectural parallel for such an arch may be seen near the Egyptian Gate).

*Phase B (750–850/Early Abbasid).* This phase is anticipated by the introduction of a new corpus of

ceramics, the Mahesh wares (post-700). There are clear architectural manifestations: new walls, floors, and occasionally complete reorganization of architectural space. The two sides of the Syrian street have radically differing histories. While the northwest side remained virtually unaffected, the southeast side was totally razed and two new rooms built upon the remains of the original walls. On this latter side, the city wall ceased to exist, at least on its inner face. Not only do rooms B and C apparently cross the city wall but their doorways, facing to the north, indicate an architectural complex built without regard to the former limits of the city. This reinforces the implications of the Square Tower of the Sea Gate, excavated in 1989, that the Early Abbasid period was a period of expansion and vigorous reorganization.

*Phase C (850–950/Middle Abbasid).* This century is difficult to distinguish from the preceding phase. Architectural evidence suggests continuities from earlier patterns. On the other hand, ceramic assemblages are marked by the presence of more sophisticated, imported glazed wares; ceramics thus presage attributes of the subsequent century.

*Phase D (950–1050/Late Abbasid or Fatimid).* The highest layer of the Syrian street contained, amid late ceramics, a hoard of 32 dinars. Preliminary analysis of these coins suggests Fatimid and North African (Sijilmasa?) issues datable to the first quarter of the 11th century. One might speculate that this purse was lost by a Maghrebi pilgrim, possibly during the attacks on 'Ayla by the Banu Jarrah in 1024.

The rooms southeast of the gate have hearths and midden debris suggesting a change in function of this building. This parallels developments in room A, where midden debris underlies late walls, also in association with a hearth. These changes in the character of deposition suggest two possible interpretations: the area was more residential in nature, and the level of prosperity (implied in sanitation and order) had abated. Not only was the street increasingly narrow, but a portion was given over to a drain. The archaeology may be said to reflect the political and social vagaries of this troubled century.

*Phase E (1050–1116/Fatimid).* This last period is the most difficult to assess, due to the combined factors of the street, pipeline, ditch, and 1991 excavations. Walls attributable to this period, chiefly in and near room A, show a tendency to tilt dramatically. This may be due to subsidence (and poor construction techniques), but it may also be evidence of the impact of the 1068 earthquake.

The 1992 excavations in area F have provided the precise location of the northeast city wall, the Syrian Gate, and its two flanking towers. Although the Syrian Gate may have functioned as a gate only in the earliest period, the Syrian street remained an important avenue for the city. This was one of four axial streets that led directly to the Central Pavilion. This urban plan changed radically, probably in phase B (the Early Abbasid). The Syrian street was blocked by an immense structure, the Large Enclosure, itself apparently surrounded by open passages. The Syrian street led directly to one of the entrances to this building, approached by stairs and a platform.

After the excavations in 1987, it was clear that the location of the Syrian Gate had been seriously disturbed by modern activities. The gate and its towers remain obscured by the Corniche Road; we now know that the gate has been destroyed since the eighth century. Aside from the benefit of a record of its precise location, further evidence confirms architectural and stratigraphic patterns already learned from the other three gates excavated. The Syrian street held its treasure; but, more importantly, it indicates the promise of the secrets of the Large Enclosure. This neutral label was given to the building in 1987,

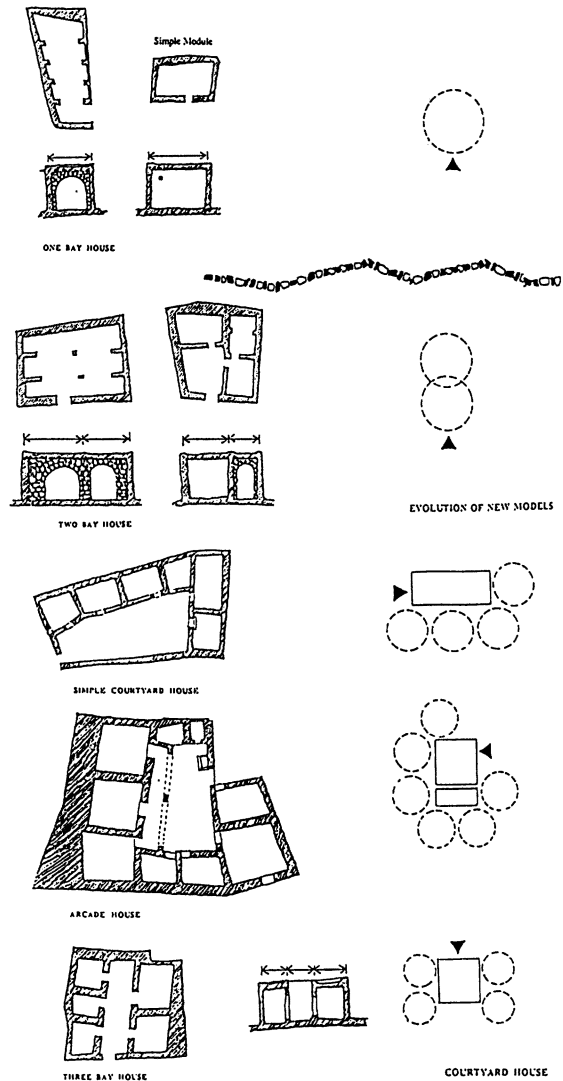


Fig. 46. Taibeh. Evolution of house models.

in spite of speculations that this might have been the Congregational Mosque and Dar al-Imara. Only further excavation will confirm this hypothesis.

#### MODERN

**Taibeh.** Leen Fakhoury, University of Jordan, reports:

Taibeh was chosen for a scheme of vitalization since it represents a prototype of a fading national vernacular heritage, threatened to be lost. An intact example of a Late Ottoman mountain village in southern Jordan, Taibeh provides a splendid opportunity for creating a tourist village attraction near the ancient Nabataean city of Petra.

The el-Liathneh first came to Taibeh some 120 years ago and settled in the caves, El-Tor. They built simple stone houses to house themselves and their

stock during the winter and to store their crops during the summer. The resulting village plan resembles that of many small villages spread across the mountains of rural lands, the nucleus being near the fields.

Typical farmhouses were constructed of local materials—stone, hay, and mud. The simple module of a villager's house evolved according to new needs and the prosperity of the villagers (fig. 46). New patterns evolved: the two-bay house, in which two arched walls were used to enlarge the space; and the courtyard house (*hosh*), which is a later development influenced by relations with surrounding villages and towns. The *hosh*, or the courtyard, became the transitional space away from the public pathway. The arcade house is a special case of a "grandhouse," in which a partly covered transitional space (arcade) is designed to connect the rooms opening onto the *hosh*. Another variation, the three-bay house, is characterized by rooms aligned along both sides of a longitudinal centralized outdoor space.

The clustering of houses was a direct response to scarcity of level space in the mountainous terrain and to social patterns and modes of privacy. Related factors are an economic system based on agriculture, availability of construction materials, traditional technologies, and climate.

Mud-walled and roofed houses can be very efficient, but need continuous maintenance. The deterioration of the roof and its collapse lead to further deterioration of the walls. Another major factor threatening the traditional buildings is the fact that villagers have deserted the old part and moved outward to create the new village of Taibeh. This move was accompanied by the introduction of poured concrete walls and roofs, and has been facilitated by the recent addition of concrete blocks to the local building technology.

Major intervention is needed to preserve the older village. Development of the area for tourism could involve rehabilitation of the earlier houses in Taibeh.

**Pioneer Farmers.** Raouf S. Abujaber, Amman, reports:

Information was gathered by R. Abujaber during the '60s and '70s about the agricultural cycle, crops and their yield in relation to seed, the effect of yearly rainfall on these crops, and water collection and use in dry-farming areas of Jordan. During the late '70s a survey of the lands of al-Yaduda, the Abujaber estate, 10 km south of Amman, was carried out in close cooperation with Henk Franken of the University of Leiden. *Pioneers of Jordan* (Diss. Oxford Univ.) was published in 1989, in which the historical, social, and economic factors that played an important role

in the lives of settled and nomadic populations alike were considered in detail. Research is now being conducted for a study tentatively titled *Transjordan's History during the 19th Century*.

#### GENERAL

**Museum Exchange Program.** Joseph A. Greene, Harvard Semitic Museum, reports:

In October through December 1991, the Jordan Archaeological Museum in Amman and the Semitic Museum of Harvard University participated in a staff exchange program sponsored by the American Association of Museums/International Council of Museums. This Jordanian-American exchange was part of the 1990–1991 round of AAM/ICOM-sponsored museum personnel exchanges conducted under the "International Partnerships among Museums" (IPAM) exchange program. The exchange partners were Joseph A. Greene, from the Harvard Semitic Museum, and Siham Balqar of the Jordan Archaeological Museum. Each spent in turn approximately six weeks at their respective partner's institution.

In Amman, in conjunction with an ongoing cooperative project between the DAJ and the Jordanian Friends of Archaeology to revise and reinstall labels for the Jordan Archaeological Museum exhibits, Greene worked with the museum staff on the reorganization of the Bronze and Iron Age display cases. This involved verifying the provenance and description of every artifact on display and cross-checking published references of the artifacts. The EBA exhibits were rearranged to reunite finds from various EB tomb groups from Jericho and El Husn that had previously not been displayed together. New labels were prepared for these cases. In addition, a full dossier of published information about all the displayed artifacts in the Bronze and Iron Age cases was compiled from excavation reports and other sources. This dossier was deposited at the museum where it will be available for consultation by researchers using the museum's display collections.

At Harvard, Balqar devoted her time chiefly to a preliminary cataloguing of the Semitic Museum's large Near Eastern ethnographic collection, which was accumulated in the late 19th and early 20th centuries. Except for a portion of the costume collection, the museum's Near Eastern ethnographic holdings had never before been surveyed.

**Conservation of Sites.** Luigi Marino, Università degli Studi, Florence, reports:

The main aim of the research is to clarify the investigative methodology and the procedures for intervening in buildings, especially those reduced to a



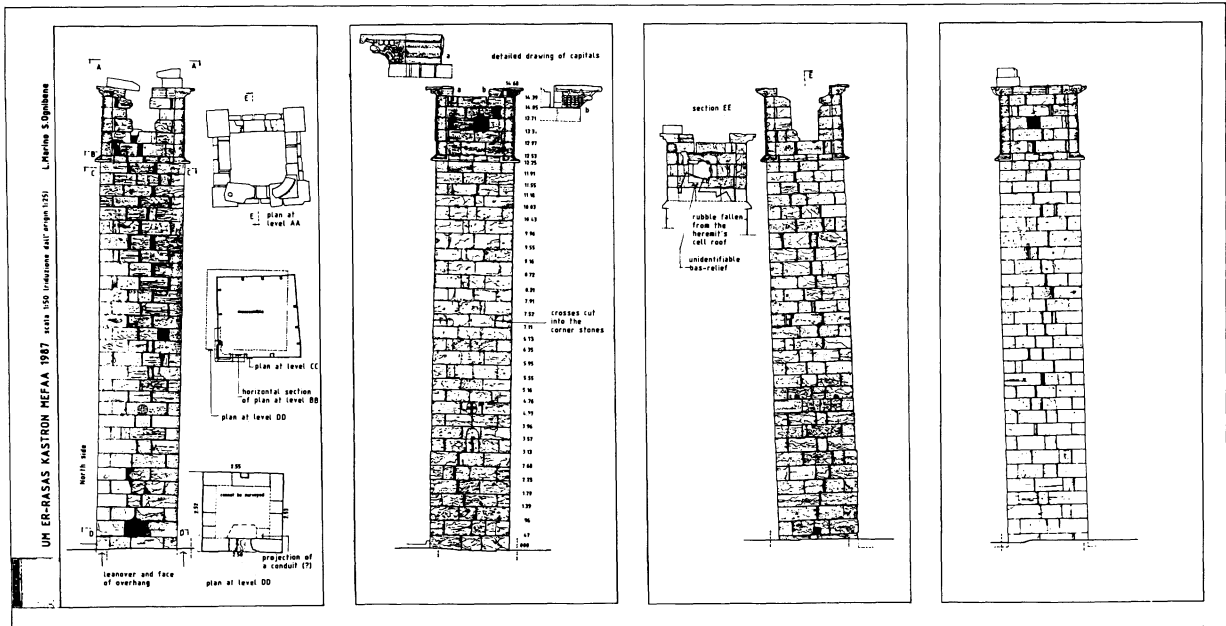


Fig. 47. Elevations of tower at Umm Er-Rasas showing condition of masonry.

ruined state. We have used the general term “intervention” to include all kinds of activity such as conservation, cleaning, integration of parts, symbolic reconstruction, replacement, abandonment, replication, temporary and permanent strengthening, protection during digging, water and vegetation control, protection from atmospheric agents, museum development both on and off site, reuse, pollution control, and protection from vandalism. These investigations form part of a more general research project into “archaeological restoration” embarked upon in 1984 by some universities and cultural heritage institutions. The conservation of ruined buildings is part of the wider discipline of restoration but with its own requirements of specialized expertise.

Of particular importance to our research, which ranges over a very wide geographical area, are the investigations carried out in Jordan. The main reasons for this are 1) the presence of very important sites and buildings, even though little is sometimes known outside their local area (fig. 47); 2) the existence of environmental conditions that hasten deterioration; 3) the continuance of nomadic and permanent settlement, using traditional materials and building techniques; and 4) the presence of numerous foreign archaeological expeditions, each with its own characteristics and methodology of intervention.

After general reconnaissance we chose some areas to be considered as privileged “observatories” in

which to carry out systematic and repeated analysis over time, with a view to defining reliable diagnostic criteria valid not only in individual cases but also applicable to a wide range of sites. From analysis of the data gathered to date, the general state of conservation may be considered adequate, but worsening of local conditions also gives rise to serious concern. The lack of systematic maintenance of sites gives most cause for concern in Jordan.

The most frequent interventions have concentrated on the large-scale replacement of a few ancient features, which in the majority of cases seem entirely unjustified. Only broad-ranging and coordinated programs of “ordinary maintenance” preceded by preventive measures could avoid or at least limit the risk of degenerative processes reemerging in the future. Attention to such efforts has been absent from almost all of the past archaeological projects in Jordan, constituting a dangerous threat to the Kingdom’s cultural heritage.

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