

The 1976 Season of Excavations at Tell Ḥesbân

by

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With most of its goals reached, the fifth season of archaeological excavations at Tell Ḥesbân, some 25 kilometers southwest of Amman, came to an official close on August 11, 1976, having begun eight weeks earlier on June 15. The results of the previous four seasons of work were reported in *ADAJ* as follows: the 1968 season: XII–XIII (1967–68) 51–52; the 1971 season: XVII (1972) 15–22; the 1973 season: XVIII (1973) 87–88 and XIX (1974) 151–156; and the 1974 season: XX (1975) 47–56. Despite skyrocketing costs and unprecedented logistical difficulties (associated primarily with trying to obtain enough water for basic necessities), the core staff readily agreed that the 1976 season was the best to date in terms of results.

Again the chief sponsor of the dig was Andrews University (Berrien Springs, Michigan), under the umbrella of the American Center of Oriental Research in Amman (whose Director, Dr. James A. Sauer, served as project advisor) and with the cooperation of the Department of Antiquities (whose Director-General, Mr. Yacoub Oweis, issued the excavation permit and proved helpful in numerous ways). Further financial and staff support came from Calvin Theological Seminary (Grand Rapids, Michigan), Covenant Theological Seminary (St. Louis, Missouri), Winebrenner Theological Seminary (Findlay, Ohio), Earthwatch (a national effort conceived by the Center for Field Research in Belmont, Massachusetts, to mobilize citizens of all ages in basic field research expeditions),

and the Kyle-Kelso Archaeological Fund. The remainder of the dig's income came from student fees and the generous help of a number of private donors.

Excavation Goals on Tell

Projected as the final season of excavations at Tell Ḥesbân, our general stratigraphic goal was to connect Area C on the western slope with Area A on the summit (Area A was already connected with Area B, on a shelf to the south, through Area D) and to complete to bedrock all squares that had been begun on the acropolis in all five seasons (1968, 1971, 1973, 1974, and 1976) so that we could ultimately publish a representative cross section of the mound from surface soil to bedrock, in quarter-pie fashion, from the western edge eastward to the center, and from the center southward to the edge of the tell's southern shelf.

In addition, certain architectural finds required further investigation. In Area A, these included the excavation of the western extent of the Byzantine basilica church, the interpretation of extensive Mamlūk remains apparently associated with the Islamic bath, and the clarification of major Roman walls that may have belonged to a temple. In Area B, our primary goal was to trace the connection between the huge Iron Age reservoir's 30 cm. thick plaster flooring first found in the original square of Area B with the 15 meter stretch of plaster retaining wall later found in adjoining squares to the east. It was hoped also that the corners of this reservoir wall

might be found so as to at least estimate the pool's extent. We also hoped to further clarify the nature of the southern access route to the acropolis by uncovering more of the Late Roman monumental stairway and its associated roadways. Between Areas A and B, in the southern most square of Area D, we had previously found considerable Iron I remains, the earliest at the site, so we decided to expose as much of them as possible. And in Area C extensive Iron Age and Roman fortifications as well as a Mamlūk domestic complex needed further investigation.

Excavation Results on Tell

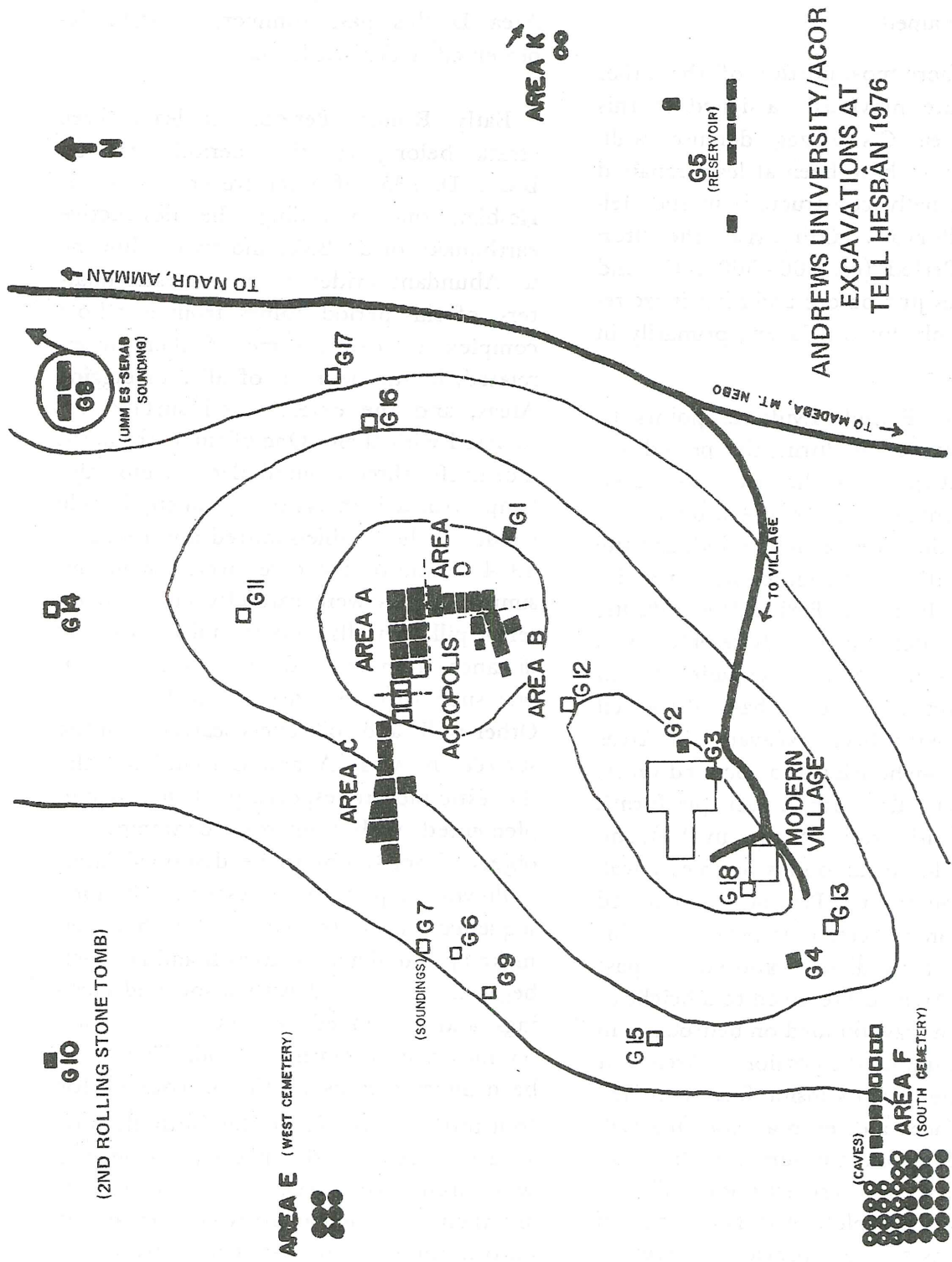
This general stratigraphic goal and these many specific architectural goals were virtually all achieved by opening up 4 new squares (to connect up Areas A and C) as well as continuing excavation in 15 previously-opened squares on the tell proper. By the end of the season, bedrock had been reached in all but one of these squares; thus out of the 32 squares begun in Areas A, B, C, and D during five seasons of work, we have reached bedrock in all but three of them (and two of these served only as limited soundings and were never intended to reach bedrock). This achievement enabled the chief stratigrapher with the help of the area supervisors to work out during the final season a site-wide synthesis and correlation of all excavated loci which yielded at least 23 strata covering a 2700 year period from Iron I to Mamlūk with very few gaps in occupation. This periodization scheme now becomes the basis for preparation of a final excavation report for Tell Hesbân.

To describe the results of this last summer's excavation in greater detail, we will start from the earliest occupational evidence on the tell and proceed to the most recent,

later returning to goals and achievements of other aspects of the expedition.

Iron I Period. PI. VII, I. As with previous seasons, the earliest stratum of occupation attested anywhere on the mound dates back to the Iron I Period (ca. 1200–1000 B.C.). The only architectural elements associated with this stratum (in Area D, a plastered cistern and a 5 meter deep, 13 meter long, reservoir [?] of undetermined width, and in the Area B continuation of this unusual feature, where it had narrowed to a deep channel in bedrock, a major wall built of rough, tightly-fitting boulders) belong to Iron IA (12th century B.C.) as does the 4 meter deep rapid fill in the Area D reservoir [?]—a fill remarkably similar to the later Iron II/Persian fill layers that were dumped into the Area B reservoir. But in the two squares farthest down the hill to the west in Area C, a 2 meter deep fill yielded an abundance of Iron IB and C sherds in addition to Iron IA sherds, about 80 circular ceramic loomweights, and an uninscribed seal containing a design typical for this period.

Iron II/Persian Period. The most notable structure of this stratum—previously reported from Area B—is undoubtedly the largest such Iron Age reservoir on Jordan's East Bank PI. VII, I. This past summer it was cleared all the way to its plastered bottom along its 6 meter deep plastered eastern retaining wall, partially cut vertically through bedrock and partially constructed header-stretcher fashion. Furthermore the two rounded plastered corners of the reservoir associated with its 16 meter long eastern wall were also excavated. Tip lines within the excavated portion of the reservoir indicate it was probably square; thus it would have originally held 1,200,000 liters of water. Whether the ca. 800 B.C. date of its upper courses applies



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A schematic plan of Tell Hesbân, showing previously opened squares or tombs in black, while those begun in 1976 are white. Notice the expanded nature of the work this season.

FIG. 1

to its construction or only its repair could not be ascertained.

The southern most portion of the other key structure previously assigned to this stratum, Area C's zigzag defense wall, now appears to have been at least repaired (if not originally constructed) in the Hellenistic Period. Otherwise the Iron II/Persian Period (ca. 800–500 B.C.) and the centuries just before and after it are represented only by soil layers, primarily in Areas B and C.

Hellenistic Period. Evidence points to two strata at Ḥesbân during this period (ca. 250–63 B.C.), the earlier one associated with reoccupation of the site after a possible gap in the Late Persian Period, and the later one, with the strengthening of the site in the Late Hellenistic Period. It was during this period that the Area B reservoir was filled with soil, that a lower defense wall was constructed around the base of the tell (portions having been excavated in Areas D, B, and C—where it was associated on its inner, uphill side, with a rock platform), sometimes with cross walls (as in D.4), and that the well-built acropolis perimeter wall protected the summit. Previously excavated in Area D, an 8 meter long portion of this latter perimeter wall was exposed this past summer in Area A. Preserved to a height of 2.5 meters, it was founded on bedrock—as in Area D, but unlike the portion in Area D, it was associated on its inside face with Hellenistic surfaces and even an abutting Hellenistic wall (which later served as the foundation for the northern exterior wall of a Late Roman temple). Another series of Hellenistic installations previously reported are the nearly ubiquitous rock-cut caverns called variously cisterns, wine cellars, or storage pits. At least the unplastered ones may now be considered silos since in the vicinity of possible threshingfloors on bedrock, several of them have contained chaff,

pyramid-shaped weights, and in one case in Area D this past summer, a perfectly-preserved Hellenistic lamp.

Early Roman Period. At least three strata belong to this period (ca. 63 B.C.-A.D. 135) of extensive occupation at Ḥesbân, one preceding the destructive earthquake of 31 B.C., and two, following it. Abundant evidence for domestic quarters of this period comes from a whole complex of caves, some of them inter-related, in the bedrock of all four digging Areas, and the exterior soil surfaces associated with them. One of these produced a beautiful three-spouted black «Herodian» lamp with a high central (broken) handle similar to the double-spouted one found in 1974. Some of the caves were rough and simple, others were carefully cut with interior pillars, walls, and several rooms. The distance from front door to back wall in one such cave in Area C was 13 meters. Other walls and soil layers scattered on the surface in Areas A and C round out the domestic picture, especially when it is supplemented with numerous contemporary objects from tombs to be described later.

Previous reports have described the long sequence of plaster layers and their soil make-up found across Areas B and D which began in this period with associated curbing and continued without interruption on into the Byzantine Period. They have been interpreted as a series of roadbeds for foot traffic, or plazas. In the southern most square of Area D this plaza led from the west through a broad gateway to a courtyard and thence through a narrower gateway out onto a ramp on the east that probably led up onto the acropolis; this ramp was repaired and reused in the Late Roman Period as well. (Another ramp, probably later, but similar in design and function, was also excavated in the easternmost square of Area C.)

Perhaps as a result of the 31 B.C. earthquake, the Hellenistic acropolis perimeter wall appears to have been repaired and buttressed in this period. In Area A, the buttressing took the form of a deep sloping layer of stones laid directly on bedrock against the outside of the perimeter wall; in Area D, a sloping buttress wall was laid up against a fill of Hellenistic soil that lay several feet deep along the outer face of the perimeter wall. Between this buttress wall and the gateway-courtyard-gateway-ramp complex (already described) to the south were the walls and floor of a house that opened onto the plaza to the west.

The period's most impressive preserved architecture belonged probably to Area C's high (6 meters preserved) stone tower whose northeastern foundation trench went down through about 5 meters of Iron Age fill to reach bedrock. Its western façade and interior seem to have been rebuilt in Late Roman and Early Byzantine times when the structure saw continued use, surely as some type of public building.

Late Roman Period. Occupation at Ḥesbân continued through at least two strata during this period (ca. A.D. 135–324). At first there was basically a continuation of the Early Roman features, at least in Area D where the buttress wall was given a new skin and the adjoining house to the south was reused, and in Area C where the high tower was remodeled and the cave rooms saw continuous habitation—even with rebuilt entrances in two cases. But then came the construction of the Area D monumental stairway Pl. VII, 2, right over the buttress wall and house already described. First discovered in 1973, this imposing stairway was traced further west this past summer into Area B until its entire preserved width of 13 meters was exposed. An adjoining robber

trench suggests it originally went another 2 meters at least. Along the entire stretch of its base it was associated with contemporary plastered roadway or plaza layers. Obviously this grand southern entrance to the acropolis must have led to an important public structure at the summit. Several imposing Late Roman walls in Area A suggest the presence of a temple during this period—one that was oriented toward the east and preceded by a paved platform and a stylobate wall that would have supported four columns. In fact, this temple may even appear on the rare Elagabalus coin minted at Esbous (Roman Heshbon) ca. A.D. 220; two examples of which have been discovered at Ḥesbân. These exterior temple walls (those running east-west abutted the Hellenistic perimeter wall on the west) and many of its finest architectural fragments (such as pillar bases and capitals) were later reused in the Byzantine basilica which succeeded it. The above mentioned Area C ramp with its associated retaining wall may have been one access route from the west at this time. Also in Area C, a Late Roman domestic complex was excavated—one that probably lasted until the A.D. 365 earthquake.

Early Byzantine Period. No less than six strata belong to this active period at Ḥesbân (A.D. 324–450). In all of these the monumental Roman stairway of Area D continued in use, but with each there was a new resurfacing of the adjoining roadway or plaza which naturally gradually raised its level in relation to the stairway. From off the Area B stairs in a secondary Early Byzantine context came the prize artistic find of the season: a finely executed ivory plaque depicting «prometheus Bound.» True to the myth, he stands with his arms above him, his wrists bound to the rocks, while a vulture eats out his entrails—all this a punishment for his having revealed to man the secret of fire Pl. VIII, I.

The destructive earthquake of A.D. 365 provided a midpoint for the Early Byzantine strata. It apparently strewn rocks clear across the Area B plaza, caused massive collapse in a subterranean installation in Area C, and may have even been responsible for ceiling fall in several of the tombs to be described later. This may have been the occasion for the Early Byzantine rebuild of the high Roman tower in Area C where a cooking pot, juglet, and unique four-spouted lamp (whose handle ends in the eye and beak of a bird) represent the refurbishing.

The last Early Byzantine stratum (ca. A.D. 400–450) represents a major new development at the site. At least partially reusing existing Roman architectural fragments and some Roman walls as foundation, a basilica-type Christian church was constructed. Probably at the same time, the large Area B kiln discovered in 1968 was built to produce the lime needed for plaster in the new church. Both the church and the kiln have been described in previous reports. This past season, however, we were able finally to clarify some of the problems connected with the narthex which remains mostly buried under the later Mamlūk bath complex: the wall separating the narthex and nave and the main entrance from one to the other were identified. The fourth and fifth pillar bases along the northern stylobate wall were also discovered.

Late Byzantine Period. (Pl. VIII, 2) Evidence for at least two strata from this period (ca. A.D. 450–661) was found, primarily associated with the ecclesiastical structures on the acropolis, most data having disappeared from lower down on the sides of the mound (Areas B and C) due probably either to erosion or robbing. In the mid-6th century A.D., the church in Area A, or perhaps rooms associated with it, were extended considerably to the west;

this is claimed on the basis of the discovery in two different probes this past season of two mosaic floors, one in A.9 on the north, and the other continuing under the west balk of A.6 on the south, on into A.8 (and possibly even A.10). The narthex wall for this Late Byzantine phase of the church was never found. Associated with it to the south in Area D, however, between the church and the acropolis perimeter wall, was the fine dolomitic limestone tile floor described in earlier reports. In the final Late Byzantine stratum this tile floor was covered with closely-fitting flagstone pavers associated with a new entrance through the acropolis perimeter wall and a new stone stairway outside it to the south (the old Late Roman stairs finally having been replaced).

Umayyad Period. The first Arab period (ca. A.D. 661–750) is represented by at least one stratum, with substantial remains again only within the acropolis perimeter walls. A house on the flagstone floor in Area D and the unusually large (2 meters in diameter, 1 meter deep) and well-preserved ceramic oven cut through a Byzantine mosaic floor in Area A have been described in previous reports. Though no major new finds from this period were made on the tell proper, some important data (to be mentioned later) from this stratum was uncovered in two soundings in the modern village to the south of the tell.

Abbāsid Period. Again, the remains of this period (ca. A.D. 750–969) comprise only one stratum at Hesbân. In addition to an Area B stone-lined pit which had previously provided the best evidence, this last season yielded several new soil layers in Area A.

Ayyūbid/Mamlūk Period. (Pl. X, 1) After a gap of over 200 years represented by some pottery but no architecture or soil

layers, came at least three strata (ca. A.D. 1200–1456). The middle stratum, Early Mamlūk, appears to have been a real renaissance for Ḥesbân, short-lived though it was. All Areas have produced some evidence. The vaulted room and series of cisterns from Area D were previously reported, as were numerous habitation caves, both on and surrounding the tell. The largest one by far, however, was discovered only this past season in Area B. One hundred meters in extent and in some places two stories high, it may be more properly termed a cavecistern complex. Too large to excavate in the final season, it was only explored; from off the surface came two large, beautifully glazed Mamlūk bowls—one patterned in brown and yellow, the other in black and green. A large complex of domestic buildings—with well-preserved walls, intact floors and thresholds, and numerous artifacts—was laid bare in the eastern sector of Area C. One vaulted building contained three rooms, each with two plastered floors in primary association with the walls. The floor of the northernmost room incorporated eight small (9 cm. diameter) cuplike circular installations, arranged in pairs, and filled with reddish earth; we have no good explanation of their function. Outside the room to the west was a water channel and sump constructed on bedrock, probably for drainage.

The Area A vaulted room, courtyard with associated channels and cisterns, and the well-preserved bath complex (Pl. IX, 1) have all been reported before. Immediately adjacent to the bath's western wall, between it and the acropolis perimeter wall, however, another major Mamlūk architectural complex was excavated in 1976. Its central feature was the finest flagstone-paved courtyard so far found at the site (Pl. X, 2). On this pavement, against the western wall of the bath, ran a high plastered bench ending on the north at a water

installation whose exact function was not clear, though it was certainly related to a drain beneath the pavement. Opening onto the northern side of the courtyard were four thresholds from adjoining corridors and rooms, while on the southern side, there were only three—including a round-about indirect access corridor from the bath. The courtyard may have remained open to the west since its entire width from north to south was at one time spanned by an arch whose well-cut springers both remained *in situ*. Beneath this arch, on the western portion of the courtyard an extensive plastered platform was later added next to the acropolis perimeter wall. Altogether, these well-preserved and related Mamlūk structures in Area A indicate a high level of creativity on the part of their builders.

Following the Late Mamlūk stratum at Ḥesbân there was another gap in occupation of about 450 years until the settlement of the Modern Period which has taken place since World War I.

Further Expedition Goals and Results

Besides the stratigraphical and architectural goals for Areas A–D on the acropolis of Tell Ḥesbân, the results of which have just been summarized, there were a number of related objectives.

Soundings. In 1973 a series of small soundings (collectively labelled Area G) was begun around the edges of the tell and in the modern village with the goal of testing the reliability of the main stratigraphical sequence obtained from the acropolis. By 1974, these soundings of the stratigraphy in the vicinity of the tell had reached the number of ten. This past season we continued one previous sounding (G.4) and initiated eight more (G.11–18).

In addition to bringing to light some important complementary data, their combined results appeared to confirm the accuracy and completeness of our more extensive work on the acropolis, especially in terms of occupation history.

Sounding G.12 was located in the saddle between the acropolis and the modern village to the south. Completed to bedrock, the earliest feature discovered was a cistern whose date was no later than Hellenistic but possibly Iron Age, though its latestest plastering was in the Mamlūk Period. A deep wall which abutted its neck stones was added later in the Late Roman and Early Byzantine Periods.

Farther south at the old Nabulsi family manor in the village, Sounding G.18 revealed a probable Late Byzantine construction date for the imposing wall fragment upon which the northwestern corner was built. Slightly to the northwest from G.18, in a courtyard sector of the village, was Sounding G.13 which uncovered a portion of an Umayyad underground plastered pool with at least one associated vaulted passageway. (Though neither of the foregoing soundings were completed to bedrock, the following two were.) At the edge of the village still farther north was previously worked Sounding G.4, a cistern-cave complex roughly 17 meters long, 3 meters deep, and 4 meters wide. The cruciform-plan of the cistern proper may go back to the Roman Period to judge from the sherds imbedded in its first plaster layer as well as the apparent date of the stairway leading down into it. In the Byzantine Period it was cleaned out and may have been reused for domestic purposes since several lamp niches appear to have been cut in the walls at that time and a cooking pot was found in the remains of a fire. Later, in the Umayyad Period, the vertical mouth

was rimmed with collar stones but subsequently blocked in the Mamlūk Period when the cistern was connected up to an adjoining cave by cutting a tunnel between them. Down the hill from G.4 to the west was Sounding G.15 where another imposing wall was found, perhaps built in the Roman Period, though all loci on its inside face were Ayyūbid/Mamluk all the way down.

On the north edge of the acropolis Sounding G.11 laid bare another wall along a scarp of bedrock. Beneath it was the vaulted entrance to another cistern—obviously used last in the Ayyubid/Mamlūk Period. To the east and slightly to the south was Sounding G.16 on the tell's eastern slope where very little previous work had been done. Though Late Byzantine soil layers and walls were reached, there was unfortunately not sufficient time to complete the probe to bedrock. In a northeasterly direction not far from the Na'ur-Madaba road those in Sounding G.17 reexcavated a small portion of a mosaic floor that had been first reported to Bastiaan Van Elderen in 1970 and seen by him that same year. Perhaps the floor of an «East Church», it contained a 6th century A.D. pattern (showing evidence of iconoclasm) almost identical to the Masuh Byzantine church floor excavated by Van Elderen in 1970. The sounding's only purpose was to reestablish and report the location of the mosaic floor so it might be included in any future work at the site.

When the expedition's drafting team discovered what looked like an apse wall almost hidden in another fence wall in the saddle north of the tell, Sounding G.14 soon established there the presence of another church (Pl. X, 2). Quickly dubbed the «North Church,» its dimensions appeared to be nearly 30 meters east-west by 15 meters north-south, with at least some

of the original structure possibly preserved to a height of 2 meters. A trench across the apse wall that was completed to bedrock outside the church combined with the architecture of the church itself, produced evidence to suggest two Late Byzantine phases for the church after its founding in the late 5th or early 6th centuries A.D., the second phase being connected with the addition of an «elder's bench» in the apse. Over the mosaic floor associated with this second phase was a domestic complex probably to be dated to the Umayyad Period, partly on the basis of a very important early Islamic coin. And last came three layers of (probable) Mamlūk cyst burials in which all the skeletons were oriented east-west (with the apse), many of the thirty with grave goods.

Cemeteries. Beginning with the 1971 season numerous Roman and Byzantine tombs have been excavated in Cemeteries E and F, to the west and southwest of the tell, respectively. The artifacts and skeletons from a variety of rock-cut tombs have complemented nicely the data gleaned from contemporary strata on the tell. In 1976 it was hoped that the same objective could be achieved for the Iron Age. Though a systematic search of the surrounding hillsides likely to conceal an Iron Age cemetery was undertaken, no earlier tombs were found. Realizing such an endeavor has more to do with chance than skill, we contented ourselves with the careful excavation of several new types of tombs for the Roman and Byzantine Periods. The following features were especially noted and studied: architectural elements, typology, tooling techniques (e.g. one tomb had been cut with at least five different tools while another had only one used throughout), history of robbing, stratigraphy (e.g. it was observed that the phasing of tomb interiors coordinated well with the stratigraphic

evidence immediately in front of their respective entrances). In all, 18 tombs and caves were cleared along the western slope of the tell (Area F.24–41, though F.24–26, 29, 32, 33, 35, 36, and 39 were probes that were eventually abandoned) and 2 tombs, in a brand new cemetery across the Wadi el-Marbat to the east (Area K.1,2).

Four of the tombs originated in the Roman Period. The earliest, F.31, was a typical loculus-type Early Roman tomb though its heaviest use appeared to be in the Late Roman and Early Byzantine Periods. A collapsed ceiling, due perhaps to the A.D. 365 earthquake, kept it from subsequent robbing (three «Herodian» lamps were found fallen immediately below a lamp niche in what looked like earthquake tumble). Primary, secondary, and cremation burials were all represented—more than 30 skeletons in all. One loculus alone produced about 30 objects, many of them distinctive (e.g. a four-handled Early Roman cooking pot, a scarab—obviously an heirloom and not a Roman imitation, a Nabataean painted spouted juglet, and an alabaster footed bowl (Pl. XI, 2).

Tomb F.28 was cut slightly later in the Early Roman Period though its use pattern and *terminus ad quem* was the same as F.31. It produced a few objects, some pig bones, and 7 skeletons, but was interesting primarily because it had an *arcosolium* above each set of loculi.

Tomb F.27 was Late Roman in origin but was reused and robbed in Byzantine (and modern) times. It was mixed in type with 8 loculi and 3 sarcophagi containing some 17 burials. From a Roman loculus came an exquisite gold earring (Pl. XI, 2) with settings containing both a pearl and a blue cameo-type relief of a woman's head, a fine incense burner, and several bone and

ivory pins. Tomb F.40 was likewise Late Roman but empty.

Two of the tombs (F. 30 and K.1) were typically Byzantine in form and contents (as was K.2 though it was not excavated). Tomb K.1 produced an interesting bronze mascara bottle in the stylized shape of a female figure.

Four caves were excavated—two of them apparently used only as animal shelters or for domestic purposes: F.41 in the Ayyūbid/Mamlūk Period and F.34 in the Byzantine Period. Wasters in the latter indicated the presence of a neaby potter, at least in Late Byzantine times. The other two caves were used for burials: F.37 had a vertically cut wall towards the back with five sarcophagi arranged along the edges around a fine balatte pavement. Late Roman in construction, it had a disproportionate number of infant bones (35 fetuses out of 50 burials). In the Byzantine Period this installation was damaged (purposefully?) and in the Ayyūbid/Mamlūk Period it was altered for domestic occupation. Cave F.38, too, was Late Roman continuing into Early Byzantine, and contained multiple (primary but disturbed?) burials—about 25 skeletons with three times that many grave goods. Whether these burials were in a cave because they were poorer or because some special circumstances surrounded these persons' death and burial could not be ascertained.

Regional Archaeological Survey. In 1973 and 1974 a team completed an archaeological survey of the region within the approximate radius of 10 kilometers of Tell Ḥesbân (from Na'ur in the north to Madaba in the south, and from the Jordan Valley in the west to the Amman-Madaba Road in the east). This concentrated effort mapped 125 sites, enabling the expedition

to sketch the patterns of occupation in the Ḥesbân region and how the tell proper fitted into them. The team also traced the Roman road from Livias (Tell er-Rameh) to Esbus (Ḥesbân) and conducted a sounding at Umm es-Sarab to test the validity and usefulness of surface sherding (there was a correlation between surface sherds and those excavated).

In 1976 it was decided to extend the successful work of the archaeological survey team to the triangular region between the Amman-Na'ur Road and the Amman-Madaba Road, with the hope that previous results could be tied in to the region's ancient and (rapidly expanding) modern capital before most of the relevant data were destroyed. This danger can be illustrated by the team's frustration in trying to locate within the target region at Khirbet es-Suk a milestone of the *Via Nova* identified by Peter Thomsen about 1917. Apparently the new settlement in the region has destroyed it for no trace of the *Via Nova* could be found. The team was successful, however, in mapping 30 sites in this extension of their previous radius; most of them were occupied in the Iron Age and Byzantine Period, about half of them in the Roman and Umayyad Periods, and less than a quarter of them in the Chalcolithic and Bronze Ages and the later Arabic periods.

The two most impressive tells in the region were Tell el-'Umeiri (with its spring, surface architectural remains, and evidence of occupation in every major period between Early Bronze and Iron II plus some later periods) and Jalul (PI.XII). For the latter, a detailed contour map was prepared and an experimental procedure was tried by surface sherding 101 randomly selected 10 x 10 meter squares on a grid. This effort produced 27,000 sherds from the Neolithic Period (?) to modern times, but with the

Bronze and Iron Ages especially well represented. Portions of at least 5 figurines were also found along with an inscription—an Iron Age 'alef incised on a Late Bronze Age sherd.

Other Scientific Data. Provision was made in 1976 for increased collection and analysis of the types of scientific data that have become so important for a fuller understanding of an ancient site. Thus, a team of more than twenty scientists and their assistants were on hand to provide the archaeological staff with in-field identifications of human (more than 200 skeletons) and animal bones, soils, rocks, and snails. In addition, this team sought to assemble diverse environmental and cultural data pertinent to the diachronic study of human adaptation at Ḥesbân. Emphasis was upon gathering data which could help to explain the continuity in the subsistence practices of the people of Ḥesbân from the earliest period down to the present—i.e., a continuous dependence upon animal exploitation, particularly sheep and goat.

The fieldwork carried out by this team can be divided as follows: 1) Environmental and ethnographic fieldwork aimed at illuminating our understanding of the existing ecological situation at Ḥesbân. Thus, ethnographic fieldwork among seven sheep and goat keeping households was carried out in conjunction with studies of the local geological, zoological, and botanical environment as well as measurements of local weather conditions (with the aid of a first-rate weather station provided through the courtesy of Jordan's Meteorological Department: Director-General, Ghazi El-Rifai). Forthcoming as a result of these activities are a cultural-ecological analysis of existing subsistence arrangements involving sheep and goats at Ḥesbân, a geological map of the Ḥesbân vicinity, up-to-date faunal and

floral lists (nearly 100 plants) of the Ḥesbân vicinity, and a climatic sequence for Ḥesbân during the past ten years.

2) Zooarchaeological and other environmental fieldwork aimed at strengthening the data necessary to establish the specific character of the subsistence practices at Ḥesbân during all of its occupational history. To this end, more than 50,000 animal bones have been identified and described individually—including osteological measurements of over 20,000 fragments—and all of this data is currently being prepared for computer-aided analysis. Of special interest are certain rare species which have now been identified, including at least 50 bones of wild boar, several bones of the Mesopotamian fallow deer, bones of a lion (from the Roman period) and of red deer, and possible remains of Indian humped-back cattle. It is of interest that most of these species require lush vegetation than now exists around Ḥesbân. Other environmental data were collected using dry and wet sieving techniques. The hundreds of land snails, molluscs, carbonized seeds, and other organic material yielded by these procedures will serve as independent lines of evidence in the attempt to reconstruct the natural environment of each of the occupational periods at Ḥesbân. Our final conclusions about human adaptation and about the development of the animals themselves at Ḥesbân will be based upon the cumulative evidence yielded by extensive zooarchaeological analysis of animal remains taken together with the evidence yielded by the other environmental, archaeological, and ethnographic data.

3) Investigations aimed at discovering the depositional, post-depositional, and excavation factors which affect our understanding of the material excavated. For example, our environmental data retrieval

system was tested throughout the 1976 season in a «control square». Square C.9 was particularly suited to this objective since it was being opened for the first time and a wall conveniently divided the square into halves-each with comparable loci to the other. The northern half was excavated in the usual fashion while in the southern half, all soil was sieved and floated and all possible data was saved. Results were roughly comparable in the two halves in terms of sherds and objects saved; the primary difference proved to be the retrieval of a relatively much greater quantity of bones of small mammals, birds, and fish in the sieving process. Other studies were carried out to ascertain what the post-depositional factors are which may affect bones. The extent to which the chemical composition of soils affect bone preservation was what interested our biochemist. Another study-involving extensive observation of dog feeding behavior coupled with a bone survey extending over 5000 square meters-established with certainty the tremendous havoc wreaked by dogs on the make-up of animal food remains. For example, dogs were observed eating entire chicken bones, an observation which may explain why almost never were chicken bones found dispersed in the yards surrounding H̄esb̄ân households, and this despite the popularity of chicken in the villagers' diet.

In addition to the thousands of bones and hundreds of scientific samples already mentioned, the stratigraphic work on the tell and in the soundings and cemeteries yielded 800 registered small finds (among them 57 legible coins and 37 whole pots), 36,000 registered sherds, and thousands of glass fragments-all now undergoing further study. A full preliminary report of the 1976 season's results is scheduled for publication during the winter of 1977-78.

Staff

The foregoing accomplishments of the past season at Tell H̄esb̄ân are due primarily to the dedicated and persistent efforts of a large, qualified, and varied volunteer staff. Key staff members remained the same as in 1974. Lawrence T. Geraty of Andrews University was director; Roger S. Boraas of Upsala College (East Orange, New Jersey), chief stratigrapher and coordinator of specialists; James A. Sauer of ACOR, project advisor and chief ceramic typologist; Siegfried H. Horn of Andrews, former director, project advisor, and object registrar. For the first time he was assisted by Abraham Terian of Andrews who promptly identified all coin finds in the field-a major aid in maintaining stratigraphic control.

Continuing as area supervisors were Bastiaan Van Elderen of Calvin in Area A, Larry G. Herr of Harvard in Areas B (while Sauer was writing) and D. W. Harold Mare of Covenant in Area C West and Robert D. Ibach, Jr., of Grace Theological Seminary (Winona Lake, Indiana) on the regional archaeological survey. New in 1976 were S. Thomas Parker of U.C.L.A. in Area C East (for purposes of efficient supervision the expanding Area C was divided into two areas) and John J. Davis of Grace in Areas F and K (the cemeteries). Supervisors over Area G (the nine separate soundings around the base of the tell) were B. Michael Blaine of Fuller Seminary (Pasadena, California), G.12; Robyn M. Brown of the University of Michigan, G.11, 16-18; John I. Lawlor of Baptist Bible College (Clarks Summit, Pennsylvania), G.14; and Donald H. Wimmer of Seton Hall University (South Orange, New Jersey), G. 4, 13, 15.

Back for the fifth time were chief architect-surveyor Bert DeVries of Calvin and

pottery registrar Hester B. Thomsen of Greater New York Academy. Other returning specialists included chief zooarchaeologist Øystein S. LaBianca of Brandeis (who also organized and supervised the 3 week post-session bone analysis when Joachim Boessneck and Angela von den Driesch of Munich's Institut für Palaeoanatomie served as consultants), physical anthropologists Robert M. Little of Andrews and James H. Stirling of Johns Hopkins, and chief photographer Paul H. Denton of Andrews. New in 1976 were director of education Robert A. Coughenour of Western Theological Seminary (Holland, Michigan), geologist P. Edgar Hare of the Carnegie Geophysical Institute (Washington, D.C.), and camp physician Ronald D. Geraty of New England Memorial Hospital (Stoneham, Massachusetts). Once again Muhammad Adawi of ACOR was chief cook and Mahmoud Rusan, Omar Yunis, Arif Abul-Ghannim, and Muhammad Murshed Khadija represented the Department of Antiquities, the latter as foreman. Other Jordanian archaeologists included Samir I. Ghishan, Nabil S. Qadi, and Saleh Sari.

Altogether there was a staff of about 100 from the United States, Jordan, Canada, Australia, Norway, West Germany, Finland, Switzerland, Peru, and Taiwan. This unusually large group (which was assisted at the tell and at camp by about 140 hired workmen) was comfortably housed about 10 kilometers south of the tell at the UNWRA Girls' School for Palestinian Refugees in Madaba. The facilities were adequate for make-shift bone and geology laboratories, a drafting room, a darkroom, and rooms for the processing of pottery, glass, and small finds—all this thanks to the

kindness of John Tanner, Director of UNWRA in Jordan, and his associates. (Despite the large staff, some of whom were overseas for the first time, we are thankful to report that there were no hospitalizations or serious accidents or illnesses during the two-month expedition.)

Other persons in Amman whose assistance greatly facilitated our work included Their Royal Highnesses Crown Prince Hassan, Crown Princess Tharwat, and Prince Raad, His Excellency Minister of Tourism and Antiquities Ghaleb Barakat, U.S. Ambassador Thomas Pickering, Elizabeth Aimé, Kenneth and Remie Fenske, and, of course, as always, Director-General of the Department of Antiquities Yacoub Oweis and his assistant, Yousef Alami, without whose cooperation none of the expedition's work would have been possible.

Future Plans

Though no further expeditions to carry out new work are planned, it is probable that after manuscripts for a final synthesis of results are well under way, it will seem advisable to return to the field once more to check or clarify certain conclusions. In the meantime the expedition has already prepared a detailed proposal for reconstruction and preservation of the excavated areas of Tell Ḥesbân (with plans and sections) which the Department of Antiquities has adopted and has already begun to implement.

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