ANDREWS UNIVERSITY

HESHBON EXPEDITION
THE FOURTH CAMPAIGN AT TELL ḤESBÂN (1974)
A Preliminary Report

ROGER S. BORAAS
Upsala College
East Orange, New Jersey

LAWRENCE T. GERATY
Andrews University
Berrien Springs, Michigan

Tell Ḥesbân, a site some 25 road kilometers southwest of Amman that has been traditionally associated with Biblical Heshbon and the Greco-Roman Esbus, was excavated in a fourth campaign from June 26 to August 14, 1974.[1] Heshbon's history as derived from the literary sources,[2] and the results of the previous three campaigns of 1968, 1971, and 1973, have already been covered in previous preliminary reports.[3]

Sponsorship

Again in 1974 the major sponsor of the expedition in terms of personnel, direction, and financial support, was Andrews University,[4]

[1] A brief report of the 1974 season by L. T. Geraty appeared in *ASOR Newsletter* No. 5 (Nov., 1974):1-8; he submitted reports to *ADAJ* and *RB* also but they have not yet been published.

[2] W. Vyhmeister, *AUSS* 6 (1968):158-177.

[3] For the 1968 season, see R. S. Boraas and S. H. Horn, *et al., Heshbon 1968* (*AUSS* 7 [1969]:97-239), *AUM,* Vol. 2, 1969; Horn, *ADAJ* 12-13 (1967-68):51-52; Horn, *ASOR Newsletter* No. 3 (1968-69):1-5; Horn, *BA* 32 (1969):26-41; Horn, *RB* 76 (1969):395-398; E. N. Lugenbeal and J. A. Sauer, "Seventh-Sixth Century B.C. Pottery from Area B at Heshbon," *AUSS* 10 (1972):21-69; A. Terian, "Coins from the 1968 Excavations at Heshbon," *AUSS* 9 (1971):147-160.

For the 1971 season, see R. S. Boraas and S. H. Horn, *et al., Heshbon 1971* (*AUSS* 11 [1973]:1-144), *AUM,* Vol. 6, 1973; Horn, *ADAJ* 17 (1972):15-22; Horn, *ASOR Newsletter* No. 4 (1971-72):1-4; Horn, *RB* 79 (1972):422-426; R. G. Bullard, "Geological Study of the Heshbon Area," *AUSS* 10 (1972):129-141; J. A. Sauer, *Heshbon Pottery 1971* (*AUM,* Vol. 7, 1973); A. Terian, "Coins from the 1971 Excavations at Heshbon," *AUSS* 12 (1974):35-46.

For the 1973 season, see R. S. Boraas and S. H. Horn, *et al., Heshbon 1973* (*AUSS* 13 [1975]:101-247), *AUM,* Vol. 8, 1975; Boraas, *PEQ* 106 (1974):5, 6; Horn, *ADAJ* 19 (1974):151-156; Horn, *ASOR Newsletter* No. 2 (1973-74):1-4; Horn, *RB* 82 (1975):100-105; F. M. Cross, "Ammonite Ostraca from Heshbon: Heshbon Ostraca IV-VIII," *AUSS* 13 (1975):1-20; B. Van Elderen, "A Greek Ostracon from Heshbon: Heshbon Ostracon IX," *AUSS* 13 (1975):21-22; A. Terian, "Coins from the 1973 and 1974 Excavations at Heshbon," below.

[4] It is a pleasure for the Director to publicly acknowledge the consistent en-

in close cooperation with the American Center of Oriental Research (ACOR) in Amman and the Department of Antiquities of Jordan. ACOR puts its personnel, tools, and excavation equipment at the disposal of the expedition,[5] and the Department of Antiquities, through its Director-General, Yacoub Oweis, issued the excavation and survey permit, loaned personnel and certain pieces of equipment, and provided assistance and courtesies in numerous ways. As with previous seasons, much of the expedition's success must be credited to the cooperation and helpfulness of Mr. Oweis and his associate, Yousef Alami, and their entire staff. Other dignitaries to whom the expedition owes a special debt of gratitude include Prince Raad Zeid Hussein, former Prime Minister Suleiman Nabulsi, Minister of Tourism and Antiquities Ghaleb Z. Barakat, and U.S. Ambassador Thomas R. Pickering.

Other institutional sponsors who provided both personnel and generous financial support included Calvin Theological Seminary (Grand Rapids, Michigan), Covenant Theological Seminary (St. Louis, Missouri), Grace Theological Seminary (Winona Lake, Indiana), and the Graduate School of Loma Linda University (Loma Linda, California). The Kyle-Kelso Archaeological Fund provided further funds and Worthington Foods, Inc., provided the staff's textured protein requirements for the season.

Major individual sponsorship came from Mrs. Ruth Kaune Baucom, Eleanor and William Berecz, Jr., Wilber A. Bishop, Sr., Dr. and Mrs. Bernard Brandstater, Dr. and Mrs. Bruce Branson, Dr. Harvey A. Elder, Dr. and Mrs. W. H. Lesovsky, Dr. and Mrs. John Wm. Schnepper, Walter E. Sooy, and Dr. Lester G. Storz. Numerous private donors provided lesser support.

The expedition tenders its special thanks to all the above institutions and individuals for their generous support which made the fourth season of excavations at Tell Ḥesbân possible.

couragement and tangible support of Andrews University through the good offices of President Richard Hammill, Vice President (for Academic Administration) J. G. Smoot, Vice President (for Financial Affairs) V. E. Garber, Dean (of the Theological Seminary) S. H. Horn, and Dean (of the College of Arts and Sciences) D. L. Ford.

[5] From its inception, *ASOR* President G. Ernest Wright was a supporter of the expedition so it was with a good deal of pride and gratitude that his first visit to the site was welcomed during July 25-28, only a month before his untimely death on August 29, 1974.

Organization

The expedition's headquarters was located between Amman and Tell Ḥesbân at the Amman Training Centre of the United Nations Relief and Works Agency for Palestine Refugees.[6] The facilities there served admirably to house the 75-member staff and provide laboratory facilities for the expedition's photographers, anthropologists, ceramists, draftsmen, and geologist. The daily program was similar to that already described for the 1968 campaign.

The staff consisted of 15 Jordanians (mostly from the Department of Antiquities and the University of Jordan) and 60 individuals (mostly professors and graduate students) from the United States, Britain, Canada, Australia, New Zealand, Denmark, Norway, and Indonesia.

Though Siegfried H. Horn of Andrews University directed the first three seasons of excavation, his current institutional responsibilities precluded his being with the expedition the entire season; he nevertheless served as senior advisor and object registrar during the final three weeks of the season. Lawrence T. Geraty, also of Andrews University, and an archaeologist who had been associated with the Tell Ḥesbân project since its inception, became the new director. Roger S. Boraas of Upsala College continued as chief stratigrapher and coordinator of specialists, and James A. Sauer of ACOR continued as chief ceramic typologist. Other members of the advisory staff who aided immeasurably in the smooth running of the organization included the official representatives from the Department of Antiquities, Sabri Abbadi and Mahmoud Rusan, and Foreman Muhammad Murshed Khadija who was directly responsible for the oversight of the 150 local workmen. ACOR Director, Bastiaan Van Elderen, gave unselfishly of his time and energy in countless ways both before and during the excavation season.

Continuity in the 1974 excavation staff was evidenced by the fact that 25 of these individuals (a full third of the staff) had already served on the Heshbon team during a previous season. In the follow-

[6] Arrangements for use of the facilities were made through the courtesy of Bastiaan Van Elderen, ACOR Director, and Richard Undeland, Public Affairs Officer of the USIS in Amman, in cooperation with John Tanner, Director of UNRWA, Jordan; Husni Ayesh, ATC Principal, and his staff were most accommodating in every way possible.

ing listing, each staff member is mentioned in connection with his or her primary assignment, though in certain cases there were temporary shifts which took place during the season.

Area A on the summit of the acropolis was again supervised by Bastiaan Van Elderen of Calvin Theological Seminary and ACOR. Of the eight squares previously opened, only Squares 5, 7, and 8 were worked in 1974, and Square 9 was begun. The Area A square supervisors were Sabri Abbadi, Kim Baker, Stephen Emmel, Jennifer Groot, Rose Habaybeh, Nola Opperwall, Oscar Schultz, and George Terzibashian.

Area B (and Square D.4) on a level shelf to the southwest of the acropolis summit was again under the supervision of James A. Sauer of ACOR. All squares previously opened (including Square D.4) were worked again in 1974 except test Squares 5 and 6; Square 7 was begun. Square supervisors in Area B were Adib Abu-Shmais, James Battenfield, James Cox, Trevor Delafield, Samir Ghishan, Kevin Howse, Kathleen Mitchell, and Susan Sauer.

Area C on the *tell's* western slope was for the first time supervised by W. Harold Mare of Covenant Theological Seminary. Excavation continued in all of the six previously opened squares except Square 4; Squares 7 and 8 were begun. Area C square supervisors were Michael Blaine, Mika Damanik, Omar Daud, Margaret Dittemore, Gerald Finneman, Myra Mare, Eunice Post, Nabil Qadi, Mahmoud Rusan, and Wesley Walters.

Area D, connecting Areas A and B, was for the first time under the supervision of Larry G. Herr of Harvard University (he had last dug at Tell Ḥesbân in 1971). Though no new squares were begun, all of the previously opened six were continued except Square 6. Square supervisors in Area D were Kerry Brandstater, Glenn Bowen, Zeidan Kafafi, John Lawlor, Lynn Malvitz, David Merling, Mogahed Mohaisin, and Orlyn Nelson.

Areas E (Tombs 4-6) and F (Caves 19-23), on both sides of the Wadi el-Majarr to the west and southwest of the *tell*, were supervised for the first time by James H. Stirling of Loma Linda University. His assistants were Suzanne Brandstater, Richard Dorsett, John Reeves, and Kerry Wiessmann.

Area G was the collective designation for several scattered soundings in the vicinity of the *tell*. Squares G.1-4 were excavated already

in 1973. Square G.5 was the Byzantine/Mamlūk reservoir east of the *tell* supervised by Larry G. Herr and his assistants from Area D. Squares G.6, 7, and 9 were soundings on the *tell's* western slope supervised by W. Harold Mare and his assistants from Area C with help from Area A. Sounding G.8 was located 4.5 km. north of Tell Ḥesbân on the northern slope of Umm es-Sarab and was supervised by Robert D. Ibach, Jr., of Grace Theological Seminary with his assistants from the archaeological survey team. Tomb G.10, a second Roman tomb found sealed with a rolling stone, was excavated by James H. Stirling.

The archaeological survey begun in 1973 completed its work within a 10 km. radius of Tell Ḥesbân under the direction of Robert D. Ibach, Jr. His assistants were Abdel Samiaᶜ Abu-Dayya, Theadore Chamberlain, Patricia Derbeck, and Richard Mannell.

Surveying and architectural drafting was again in the charge of Bert DeVries of Calvin College; his assistants were Paul Brohl, Anita Van Elderen, and Thomas Walters.

Paul H. Denton of Andrews University supervised all photography; his full-time assistants were Paul Bonney, Henry Lamberton, and Robert Lloyd.

The anthropology team was headed by James H. Stirling, whose primary responsibility was the human skeletal remains, and Øystein Sakala LaBianca who took charge of the zooarchaeology and ethnography. Their assistants were Shirley Finneman, Douglas Fuller, Ralph Stirling, and Michael Toplyn. Harold James of the Geoscience Research Institute at Andrews University was the expedition's geologist.

Hester Thomsen of Greater New York Academy was once again in charge of all pottery washing, drying, and sorting, and the registration of more than 23,000 saved sherds; Melissa Lloyd assisted her.

The supporting staff included Vivolyn Van Elderen who again served as camp director, assisted by receptionist-secretary Inge-Lise Howse. Michael Blaine coordinated week-end tours and Shirley Finneman was camp nurse. Muhammad Adawi, ACOR's majordomo, was once again chief cook; his assistants were Ishaq Adawi, Hasan Salam, Issa Muhammad, and Issa Ibrahim.

Contributions by many of these key staff members follow below in this preliminary report of the 1974 season. The contributions and

analyses of several non-staff authors also follow, with many others yet to be completed. The season's pottery report will appear separately.

Aims[7]

Three major unsolved problems at the end of the 1973 season guided the aims of and supported a commitment to conduct two further seasons of broad excavation effort. These primary questions were 1) the unclear location of the west exterior of the Byzantine basilica on the acropolis, 2) the unclear nature of possible defense installations on the west slope (evidence suggested both Early Roman and Iron II systems might be found), and 3) the unclear relations of portions of what might be a large Iron II reservoir on the southwest shelf.[8] In addition, the archaeological survey of the Ḥesbân region was not complete, nor were there necropolis installations for occupation earlier than the Early Roman period. The result of considering these factors was the commitment to assume two additional seasons of work on the site, recognizing that the responsible handling of the stratigraphic work needed to resolve the first and third major questions would require more than one season's effort if done properly. Given that decision, additional strategic options could be considered in relation to necropolis searches, soundings of peripheral architectural evidence on various parts of the site, exploration of reservoir and road locations adjacent to the site, more

[7] The strategy adopted for the first three seasons was continued in regard to the stratigraphic examination of a "quarter pie" of the site, using the main N-S and E-W axes of the site grid as balk sections linking the four main Areas (A-D) of excavation on the *tell* proper. Extension work in the form of necropolis search was conducted as Areas E-F and scattered soundings were identified as Area G. The excavation and recording methods were extensions of those employed in previous seasons (see *Heshbon 1968,* pp. 110-17). In this report the Area is designated by a capital letter, the Square by an Arabic numeral preceded by a period, and the Locus by an Arabic numeral preceded by a colon. A.7 refers to Area A, Square 7, whereas C.5:60 refers to Area C, Square 5, Locus 60.

[8] Period divisions follow the scheme reported by James A. Sauer, *Heshbon Pottery 1971,* pp. 1-7. Stratum designations with Arabic numerals have been adopted by the authors of reports on Areas B and D as means of distinguishing accumulated stratification within each Area. Because the sequences vary from one Area to another these Strata numbers designate evidence of different periods in some instances. Designation of Strata by Roman numerals is reserved for site-wide Stratum identification, as indicated in *Heshbon 1968,* pp. 114-15.

thorough accumulation of ecological data bases and a test of the adequacy of surface sherd gathering as a guide to the chronology of occupation of outlying settlements in the vicinity of Ḥesbân.

Within the general aim of completing stratigraphic excavation of all Squares opened, the following specific aims were adopted for the 1974 season: 1) explore the location of the west exterior of the basilica by extending Area A south of the Islamic bath to intersect the southwest corner of the basilica if possible; 2) explore the dimensions of Roman architecture on the acropolis by continuing work in A.5, 6, and 7, as well as through a new Square along the E-W axis west of previous work; 3) attempt to fix the north perimeter of the suspected reservoir in Area B by opening a new Square north of B.2 and 3; 4) continue the work recognized as needing at least two seasons to complete to test the link of the heavy cement layers with the plastered wall-bedrock face in the possible reservoir in B.1, 2, and 4; 5) improve the stratigraphic link between Areas B and D, and test the northern extent of the roadway/plaza on the south shelf next to the acropolis; 6) sound the depression across the road east of the site to test the projected location of an additional reservoir and its dates of construction and use; 7) complete the archaeological survey of the 10 km. zone surrounding the site; 8) sound several projected cave-tomb locations west and southwest of the site; 9) explore further the cave-tomb facilities of Area E across the wadi west of the site, and pursue a rumor concerning a tomb equipped with a rolling stone sealing device; 10) improve the data base of ecological information by flotation seed and pollen sample gathering from all loci (ground surface to bedrock) in three representative new Squares from Areas A, B, and C; 11) test the possible presence of defenses on the west perimeter in C.5 and in a new Square C.7 south of C.3.

Accomplishments

A summary of the results of the 1974 season are given here by reporting the new material found for each of the periods involved, beginning with the earliest. It is assumed that the reader is acquainted with the accomplishments reported from the three preceding seasons.

Iron I (ca. 1200-900 B.C.). Scattered sherds from the period occurred in a few loci in C.1, 2, and 5. As with such materials found in

1973, the soil layers involved lay just above bedrock, but their mixed ceramic contents suggested materials deposited by weather action or human dump deposition. More substantial evidence was recovered in B.2 and 3. The combination of soil, rock, and ash in B.3:93-97 together with Wall Fragments B.3:86 and B.2:112 (= B.3:80) suggested occupation debris from domestic settlement. The date of Wall B.2:112 (= B.3:80) was confirmed by sherd evidence recovered from the removal of the upper 2 of the 4 surviving courses. The sequence of material suggested an accumulation of destruction debris above sparse evidence of occupation in spaces used in natural or partially modified declivities in bedrock. Ceramic typology comparisons suggested a date ca. 1200-1100 B.C. for the material in Area B. Some additional material was recovered from a layer of silt in Cistern D.1:63 which might be considered the last use deposit or the earliest material lost as use was abandoned. More substantial were the remains found in D.4 where a sequence of soil layers above and below a cobble paving and two wall fragments combined to suggest a domestic occupation accumulation. As in B.2, 3, the utilization of natural or partially worked formations in bedrock was characteristic. While still sparse in variety of evidence, the emerging pattern of domestic settlement using and modifying bedrock formations was considerably strengthened by the results of this season.

Iron II/Persian (ca. 700-500 B.C.). One soil layer in the abandoned Cistern D.1:63 and various dump layers in C.2 were datable to the period. A new major extension of Wall C.2:90 (= *H73* Wall C.2:52) was just exposed in the new Square C.7 by the end of the season. Traced for 3.10 m. of its length, the thickness of the wall, its substantial construction, and its placement (as continuation apparently of Wall C.3:60 = 26) all suggested that it may have been part of the defense perimeter on the west slope in this period. The work of an additional season is needed to confirm or correct such conclusions, but the evidence available to date indicated very likely defense function for the construction.

The most substantial new information from this period was derived from Area B materials pertaining to the possible reservoir on the south shelf of the site. A series of channels cut in bedrock (some of which were plastered) appeared to have been used to direct water

flow into the basin of the constructed reservoir. Additional material included the earlier constructed Wall B.2:84, the continued line of the east wall of the reservoir as cut vertically in bedrock, and plaster layers laid up as lining on the bedrock face-cuts, presumably to safeguard against leakage of the reservoir contents. As anticipated, the stratigraphic removal of material was insufficient in one season's work to confirm or correct the supposed connection of the heavy floor of cement layers to the lower edge of the constructed wall + plastered bedrock face, but the evidence recovered in this season offered no substantial dissuasion from the reservoir hypothesis. Rather, the evidence of the channels and the additional exposure of the wall and bedrock modifications tended to confirm the conjecture that a major water storage facility had been constructed at this portion of the site in the period. The clarification of the nature of this construction remains one of the primary tasks in completing excavation of the site.

Early Hellenistic (332-198 B.C.). No new data from this period was recovered. It remains relatively sparsely attested on the site.

Late Hellenistic (198-63 B.C.). Of still imprecise date, but possibly early in the Hellenistic occupation of the site, was the massive dumping of large quantities of Iron II/Persian occupation debris into the basin of the reservoir, filling it with rock, soil, and miscellaneous artifacts. The accumulation, combined with the stratigraphic situation on the acropolis (evident in Areas A and D.1, 5, and 6), suggested that the Hellenistic occupants may have "cleaned" most previous occupation accumulations from the acropolis and used the abandoned reservoir as part of their dumping ground. Near the reservoir to the east was a substantial plastered basin in which a thick layer of compact grayish-black clay suggested possible industrial use. It contained a clearly inscribed 2d century B.C. jar handle. Analysis of the soil for possible clues of metallurgical or other industrial function is still under way. Later in the period foundation trench excavation and construction for Wall B.2:62 was conducted, but the function of the construction remained unclear.

Also from this period was the evidence of the sealing of an earlier Iron Age cistern, and two phases of use of some open storage bin and silo installations in Area D, Square 2.

Early Roman (63 B.C.-A.D. 135). On the acropolis new Early Roman occupation was evident in a fragment of surface exposed in A.7 (Locus 80) but cut by Late Roman wall construction, and the use of dry storage pits cut into bedrock near the quarry (A.5). On the south access route to the acropolis, an Early Roman dwelling including Walls D.2:85, 21, and 55B, and the enclosed Surface D.2:89 over the levelling makeup fill laid above bedrock may have continued in use into the Late Roman period (ca. A.D. 150). Clearly earlier in construction and destruction/modification by later occupants were the Early Roman Wall D.2:26, plastered Surface D.3:85, room parts Wall D.2:64 with Surface D.2:66 attaching also to a second phase of Wall D.2:26, silos, pits, and Cave D.3:83, all apparently domestic facilities.

On the south shelf of the site, Area B evidence for the period was discernible in two major stages divided by substantial earthquake damage (concluded to be dated in 31 B.C.). Pre-quake settlement was apparently primarily in caves in the bedrock where soil layers, pits cut for storage, and divider walls were found in B.4, all apparently domestic in function. Outside the caves pre-quake facilities included at least two *ṭabuns*. Through the accidents of between-seasons erosion, remains of two "podium" bases were cleared just north of the later industrial kiln in B.1. With only parts of one or two courses of the neatly worked stone surviving the kiln construction, a sure conclusion as to their function was impossible. They were associated with the earliest of the plaster roadway/plaza surfaces laid down in the period along the full east-west extent of Areas B and D.

Perhaps most impressive from the period was the apparently defensive tower installation on the western perimeter of the site in Area C. In addition to the substantial surviving fragments of Walls C.1:40, 63, reported from work in 1973, additional portions of the construction were located in Square C.5, further west along the main East-West axis. These included the north and west walls of the tower proper (C.5:60 and 77 respectively), a clear segment of the foundation trench for Wall C.5:60, a well constructed doorway into the tower from the west, an entrance corridor to the doorway bounded on the north by Wall C.5:82, and paving stones serving as a surface leading into the doorway (Surface C.5:83). The weight of

all these elements confirmed the previous conclusion that major defensive architecture might be located in this portion of the site, and that Early Roman construction of this sort was indeed substantial. Further work is needed to detect whether the founding of the easternmost wall of the tower on bedrock held true for the downhill construction as well.

Additional Early Roman material was recovered from two tombs and the G.8 test sounding at Umm es-Sarab. Tomb E.6 yielded evidence of having been cut in the period, but there was no burial use in the period apparent. The second tomb found with a rolling stone sealing device had been used for burials during the period, but later robbery had severely disturbed all burial evidence. The evidence from Umm es-Sarab comprised three burials (two adults ca. 25 years old and one child under 12 years) and one commercial installation, possibly a wine vat. The total spectrum of evidence from the period supported the previous observation that Early Roman settlement in the site and its surroundings was substantial and extensive.

Late Roman (A.D. 135-324). On the acropolis, work in Area A recovered additional portions of the massive masonry wall with piers first found and reported in 1973 work. It suggested the major classical period structure from which later Byzantine architects culled both column drums and capitals for their basilica construction. It further suggested the classical design temple represented on the "Esbous" coin mint of Elagabalus, but further work is needed to confirm or correct these suggestions. At the south edge of the acropolis, a vault constructed as ceiling for a major cistern (D.5:5) and a soil layer immediately over bedrock comprised the new material recovered for the period.

Down the slope of the acropolis on the south, Surface D.3:45 connected with the north-south boundary wall (D.3:16) for the access route and linked up with "roadway" construction further south in D.4. Roadway/plaza surfacings were found in D.4 and B.1 this season. Partial collapse of the eastern boundary wall for such roadway/plaza surfaces was recovered in rock Tumble D.4:35-53, collapse possibly due to earthquake tremors. In B.1 what appeared to be portions of the same surfaces sealed up against the foundations

stones of the "podium" bases still in place from Early Roman times. No Late Roman burials or tombs were recovered.

Early Byzantine (A.D. 324-491). While some Byzantine material could not be dated precisely as to its being early or late, clearly early evidence was found in Areas A, B, and D. In a room apparently outside the north exterior wall of the basilica, previous work had indicated a mosaic floor cut by excavation for an Umayyad *ṭabun.* Excavation of the soil layer under a part of that mosaic indicated a fourth century *terminus post quem* for the soil layer in the form of a coin of Theodosius I (A.D. 378-395). Also related to the basilica was the ceramically dated early to middle Byzantine material in the back-fill of the foundation trench for the bottom two courses of the south exterior basilica wall (D.5:12). Additional evidence for the period comprises roadway/plaza surfaces and makeup for surfaces as recovered in B.7 and D.4. These were extended segments of such surfaces found earlier in all Squares of Area B and portions of D.3.

Late Byzantine (A.D. 491-640). Chief evidence for the period was recovered on the acropolis as part of the basilica and its facilities. The mosaic which lay north of the basilica exterior at the northwest corner was typical in construction, as previously reported, comprising mosaic stones set in cement layers laid over brown clay packed over small stones. Only a fringe around the room edges remained north and south of the later intrusive *ṭabun.* South of the basilica portions of a drain guiding water apparently from the basilica roof to Cistern D.5:5 were recovered. Part of another drain reused in the period lay in the west balk of D.1 inside the acropolis perimeter. Indications also suggested that the extended paving of the space between the south wall of the basilica and the perimeter wall defending the acropolis had been laid down in this period. Portions allowed to be removed were dated by the ceramics of latest date in the makeup layers beneath the pavers. Earlier in the period, but still Late Byzantine construction, were portions of a tile floor near the gate in the acropolis perimeter wall, paving stone floor leading up to a threshold in the south exterior wall of the basilica (said door subsequently blocked by basilica remodeling), and material in the foundation trench for the upper courses of the south exterior wall of the basilica. This evidence would appear to confirm the previous

judgment of re-design and remodeling construction based on the interior floor evidence from previous seasons' work on the basilica.

Other Byzantine material of less precisely fixed dates included some dump layers and one possible secondary burial in C.5; evidences of uses of caves as domestic or animal shelters (Area F); possible disturbance, but no burial use of Tomb E.6; earliest construction and use of a major open reservoir across the road east of the site (G.5); possible construction of some earliest wall fragments in the vaulted architecture of the Sounding G.6; and disturbance and dumping of terrace clearance debris at Umm es-Sarab (G.8).

Umayyad (A.D. 661-750). The major new evidence for the period was through completion of the excavation of the *ṭabun* north of the basilica's north exterior wall. A foundation pit 2.05 m. in diameter had been dug into the Byzantine floor and layers beneath. Within the pit a ceramic cone 1.39 m. in diameter at its base was constructed with a flagstone floor set for the firing pit. The apparent fuel/draft feeder shaft was run into the *ṭabun* from the west, taking good advantage of the prevailing winds to force draft into the firing chamber. In addition to this installation, possible Umayyad surfaces were found in rooms later developed by Ayyūbid/Mamlūk occupants along the west perimeter of the acropolis, and two fragments of possibly Umayyad soil layers were identified in Squares C.3 and 7 on the west slope. It remains to be seen whether another season will allow more precise isolation of Umayyad occupation evidence on that portion of the site.

'Abbāsid (A.D. 750-969). No new clear stratigraphic evidence from the period was identified. It remains unclear at this writing whether additional ceramic distinctions might be concluded from the post-season analyses of 1973 or 1974 ceramic data.

Ayyūbid/Mamlūk (A.D. 1174-1516). As in previous seasons, extensive remains were recovered from this period from nearly every sector under excavation. On the acropolis, the extensions of Area A by complete coverage of Square 8 and the opening of the new Square 9 along the axis toward the west brought both additional features of the Islamic bath and new domestic/commercial features to light. Of the bath, the main entrance corridor, its exterior doorway, a door-

way to an interior waiting room, the plastered waiting room equipped with clothing storage slots, and the doorway into the corridor to the bathing room were all recovered, including the lintel height survival of some walls and one intact lintel construction *in situ*. In Square 9, four rooms (one with a vaulted stone ceiling still largely intact) and a long narrow passage or storage chamber were part of the domestic and possibly commercial facilities along the west perimeter of the acropolis. A circular cooking installation was recovered in the southeastern room of the facility and up to five distinguishable living surfaces were cleared in the room on the southwest corner of the Square. Similar walled rooms and courtyard enclosures from the period were excavated in Area C on the west slope in Squares 6, 7, and 8. The stratigraphic sequence included the gradually decayed destruction debris layers, several distinct occupation floors and surfaces (in one instance coin-dated to a *terminus post quem* of the late 12th century), and a rather unusually elaborate double doored sunken entrance. On the south slope of the site, new evidence included added portions of a massive robber pit formerly known in D.2 and 3 and now traced into B.7. In D.4 in addition to ground surface wall fragments used possibly as animal pens, a walled room with a vaulted stone ceiling partly exposed in 1973 was excavated, including related pits for storage, caves used for storage, walls and their foundation trenches, and one possible grave or robber pit used for secondary burial first partially exposed in D.3 in 1968. Supportive evidence of the widespread inhabitation of the site and its environs was found in the evidence of use of caves in Area F as animal or human shelters, similar use of possibly Byzantine built domestic facilities down the wadi west of the *tell* (Soundings in G.6, 7, and at Umm es-Sarab [G.8]), and the major re-lining and rehabilitation of the large reservoir across the road east of the *tell* (G.5). Reconditioning that reservoir included laying a solid layer of fist sized stones packed in cement over the finish cement of the earlier Byzantine facility, followed by a substantial layer of their own finish cement. It was not apparent from the three small sectors explored in the sounding whether major structural damage to the side walls had occurred and needed repairs. The Byzantine construction of large stone blocks built into a cement mortared stone

wall lining an earthen rampart as the perimeter of the reservoir was substantially reused in any case.

Other achievements. The survey of the 10 km. radial zone around Tell Ḥesbân was completed with a total of 125 sites identified within the zone. Ceramic and other indications confirm occupation from Chalcolithic times to the modern period. Post season studies will refine the preliminary indications of substantial settlement concentrations in the Early Roman, Byzantine, and Ayyūbid/Mamlūk periods, matters reflected in the volume of evidence available on the *tell* for those periods.

Of the caves sounded for possible pre-Roman burial evidences, not a single instance provided such data. The rumored rolling-stone tomb (G.10) was located and cleared as reported above. It's blocking stone was set in a track which was constructed only to the left of the tomb door, the right being an extrusion of the natural rock formation which was left untrimmed by the tomb-cutters.

While the results are still too preliminary to draw firm conclusions, the acquisition of seed, pollen, micro-fauna, and soil samples from three newly opened Squares (C.7, B.7, and A.9) was drawn from every soil locus identified in each Square. The intention to continue such sampling on the same scale until work in all Squares is completed should provide a diverse and representative horizon of the pertinent data as a basis of drawing comparisons both within the site sectors and across to other sites as similar studies are pursued at other locations.

In summary, the work allowed the completion of all stated aims for the season. Most disappointing was the lack of success in the location of pre-Roman burials. They continued to elude us. Recognizing the limited expectation regarding the three major architectural problems, solution of which was seen to require two seasons' work to bring firmly satisfying results, it can still rightly be anticipated that the excavations scheduled for the summer of 1976 should bring clarification to all those questions. As for the rest of the processes, we look for additional information to be derived from post-season laboratory and related studies, especially in ceramic typological refinements, zoological analyses, human skeletal analyses, and the still unfolding patterns of floral and micro-faunal studies just barely begun for the site.

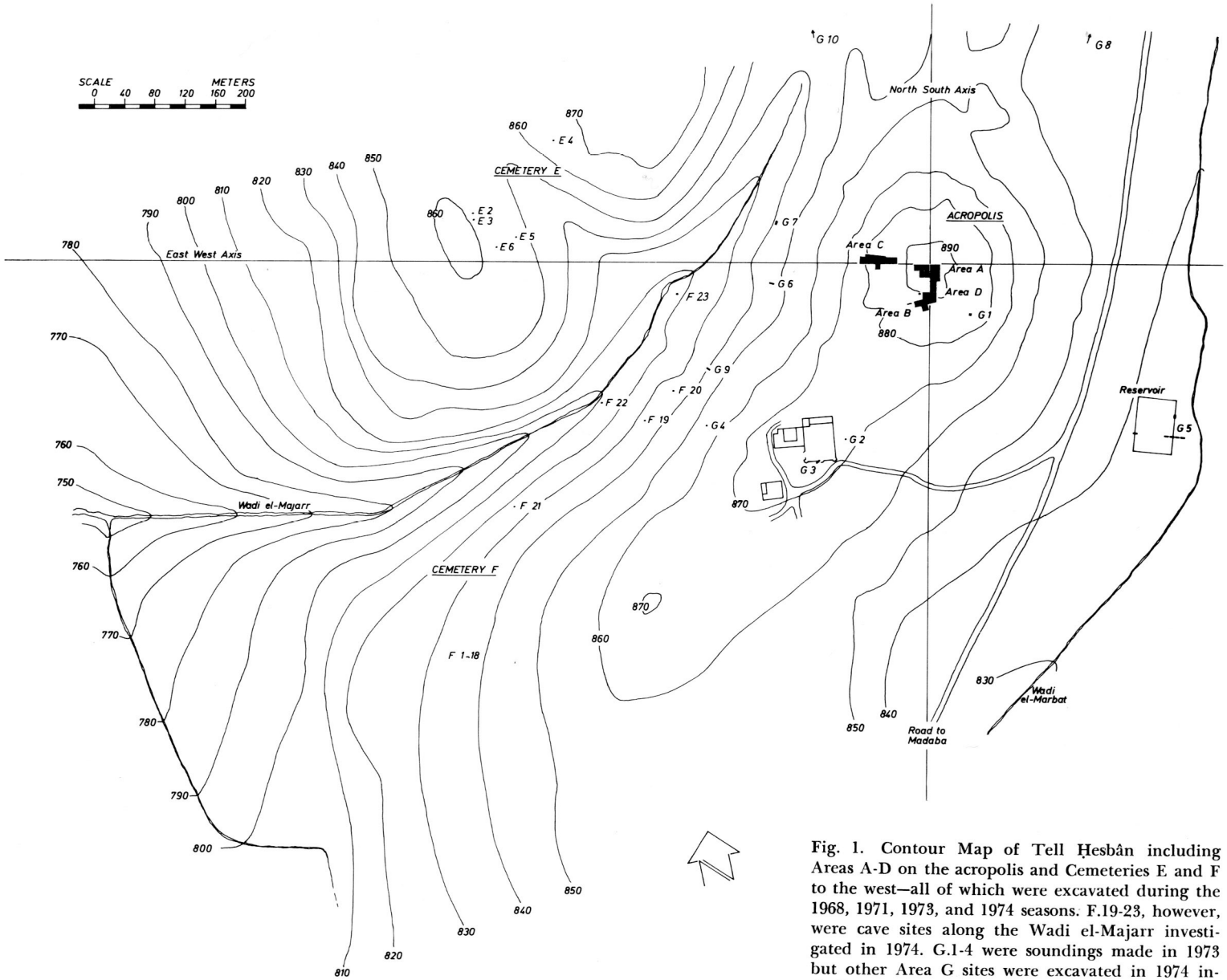


Fig. 1. Contour Map of Tell Ḥesbân including Areas A-D on the acropolis and Cemeteries E and F to the west—all of which were excavated during the 1968, 1971, 1973, and 1974 seasons. F.19-23, however, were cave sites along the Wadi el-Majarr investigated in 1974. G.1-4 were soundings made in 1973 but other Area G sites were excavated in 1974 including Reservoir G.5 located to the east of the Madaba Road, Soundings G.6, 7, 9, on the tell's western slope, Sounding G.8 (Umm es-Sarab) about 4.5 km. north along the Madaba Road, and "Rolling Stone" Tomb G.10 just to the northwest of the tell.

AREA A

BASTIAAN VAN ELDEREN
Calvin Theological Seminary
Grand Rapids, Michigan

The major architectural feature identified in Area A in the first season (1968) was the Byzantine church which dominated the acropolis. This was excavated further in the 1971 and 1973 seasons and the east, north, and south exterior walls traced. Completing the plan of the western end (narthex), entrance, and exterior wall, not yet identified, was one of the objectives of the 1974 season. The extensive Islamic deposits in this area precluded the achievement of this objective.

In 1973 portions of an Islamic bath complex were uncovered in Squares A.7 and A.8 (partially excavated). Additional features of this complex were exposed in 1974 in A.8. A large Islamic baking facility (*ṭabun*), pre-dating the bath complex was partially uncovered in 1973 in A.7. This was fully excavated in 1974. On the western edge of the acropolis west of A.7, Square A.9 was opened in 1974 and yielded further evidence of extensive Islamic facilities associated with the bath complex. In 1971 some puzzlingly small openings to subterranean chambers were found in A.5. These also were investigated further in 1974.

Square A.8

In 1973 a portion (4 × 2 m.) of Square A.8 was excavated in order to expose the south wall of the Islamic bath installation identified in A.7.[1] In addition to the south wall (A.8:2) of the bathing room, an east-west hallway with a doorway in its south wall was exposed. The presence of this doorway suggested the existence of additional features of the bath complex in A.8 to the south. During the latter half of the 1974 season these features were

[1] B. Van Elderen, "Heshbon 1973: Area A," *AUSS* 13 (1975): 117-20.

exposed as the remainder of A.8 was excavated.

After the removal of surface debris and a considerable number of fallen building blocks and miscellaneous stones on the ground surface, walls began to appear which could be correlated with walls and rooms of the bath complex uncovered in 1973 (see Fig. 2). An additional room and hallway of the bath complex were identified (see Pl. II:A). All the loci excavated in A.8 dated in the Ayyūbid/Mamlūk period and this confirmed the use date for the bath installation that was determined in the 1973 season.

The doorway (A.8:6) in the south wall of the hallway uncovered in 1973 led into a rectangular room (3.50 × 2.00 m.) which functioned as an anteroom or lounge in the bath complex. This room was bounded by Walls A.8:17 on the south, A.8:4 on the east, A.8:5 on the north, and A.8:16 on the west. In the south wall of this room was a doorway leading into a hallway formed by Walls A.8:17 and A.8:19.

The floor of the room was raised about 0.50 m. above the floors in the hallways on the north and south sides. However, there was an aisle 1.25 m. wide between the doorways in the north and south walls. The floor (A.8:25) of this aisle was the same level as the floors of the adjoining hallways but sloped downward slightly to the south to compensate for a variation in level in the two hallways. The floor was paving of large rectangular slabs. On both sides of the aisle were retaining walls (A.8:22 and A.8:23) supporting the possibly raised floors on both sides of the aisle. The larger raised sector or platform on the east measured 1.50 × 2.00 m. A considerable portion of the plaster surface on this platform was preserved, and also its connections with the surrounding walls. In the face of the retaining wall (A.8:22) east of the aisle were three triangular-shaped slots approximately 0.35 m. wide at the base and 0.30 m. deep. Apparently these were storage places for personal belongings of those using the bath. The platform along the west wall of the room was smaller, 0.75 × 2.00 m., and its retaining wall had no slots. A sizeable portion of the plastered surface face of this platform was also preserved.

These features—raised platforms, plastered surfaces, storage receptacles—suggested that this rectangular room served as a kind of lounge for the users of the bath. Possibly pads and cushions were placed on the platforms. The bathing room was separated from the lounge by a hallway running 2.25 m. east-west between the two rooms. The entrances to the rooms were on opposite sides and at opposite ends of this hallway. This arrangement obviated a direct draft from the lounge into the bathing room and it also made it impossible to see directly into one room from the other.

The doorway through the south wall of the lounge led into another hallway running 3.80 m. east-west along the south side. The floor (A.8:20) of this hallway was paving of large rectangular stone blocks. At the east end of the hallway a doorway (A.8:18) was identified with threshold and doorstops *in situ*. The south wall (A.8:19) of this hallway was rather crudely constructed and varied in width from 0.70 m. to 0.95 m. The space between Wall A.8:19 and the south balk was 1.00 m. wide and was excavated only to the level of the floor of the hallway. In the southwest corner of this sector a layer of stones was found (Surface A.8:26), but the limited space for operations made it impossible to identify precisely. The determination of the nature of this feature must await the excavation of the next Square to the south.

The entire bath complex was bounded on the west by a wall running north-south through Squares A.7 and 8. There were no openings found in this wall of the bath complex, thus implying that there was no access to the bath from the rooms on the west in Square A.9 (described below). Since the lounge was about 1.00 m. longer east-west than the bathing room and the adjacent hallway, its Wall A.8:16 formed a corner with Wall A.8:5 in the northwest sector of the Square.

Outside the bath in the corner formed by Wall A.8:3 (the west wall of the hallway and bathing room) and Wall A.8:15, another installation was uncovered (A.8:27). The floor was tiled (just as in the bathing room). There were two upright stone slabs (0.60 m. high) with a small slab standing upright between them on the

south, leaving the north end open. Between the slabs, but slightly off center, was a small hole (0.035 m. in diameter) connected with a stone-covered drain channel running in front of the open end. The purpose of this installation could not yet be ascertained when the 1974 season ended. It appeared to be some type of water installation (washing facility?). Its location near a large doorway visible in the north balk of Square A.8 suggested that it may have been used by people as they entered through this doorway into some type of assembly room. The determination of its possible relationship to the room to the west must await further work.

Square A.9

Square A.9, located directly west of A.7, was opened at the beginning of the 1974 season. Its size, like that of all the Squares in Area A, was 8.00 m. north-south and 6.00 m. east-west.

After the removal of the ground surface debris and top soil, various wall lines began to appear. A major north-south wall (A.9:5) averaging 1.15 m. wide extended from the south balk to Wall A.9:12 which was parallel to and near the north balk. As with the wall forming the west side of the bath complex, this wall had no openings or doorways. Excavation exposed an approximately 3.40 m. surviving height of both faces of this wall. Surfaces identified with this and the rooms formed by it and adjacent walls dated from the Ayyūbid/Mamlūk period.

A short wall (A.9:11) with a doorway was found between Wall A.9:5 and the east balk. With a wall visible in the south balk and a wall partially exposed in the east balk, these walls in Square A.9 formed a small room in the southeast sector of the Square. Similarly, a room was formed in the northwest sector of the Square, bounded on the north by Wall A.9:12. Some of the plaster was found on the wall faces of both these rooms.

On the west side of Wall A.9:5 another north-south wall ran approximately parallel to Wall A.9:5 and formed a passageway between the two walls approximately 1.00 m. wide. Between Wall

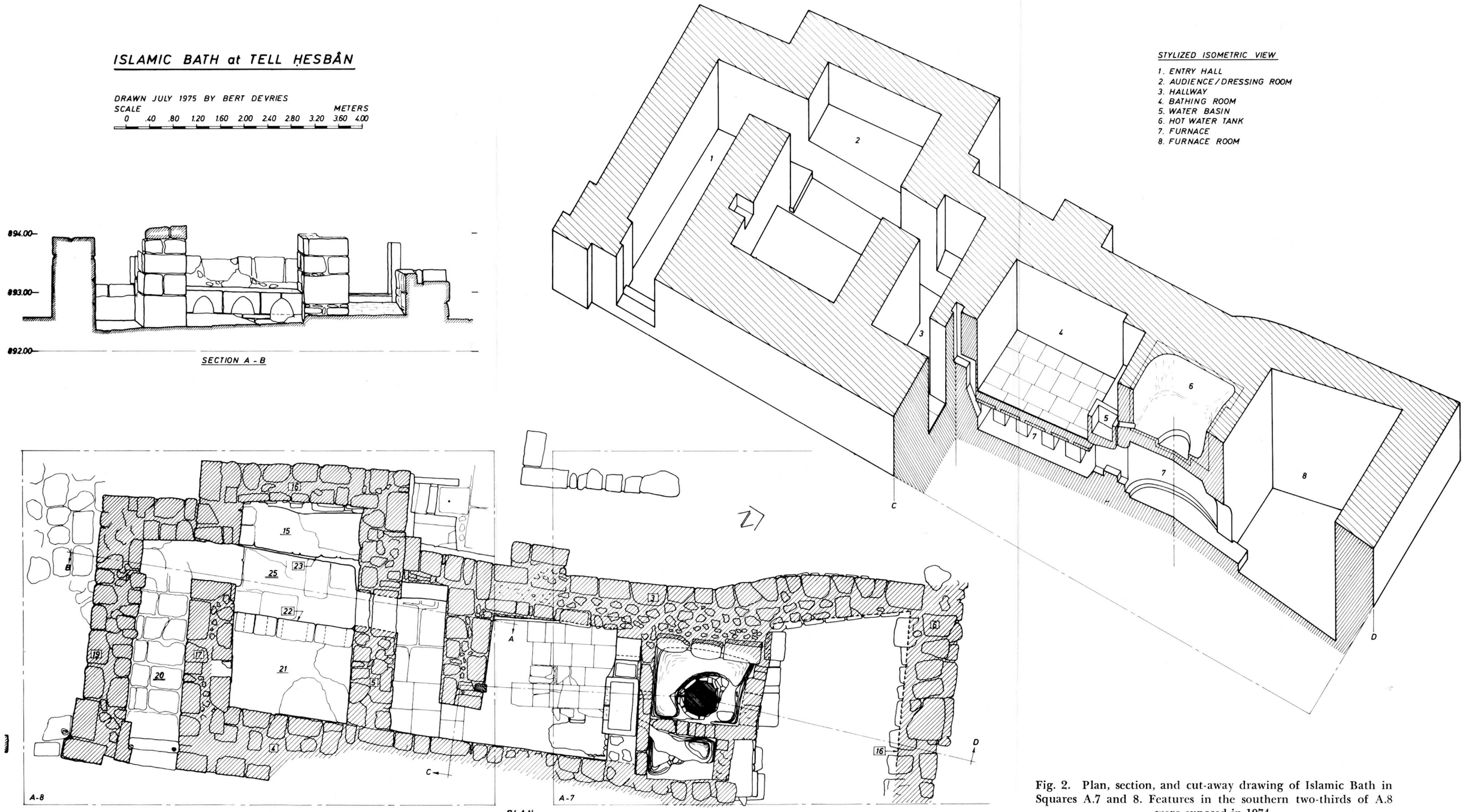


Fig. 2. Plan, section, and cut-away drawing of Islamic Bath in Squares A.7 and 8. Features in the southern two-thirds of A.8 were exposed in 1974.

A.9:3 and the west balk along and partly in the south balk, Wall A.9:2 with its doorway was exposed. Wall A.9:4 lay between Wall A.9:3 and the west balk about 2.00 m. north of Wall A.9:2. This complex of walls formed a room in the southwest sector of the Square. A number of surfaces were identified at various levels to a depth of 3.40 m. in this room—all dating from the Ayyūbid/Mamlūk period.

Between Wall A.9:4 and Wall A.9:12 was a construction with a vaulted roof of worked stone (A.9:29). The springers for the vault rested on an outer course of Wall A.9:12 and on an earlier wall (A.9:33) under Wall A.9:4. When the space east of the vaulted roof was cleared a crude wall set against the end of the vaulted roof was exposed and removed. A section cut inside the vault was removed, and the latest sherds in the layers identified (A.9:60, 61, 62) dated from the Ayyūbid/Mamlūk period. It was not possible in the 1974 season to clear the vaulted area to its occupation floor level.

As Walls A.9:4 and A.9:11 were being exposed, it was observed that both had been built upon an earlier major wall (A.9:33). Wall A.9:5 had been built over and around this wall. The stone blocks in the earlier wall were well dressed and tightly fitted together—a striking contrast to the later walls made of undressed stones. This wall ran from the west balk across the Square and continued in Square A.7 as Wall A.7:47. Its width was 1.41 m. This wall had a small jutting pier in Square A.9 near the west balk (a similar pier was found in Square A.7). In 1973 this wall was dated Late Roman on the basis of evidence from connecting surfaces and in its foundation trench in Square A.7.

During the last week of the 1974 season a circular cooking installation (A.9:81) was uncovered in the southeast room. This installation as well as the loci covering it (A.9:77-79) dated from the Ayyūbid/Mamlūk period. In the northeast room the lowest two surfaces removed (A.9:85 and 86) contained predominantly Umayyad pottery (but possibly some sherds from later periods). In the southwest room the lowest five surfaces removed during the season

(A.9:70, 76, 80, 82, 84) were dated to the Ayyūbid/Mamlūk period.

All the loci in Square A.9 were dated to the Ayyūbid/Mamlūk period with possibly some earlier Islamic material in Loci A.9:85 and 86 in the northeast room. This Mamlūk dating was supported by two coins found in these loci which date from the 14th century (Object no. 1735—An-Nāṣir Muḥammad [1293-1341] and Object no. 1924—An-Nāṣir Ḥasan [1347-1361]). In the southwest room a coin of Justinian I (527-565) was found in Surface A.9:76—a hard packed white plaster surface which contained 'Abbāsid and Umayyad sherds with possibly some Ayyūbid/Mamlūk.

It appears that Islamic accumulations stood to a greater surviving depth in Square A.9 than in A.7, a question remaining to be resolved by further excavation in A.9.

Square A.7

The major installation in Square A.7 identified in 1973 was the Islamic bath. At the end of the 1973 season a *ṭabun* (A.7:73) was found in the sector north of the bath and extended partially into the east balk. Since it was only partially exposed in 1973, the *ṭabun* and the related layers were cleared to bedrock during the first part of the 1974 season (see Pl. II:B).

The removal of the destruction layer (A.7:82) in the *ṭabun*, consisting of roof tiles, brick fragments, tesserae, rocks, ash, soil and some charcoal, exposed an ash-layer (A.7:86) directly above the base of the *ṭabun*. The base was a layer of roof tiles, stones, and floor tiles laid in an irregular pattern. The latest pottery in A.7:82 was Umayyad, while the small amount of pottery (all body sherds) in A.7:86 contained nothing later than Umayyad.

The upper courses of the north-south wall (A.7:46) along the west side of the *ṭabun* were removed, and this exposed a curious channel (A.7:103) sloping down eastward to the *ṭabun* and fitted into the ceramic rim at the bottom. The purpose and function of this channel are unclear—possibly it served as a fuel feeder or flue but its opening in Wall A.7:46 with an "elbow" arrangement

would not allow a strong draft. Perhaps this arrangement could catch a back draft. Part of the fill material between the ceramic rim of the *ṭabun* and the edge of its foundation pit was removed. Pottery evidence here indicated an Umayyad date for the *ṭabun* construction.

Installation A.7:73 has been interpreted as some type of baking oven, *ṭabun,* or kiln. Its size is rather large–2.05 m. diameter for the foundation pit and 1.39 m. diameter for the inner ceramic rim; however, such a large baking installation is not unparalleled.

West of the location of the *ṭabun* a room was identified in 1973 formed by Walls A.7:46 on the east, A.7:47 on the south, and A.7:57 on the north. Wall A.7:57 was constructed of well-dressed stones closely fitted together–similar to Wall A.7:47 described above (= Wall A.9:33). In 1973 the foundation trenches of these walls were identified. These trenches cut through a hard *huwwar* surface (A.7:80) and were dated to the Late Roman period. Surface A.7:80 was removed in 1974 and dated in the Early Roman period. Under this surface an east-west wall (A.7:89) was found. This wall was 1.00 m. wide and extended from the west balk to the foundation trench of Wall A.7:46. Two surfaces were identified north of this wall–a dirt layer (A.7:88) and a thin irregular plaster layer (A.7:90). These loci contained predominantly Early Roman pottery with none clearly later.

The tile floor of the bathing room of the Islamic bath installation was extensively vandalized after the 1973 season. In a small sector along the south balk the material below this floor was removed. This consisted of a soil layer (A.7:85), a layer of medium-sized stones (A.7:87–the bottom of the heating passage under the bathing room floor), another dirt layer (A.7:91), and a hard packed earth surface (A.7:92). Loci 85, 87, and 91 were dated to the Ayyūbid/Mamlūk period, whereas the material directly on A.7:92 was dated in the ʿAbbāsid period. Further work in this small space was not possible because lying on Surface A.7:92 was a section of a pillar–presumably lying where it fell.

Square A.5

In 1974 work in Square A.5 was done in two sectors—the portion along the west balk and the cistern in the southeast sector. The balk between Squares A.5 and 7 had been extensively removed in 1973 in order to expose the entire circumference of the *ṭabun*. In 1973 it was observed that construction of the *ṭabun* had cut through a mosaic floor in an anteroom of the Byzantine church identified in Area A. Traces of this mosaic floor were found in a perimeter around the *ṭabun*. Unfortunately, between the 1973 and 1974 seasons most of this mosaic floor was damaged by vandalism. However, in 1974 it was possible to examine closely the underlayment and foundation of this mosaic along the west balk of Square A.5.

The construction features of this mosaic were identical to those of the portions of mosaic pavement uncovered in Square A.6.[2] Such floors were constructed of a layer of small stones (A.5:76), over which a fill of brown clay was laid around the stones (A.5:74) into which the tesserae of the Mosaic A.5:73 were set. In the earth layer (A.5:77) below the foundation stones layer (A.5:76) of Mosaic A.5:73 there was found a coin (Object no. 1701) of Theodosius I (A.D. 378-395). The potsherds in this layer dated predominantly Late Roman, with some possible Early Byzantine sherds. In the corresponding layer in Square A.7 (A.7:97) was found a coin (Object no. 1702) of Maximian (A.D. 296-305). The pottery comprised Early Byzantine and predominantly Late Roman sherds.

A portion of the *ṭabun* extended into Square A.5. To avoid collapse of the *ṭabun*, only a portion of the fill between the inner ceramic rim and the outer foundation wall was excavated. This fill (A.5:81) contained Umayyad sherds, and the analysis of two soil samples identified seeds of wheat, barley, lentil, olive, and vetch. Some *ṭabun* fragments in the fill indicate that the *ṭabun* had been relined during the course of its use.

Along the east side of the *ṭabun* was a wall (A.5:82) with re-

[2] Van Elderen, "Heshbon 1973: Area A," p. 125.

lated installations (A.5:72 and 83) which had been cut through the mosaic floor and its underlayment. An earlier wall (A.5:85), upon which Wall A.5:82 had been built, was dated to the Early Byzantine period. In turn, Wall A.5:85 rested on Wall A.5:88, a row of stones set on bedrock. The sherds were dated consistently to the Early Byzantine, Late Roman, and Early Roman periods. The same dating sequence was found in the earth layer (A.5:77) below the mosaic floor.

These investigations when correlated with the data from Square A.7 provided the following sequence of occupation in these squares:

Early Roman surfaces (A.7:80, 88, 90)
Late Roman walls (A.7:46, 47, 57)
Early Byzantine walls and surfaces (A.5:77, 85, 88)
Late Byzantine mosaic (A.5:73)
Umayyad *ṭabun* (A.7:73)
Ayyūbid/Mamlūk bath complex

In 1971 small openings in the bedrock (A.5:61 and 62) were uncovered and a limited amount of excavation done in the chambers below. In 1974 these underground sectors were excavated extensively, although the work was impeded by small entrances (about 0.33 m. in diameter) and the limited working space below (see Fig. 3). Entrance A.5:61 was partly covered by east-west Wall A.5:10, whereas Entrance A.5:62 was just north of this wall. South of this wall near the west balk, removal of debris and soil Layer A.5:80 exposed a third opening (A.5:79) to underground chambers. Locus A.5:80 was dated to the Early Roman period and post-dated the use of the underground facilities since this layer sealed over Entrance A.5:79.

The underground chambers were only 2.00 m. deep. No clear stratification was discernible in the debris below the entrances (A.5:61, 62, 79). All spaces were connected by cut arched passageways. Later in the season a fourth opening (A.5:90) was found near the east balk, east of Wall A.5:11 and north of Wall A.5:51. This appears to have been cut by the quarrying which

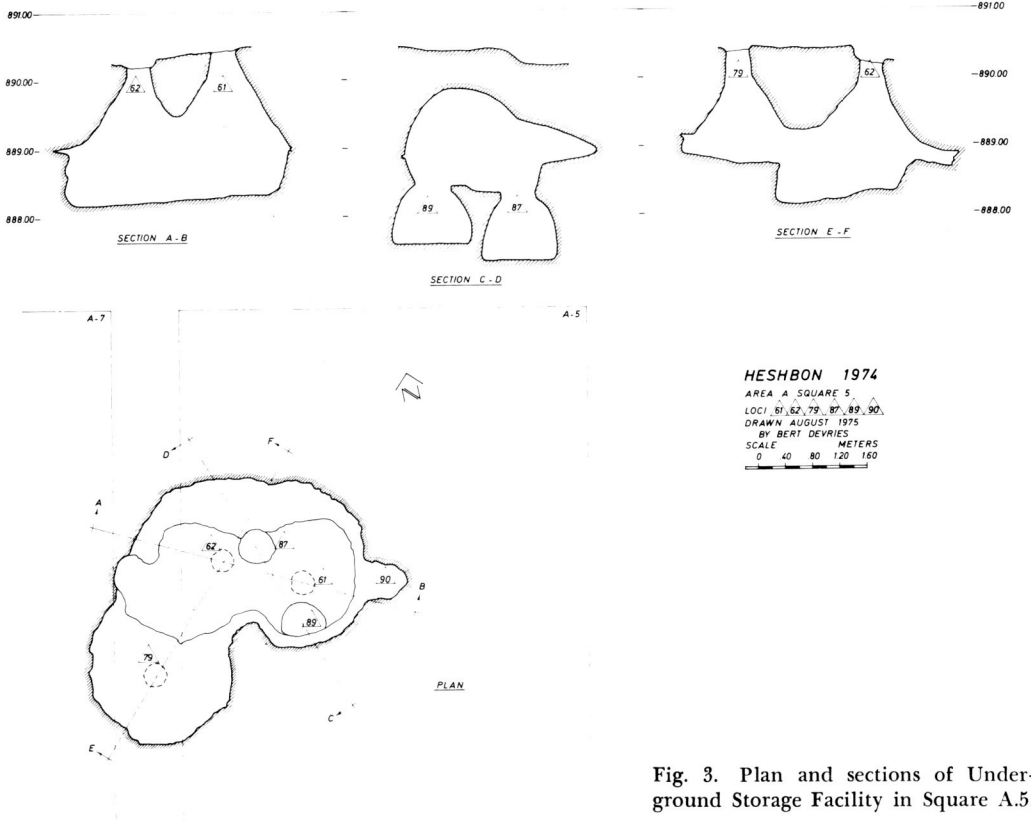


Fig. 3. Plan and sections of Underground Storage Facility in Square A.5.

was evident to the east. The space below this opening lay east of A.5:61 and was connected to it by a cut arched passage.

Two shallow pits (A.5:87 and 89) were found in the floor northwest and south of Entrance A.5:61 respectively. Their sides were too porous to hold any liquid. The underground complex consisted of three (and possibly four) circular spaces under Entrances A.5, 61, 62, and 79, each approximately 3.50 m. in diameter. The space under A.5:79 lies southwest of and overlaps slightly with the space under A.5:62 and the space under A.5:61 lies east of and overlaps slightly with the space under A.5:62.

The latest pottery found in all the loci in these underground spaces was from the Early Roman period. Since the walls of the pits, cavities, and chambers were very porous and there was no evidence of plastering, it seemed that these spaces could not have been used for the storage of liquids. As no evidence was found in the soil of any particles of grain, straw, or other organic substances, storage must have been in jars. The small openings, as described above, may have been intended to prevent dirt from falling in and to keep the temperature cool. A possible parallel to this type of storage facility with small entrances (averaging about 26 inches in diameter) was found at Gibeon. The chambers at Gibeon served as storage areas for wine kept in large jars which were stacked in tiers. The fairly consistent temperature in the underground spaces was ideal for the storage of wine. The chambers at Gibeon were dated to the Iron Age.[3]

However, the dates of the material removed from these underground chambers at Tell Ḥesbân has been consistently Early Roman. Some Hellenistic material came from the bottom layers under Entrance A.5:62. Furthermore, few traces of storage jars were found in these chambers. If these chambers were used for wine storage in the Iron Age, the area must have been cleaned out completely after that or later periods of its use and filled with a continuous sequence of debris during the Early Roman period.

[3] James Pritchard, *Gibeon, Where the Sun Stood Still* (Princeton, 1962), pp. 79-99.

In any case, the parallel with Gibeon must remain inconclusive at present.

Summary

The 1974 season in Area A provided further elucidation of the occupation of the acropolis, especially in the Islamic periods. No new light was thrown on the Byzantine period; the western end of the church was not identified. The gradual accumulation of evidence of the Roman occupation raised the question regarding the architecture on the acropolis in both Early and Late Roman periods. The well-constructed Late Roman wall identified in Squares A.7 and 9 suggested a major building of impressive construction. A platform and remains of a stylobate wall in Square A.6 (excavated in 1973) appeared to be part of the same Roman building. These Roman remains were set on bedrock on the acropolis. Sherds from earlier periods were found on and around the acropolis. It seemed probable that the Romans removed all prior structures on the acropolis so that they could build directly on bedrock. As more evidence of earlier occupations was identified on the *tell*, this denuding of the acropolis by the Romans seemed more plausible.

Other questions remained to be answered in a future season's work. Squares to the south and west of sectors excavated in 1974 could be opened to clarify the extent and nature of the Islamic occupation of the acropolis. If this Islamic occupation can be cleared one might identify the western end of the Byzantine church and ascertain more fully the nature of the Roman architecture on the acropolis. The history of Islamic, Byzantine, and Roman occupation is thus being elucidated by these excavations on the acropolis.

AREA B AND SQUARE D.4

JAMES A. SAUER
American Center of Oriental Research
Amman, Jordan

In 1974, work in Area B was carried out in Squares B.1, B.2, B.3, B.4, and D.4, Squares which had been opened during earlier seasons,[1] as well as in Square B.7, a large new Square which was laid out to the north of B.2 and B.3.[2] Squares B.5 and B.6, small probes which had been opened in 1973, were not continued in 1974. Squares B.2, B.4, B.7 and D.4 were worked simultaneously throughout the 1974 season, while Squares B.1 and B.3 were each worked for only one to two weeks. In Square B.1, the work consisted only of balk trimming in the 3.75 m. north extension of the Square, to uncover new architecture which the winter rains had partially exposed in the east and the west balks. Since the rains had also exposed an articulated human skeleton in the north balk of Square D.4, part of that balk was also taken down stratigraphically. Otherwise, the other Area B balks were not removed during the 1974 season. The Area B dump continued to be located to the southeast of Square D.4.

Ayyūbid/Mamlūk Strata 2-3 (ca. A.D. 1200-1456)

Description (Stratification):[3] Additional remains of Ayyūbid/Mamlūk Strata 2-3 were attested in Area B (B.7, D.4) in 1974.

[1] For the results of the 1968, 1971, and 1973 seasons, cf. D. M. Beegle, "Heshbon 1968: Area B," *AUSS* 7 (1969): 118-126; E. N. Lugenbeal and J. A. Sauer, "Seventh-Sixth Century B.C. Pottery from Area B at Heshbon," *AUSS* 10 (1972): 21-69; J. A. Sauer, "Heshbon 1971: Area B," *AUSS* 11 (1973): 35-71; J. A. Sauer, "Heshbon 1973: Area B and Square D.4," *AUSS* 13 (1975): 135-169. The present report assumes complete familiarity with the above reports, especially with the descriptions and interpretations of "Heshbon 1971: Area B" and "Heshbon 1973: Area B and Square D.4."

[2] Cf. Fig. 1. The irregular shape of Square B.7 (8.00 x 6.00 x 8.21 x 7.78 m.), like the irregular shapes of Squares B.3 and D.4, was caused by the need to align the balks of the Square with the main north-south axis of Area D.

[3] Pre-excavation cleanup in Area B consisted of Loci B.2:117, 123, B.3:88,

Square B.7 was located on a fairly level shelf at the base of the acropolis, but the Stratum 2 ground surface soil (B.7:1, 2, 3) in the Square still sloped down gradually towards the south and the west. The layer of soft black soil (ca. 0.30 m. thick) had a number of large (ca. 0.50 m.) boulders resting in it, and it sealed against Ayyūbid/Mamlūk Wall B.7:6 in the southern portion of the Square.

Wall B.7:6 ran east-west through the southern portion of B.7, where it was the continuation of Wall D.4:6, which appeared in the north balk of D.4 in 1973. The wall was visible in the unexcavated ground surface soil, running ca. 4.00 m. to the west of B.7, and it joined another wall there which ran north-south up the slope of the acropolis. Wall B.7:6 was constructed of large (ca. 0.50 m.) boulders, and while it was two rows wide (ca. 1.15 m.),[4] it had a preserved height of only one course. There were no use surfaces preserved against the wall, but its shallow foundation trench (B.7:7, 9) cut down into the B.7:5 plaster layer of Early Byzantine Stratum 5.

In northern B.7, two large, intersecting Ayyūbid/Mamlūk pits (B.7:4, 10),[5] beneath the Stratum 2 ground surface soil, cut down deeply into Early Byzantine Strata 5 and 6.

Pit B.7:4, equaling Pit D.2:16=D.3:9 of 1968, was located in the northeast portion of the Square. It ran ca. 4.00 m. along the

B.4:199, 200, 201, 206, and D.4:39, 52, 54, 55. These loci produced the following bones:

Sheep/Goat	56	Large Mammal	2	Chicken	1
Cattle	3	Dog	1	U.D.	5
Camel	1				

The cleanup loci also produced one registered artifact, a stone loomweight from Locus B.2:123 (Object 1932).

[4] Locus B.7:8 was the Ayyūbid/Mamlūk soil between the two courses of Wall B.7:6.

[5] Although it would not be impossible for Pit B.7:4 and Pit B.7:10 to have been one large interconnected pit or robber trench, there was a difference between them in shape and in soil, and possibly also in artifacts, which would argue for keeping them separate (as excavated).

north balk, and it extended irregularly ca. 0.50–2.00 m. south into the Square. The pit was ca. 1.50 m. deep, and it contained gray-brown soil and small rocks. Undercutting sharply to the south,[6] the B.7:4 pit cut through the B.7:5, 14 layers of Early Byzantine Stratum 5, as well as the B.7:17 rock tumble layer of Early Byzantine Stratum 6. Beneath the B.7:4 Ayyūbid/Mamlūk pit was the B.7:12 plaster layer (unexcavated), apparently of Early Byzantine Stratum 7.

Pit B.7:10 was located in the northwest portion of the Square, and it ran ca. 4.00 m. along the north balk, to intersect with Ayyūbid/Mamlūk Pit B.7:4. Somewhat circular in shape, Pit B.7:10 extended ca. 3.00-4.00 m. south into the Square, and it was ca. 1.25 m. deep (partially excavated). The pit contained loose brown soil, and, like Pit B.7:4, it cut through the B.7:5, 14 layers of Early Byzantine Stratum 5, and the B.7:17 rock tumble layer of Early Byzantine Stratum 6.

In the north balk of D.4, the D.4:1 Stratum 2 ground surface soil and the D.4:6 Ayyūbid/Mamlūk wall covered over the D.4:7, 8 Ayyūbid/Mamlūk pit (equaling Pit D.3:14 of 1968), which contained an articulated human skeleton. The adult skeleton, positioned east-west with its head to the west, was laid out on its back, with its head facing south and its hands resting folded across the hips. The pit, partially excavated in D.4 in 1973,[7] cut through Pit D.4:9, 11 of Early Byzantine Stratum 4, plaster Layer D.4:3 of Early Byzantine Stratum 5, rock tumble Layer D.4:4 of Early Byzantine Stratum 6, and the plaster and soil layers of Early Byzantine Stratum 7.

In the southeast portion of D.4, the D.4:2, 13 Ayyūbid/Mamlūk structure, with its D.4:17, 10 foundation trenches, cut down into the Early Byzantine-Early Roman remains of Strata

[6] Locus B.7:11 was a vertical trimming of the undercut south edge of Pit B.7:4, to prevent the collapse of the overhanging B.7:5, 14 and B.7:17 layers of Early Byzantine Strata 5 and 6.

[7] In 1973, Pit D.4:7, 8 was assigned to the 'Abbāsid period (ca. A.D. 750-878), but in 1974, several Ayyūbid/Mamlūk sherds came from the pit.

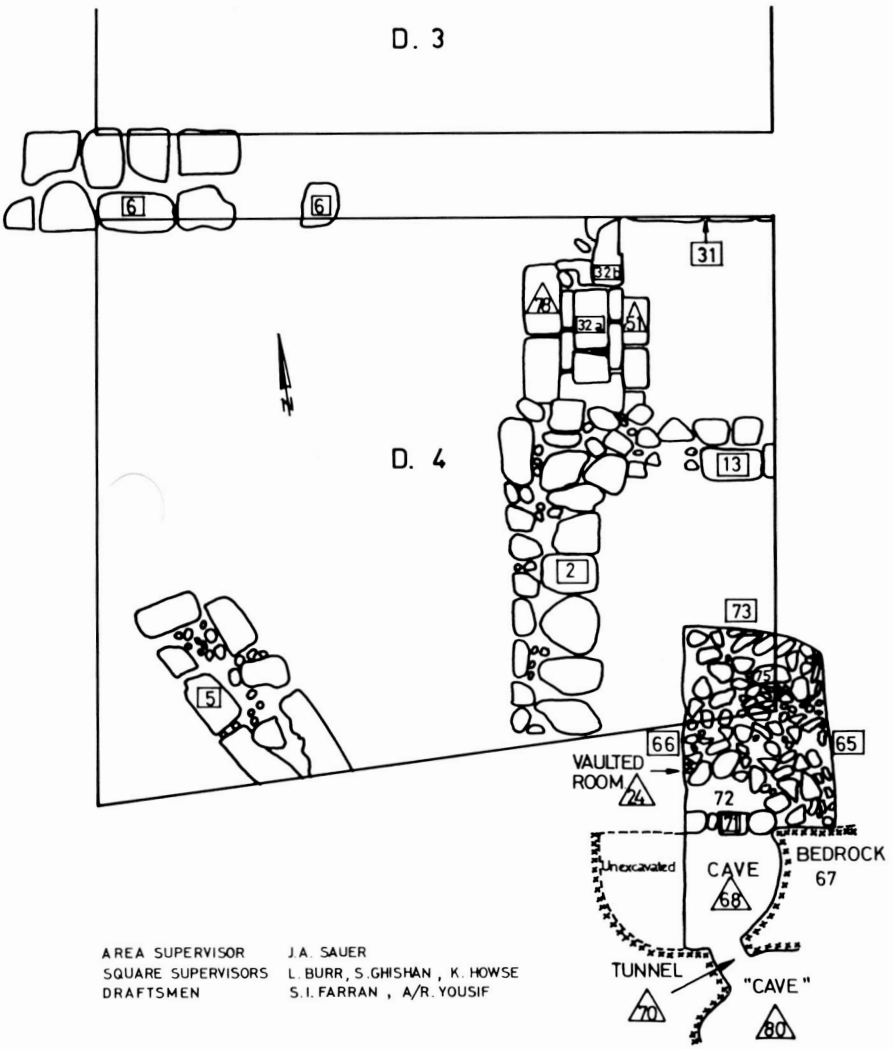


Fig. 4. Composite plan of Square D.4.

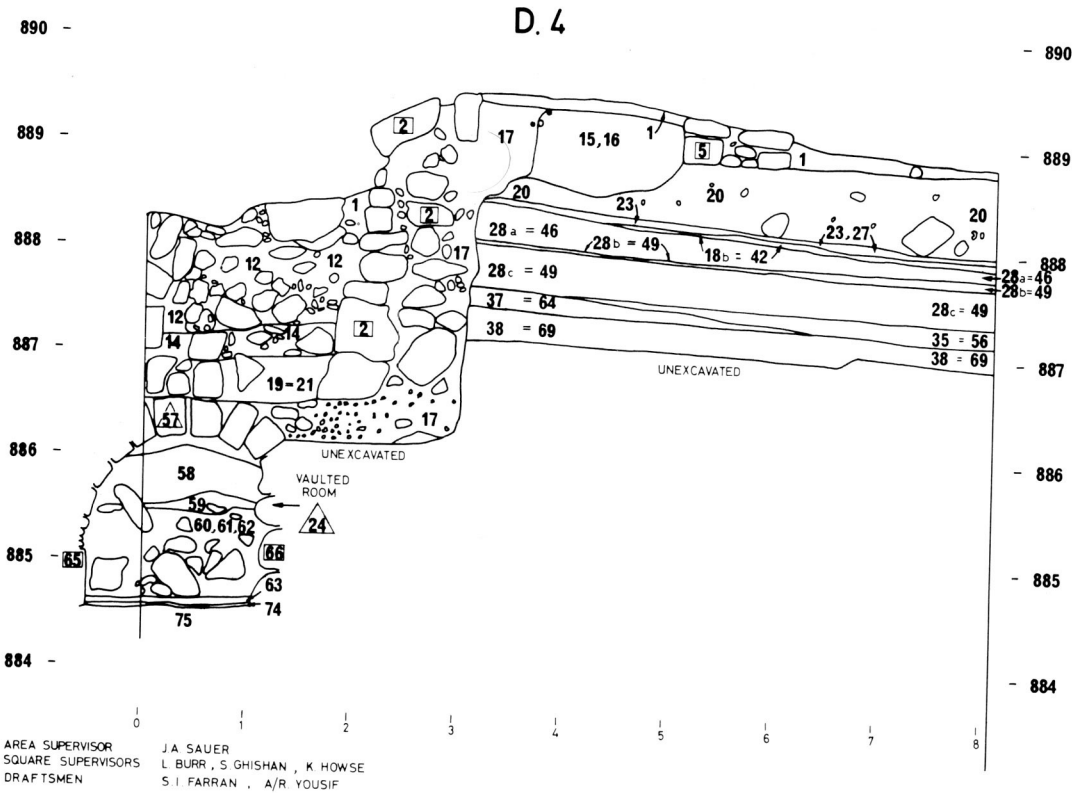


Fig. 5. Section of south balk of Square D.4.

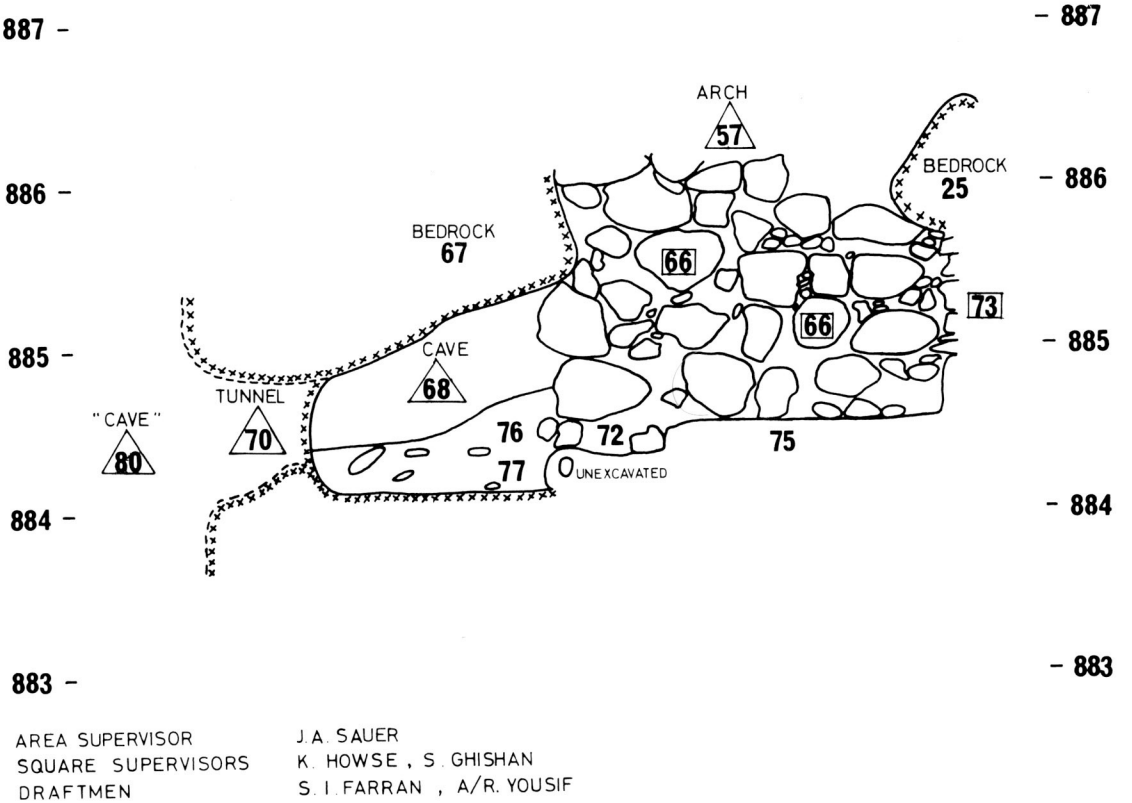


Fig. 6. North-south section through vaulted Room D.4:24 (Arch D.4:57 and Wall D.4:66), Cave D.4:68, Tunnel D.4:70, and "Cave" D.4:80.

6-12.[8] Partially excavated in 1973, the interior of the structure had a cracked bedrock floor (D.4:25, 26), with a small vaulted room (D.4:24) built against it (and at the same level) to the south.

The D.4:24 vaulted room was constructed in the ca. 2.10 m. north-south space between two bedrock blocks, Bedrock D.4:25 to the north, and Bedrock D.4:67 to the south (outside the Square). Two north-south walls (D.4:65, 66), constructed of medium-sized (ca. 0.25-0.40 m.) unworked stones, formed the east (D.4:65) and the west (D.4:66) sides of the ca. 1.60 m. wide room. The north side was formed by the edge of Bedrock D.4:25, supported underneath by another wall constructed of unworked stones (east-west Wall D.4:73). The south side was formed by the edge of Bedrock D.4:67, which had an opening, partially blocked by another low wall (Wall D.4:71), into Cave D.4:68.

The D.4:57 arched roof of the vaulted room, constructed of ca. 0.25-0.40 m. squared stones, curved from east to west on top of Walls D.4:65 and D.4:66, to reach a combined height of ca. 1.50 m. On the north and south, the arch was built against Bedrock D.4:25 and Bedrock D.4:67. Two small openings in the arch, where several squared stones were missing, provided access to the vaulted room from above.

The D.4:24 vaulted room was almost completely filled with superimposed layers of Ayyūbid/Mamlūk soil (D.4:58), soil mixed with white organic material (D.4:59), and rock tumble (D.4:60, 61, 62), which rested on the fairly even, ca. .10 m. thick, compacted D.4:63 soil layer of Iron I Stratum 19. To the south, the low Wall D.4:71, which partially blocked the opening to Cave D.4:68, retained the D.4:61, 62 rock tumble layers, but its shallow D.4:72 foundation trench cut down into the D.4:63 layer of Iron I Stratum 19.

[8] Locus D.4:40 was a vertical trimming of the west edge of the D.4:17 Ayyūbid/Mamlūk foundation trench. In addition to bone evidence (Sheep/Goat 14; Cattle 3; U.D. 1), the locus produced two registered artifacts, a ring stone (Object 2007) and a mortar fragment (Object 1707).

Cave D.4:68 lay beneath Bedrock D.4:67, and its opening was partially blocked by Wall D.4:71. It was a semi-circular cave, ca. 1.50 wide north-south, ca. 2.50 m. wide east-west at its opening (extending west of Wall D.4:66, unexcavated), and ca. 0.75-1.25 m. high. The shallow cave was only partially filled with two Ayyūbid/Mamlūk layers of soil and small rocks (D.4:76, 77), which sloped down to the south from Wall D.4:71.

Leading off to the southeast from the back of Cave D.4:68 was a small (ca. 0.50 m. wide, ca. 0.70 m. long) rock-cut tunnel (D.4:70), which was blocked by a single large stone. The D.4:70 tunnel led to another opening in bedrock, which appeared to be another, larger cave to the south (D.4:80). A 1.00 m. probe inside "Cave" D.4:80 revealed collapsed bedrock blocks, air pockets, and soft brown Ayyūbid/Mamlūk soil (D.4:79).

Description (Bones): The Ayyūbid/Mamlūk loci produced the following bones in 1974:

Sheep/Goat	334	Gazelle	1	Small Mammal	1
Cattle	28	Large Mammal	36	Rodent	5
Horse	2	Pig	5	Chicken	22
Donkey	1	Dog	16	Human	7
Camel	4	Cat	1	U.D.	51

Description (Samples):[9] The analysis of samples taken from the Ayyūbid/Mamlūk loci produced the following results:

B.7:4 2 Common Wheat, 1 Lentil
B.7:8 2 Barley
B.7:10 Modern Cache of Wild Grass (Hordeun)

Description (Artifacts): The latest pottery from the above loci was Ayyūbid/Mamlūk. A single Mamlūk coin of An-Nāṣir Muḥammed (A.D. 1293-94, 1299-1309, 1310-41) came from Pit B.7:10 (Object 1741), and an Umayyad (A.D. 661-750) coin came from Locus D.4:62 in the D.4:24 vaulted room (Object 2057). In addition, the following registered artifacts came from the Ayyūbid/Mamlūk Loci:[10]

B.7:3	1759	Bronze Ring	D.4:59	1920	Bottle
B.7:4	1795	Shell	D.4:60	2084	Jar Lid
B.7:10	1745	Iron Nail	D.4:61	1925	Plough Point
B.7:10	1746	Iron Nail	D.4:61	1977	Metal Ring
B.7:10	1830	Iron Nail	D.4:62	2091	Spindle Whorl
B.7:10	1856	Iron Nail	D.4:62	2096	Iron Nail

[9] The samples included in this report were analyzed by Robert B. Stewart. Other samples were taken from controlled Loci in 1974, but these samples have not yet been fully reported.

[10] Only registered artifacts have been included in this report. Other artifacts, especially of glass, stone, and metal, were found and were saved, but were not registered as "objects."

Interpretation: Although the new numismatic evidence from Area B was still meager, it would seem possible, tentatively at least,[11] to phase the Ayyūbid/Mamlūk remains of Area B into two phases of Stratum 2 (Mamlūk), and one phase of Stratum 3 (Ayyūbid).

The large boulders resting in the ground surface soil of Stratum 2 could probably be interpreted as the earthquake-caused tumble from the collapse of Wall B.7:6=D.4:6 and other contemporary walls to the north, especially Wall D.1:4a in Area D. These walls, as well as Wall B.6:11 (and Wall D.4:5?), would seem to have been boundary walls, constructed for agricultural or pastoral purposes on the southern slopes of the acropolis. Since the boulders and the walls represented the latest Ayyūbid/Mamlūk occupational evidence in Area B (and Area D), they could probably be dated to the Late Mamlūk period of occupation at the site (ca. A.D. 1400-1456).

The D.4:2, 13 structure, including the D.4:24 vaulted room, the D.4:68 cave, the D.4:70 tunnel, and the D.4:80 "cave," could probably be dated, with the vaulted rooms of Area D (D.1:3, 5) and Area C ("North Building"), to the ca. A.D. 1260-1400 Early Mamlūk period (Stratum 2).[12] Iron I remains of Stratum 19 would have been reused when the D.4:24 vaulted room was constructed, and it cannot yet be determined when the D.4:68 cave, the D.4:70 tunnel, and the D.4:80 "cave" would originally have been cut into Bedrock D.4:67. The D.4:2, 13 structure, like the B.6:10 wall, could have been part of a domestic complex, and the D.4:24 vaulted room and its associated caves could have served as cellars. Some of the Area B Ayyūbid/Mamlūk pits could also be dated to the Early Mamlūk period

[11] It should be stressed that the phasing is tentative, and that it could be changed when additional numismatic evidence becomes available, or when the final ceramic analysis is completed.

[12] The A.D. 661-750 Umayyad coin from Locus D.4:62 inside the D.4:24 vaulted room must, on the basis of the clear Ayyūbid/Mamlūk ceramic evidence, be considered outside its original chronological context. The correlations referring to data in other Areas are based on field judgments about the architectural, ceramic, and numismatic evidence available at the conclusion of the excavation season.

(ca. A.D. 1260-1400), especially Pit B.7:10, which produced the A.D. 1293-1341 Mamlūk coin. Pit B.7:10 could either have cut through Pit B.7:4, or it could have robbed out additional Early Byzantine architecture to the west of Pit B.7:4.

Pit B.7:4 could probably be dated, with its D.2:16=D.3:9 extension across the balk into Area D, to the ca. A.D. 1200-1260 Ayyūbid period (Stratum 3). Since the very large pit cut off the plaster, soil, and rock tumble layers of Early Byzantine Strata 5-6, it could have been a robber trench which removed architectural remains (stairs?) from along the north side of those layers. Pit D.4:7, 8, which contained the articulated human skeleton, could probably be dated either to the Ayyūbid period (Stratum 3), or to the Early Mamlūk period (Stratum 2), and it could clearly be interpreted as a grave pit.

The five pig bones (from Loci B.7:3, D.4:7, and D.4:62) would contrast with the evidence from 1973, when no pig bones were attested from the Ayyūbid/Mamlūk loci.

'Abbāsid (ca. A.D. 750-878)

Description: No new 'Abbāsid remains were attested in Area B in 1974. In 1973, Pit D.4:7, 8 produced mixed pottery, the latest being 'Abbāsid, but in 1974 several Ayyūbid/Mamlūk sherds came from the pit.

Interpretations: Pit D.4:7, 8 should be dated to the Ayyūbid/Mamlūk, rather than to the 'Abbāsid period (cf. above).

Early Byzantine Strata 4-9 (ca. A.D. 324-410ff.?)

Description (Stratification): Additional remains of Early Byzantine Strata 5-9 were attested in Area B (B.7, D.4) in 1974.

In B.7, beneath the B.7:3 Ayyūbid/Mamlūk ground surface soil, cut into by the B.7:7, 9 foundation trench of Ayyūbid/Mamlūk Wall B.7:6, and cut through entirely along the north by the B.7:4 and B.7:10 Ayyūbid/Mamlūk pits, was the B.7:5 plaster layer (ca. 0.50-0.80 m. thick) of Early Byzantine Stratum 5. Although the layer was composed of five (or seven?) distinct thin (ca. 0.10-0.15

m.) plaster layers (B.7:5 A-E), in some places it was eroded into a single decomposed layer (B.7:13). Within the Square, the B.7:5 plaster layer sloped down gradually to the west, but it was essentially horizontal from north to south. Beneath the plaster layer was the B.7:14 soil layer (ca. 0.10-0.35 m. thick) of Stratum 5,[13] which covered over the B.7:17 rock tumble layer of Early Byzantine Stratum 6.

The B.7:17 rock tumble layer of Early Byzantine Stratum 6, exposed but not excavated, lay beneath the B.7:14 soil layer of Early Byzantine Stratum 5. The layer contained numerous medium and large sized (ca. 0.25-0.75 m.) rocks, and it was cut off along the north by the B.7:4 and B.7:10 Ayyūbid/Mamlūk pits. The layer sloped down gradually to the west, and it may have rested on top of plaster Layer B.7:12.

Plaster Layer B.7:12, exposed but not excavated, lay beneath the B.7:4 Ayyūbid/Mamlūk pit in the northeast corner of the Square, and it could possibly represent the plaster layer of Early Byzantine Stratum 7.

In D.4, the thin D.4:18B=42 plaster layer over the ca. 0.20-m.-thick D.4:28A=46 soil layer, both belonging to Early Byzantine Stratum 8, were cut through in the southeast portion of the Square by the D.4:17, 10 foundation trenches of the D.4:2, 13 Ayyūbid/Mamlūk structure, but elsewhere in the Square these Stratum 8 layers sloped down gradually from the east balk to the west balk.

Beneath the D.4:28A=46 soil layer of Early Byzantine Stratum 8 were the westward sloping D.4:28B=29=49 plaster layer and the D.4:28C=49, 30 soil layer of Early Byzantine Stratum 9, which were also cut off in the southeast portion of the Square by the D.4:17, 10 foundation trenches of the D.4:2, 13 Ayyūbid/Mamlūk structure. The D.4:28C=49, 30 soil layer of Stratum 9 covered over the D.4:34=53 Late Roman rock tumble from Wall D.4:32A, as well as part of the D.4:35=56 plaster layer of Late Roman Stratum 10, and in the northeast corner of the Square

[13] Loci B.7:15, 16 were cleanup loci beneath the B.7:5E plaster layer, and they probably equaled Locus B.7:14.

it also covered over Wall D.4:31 and the thin D.4:30A-D Late Roman plaster and soil layers.

Description (Bones): The Early Byzantine loci of Strata 5-9 produced the following bones in 1974:

Sheep/Goat	153	Large Mammal	5	Poss. Cat	1
Cattle	22	Pig	11	Chicken	16
Donkey	2	Dog	4	U.D.	12
Camel	1				

Description (Samples): The analysis of samples taken from the Early Byzantine Loci produced the following results:

B.7:5 1 Wheat

Description (Artifacts): The latest pottery from the above loci was Early Byzantine. No relevant coins were attested in 1974, but the following registered artifacts came from the Early Byzantine Loci:

B.7:14 2067 Bead D.4:49 1886 Decorated Fragment

Interpretation: The Strata 5, 7-9 plaster and soil layers could still be interpreted as roadway resurfacings. They were definitely attested from B.7 in the north to B.4 in the south, for a total width of ca. 19 m. Along the north, the Stratum 5 layers were cut off by the B.7:4, 10 Ayyūbid/Mamlūk pits, which could have removed architectural connections between the plaster layers and the Area D stairway. The layers would still seem to reflect the history of the two Roman roads which met at *Ḥesbân,* but in light of the new architectural evidence for a temple beneath the church in Area A, with which the two architectural "podiums" (B.1:154, 153) of Area B would agree (cf. below, *Late Roman, Early Roman*), it would now seem better to associate the layers with a temple on the acropolis of the site, rather than with a fort (suggested in 1971).[14] Because of the B.7:5A-E plaster layer of Stratum 5 was so thick (ca. 0.50-0.80 m.), it would be possible for Stratum 5 to have continued somewhat into the 5th century A.D., beyond ca. A.D. 400.[15] The Stratum 6 rock-tumble layer could still be interpreted in the context of the A.D. 365 earthquake.

[14] Cf. "Heshbon 1971: Area B," pp. 47-57. In addition to the archaeological evidence itself, it would make better historical sense for a temple to have preceded the church on the acropolis of the site (cf. F.-M. Abel, *Histoire de la Palestine* [Paris, 1952], II, pp. 315-317 ff.).

[15] The thin B.7:5A-E plaster layers of Stratum 5 were peeled off separately during excavation, but the layers produced no coins, and only small quantities of Early Byzantine pottery, mostly body sherds.

Late Roman Strata 10-11 (ca. A.D. 135-324)

Description (Stratification): Additional remains of Late Roman Strata 10-11 were attested in Area B (B.1, D.4) in 1974.

Wall D.4:32A, constructed of medium sized (ca. 0.25-0.60 m.) roughly squared stones on top of Wall D.4:32B, ran ca. 2.50 m. north-south into the Square from the north, ca. 1.75-2.50 m. from the east balk. Four courses of the wall were preserved above Wall D.4:32B, and at the level of the second course, three rectangular stones were laid end-to-end along the west face of the wall to form a kind of bench (D.4:78). To the south, Wall D.4:32A and "Bench" D.4:78 were cut off by the D.4:10 foundation trench of the D.4:13 Ayyūbid/Mamlūk wall, but the southernmost stones of Wall D.4:32A and "Bench" D.4:78 were left in position and were incorporated into Wall D.4:13.

In the western portion of D.4, the D.4:34=53 Late Roman rock tumble, beneath the D.4:28C=49 soil layer of Early Byzantine Stratum 9, sloped down to the west and the south from above and against the west face of Wall D.4:32A and "Bench" D.4:78. The rock tumble consisted of medium and large sized (ca. 0.25-0.70 m.) squared and unsquared stones, and while it was ca. 1.00 m. thick next to Wall D.4:32A and "Bench" D.4:78, it tapered out completely ca. 1.00-2.00 m. from the west and the south balks of the Square. The rock tumble rested on the D.4:35=56 and D.4:37=64 layers of Late Roman Stratum 10, and it was cut through to the southeast by the D.4:17, 10 foundation trenches of the D.4:2, 13 Ayyūbid/Mamlūk structure.

Beneath the D.4:34=53 Late Roman rock tumble, and also partially beneath the D.4:28C=49 soil layer of Early Byzantine Stratum 9, were the D.4:35=56 and D.4:37=64 layers of Late Roman Stratum 10. Layer D.4:35=56 was a plaster layer, ca. 0.15 m. thick in the west balk, which tapered out gradually to the east, but which continued beneath the D.4:34=53 rock tumble as a compact brown soil layer (D.4:37=64), which sealed against the lower part of "Bench" D.4:78. To the southeast, the D.4:37=64 layer was cut through by the D.4:17, 10

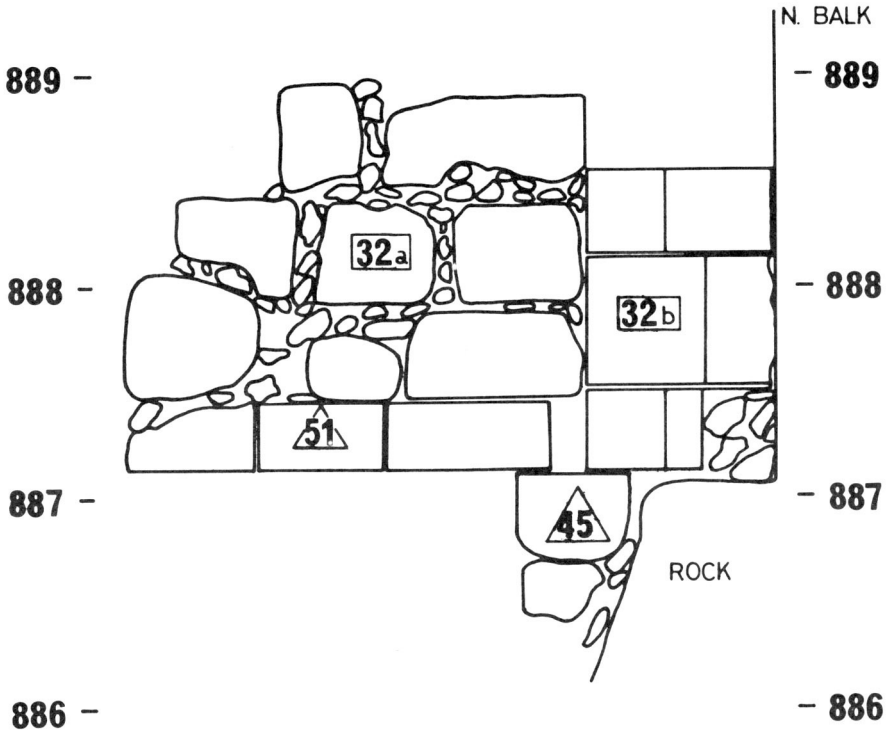


Fig. 7. East elevation of Wall D.4:32, showing Wall D.4:32a, Wall D.4:32b, Threshold D.4:45, and Threshold D.4:51.

foundation trenches of the D.4:2, 13 Ayyūbid/Mamlūk structure.

Beneath the D.4:35=56 and D.4:37=64 layers was the D.4:38=69 soil layer of Late Roman Stratum 10, which ran under "Bench" D.4:78 and sealed against the lower part of Wall D.4:32A. The D.4:38=69 soil layer covered over partially excavated bedrock blocks and a possible wall (Wall D.4:83) in the northwest corner of the Square, but beneath that Stratum 10 soil layer, the plaster layers of Late Roman Stratum 11 and Early Roman Stratum 12 were not attested in 1974.[16] In the southeast corner of the Square, the D.4:38=69 soil layer of Stratum 10 was cut through by the D.4:17, 10 foundation trenches of the D.4:2, 13 Ayyūbid/Mamlūk structure.

In the northeast corner of D.4, beneath the D.4:30 soil layer of Early Byzantine Stratum 9, were the thin D.4:30A-D Late Roman plaster and soil layers, which sealed against Wall D.4:32A on the west, and against Wall D.4:31 on the north. The D.4:30A-D plaster and soil layers, which were cut through to the south by the D.4:10 foundation trench of the D.4:13 Ayyūbid/Mamlūk wall, covered over the D.4:33 Early Roman layer.

In the 3.75 m. north extension of B.1, the B.1:154 and B.1:153 "podiums" of Early Roman Stratum 12 (cf. below), cut through by the B.1:10 installation of Early Byzantine Stratum 4, were sealed over by the B.1:12 soil layer of Late Roman Stratum 10, and were sealed against by the B.1:13A thin plaster layers of Late Roman Stratum 11.

Description (Bones): The Late Roman loci produced the following bones in 1974:

Sheep/Goat	77	Large Mammal	4	Chicken	1
Cattle	12	Pig	3	Shell	1
Poss. Horse	1	Poss. Dog	1	U.D.	16
Poss. Donkey	1				

Description (Artifacts): The latest pottery from the above loci was Late Roman. A 3d century A.D. coin (Object 2104) came from Locus B.1:12 of Late Roman Stratum 10, in the 3.75 m. north extension of B.1. In addition, the following registered artifacts came from the Late Roman loci:

D.4:64 1978 Ring Fragment D.4:64 2087 Bronze Bead

[16] The plaster layers of Strata 11-12 were not attested in the D.4:40 vertical

Interpretation: Wall D.4:32A (including "Bench" D.4:78) could still be interpreted as the eastern boundary of the Stratum 10 roadway, which led to the Late Roman stairway in Area D. Wall D.4:32A continued north into D.3 as Wall D.3:16, where it formed the eastern boundary of the D.3:39 Late Roman stairway.[17] The D.4:35=56 plaster layer of Stratum 10 also continued north into D.3, probably as plaster Layer D.3:44, which ran up to the lowest step of the D.3:39 stairway.[18] And, above the D.4:35=56 plaster layer, the D.4:34=53 Late Roman rock tumble layer could probably still be interpreted as the earthquake-caused collapse of Wall D.4:32A onto the Stratum 10 roadway.

Since the plaster layers of Strata 11 and 12 were not attested in western D.4 or in southwestern D.3, it could be suggested that they ran up to a north-south wall located in western D.4 (Wall D.4:83?) and western D.3 (Wall D.3:47?), or in the balk between B.3 and D.4. There could thus have been a major change in the Area B roadway system between Late Roman Stratum 10 and Late Roman Stratum 11. The two "podiums" in B.1 (B.1:154, 153), which were associated with the plaster layers of Strata 11 and 12, would argue for interpreting the Strata 5, 7-12 roadway layers in the context of the new architectural evidence for a temple on the acropolis of the site (cf. above, *Early Byzantine*; below, *Early Roman*).

In the northeast corner of D.4, outside the area of the Stratum 10 roadway, the D.4:30A-D Late Roman plaster and soil layers could have belonged either to Stratum 10 or to Stratum 11.

The 3d century A.D. coin from Locus B.1:12 would agree with the ca. A.D. 135-324 date which was suggested in 1971 for Late Roman Strata 10 and 11.

trimming of the D.4:17 foundation trench (cf. above, n. 8), nor were they attested in the southwest corner of D.3 in 1973 (cf. Geraty, "Heshbon 1973: Area D," pp. 196-199).

[17] Cf. Geraty, "Heshbon 1973: Area D," pp. 198-199.

[18] Ibid.

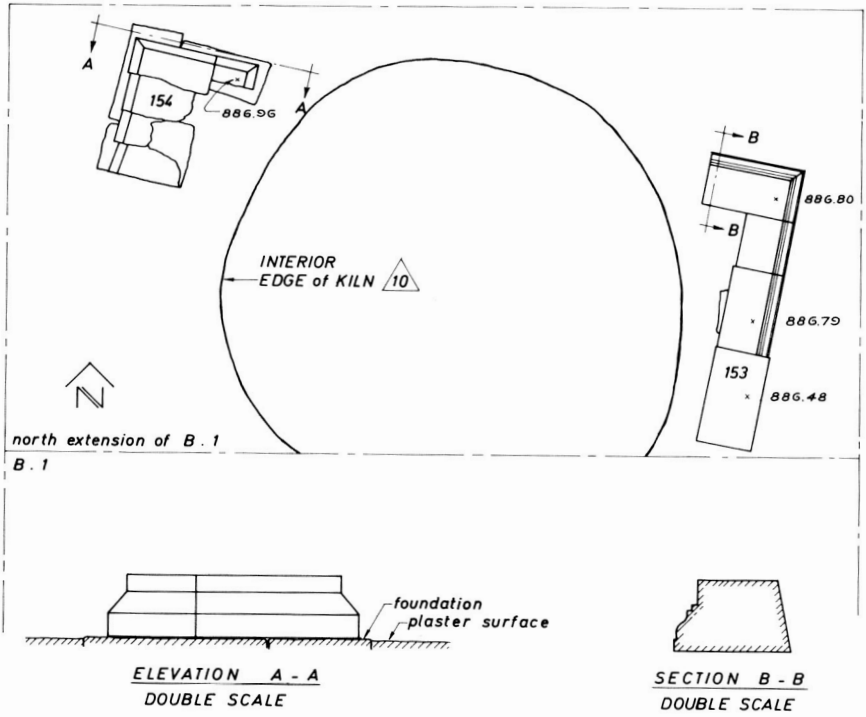


Fig. 8. "Podiums" B.1:154 and B.1:153, cut by Kiln B.1:10 in the 3.75 m. north extension of Square B.1.

Early Roman Strata 12-13 (ca. 63 B.C.-A.D. 135)

Description (Stratification): Additional remains of Early Roman Stratum 12 and Stratum 13 (earthquake, pre-earthquake) were attested in Area B (B.1, B.4, D.4) in 1974.

In the western portion of the 3.75 m. north extension of B.1, the B.1:154 "podium" of Early Roman Stratum 12 was partially cut through by the B.1:10 circular installation of Early Byzantine Stratum 4. The B.1:154 "podium" (ca. 1.10 × 1.10 m. square) was constructed of medium sized (ca. 0.25-0.40 m.) finely squared stones, which formed a one-course high base with fairly plain, slanted sides. The "podium" was approximately oriented to the main north-south axis of the excavation, but its (unexcavated) foundation stones had a slightly different orientation. The B.1:154 "podium" lay beneath the B.1:12 soil layer of Late Roman Stratum 10, was sealed against by the B.1:13A plaster layers of Late Roman Stratum 11 and the upper B.1:13B plaster layers of Early Roman Stratum 12, and it rested on top of the lower B.1:13B plaster layers of Early Roman Stratum 12.

In the eastern portion of the 3.75 m. north extension of B.1, the B.1:153 "podium" of Early Roman Stratum 12 was also cut through by the B.1:10 installation of Early Byzantine Stratum 4. Only four of the "podium's" finely tooled, rectangular (ca. 0.45 × 0.70 m.) stones were preserved, three of them running north-south to form the east side of the "podium," and the fourth running east-west to form the northeast corner of the "podium." The southernmost stone, laid partially beneath the next stone to the north, formed a possible step on the south side of the "podium." The other three stones had ornately tooled external faces, with a combination of ribbed and curved sides. The B.1:153 "podium" was covered over by the B.1:12 soil layer of Late Roman Stratum 10, was sealed against by the B.1:13A and B.1:13B plaster layers of Late Roman Stratum 11 and Early Roman Stratum 12, and it rested on top of the B.1:15B soil layer of Hellenistic Stratum 16.

In the northeast corner of D.4, Wall D.4:32B, beneath the

D.4:32A Late Roman wall, extended ca. 2.50 m. north-south into the Square, ca. 1.75-2.50 m. from the east balk. Wall D.4:32B, constructed of finely squared stones, consisted primarily of a doorway, only the north doorjamb and the threshold(s) of which were preserved. The north doorjamb was preserved to a height of three courses, which from the front (east) were tooled with alternating vertical bosses. The doorway had a lower, original threshold (D.4:45) at a level of 887.10, and an upper, later threshold (D.4:51) at a level of 887.44, set in front of the doorway itself. The two thresholds extended ca. 1.75 m. south from the doorjamb, where they were cut off by the D.4:10 foundation trench of the D.4:13 Ayyūbid/Mamlūk wall.

Beneath the D.4:30A-D Late Roman plaster and soil layers was the D.4:33 Early Roman plaster layer, which sealed on the west against the D.4:51 upper threshold of Wall D.4:32B, and on the north against Wall D.4:31. It covered over soil Layers D.4:41, 43, which lay on top of the compact brown D.4:44 Early Roman soil layer. Layer D.4:44 sealed against the D.4:45 lower, original threshold of Wall D.4:32B, and it ran under Wall D.4:31 in the north balk. Beneath Layer D.4:44 were three additional soil layers (D.4:47, 48, 50, partially excavated), which sealed against and possibly ran under Wall D.4:32B itself. All of these Early Roman layers, like Wall D.4:32B, were cut off to the south by the D.4:10 foundation trench of Ayyūbid/Mamlūk Wall D.4:13.

In the southeast corner of B.4, beneath the B.4:112, 113, 119 Late Roman layers, a portion of Layer B.4:122 remained unexcavated above Bedrock B.4:193 and Channel B.4:250.[19] Excavated in 1974 as many thin layers (B.4:208-214), Layer B.4:122 sealed against Wall B.4:120 (except in the east balk) and Wall B.4:156 of Early Roman Stratum 12.

A new Early Roman rock tumble layer was identified in B.4 in 1974, beneath the mixed layer of Early Roman Stratum 12, and between the post-earthquake and the pre-earthquake remains of Early Roman Stratum 13.

[19] It was left as part of the small excavation stairway in 1973.

In the southeast corner of B.4, beneath the mixed layer of Stratum 12, and beneath Bedrock B.4:193 and Bedrock B.4:246 in the B.4:247 "cave," the rock tumble of earthquake Stratum 13 (B.4:217, 223, 230, 237, 256, 257, 258, 260, 263) lay against the west and east faces of pre-earthquake Wall B.4:222, and it covered over the B.4:226, 227 Early Roman soil layers of pre-earthquake Stratum 13. The rock tumble also filled the B.4:275A "channel" between Bedrock B.4:194 and Bedrock B.4:195, covering over the smaller B.4:244 channel (cf. below, *Iron II/Persian*).

In western B.4, west of Bedrock Blocks B.4:191, 195, 192, the rock tumble of earthquake Stratum 13 (B.4:238, 248, 251, 254) was cut into by the B.4:236 shallow foundation trench of Wall B.4:120=239 of Early Roman Stratum 12, and it lay beneath the mixed layer of Stratum 12, and beneath Wall B.4:73/127 of post-earthquake Stratum 13. The rock tumble sealed against the south face of pre-earthquake Wall B.4:115=231, and to the south it covered over the B.4:253=268 wall, the B.4:262, 261 *ṭabuns,* and the other partially excavated remains of pre-earthquake Stratum 13.

Early Roman remains of pre-earthquake Stratum 13 were attested in the southeast corner of B.4, in western B.4, and in northeastern B.4.

In the southeast corner of B.4, in the B.4:247 "cave" beneath Bedrock Block B.4:193 and Bedrock Block B.4:246, was the B.4:222 Early Roman wall of pre-earthquake Stratum 13. Wall B.4:222, constructed of small and medium sized (ca. 0.10-0.50 m.) unhewn stones, was ca. 1.50-1.75 m. high and ca. .60 m. thick, and it ran ca. 3.00 m. north-south into the Square from the south balk. The wall was preserved intact as a kind of support wall beneath ceiling Bedrock B.4:193, but it had collapsed to the north beneath fallen ceiling Bedrock B.4:246, which had broken off from Bedrock B.4:193 and Bedrock B.4:194 (the ceiling bedrock of Cave B.4:74), along the line of possible "Channel" B.4:275B (cf. below, *Iron II/Persian*). To the west, Bedrock B.4:195, the collapsed ceiling bedrock of Cave B.4:171,

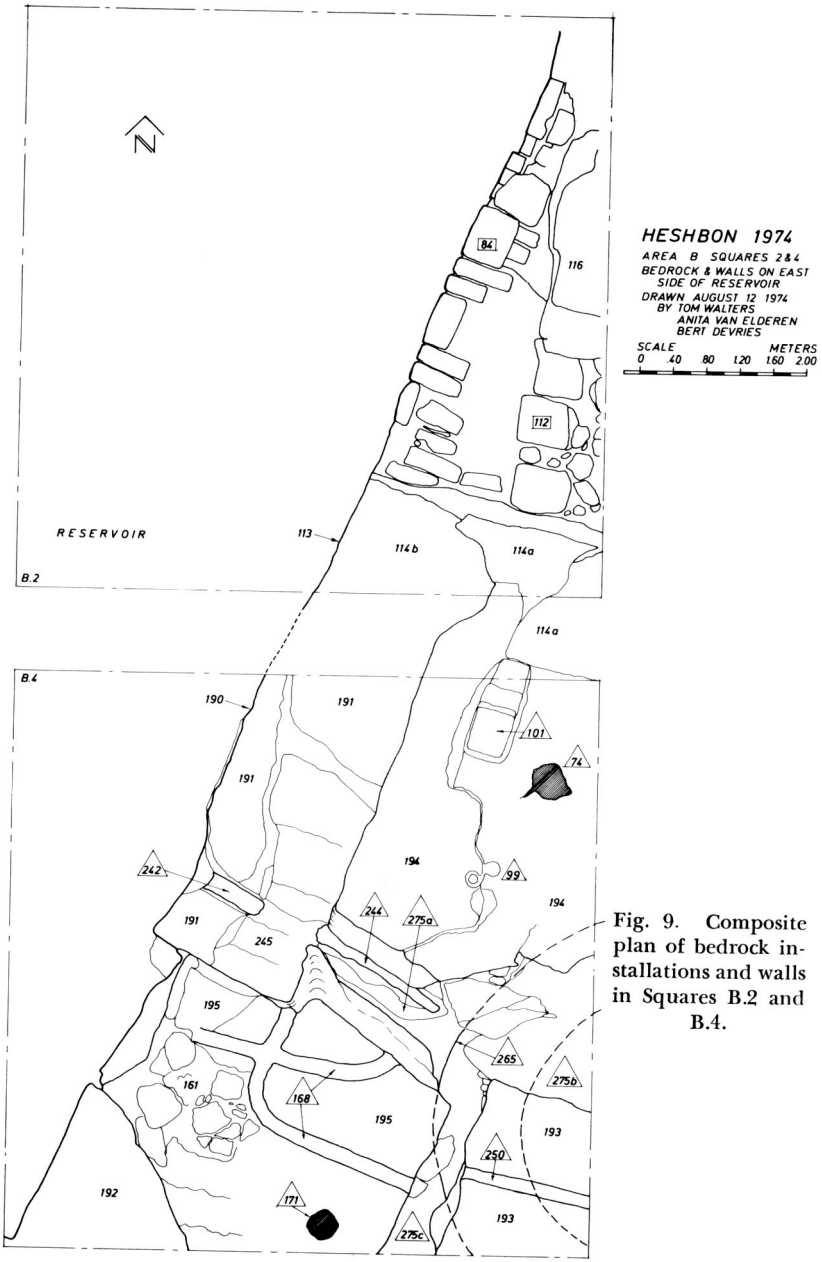


Fig. 9. Composite plan of bedrock installations and walls in Squares B.2 and B.4.

had also broken off from Bedrock B.4:193, along the line of possible "Channel" B.4:275C, and from Bedrock B.4:194, along the line of possible "Channel" B.4:275A, and it had fallen down onto the B.4:235 floor bedrock (equaling the B.4:197 floor bedrock inside Cave B.4:171) in front of Wall B.4:222. Wall B.4:222 was built on top of several thin Early Roman plaster and red soil layers (B.4:226, 227), which sloped up slightly from east of the wall to the B.4:235 floor bedrock on the west, and which covered over Pool B.4:265 (cf. below, *Late Hellenistic*). Beneath the B.4:226, 227 layers was the thicker B.4:228=259 Early Roman soil layer, which filled the upper 0.25-0.40 m. of the B.4:265 pool, and which covered over the B.4:229 Late Hellenistic layer in the pool.

In western B.4, above Bedrock B.4:191, Wall B.4:115=231 of pre-earthquake Stratum 13 was built over the B.4:242 channel of Iron II/Persian Stratum 18. Along the north side of Wall B.4:115=231, its B.4:149=225 foundation trench cut down into the soil layers of Hellenistic Stratum 16. Along the south side of the wall, beneath Wall B.4:73/127 of post-earthquake Stratum 13, the rock tumble of earthquake Stratum 13 sealed against the wall.

South of Wall B.4:115=231, and beneath the rock tumble of earthquake Stratum 13, Wall B.4:253 ran north-south ca. 4.50 m. into the Square from the south balk, ca. 0.50-1.00 m. in front of Bedrock B.4:192, 195, 191, (partially in the west balk), and it cornered (as Wall B.4:268) to run ca. 0.90 m. into the west balk. The partially exposed, irregular B.4:253=268 wall was constructed of medium sized, unhewn stones, ca. 0.40 m. high. Along the north side of Wall B.4:268, its B.4:269 foundation trench cut down into the soil layers of Hellenistic Stratum 16.

Running north-south in front of Bedrock B.4:192, 195, and 191, Wall B.4:253=268 almost blocked a partially exposed western lateral entrance into Cave B.4:171, beneath the ceiling Bedrock B.4:192 and 195.

In the irregular space between Wall B.4:115=231, Wall B.4:

253=268, and Bedrock B.4:192, 195, 191, and beneath the rock tumble of earthquake Stratum 13, were two Early Roman *ṭabuns* (B.4:262, 261) of pre-earthquake Stratum 13, with their associated soil layers. The *ṭabuns* and soil layers did not seal against the south face of Wall B.4:115=231, but they were cut down in front of that wall into the soil layers of Hellenistic Stratum 16.[20]

The later (southern) *Ṭabun* B.4:262, ca. 0.35 m. in diameter, contained a layer of soft brown soil (B.4:262A) over a layer of soft gray-black ash (B.4:262B). *Ṭabun* B.4:262 was sealed against by the thin B.4:267 plaster layer, which also sealed against Bedrock B.4:195, 191 and Wall B.4:253=268, but which partially covered over the earlier (northern) *Ṭabun* B.4:261.

Ṭabun B.4:261, ca. 0.50 m. in diameter, but partially cut through by *Ṭabun* B.4:262, contained the B.4:261A layer of gray-black ash. *Ṭabun* B.4:261 was sealed against by the thin B.4:266 plaster layer (beneath *Ṭabun* B.4:262 and Layer B.4:267), which also sealed against Bedrock B.4:195, 191 and Wall B.4:253=268. *Ṭabun* B.4:261 was founded on the partially excavated B.4:264=270 Early Roman soil layer, beneath the B.4:266 plaster layer.

In northeastern B.4, "Cistern" B.4:188 of pre-earthquake Stratum 13 was cut into the B.4:196 bedrock floor of Cave B.4:74. The cone-shaped, circular "cistern" was ca. 1.80 m. high and ca. 2.10 m. wide at the bottom, and it had a ca. 0.95 m. round opening, with a slightly smaller (ca. 0.70 m.) lip. The sides of the "cistern" were unplastered, and bedrock cracks and toolmarks were visible. The "cistern" contained superimposed layers of Early Roman soil (B.4:184, 187, 232), white straw-like material (B.4:240), and rock tumble (B.4:241, 243), which rested on its B.4:252 bedrock floor.

[20] Also cutting down into the soil layers of Hellenistic Stratum 16 in the northwest corner of B.4 were several Early Roman pits (B.4:204, 221, 233, 255), which lay mostly in the west balk of the Square.

Description (Bones): The Early Roman loci produced the following bones in 1974:

Sheep/Goat	254	Camel	2	Rodent	16
Cattle	61	Large Mammal	20	Chicken	12
Horse	1	Pig	4	U.D.	28
Donkey	1	Dog	21		

Description (Samples): The analysis of samples taken from the Early Roman loci produced the following results:

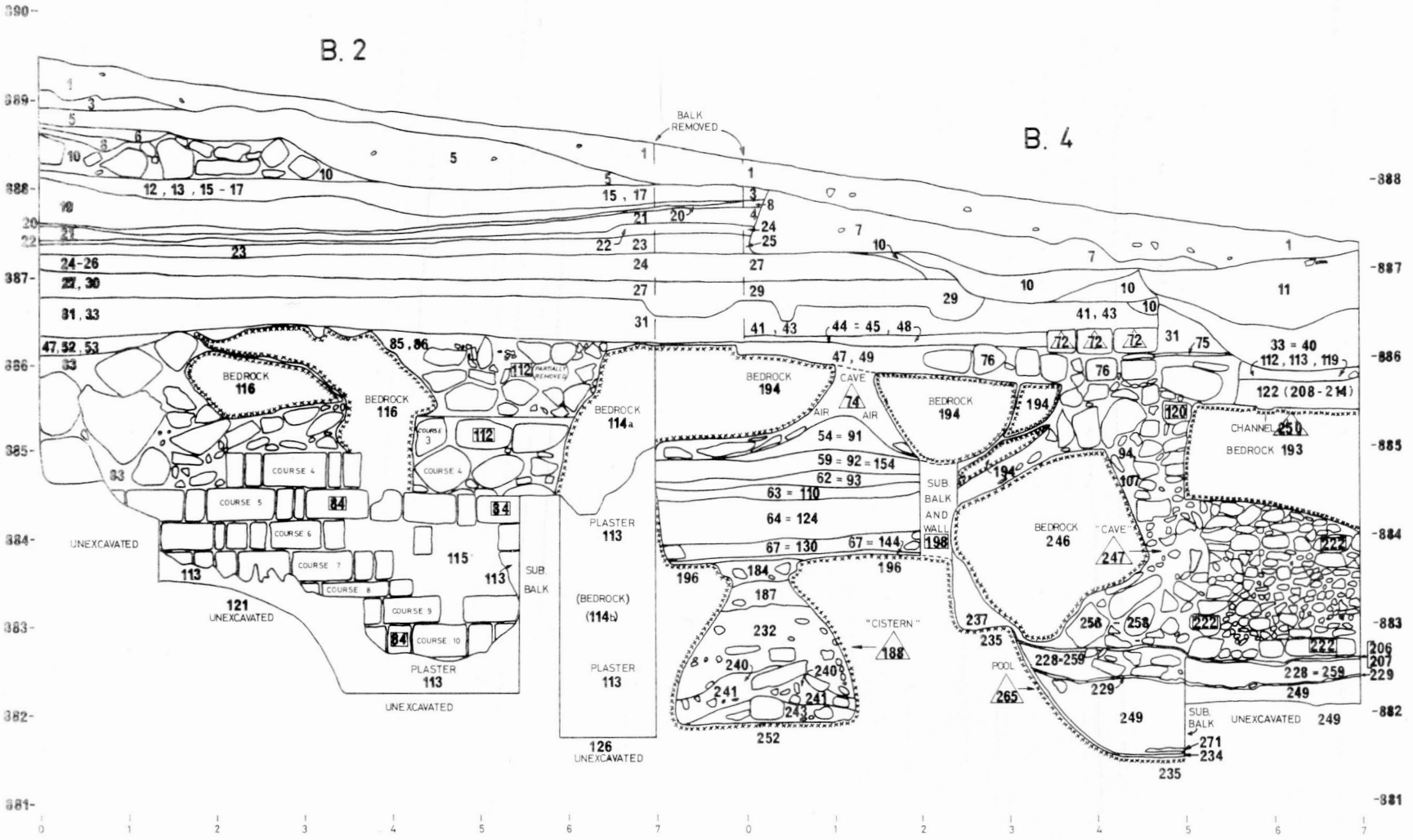
B.4:217 4 Common Wheat, 3 Barley
B.4:232 5 Common Wheat, 4 Barley, 1 Bitter Vetch
B.4:255 2 Olive

Description (Artifacts): The latest pottery which came from the above loci was Early Roman. An A.D. 64-109 Phoenician coin came from Locus B.4:211 (Object 1768), and an A.D. 117-138 coin of Hadrian came from Locus D.4:41 (Object 1743). In addition, the Early Roman loci produced the following registered artifacts:

B.4:209	1780	Flint	B.4:254	1969	Slingstone
B.4:222	1968	Stone Pestle	B.4:263	2083	Ivory Hairpin
B.4:228	1972	Mortar Fragment	B.4:263	2093	Stone Grinder
B.4:237	2009	Pendant Fragment	B.4:264	2038	Stone Weight

Interpretation: The beautifully tooled B.4:154 and B.4:153 "podiums," associated with the Stratum 12 roadway layers, would fit the context of an acropolis temple better than an acropolis fort (cf. above, *Early Byzantine, Late Roman*). "Podium" B.1:154 would have postdated slightly "Podium" B.1:153, which was sealed against by the earliest Stratum 12 roadway layers, but both of the Stratum 12 "podiums" would have remained in use through Late Roman Stratum 11, after which they would have been covered over by the roadway layers of Late Roman Stratum 10. The "podiums" could originally have stood higher than their preserved single courses, but the exact function of the "podiums" cannot yet be determined.

The Stratum 12 roadway layers, like those of Stratum 11, could have run up to a north-south wall located in western D.4 (Wall D.4:83?) and western D.3 (Wall D.3:47?), or in the balk between B.3 and D.4 (cf. above, *Late Roman*). If so, Wall D.4:32B, the finely tooled north-south doorway, could have paralleled that wall to form the eastern entrance to a Stratum 12 structure, located to the east of the Stratum 12 roadway itself. Supporting this suggestion would be the A.D. 117-138 coin which



AREA SUPERVISOR J. A. SAUER
SQUARE SUPERVISORS
B. 2 L. HERR, T. ISLIM, N. JOHNSON, U. WORSCHECH, A. ABU SCHMAIS
B. 4 P. POST, D. UNDELAND, J. BATTENFIELD, S. SAUER
DRAFTSMAN S. I. FARRAN

Fig. 10. Composite section and elevation of east balks of Squares B.2 and B.4.

came from Locus D.4:41, one of the soil layers which sealed against the thresholds of Wall D.4:32B.

If Layer B.4:122 and "Stairway" B.4:71, 155, 156 were associated with the Stratum 12 roadway, as was suggested in 1973, then the A.D. 64-109 coin which came from Layer B.4:211 (=B.4:122) would agree with the ca. A.D. 70-135 date which was suggested in 1971 and 1973 for the Stratum 12 roadway.

The new Early Roman rock tumble layer of Stratum 13 could be interpreted in the context of the 31 B.C. earthquake, which probably brought about the collapse of Bedrock Blocks B.4:195 and B.4:246, and which cracked Bedrock B.4:194. It would seem likely that when Bedrock Blocks B.4:195 and B.4:246 collapsed, they broke off from Bedrock B.4:194 and Bedrock B.4:193 along the weakened lines of "Channels" B.4:275A, B, C (cf. below, *Iron II/Persian*).

Thus, prior to the 31 B.C. earthquake, Caves B.4:74, 247, and 171 would probably have been connected beneath a single B.4:194, 246, 193, 195, 192 bedrock ceiling, and Walls B.4:198 and 222 would probably have served as dividing walls within that large cave. In addition to the ca. 0.40 m. circular openings into Caves B.4:74 and B.4:171, there would seem to have been a lateral entrance into Cave B.4:171 from the west, where the pre-earthquake Stratum 13 walls and *ṭabuns* were cut down into the soil layers of Hellenistic Stratum 16. In Cave B.4:74, "Cistern" B.4:188 would probably have been used for dry storage, which would support the other evidence for interpreting the pre-earthquake Stratum 13 remains as a domestic occupation. Since there was evidence for Hellenistic, and possibly for Iron II/Persian, use of the B.4:74, 247, 171 cave (cf. below), it would seem likely that the cave was largely cleaned out prior to its use by the Early Roman occupation of pre-earthquake Stratum 13.

Late Hellenistic Strata 14/15, 16 (ca. 198-63 B.C.)

Description (Stratification): Additional remains of Late Hellenistic Strata 14/15, 16 were attested in Area B (B.2, B.4) in 1974.

In B.2, the B.2:69, 105 foundation trench of the Stratum 14/15 B.2:62 wall cut down ca. 3.75 m. deep into the soil layers of Hellenistic Stratum 16. The ca. 1.80-1.25 m. wide lower courses of Wall B.2:62 were constructed of medium and large sized (ca. 0.25-1.50 m.) unhewn stones, and they butted up against Plaster B.2:113 on vertical bedrock Face B.2:114B of Iron II/Persian Stratum 18.

In the southeast corner of B.4, inside the B.4:247 "cave" and beneath the Early Roman remains of pre-earthquake Stratum 13 (including Wall B.4:222), was the B.4:265 plastered pool. The partially excavated circular pool was cut down ca. 1.50 m. deep into the B.4:235 bedrock floor of Cave B.4:247, and it had a rim diameter of ca. 4.00-5.00 m. The gradually sloping sides of the B.4:265 pool were plastered with three thin (ca. 0.04, 0.01, 0.01 m.), greenish-colored plaster layers (B.4:234A, B, C), against Bedrock B.4:235. The upper (ca. 0.25-0.40 m.) portion of the pool was filled with the B.4:228=259 Early Roman soil layer of pre-earthquake Stratum 13. Beneath Layer B.4:228=259 was the thin B.4:229 gray compact layer of Late Hellenistic Stratum 14/15. And filling up the pool beneath Layer B.4:229 was the very thick (ca. 0.80-1.00 m.), stoneless, moist, gray-black, clay Layer B.4:249, which included the small B.4:271 pocket of huwwar and soil, of Late Hellenistic Stratum 14/15.

The soil layers of Hellenistic Stratum 16 were attested in B.2, where they were cut into by the B.2:69, 105 foundation trench of Late Hellenistic Wall B.2:62 of Stratum 14/15, and in northwestern B.4, where they were cut into by the remains of Early Roman Stratum 13. The Stratum 16 layers consisted of numerous brown soil and black ashy layers (B.2:94, 107, 111=118, 119, 120, 122, 124, 125, 126; B.4:202, 203, 205, 207, 215, 216, 218, 219, 220, 224, 272, 273, 274), partially excavated in B.2 (ca. 3.50 m. deep) and in northwestern B.4 (ca. 1.75 m. deep), which produced quantities of Iron II/Persian pottery. The layers sealed against the B.2:113, B.4:190 plastered face of Wall B.2:84, vertical Bedrock B.2:114B, and vertical Bedrock B.4:191 (the

eastern wall of the Iron II/Persian Stratum 18 "reservoir"). From that plastered wall the soil layers sloped down sharply to the west, but while in northern B.2 they also sloped down to the south, in northwestern B.4 they sloped down to the north. Beneath the soil layers in northern B.2, exposed but not excavated, was the B.2:121 rock tumble of Stratum 16, which also sealed against the plastered face of Wall B.2:84.

Description (Bones): Of the Late Hellenistic Stratum 14/15 loci, only Wall B.2:62 produced bone evidence in 1974, as follows:

Sheep/Goat	134	Pig	3	Chicken	11
Large Mammal	7	Cat	1	U.D.	15

The bones from Stratum 16 have been cited as Iron II/Persian bone evidence (cf. below).

Description (Samples): The analysis of samples taken from the Late Hellenistic loci of Stratum 14/15 produced the following results:

B.4:229 Cow Dung/Dung Ash
B.4:249 2 Wheat
B.4:271 Dung Ash

The samples from Stratum 16 have been cited as Iron II/Persian evidence (cf. below).

Description (Artifacts): The latest pottery from the loci of Stratum 14/15 was Late Hellenistic. The Stratum 16 layers produced essentially pure Iron II/Persian pottery, but a single clear Hellenistic sherd came from the Stratum 16 rock tumble in 1973. A stamped jar handle (Object 2095), reading ΕΠΙΑΡΙΣ-ΤΕΙΔΑ ΣΜΙΝΘΙΟΥ, and dated to the early 2d century B.C.,[21] came from the B.4:249 thick clay layer in Pool B.4:265. In addition, the following registered artifacts came from the loci of Stratum 14/15 in 1974:

B.2:62 1765 Arrowhead
B.2:62 2001 Bone Spatula

The artifacts from Stratum 16 have been cited as Iron II/Persian evidence (cf. below).

Interpretation: The B.4:229, 249 Stratum 14/15 layers in the B.4:265 plastered pool would show that "Cave" B.4:247, probably including Caves B.4:74 and B.4:171 (cf. above, *Early Roman*), was used in the Late Hellenistic period. Inside Cave B.4:74, "Cistern" B.4:188 was similar in shape to the B.3:47, 59, 64 Late Hellenistic "cisterns" inside the B.3 cave, and thus the B.4:188 "cistern" could also have been cut originally in the Late Hellenistic period. The B.4:265 pool could perhaps represent some kind of industrial use of Cave B.4:247, south of Wall B.2:62, and the early 2d century B.C. stamped jar handle would agree

[21] Cf. James J. C. Cox, "A Rhodian Potter's Date-Stamp," pp. 149-155 below.

with the ca. 198-63 B.C. date which was suggested for Stratum 14/15 in 1973.

Since, except for the B.4:229, 249 layers in the B.4:265 pool, Caves B.4:74, B.4:247, and B.4:171 contained only Early Roman remains, it would seem likely that the caves were cleaned out prior to their use by the Early Roman occupation of pre-earthquake Stratum 13. Since, however, there was also some possible evidence for Iron II/Persian use of the caves (cf. below), it would even be possible for the caves to have been cut originally in the Iron II/Persian period.

The Stratum 16 soil layers could still be interpreted as a massive fill, which was scraped from the acropolis and dumped into the Iron II/Persian "reservoir" of Strata 17 and 18, early in the Hellenistic period (prior to Stratum 14/15). Thus, the bones and artifacts from the Stratum 16 soil layers have been included below with the description of the Iron II/Persian evidence.

Iron II/Persian Strata 17, 18 (ca. 800?-500 B.C.)

Description (Stratification): Additional remains of Iron II/Persian Stratum 18, and possibly also Stratum 17, were attested in Area B (B.2, B.4) in 1974.

In B.2, two more courses of the Stratum 18 B.2:84 header-stretcher wall were exposed, sealed against on the west by the soil layers of Hellenistic Stratum 16. The two courses brought to ten the total number of exposed courses for the wall, and while the uppermost surviving (tattered) course was removed in 1973, the second and third courses, and the southern portion of the fourth course, were removed in 1974 to provide ceramic evidence for dating the construction of the wall.[22] The wall was constructed of uniform stones[23] in an alternating double-header,

[22] These courses were also removed during the 1974 season because they threatened to collapse where some of the stones from the lower courses were missing (B.2:115). All of the stones from Wall B.2:84 were kept for possible future restoration of the wall.

[23] Harold James, the expedition geologist, noted that Wall B.2:84 was one of the very few walls at the site which was constructed of uniform lithic material.

single-stretcher fashion, with additional double headers placed behind the stretchers to produce a wall of ca. 1.20 m. thickness (against Bedrock B.2:116 and Wall B.2:112 of Iron I Stratum 19). Wall B.2:84 continued to the south as vertical bedrock Face B.2:114B, which slanted down slightly westward to an exposed depth of ca. 3.50 m. Three thin layers (ca. 0.02, 0.01, 0.01 m.) of white plaster (B.2:113A, B, C) remained well preserved on the west face of Bedrock B.2:114B, and while only patches of the plaster were preserved on the upper courses of Wall B.2:84, the plaster seemed to be better preserved on the lower courses of the wall.

Vertical bedrock Face B.2:114B and Plaster B.2:113A, B, C of Stratum 18 continued into the northwest corner of B.4 as vertical bedrock Face B.4:191 and Plaster B.4:190A, B, C, sealed against on the west by the soil layers of Hellenistic Stratum 16, and exposed to a depth of ca. 1.25 m. Wall B.4:115=231 of Early Roman pre-earthquake Stratum 13 was built on the east over Bedrock B.4:191, while on the west its B.4:149=225 foundation trench cut down into the soil layers of Hellenistic Stratum 16. To the south of Wall B.4:115=231, the Early Roman remains of Stratum 13 (partially excavated) sealed against the continuation of Bedrock B.4:191. Bedrock B.4:195, the eastward-tilted ceiling bedrock of Cave B.4:171, joined Bedrock B.4:191, but south of that join the B.4:195 and B.4:192 bedrock blocks opened up to form a possible lateral entrance into Cave B.4:171 of Early Roman Stratum 13. In the southwest corner of the Square, Bedrock B.4:192 cornered to run west.

Beneath the Early Roman Wall B.4:115=231 of pre-earthquake Stratum 13, the B.4:242 plastered channel, ca. 0.25 m. wide, 0.25 m. deep, and 0.70 m. long, was cut east-west into the lip of Bedrock B.4:191 (level: 884.09). To the east, beyond a depression (B.4:245) in Bedrock B.4:191, and beneath the Early Roman rock tumble of earthquake Stratum 13, the B.4:244 unplastered channel, ca. 0.20 m. wide, 0.15 m. deep, and 1.70 m. long, was cut east-west into bedrock along the south face of Bedrock

B.4:194, to an easternmost point (level: 884.16) at the edge of "Cave" B.4:247 and above Pool B.4:265 (cf. above, *Early Roman, Late Hellenistic*).

Channel B.4:244 was cut into Bedrock B.4:194, beneath and along the line of "Channel" B.4:275A, one of three possible connected "channels" which ran between Bedrock B.4:194 and B.4:195 ("Channel" B.4:275A), between Bedrock B.4:246 and B.4:193 ("Channel" B.4:275B), and between Bedrock B.4:195 and B.4:193 ("Channel" B.4:275C). The B.4:275A, B, C "channels" would have weakened the ceiling bedrock of Caves B.4:74, B.4:247, and B.4:171, so that during the earthquake of Early Roman Stratum 13, Bedrock B.4:195 would have broken off from Bedrock B.4:194 and Bedrock B.4:193 along the lines of the B.4:275A and B.4:275C "channels." To judge from the broken edges of Bedrock B.4:193 and Bedrock B.4:195, the B.4:275C "channel" would have been ca. 0.65 m. wide and ca. 0.55 m. deep, and it would have had vertical sides and a horizontal floor. The dimensions of the B.4:275A and B.4:275B "channels" could not be determined. The B.4:275A, B, C "channels" would apparently have intersected the smaller B.4:168, 250 channels, which were cut into the top of Bedrock B.4:195 and Bedrock B.4:193.

Description (Bones): The Iron II/Persian loci produced no bones in 1974, but the following bones came from the soil layers of Stratum 16 (cf. above, *Late Hellenistic*):

Sheep/Goat	698	Camel	1	Rodent	4
Cattle	23	Large Mammal	45	Reptile	1
Horse	1	Pig	5	Chicken	19
Donkey	2	Dog	9	U.D.	46

Description (Samples): The analysis of samples taken from the soil layers of Stratum 16 (cf. above, *Late Hellenistic*) produced the following results:

B.2:118 4 Olive
B.4:203 1 Olive
B.4:205 65 Olive
B.4:207 6 Emmer Wheat, 50 Six-Rowed Barley, 1 Bitter Vetch, 2 Olive

Description (Artifacts): The second, third, and fourth courses of Wall B.2:84 produced a total of 28 small body sherds, the dominant and latest of which were Iron II/Persian. While red wheel-burnished, and black-painted sherds were well attested, the wall did not produce any black wheel-burnished pottery. The soil in the B.4:244 channel also produced clear Iron II/Persian

pottery. Otherwise, no registered artifacts came from the Iron II/Persian loci in 1974. An ostracon (Object 2092), dated by Cross to the early 6th century B.C.,[24] came from the B.2:126 ashy layer of Stratum 16 (cf. above, *Late Hellenistic*). In addition, the following registered artifacts came from the soil layers of Stratum 16:

B.2:118	1727	Bone Spatula	B.4:205	1728	Pierced Shell
B.2:124	2034	Bronze Button	B.4:205	1793	Ceramic Figurine
B.4:202	1757	Metal Needle	B.4:205	1827	Ivory Inlay
B.4:205	1704	Flint	B.4:205	2103	Stone Bowl Fragment

Interpretation: Wall B.2:84 and vertical bedrock Faces B.2:114B, B.4:191, B.4:195, and B.4:192 could still be interpreted as the ca. 16 m. long plastered eastern boundary of the Stratum 18 "reservoir." The "reservoir" would have been filled with the soil and rock tumble layers of Stratum 16, above the B.1:119=143 clay layer of Stratum 17, early in the Hellenistic period. In southwestern B.4, the Stratum 16 layers would have been cut into, along the face of Bedrock B.4:191, B.4:195, and B.4:192, by the Early Roman occupation of pre-earthquake Stratum 13.

It would seem likely that Channels B.4:242 and B.4:244 were originally connected, and their slight westward slope would indicate that they probably directed water over the lip of Bedrock B.4:191 into the Stratum 18 "reservoir." Since the B.4:244 channel extended eastward to the edge of "Cave" B.4:247, above Pool B.4:265, it would not be impossible for "Cave" B.4:247 and Pool B.4:265 to have been used in the Iron II/Persian period, in connection with the Stratum 18 "reservoir." Some support for this possibility would be the fact that the B.1:121=144 "cement" layer and the B.2:113=B.4:190 plaster layer of the "reservoir," and the B.4:234 plaster layer of Pool B.4:265, each attested three distinct layers of "cement" or plaster. Against the possibility would be the fact that the B.4:234 plaster alone was greenish-colored (tinted by the B.4:249 clay?), that the B.4:265 pool produced only Late Hellenistic pottery, and that the B.4:74, B.4:247, and B.4:171 caves otherwise produced no Iron II/Persian pottery.

[24] Cf. F. M. Cross, Jr., "Heshbon Ostracon XI," pp. 145-148 in this number.

Since the B.4:244 channel was cut into Bedrock B.4:194, beneath and along the line of "Channel" B.4:275A, it could be suggested that "Channels" B.4:275A, B.4:275B, and B.4:275C were originally cut in the Iron II/Persian period, in connection with the Stratum 18 "reservoir."

The Iron II/Persian pottery from Channel B.4:244 could perhaps reflect the Stratum 17 (ca. 700-500 B.C.) use of the channel. The pottery and the header-stretcher construction of Wall B.2:84 could indicate that the Stratum 18 "reservoir" was constructed earlier in the Iron II period (pre-700 B.C.?).

Iron I Stratum 19 (ca. 1200-1100 B.C.)

Description (Stratification): Additional remains of Iron I stratum 19 were attested in Area B (B.2, B.3, D.4) in 1974.

In southeastern B.2, in the space (ca. 1.50-2.50 m. wide) between vertical bedrock Face B.2:116 (north) and vertical bedrock Face B.2:114A (south), the upper two courses of Stratum 19 Wall B.2:112, constructed of large (ca. 0.75 m.) boulders, were removed in 1974 to provide ceramic evidence for dating the construction of the wall. Beneath those two courses, two additional courses of Wall B.2:112 (=Wall B.3:80) were exposed (but not removed) when the upper courses of Wall B.2:84 were removed (cf. above, *Iron II/Persian*).

In southern B.3, in the space (ca. 1.50-2.00 m. wide) between vertical bedrock Face B.3:84=90, 85 (north) and vertical bedrock Face B.3:86 (south), additional superimposed soil, rock tumble, and ash layers of Iron I Stratum 19 (B.3:82, 83, 91, 92, 93, 94, 95, 96, 97)[25] were attested, beneath those which were excavated in 1973. The B.3:83 rock tumble covered over the B.3:91 red layer, and beneath B.3:91 the B.3:92 rock tumble covered over the B.3:93-97 brown soil and ash layers. The layers sealed against bedrock Face B.3:90 on the north, against bedrock

[25] Locus B.3:89 was a temporary balk left against the face of vertical Bedrock B.3:90, which was later removed.

Face B.3:86 on the south, and against Wall B.3:80 on the west.[26] Wall B.3:80 (=Wall B.2:112) was constructed of medium and large sized (ca. 0.25-0.75 m.) boulders, in the west balk between Bedrock B.3:84=90, 85 and Bedrock B.3:86. The soil, rock tumble, and ash layers continued into the east balk, but to the southeast they were cut off next to Bedrock B.3:86 by Wall B.3:78, which equaled the B.4:198 eastern boundary wall inside Cave B.4:74 (Early Roman pre-earthquake Stratum 13). Bedrock B.3: 90 and Bedrock B.3:86 sloped down gradually, ca. 4.00 m. deep, to join and form the ca. 0.75-m.-wide B.3:98 bedrock floor, which lay beneath the Stratum 19 soil, rock tumble, and ash layers. Irregularities in the surface of vertical Bedrock B.3:90 were filled with smooth gray plaster (B.3:99).

In southeastern D.4, in the ca. 2.10-m.-wide space between vertical bedrock Face D.4:25 (north) and vertical bedrock Face D.4:67 (south, outside the Square), the D.4:57 arched roof of the D.4:24 Ayyūbid/Mamlūk vaulted room was built on top of two north-south walls, Wall D.4:65 to the east and Wall D.4:66 to the west. The two walls, set ca. 1.60 m. apart east-west, were constructed of medium sized (ca. 0.25-0.40 m.) unworked stones, and they sealed against Bedrock D.4:25 to the north, and against Bedrock D.4:67 to the south. Beneath Bedrock D.4:25 was another wall, east-west Wall D.4:73, which formed the north side of the "room." To the south, Bedrock D.4:67 opened up into Ayyūbid/Mamlūk Cave D.4:68, which was partially blocked by Ayyūbid/Mamlūk Wall D.4:71. Inside the "room" formed by Walls D.4:65, 66, and 73, and beneath the D.4:61, 62 Ayyūbid/ Mamlūk rock tumble, the D.4:63, 74 thin compacted soil and ash layers of Iron I Stratum 19 lay above the D.4:75 cobblestone pavement, which was constructed of small (ca. 0.10-0.25 m.), flat stones. The D.4:63, 74 layers and the D.4:75 cobblestone pavement sealed against Walls D.4:65, 66, and 73, and they were cut

[26] For safety reasons, a balk ca. 0.60 m. high was left in front of Wall B.3:80, just above bedrock Floor B.3:98; so it is not certain whether the B.3:93-97 soil and ash layers ran up against or ran under Wall B.3:80.

through to the south by the D.4:72 foundation trench of Ayyūbid/Mamlūk Wall D.4:71. A probe (ca. 0.70 × 1.70 m.) beneath the D.4:75 cobblestone pavement exposed the D.4:81, 82 Iron I soil and ash layers (partially excavated), which sealed against Walls D.4:66 and 73.

Description (Bones): The Iron I loci of Stratum 19 produced the following bones in 1974:

Sheep/Goat	23	Large Mammal	7	U.D.	19
Cattle	13	Pig	1		

Description (Samples): The analysis of samples taken from the Iron I loci produced the following results:

B.3:94 Ash Only

Description (Artifacts): The pottery from the above Stratum 19 loci was Iron I, with nothing earlier. The Iron I loci of Stratum 19 produced no registered artifacts.

Interpretation: The preserved Iron I Stratum 19 occupation in Area B would seem to be confined to a space ca. 1.50-2.50 m. wide, 4.00 m. deep, and 13.00 m. long (east-west) between two relatively vertical bedrock faces, Bedrock B.2:116, B.3:84=90, 85, D.4:25 on the north, and Bedrock B.2:114A, B.3:86, D.4:67 on the south. It was not possible to determine if the vertical bedrock faces were manmade or natural, but at least in B.3, one of the bedrock faces was partially plastered. The western end of the space would have been blocked by the large B.2:112=B.3:80 wall, and in eastern D.4, the two small D.4:65, 66 walls, associated with the D.4:75 cobblestone pavement, would have been built across the space as well. In B.3, the lower (B.3:93-97) soil and ash layers would seem to have been occupational remains, while the upper soil layers and rock tumbles would seem to have been fill. The D.4:65, 66 walls and cobblestone pavement would seem to represent a domestic occupation, and perhaps the bedrock space occupied by the Iron I remains of Stratum 19 could be compared to the pits which are characteristic of Iron I occupations at other sites.

AREA C

W. HAROLD MARE
Covenant Theological Seminary
St. Louis, Missouri

Area C, located on the west slope of the acropolis of Tell Ḥesbân, produced evidence, through the 1968, 1971 and 1973 excavations, from the Ayyūbid/Mamlūk back to the Iron II period. Excavation in 1974 had as aims: (1) to clarify the distinctions in the strata represented especially in C.2 and C.3; (2) to investigate further the extent and function of the Roman wall which had been discovered in C.1 and which seemed to extend into C.5; (3) to trace the possible extension of the Iron II wall in C.3 into a new Square (C.7) opened to the south; (4) to investigate further the Ayyūbid/Mamlūk architectural remains that extended east from C.4; and (5) to excavate C.8 east of C.6 and up the slope toward Area A to see what connections might be found between Areas A and C.

This report will comprise three sections: (1) describing the excavations in the various squares; (2) offering interpretation of the results; and (3) drawing pertinent conclusions.

In this report, the order of treatment of the Squares will be, C.1 and 5; C.2, 3 and 7; and C.6 and 8, to give a picture of the relationship of material in these squares.

Description of the Excavation

Square C.1 (see Fig. 11). The Roman Wall C.1:49 exposed by previous work was thought to extend possibly through the west balk of C.1 into C.5. In C.1 Wall 49 had turned south and become Wall C.1:63 and Wall C.1:40, both of which rested on bedrock. At the corner of Walls C.1:49 and 63 there was a joint where Wall C.1:30 proceeded to the north.

C.1:102 was the inter-seasonal erosion debris containing sherds from Ayyūbid/Mamlūk back to Iron I and miscellaneous objects and bone fragments. At the northwest corner of C.1 lay C.1:103

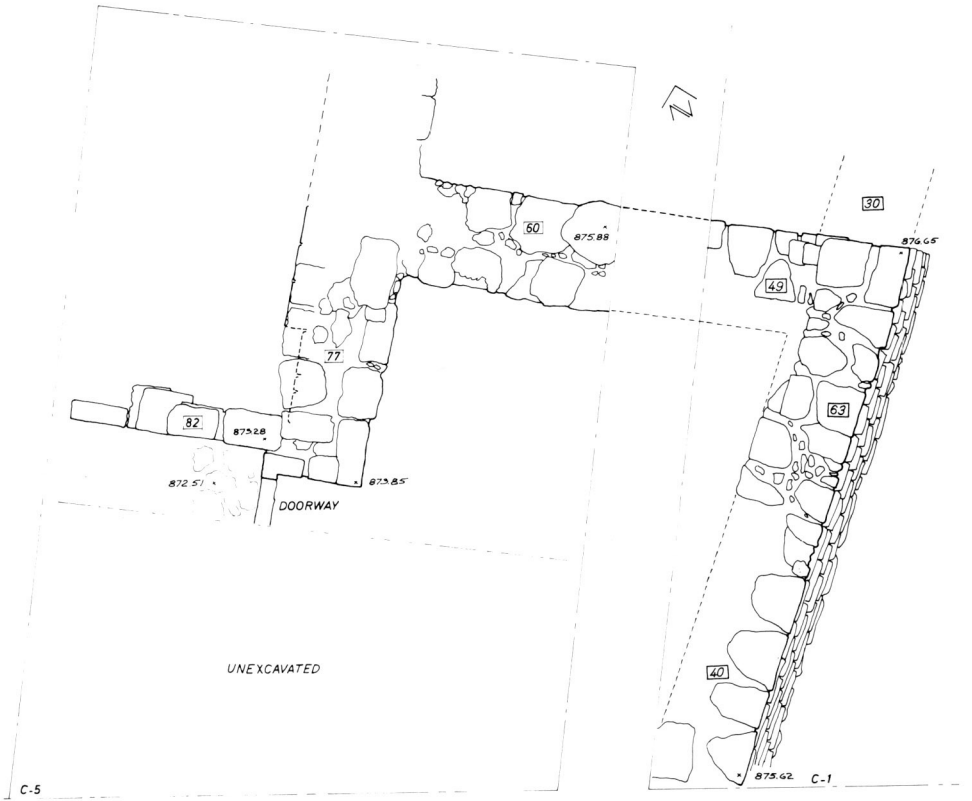


Fig. 11. Top plan of the Early Roman Tower in Squares C.1 and 5 on the west edge of the city.

and 104, gray soil layers of Early Roman date, under which was C.1:105, a brown packed soil layer with sherds from Early Roman to Iron I. It was not possible to determine the point at which the Iron Age accumulation was covered by Early Roman material.

C.1:106, possibly a fire pit of gray soil and ash next to the west balk, produced Roman sherds and earlier Hellenistic, Iron II, and Iron I. In it was C.1:107, a shallow pit of Roman date probably used for outdoor cooking. C.1:109 and 111, containing loose soil and *huwwar* bits and running along the west and east sides of Wall C.1:30 respectively, were foundation trenches for Wall 30. The dates from sherds were Early Roman.

C.1:110, of Early Roman date, was the foundation trench on the north side of Wall C.1:49, extending east from the west balk toward C.1:51, the foundation trench for Walls C.1:63 and 40. C.1:110 was probably related to C.1:51, both having been dug together when Walls C.1:40, 63 and 49 were built.

On the east side of Wall C.1:30, Late Roman C.1:112, comprised a number of lenses of different soils.

Wall C.1:30, which ran north from the corners of Walls C.1:63 and 49, being 4.50 m. long, 0.80 m. wide, and surviving up to 1.60 m. high, was composed of large smooth stones on the west face and small stones roughly fitted together on the east. Its foundation trenches C.1:109 and 111 and the material under C.1:30 date it as Early Roman.

C.1:117 sloped down westward under Wall C.1:30 to the edge of Layer C.1:105 in lenses of brown-gray soil with a spread of sherds from various periods. C.1:118, under C.1:105, with Iron II sherds as the latest but including some Iron I, extended along the west balk. What the transition between the Early Roman and Iron II of C.1:117 and C.1:118 means is not clear.

Square C.5 (see Fig. 11). In the 1971 season a 3.00 m. to 4.00 m. depth of Ayyūbid/Mamlūk dump had been cleared down the westward slope of C.5. As in C.1, many tip lines angled from southeast to northwest with heavy undulation.

In 1974 excavation in this massive fill was continued in the

northern part of the Square. C.5:50, a soil layer with a top level of 876.91 m. (southeast) and 874.37 m. (northwest) contained sherds ranging from Ayyūbid/Mamlūk to Early Roman. In the Ayyūbid/Mamlūk Loci C.5:51, 52 and 54, C.5:52 seemed to have been a fire pit, either Ayyūbid/Mamlūk or possibly Umayyad.

A large number of loci from C.5:55 down were of Byzantine date, mostly dump materials scattered over much of the Square. Wall C.5:55, dated Byzantine by the sherds in and under it and measuring 3.15 m. long, 0.75 m. wide and 0.60 m. high, ran northwest-southeast in the northeast corner of C.5.

Byzantine dump materials continued from C.5:63 through C.5:71, containing small- to large-sized rocks, some of which seem to have fallen from destructions up the slope. In C.5:66, 0.83 m. north of the south subsidiary balk and 1.08 m. east of the west balk was found a small number of bones of a human skeleton which possibly had been thrown into the Byzantine dump in a time of destruction (there were ash pockets). C.5:70 produced a Greek ostracon with the letters H Σ preceded by another broken letter, possibly the end of a name. C.5:63-71 produced a few bone fragments and a Maccabean coin.

C.5:72-74, 76, all in the southwest corner of C.5, and triangular in plan, comprised portions of possible surfaces, dated Byzantine, with a moderate quantity of bone fragments, mostly of sheep and goat. C.5:59 and 61 in the northeast corner produced brown dump materials of the Early Roman period. C.5:75, moist brown soil 0.48 m. deep with Byzantine and Roman sherds, was bounded by Walls C.5:60 and 77.

Wall C.5:60, of fairly smooth partly worked stone, extended west from the east balk, measuring 2.40 m. long, 1.08 m. wide and 1.90 m. high; it was clearly an extension of Wall C.1:49. C.5:62 was the north face foundation trench for Wall C.5:60 and its sherds showed the construction of Wall C.5:60 to be Early Roman. Wall C.5:77 formed the northwest terminus of Wall C.5:60 and ran 2.85 m. south, varying from 1.30 m. to 0.60 m. wide

and surviving from 2.14 m. to 1.30 m. high. It ended in a well worked door entrance with a bolt hole in one upright.

C.5:82, a well formed worked stone wall extended west from the door entrance of Wall C.5:77 for 2.42 m., being 0.46 m. wide and surviving from 0.79 m. to 0.24 m. high, with paving stones (C.5:83) laid to its south. C.5:80 and 81 to the north and west of Walls C.5:82 and 77 were parts of the Byzantine dump materials.

Square C.2. In 1974 work was done only in the sector south of the subsidiary north balk. The balk erosion debris C.2:53-55 contained a mixture of sherds from the Ayyūbid/Mamlūk period back to the sixth century B.C.

Many of the loci excavated in C.2 in 1974 may be considered dump material from the eighth to sixth centuries B.C. This was true of the triangular locus C.2:87 next to bedrock under the Hellenistic Pit C.2:46, in the northeast sector. On the north, adjacent to the subsidiary north balk and to the west of C.2:87, lay C.2:69-71 and 74, thin loci of gray *huwwar* layered between accumulations of small grained sand and gravel, with C.2:74 quite stony. Though Early Roman sherds show up with Iron II and Hellenistic, these loci may be interpreted as seventh or sixth century B.C. dump material with balk-fall intrusions. The thin gray *huwwar* layers of C.2:75-83, in the northeast sector, are also to be considered Iron II dump material. The bone fragments were predominantly sheep and goat. The same interpretation can be given for the gray *huwwar* to reddish brown soil of C.2:84-85 near the northeast corner of the subsidiary south balk, and for C.2:56-63 and 73, loci of gray *huwwar,* located 1.25 m. north of the south balk and 1.50 m. east of the west balk. The thin loci, C.2:64-68 and 72, one under the other, extending south from C.2:56-63 are the same; the bones here were mainly sheep and goat.

The remainder of a course (two large stones) of Wall C.2:90, a wall of undressed stones designated Wall 52 in 1973, was removed, showing a lower course of fist-to-head-sized stones underneath. With the consistent Iron II sherd evidence from the soil

in Wall C.2:52=90, and the wall's foundation trench appearing to cut into Iron II *huwwar* material, the wall may be dated in the seventh or sixth centuries B.C. Although Wall C.2:90 turned south into the south balk and also continued westward into C.1 possibly to join Wall C.1:90 there, such evidence did not indicate a function for Wall C.2:90. There were in it only a few bone fragments.

C.2:90-94 and 96-99, loci under one another comprising gray *huwwar* shifting to yellowish and reddish *huwwar*, located in the southwest sector, contained pottery as early as Iron I and led to the conclusion that they represented an earlier Iron Age dump. The reddish soil showing up over bedrock (C.2:99) was virgin soil.

Square C.3 (see Fig. 12). Work in 1974 was concentrated mainly in the south half of the Square, at the previously left subsidiary south balk. Cleanup Locus C.3:44 had a variety of sherds from Ayyūbid/Mamlūk to Roman and yeilded a number of sheep and goat bone fragments and a bronze spatula.

C.3.45 was the ground surface soil with some stones at a top level of 881.20 m. The succeeding loci, C.3:46-47, Ayyūbid/Mamlūk as was C.3:45, continued the layers of stone material, possibly part of a wall. C.3:50, a black soil layer sloping down westward at 20° near the southwest corner of C.3, was the first distinguishable soil layer under C.3:45-48 and was not clearly dated, possibly Byzantine.

Ceramics from C.3:51-57, loci all sloping downward to the west at 15° to 20°, represented a mixture of periods: first 'Abbāsid, then Umayyad, Ayyūbid/Mamlūk and again Umayyad. It may be concluded that these materials were mixed in being moved down the slope, perhaps partly by the seasonal rains. This same erosion process seems a possible cause of sloping loci in C.2, such as C.2:7 and 9. The charcoal and burnt *huwwar* material in C.3:52 and 53 suggested that some burned structures and debris had come down from further up the slope. There were a number of

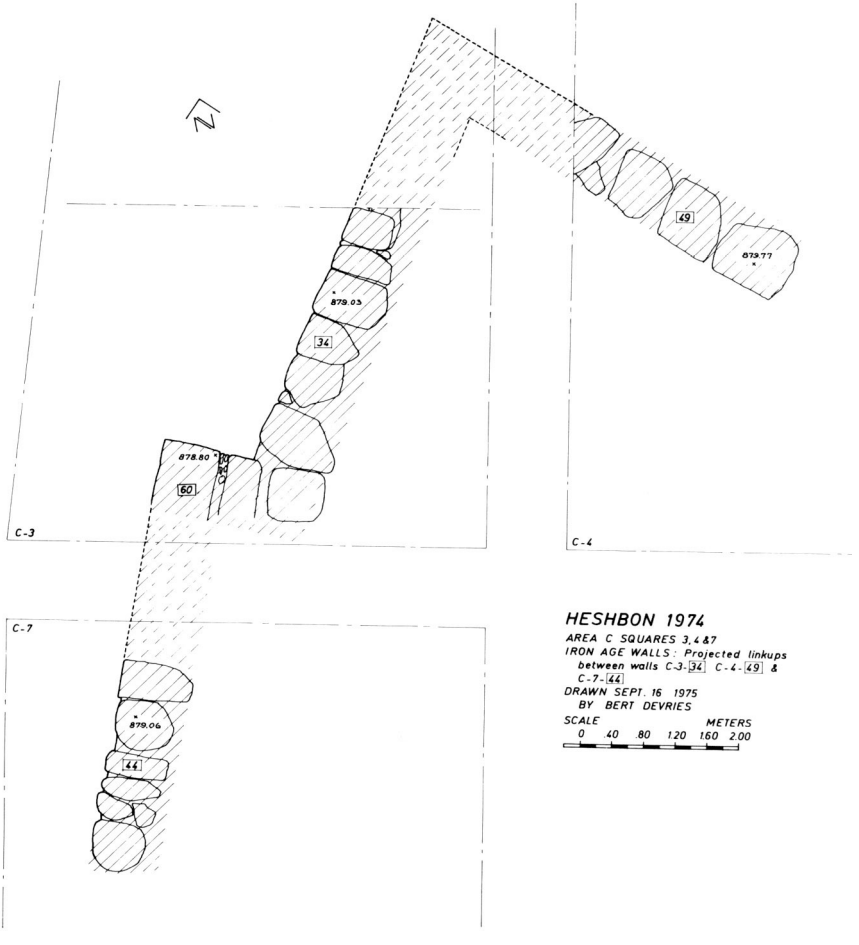


Fig. 12. Top plan of the possible Iron II Defense Perimeter in Squares C.3, 4, and 7, on the west side of Tell Ḥesbân.

sheep and goat bone fragments scattered through C.3:51-57. C.3:53 produced a Late Roman coin (early fourth century A.D.)

C.3:58, of Umayyad date, was a horizontal locus, as was C.3:59, whose Byzantine date meant that it separated the later loci above from the Iron II Wall C.3:26=60 beneath.

C.3:60 included the head-sized stones that extended east 3.20 m. from the west balk and also included from that point east for another 1.33 m. the large stones resting on bedrock. The large stone group was called Locus 26 in 1973. C.3:26=60, from the 1973 pottery evidence, seemed definitely to be an Iron II wall and was seen to enter the south balk.

C.3:61, dark brown soil in a small probe from the northwest corner of C.3, together with C.3:62, a semicircular pit in that probe along the west balk, produced Ayyūbid/Mamlūk sherds. There were no bones, and only two beads found.

Square C.7 (see Fig. 12). C.7:1 was the surface soil of a new 6.00 m. Square south of C.3 at a top level of 881.46 m. (southeast corner), with an array of sherds from Ayyūbid/Mamlūk to Iron II and a needle point, flint and iron nail. C.7:2-12 included several wall fragments, all of Ayyūbid/Mamlūk construction, and Loci C.7:13-37 and 39, primarily Ayyūbid/Mamlūk also, were soil materials found within, around and under these wall fragments. C.7:40-43 were soil layers dated from the sherds as Umayyad, except for C.7:41, which may possibly be 'Abbāsid (from one piece found).

Wall C.7:2, 0.86 m. wide and surviving 0.70 m.-1.10 m. high, ran south from the north balk 2.40 m. to near, but not joined to, Wall C.7:3, which extended east 1.40 m. from the west balk, being 0.45 m.-0.65 m. wide and surviving 0.80 m.-1.10 m. high. It is possible that Walls C.7:2 and 3 together with installation C.7:12, a semi-circular row of stones joining Wall C.7:2 on its west face, considered a manger, formed a part of an Ayyūbid/Mamlūk courtyard.

Of Walls C.7:4, 5 and 6, located in the southeast sector, Wall C.7:4, 0.45 m. wide and surviving 0.80 m. high, ran west from the

east balk 1.45 m. Walls C.7:4 (E-W) and 2 (N-S) may have formed a room, part of which was preserved in the northeast corner of the Square. That such a room was a domicile might be argued from the bone needle found there in the medium brown packed earth of C.7:8. C.7:11, composed of a hard packed brown soil embedded with small stones, was probably a rough floor surface inside Walls 2 and 4. Soil Loci C.7:7-11 yielded some sheep and goat bone fragments. Wall C.7:5, 0.30 m. wide and surviving 0.82 m. high, extended north from the south balk for 2.50 m. and lay at a right angle to Wall C.7:4, while Wall C.7:6 lay southeast of Walls C.7:4 and 5. C.7:19, 26, 31, 33, 34, soil layers also in the northeast sector, produced a number of bones, mainly sheep and goat; also there were found an iron knife, an Umayyad coin, and a bone needle.

In C.7:20, 22, 28 and 39, in the south and west sectors, were found a number of bones, mainly sheep and goat, and an iron nail, a bronze ring and a stone mortar foot. C.7:13-17, 21, 23-26, 27, 29, 30 were soil layers in the northwest sector, and of these C.7:14, a hard packed stony soil, may have been a floor for the possible courtyard west of Wall C.7:2. C.7:13-17 produced a number of sheep and goat bones.

C.7:44, a wall of large stones in the northwest sector, 0.70 m.-0.90 m. wide, extending 3.10 m. south from the north balk, seems clearly to be a continuation of Iron II Wall C.3:60, which extended into the C.3 south balk. Brown crumbly soil holding Ayyūbid/Mamlūk to Iron II sherds, which was over and around the surviving top of Wall C.7:44, produced a few sheep and goat and other bones.

Square C.6 (see Fig. 13). All the loci worked in 1974 (C.6:10-25) represented material deposited in Ayyūbid/Mamlūk times, but also containing sherds of the 'Abbāsid, Umayyad, Byzantine, Roman (C.6:14 and 25) and Iron Age (C.6:25).

In the southeast sector, Wall C.6:4, 1.80 m.-1.00 m. wide and surviving three to four courses high, extended 3.35 m. north from the south balk to the corner doorpost in Wall C.6:7, at which was

an entrance for a room in the house. Powdery gray soil (C.6:11) which covered this and the southwest sector produced many sheep and goat and other bones, an Islamic coin (Ayyūbid, el-Aziz Uthman, 1193-98), one bronze ring and a second fragment, and a lamp handle. The soil of C.6:18 inside the room (southeast corner of the Square), showed signs of burning, evidence of destruction. C.6:28, the hard surface layer in that corner, was probably a floor for the room.

In the northeast sector of C.6, Wall C.6:15 was a double-row, slightly curving wall running north-south and connecting Wall C.6:4 with Wall C.6:2 (to the north) which extended east from the west balk. C.6:19 was a stub of a wall surviving three courses high and 0.63 m.-0.84 m. wide, extending south from the north balk for 0.63 m. to come near the east end of Wall C.6:2, forming a threshold there. The tumbled hewn and field stones of C.6:16, lying in between Wall C.6:7 and Wall C.6:8 (the latter a spur out of the east balk in the northeast corner of the Square), suggested a wall or roof collapse; this locus contained a large number of sheep and goat bones, several iron pieces, jewelry, and a sherd inscribed with the Arabic word for "four."

In the northwest sector was another room bounded by Wall C.6:2, the west balk, the north balk, and the threshold between Walls C.6:2 and 19, with its double door-socket stones *in situ*. C.6:21 was a nicely laid *huwwar* floor, running right up to Wall C.6:2, on which was found a loaf-shaped grinding stone.

In the southwest sector of C.6, C.6:22 and 23 produced an outdoor surface and C.6:25 the tumbled hewn stones of a time of disuse and decay. There were a number of sheep and goat bones found here. The objects found in C.6:20, 22, 23, and 25 included two Mamlūk coins (both with the inscription of al-Manṣūr Ṣalāḥ ad-Dīn Muḥammad, 1361-63), a bracelet, and beads.

Square C.8 (see Fig. 13). C.8, 6.00 m. east-west by 8.00 m. north-south, was located east of C.6 up the slope toward Area A north of the main E-W axis. C.8:1, the surface soil, produced Ayyūbid/Mamlūk, 'Abbāsid, Umayyad, Byzantine and Early Roman sherds,

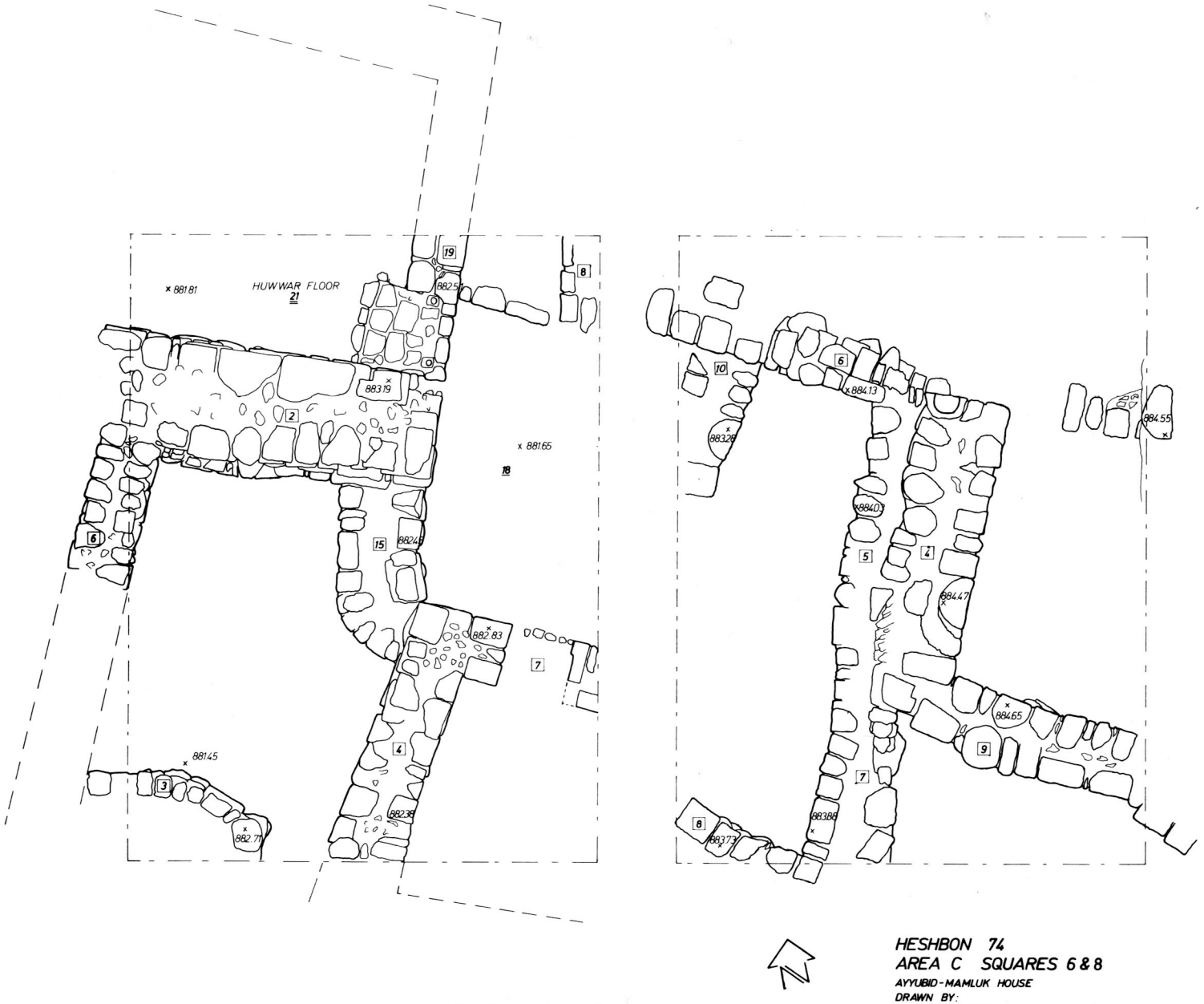


Fig. 13. Top plan of Ayyūbid/Mamlūk Domestic Structures exposed in Squares C.6 and 8.

and a number of sheep and goat bones, an Islamic lamp fragment, and an iron ring.

The loci worked in C.8 this season were all of Ayyūbid/Mamlūk dates. Walls C.8:4, 5, 6, 7, and 10 on the west side seem to connect together to form an auxiliary room although no clear entrance was found. Wall C.8:4, three surviving courses exposed, was located in the north-central sector of C.8, and bounded at its north end to Wall C.8:6 at 1.95 m. from the north balk. Wall C.8:5, of roughly dressed stones exposed to six of its surviving courses, was a skin wall on the west face of Wall C.8:4, ending at its south end at what seemed to be a threshold stone. South of it continued Wall C.8:7 with four surviving courses of dressed stone exposed on its west face, continuing in a double row of stones to the south balk where it met Wall C.8:8. Wall C.8:8 of which three surviving courses were exposed (average width of 0.50 m.) extended in a northwest line into the west balk.

In the northwest sector Wall C.8:6, composed of dressed stone (c. 0.50 m.-0.60 m. wide), extended west-northwest from its junction with Walls C.8:4 and 5 into the west balk where it seemed to connect with C.6:8. Wall C.8:10, mainly of undressed stone, exposed to a depth of two surviving courses, c. 1.00 m. wide, extended 1.50 m. south-southwest from Wall C.8:6 where it ran into the west balk. C.8:14, an additional wall with two surviving courses exposed, mainly of undressed stone (c. 0.90 m. wide), extended somewhat parallel to wall C.8:10 for 1.80 m. from Wall C.8.6. This sector, encompassed by these walls and the west balk, may be a room or a yard. In this west sector, the large fallen stones in soil Layer C.8:11 may have been collapsed parts of surrounding walls. C.8:11 also included an Islamic lamp and a few sheep and goat bones.

In the east half of C.8, Wall C.8:4 (east face) with Wall C.8:15 extending E-W to the east balk, and Wall C.8:9 extending west from the east balk to Wall C.8:4 may enclose part of another room.

In the south east sector of C.8, south of Wall C.8:9 and east of Wall C.8:7, soil layer C.8:12 contained large fallen stones and a

whetstone. Likewise in the north Locus C.8:13 north of Walls C.8:15, 4 and 6, contained large fallen stones.

Interpretation of the Remains

The following portion gives an analysis, by strata and phases, of the possible integration of the architectural features, soil layers, bone analysis, and coins of the loci involved. Also included is an analysis of the functional evidence of the architectural features and other loci excavated.

Ayyūbid/Mamlūk. The wall structures of C.6 and C.8 have been seen to be parts of the same basic house complex. The pottery from the walls and soil layers of C.6 and 8 consistently continued to show the Ayyūbid/Mamlūk period of construction and habitation, and since in C.6 this dating was found also below the founding levels of Wall C.6:2 (on its south face) and in the rooms and courtyards there, the conclusion is that those constructions in C.6 are to be dated to the Ayyūbid/Mamlūk period. The walls of C.8 seem to connect with the room doorways near the east balk in C.6. All this indicated that there was in C.6 and 8 a dwelling complex of several rooms and courts. In C.6 there were two or three rooms, a part of one of which (between Wall 2 and the north balk) seemed to be some sort of work space, since a grinding stone was found on its floor (Locus 21); the southwest sector of C.6 can be taken to be a courtyard where (in Locus 23) a great number of bone fragments were found, some of sheep and goat, cattle, camel, and one of a horse. In C.8 toward the west balk there is a sector which may have been a courtyard or room for domestic use, to the east of which there seemed to be one or two more rooms. The north building in C.4, described in the Heshbon 1971 report, may also be a part of this house complex lying further west.

The wall structures and soil layers of C.7 have been shown to be of the Ayyūbid/Mamlūk period and thus were of the same general date as those in C.6 and C.8, but how these walls and enclosures connected, if at all, was not yet determined. The same

general domestic pattern was seen in C.7 as in C.6 and 8: an outer courtyard and other rooms. In the sector of C.7 proposed as the courtyard with manger, Locus C.7:12 and 14 produced a substantial quantity of sheep and goat bone fragments together with some of cattle. The other Squares of Area C produced no Ayyūbid/Mamlūk structures, and the sherds found in those squares from that period were parts of eroded debris from earlier seasons of work.

'Abbāsid. There were no structures found from this period, and the evidence for an 'Abbāsid occupation is sparse, being found to a limited degree in C.7, in Locus 21 and possibly Locus 35 (cf. Loci 51 and 52 at the south balk of Square 3).

Umayyad. No structures of this stratum were found, but here and there were uncovered apparently Umayyad soil layers. For example, in the northwest corner of C.7 the pottery and stratigraphy indicated several layers of Umayyad deposit (Loci 38, 40, 44); (cf. C.3:54, 56-58). It is to be remembered that Umayyad walls were found in C.4:12, 13 and 50, in C.1:7, C.5:7, and C.2:11, as described in an earlier report.

Byzantine. There were no walls or other evidence of structures from the Byzantine period found in Area C this season, such as the Byzantine Wall C.1:8 and some early Byzantine layers found earlier in C.4:41, 53, 54. However, the 1974 season continued to show through analysis of the pottery, especially within the Roman tower (bounded by Walls C.5:60 and 77), evidence of the massive fill from the Byzantine period that had evidently been dumped there from some structures and layers farther up the slope. Evidence of an Early Byzantine locus was seen in the dump material of C.3:71, and C.7:43 also showed a Byzantine layer (cf. C.3:59, south balk).

Late Roman. There was practically no evidence from this period. A Late Roman coin (fourth century A.D.) showed up in C.5 but it was found in the Byzantine dump material of C.5:81; there appeared also a few Late Roman sherds in the Roman Wall C.5:60.

Early Roman. The main evidence in Area C for this period in 1974 was found in what can tentatively be called a Roman defense tower in C.1 and C.5. The pottery coming from the foundation trenches of Wall C.1:49 and C.5:60 was consistently Early Roman, and so it seemed reasonable to conclude that the complex of Walls 40, 63, and 49 in C.1, and Walls 60 and 77 in C.5, connected to make three sides of a structure (the fourth side presumed to be in the subsidiary south balk of C.5 and the south balk of C.1) built in the Early Roman period. The threshold at the bottom of the doorjamb (with a bolt hole cut into it) on the south end of Wall C.5:77, and the paving to the west of the doorway there, with a corresponding line of stones with a surviving upper course offset (Wall C.5:82), all the stones being fairly dressed, and extending to the west balk, indicated a rather formal entrance running uphill eastward into the sector beyond Wall C.5:77. There was another possible doorway off Wall C.5:82 opening north into another room. Thus, this whole structure may well have been part of a Roman defense tower with a guardroom inside. A number of large well-cut stones, some of them grooved and one with a bolt hole in it, that had fallen on and into the wall complex suggested that there was more of the structure in finished stone higher up on the tower to the east, possibly meaning that there was a second story to the tower. The other part of the doorway at the south end of Wall C.5:77 lay in the subsidiary south balk of Square 5. The tower complex seemed to extend north into the north balk of C.5, and the Wall C.5:82 running west of the doorjamb of Wall C.5:77 seemed to extend into the west balk of C.5, all suggesting that there may have been a larger and more intricate defense system of which the tower was one part.

It is to be noted that the foundation-trench material for Wall C.1:30, a wall abutting the corner Wall C.1:49, extending north, was shown to be Early Roman, thus dating Wall 30 to this period also.

Hellenistic. There were no Hellenistic structures discovered in Area C in this season. Although Hellenistic sherds appeared

here and there in C.1 and C.5, there were no clearly Hellenistic loci uncovered. This agrees with evidence from other parts of the *tell* that Hellenistic settlement here may have been slight.

Iron II. In the northwest sector of C.7, below the Umayyad Loci C.7:38, 40-42 and the one Byzantine locus (43), there was uncovered Wall C.7:44. It was c. 1.00 m. wide, built of coarse stones, and lay on a line running from the north balk south-southwest. This wall was in line with the Iron II Wall C.3:60 (the C.3:26 of 1973) as the latter entered into the south balk of C.3. The surviving top of Wall C.7:44 was at almost the same level (from 879.06 m. to 878.97 m.) as the top of Wall C.3:60 (at 878.80 m.), which suggested that Wall C.7:44 was the extension of, or an upper layer of, stones overlaying Wall C.3:60. This pattern seen in C.7 and C.3 suggested a similarity to other Iron II zigzag walls.

In C.1, in the sector under the Early Roman Wall C.1:30 which abutted on, and extended north from the massive Early Roman Wall complex C.1:49, 63, and 49, the mixed pottery of the Early Roman, Iron II, and the Iron I periods (Loci 117, 118) presented a stratigraphical problem as to the distinction between the Early Roman, the Iron II, and the Iron I periods. This was the same problem encountered regarding those same periods in one of the Squares of Area B. It is to be observed that the Iron II, Iron I dating in C.1:118 can in a number of cases be determined only on the basis of body sherds. Iron II sherds, though mixed with later ones in several Area C Squares, are the latest sherds in some loci of C.2 and date them accordingly.

Iron I. Although scattered sherds of the Iron I period appeared in Squares C.1, 2 and 5, there was no evidence of Iron I structures and very little evidence for clearly Iron I loci; the few cases were Loci C.2:92, 94, 96-99. The paucity of evidence found so far seemed to point to a scanty Iron I habitation on this part of the tell.

Conclusions

In summary, the 1974 excavation in Area C has shown on the lower west slope evidence for a substantial Roman outer defense tower, and up the slope has provided more evidence regarding the Iron II wall in C.3, now also found in C.7. An extensive Ayyūbid/Mamlūk house complex has been uncovered. Further seasons of excavation should help clarify the meaning of these habitations. Evidence of meaningful connections between Areas A and C has not yet been produced.

AREA D

LARRY G. HERR
Harvard University
Cambridge, Massachusetts

Area D was originally laid out to check the stratigraphy of Tell Ḥesbân on the south slope of the acropolis and to expose, if possible, the southern acropolis access route. Later, with the eastward expansion of Area B, Area D served to connect stratigraphically Area A on top of the acropolis with Area B on the southern shelf below.

During the 1974 season digging was continued in all Squares of Area D except D.6 which was completed the previous season. As in 1973, D.4 was excavated with Area B and its results are published with that Area. Excavation of D.1, now straddling the acropolis perimeter Wall D.1:4, was two related operations, one north of the perimeter wall, D.1 North, and one south, D.1 South. The Department of Antiquities allowed us to lift part of the Flagstone Pavement D.1:33/34 in D.1 North, which they had decided earlier to preserve for tourism. In 1971 D.1 North had been excavated to bedrock in the east, but the flagstone pavement precluded excavation up to the west balk—important because it was the main north-south balk connecting Areas A and B. In 1974 eight of the pavers were removed (and marked for reconstruction) creating a digging area shaped like a rough "T" with the crossbar stretched along the west balk. Thus we could use the subsidiary west balk left standing by the 1971 excavations as a stratigraphic guide and could peel the remaining strata until bedrock was reached.

In D.1 South excavation was limited to "Cave" D.1.63, just begun in 1973, near the southeast corner of the Square. What we had thought earlier to have been a cave was really a cistern

with half of its roof collapsed. Left unexcavated was the post-abandonment debris in D.1's south balk.

In 1973 work had focused on the western part of D.2 so that, if that was to have been the last season, the north-south axis (west balk) would have been exposed fully. But bedrock had not been reached, nor, in the east sector, had the bottom of the great pit containing sherds from the Ayyūbid/Mamlūk periods. We first worked to bring the Square into phase and then continued to bedrock.

At the beginning of the season it seemed to us that there would be little work remaining in D.3 since the western sector had been excavated to bedrock leaving us roughly a third of the Square to complete. North of the remains of Stairway D.3:39 near the north balk was a silo cut into bedrock while south of the stairs there remained a stub of debris, the contents of which were somewhat known since it was through the western portion that the 1973 excavations had dug. The third and major sector to be excavated was east of Wall D.3:16, a sector about 1.75 x 6.00 m. Our hopes for a quick completion were shelved when, near the close of the season, we came to the bedrock lip of a very large cave which went down and eastward for at least another 5 m.

In D.5 the Department of Antiquities allowed us to lift more of the flagstone pavement (D.5:11=D.1:33/34) to expose part of the west balk as it ran south from the south wall of the Area A church. As in D.1 North we were able to use the west subsidiary balk of the 1971 and 1973 seasons as a guide and approach the main west balk from the east. The sector excavated in D.5 was smaller than in D.1 North; we took up only six stones to create a working zone in the shape of a long "V". These limits, with the open mouth of the "V" at the west balk, were set by the church's south Wall D.5:12 on the north and the ceiling vault of Cistern D.5:5 on the south.

With this brief introduction to the Squares, the sectors excavated, and the progress made, we go to a detailed discussion of

the work, stratum by stratum. In doing this we are forced by the massive presence of Wall D.1:4 to be uncertain of some stratigraphic connections across that wall. Nevertheless, connections have been suggested which we hope the reader will regard critically. Where possible the discussion will relate the *H74* strata to Geraty's scheme published in the *H73* report.[1] Continued excavation has revealed additional strata in the earlier periods, and a new scheme is demanded. For clarification a table is provided connecting Geraty's scheme with the 1974 season's additions (Fig. 14A).

Stratum 3

Next to the west balk of D.5 the Stratum 6 flagstone pavement had been disturbed by soil and hewn stones (a foundation trench and wall?) containing Ayyūbid/Mamlūk sherds, but since it extended only 0.30 m. into the Square (it undoubtedly ran farther to the west) it was difficult to ascertain its function. It could have been related to the Stratum 3 acropolis structures.[2]

In Squares D.2 and D.3 a giant pit which consistently turned up pottery of the Ayyūbid/Mamlūk horizon was excavated in 1974 as well as in 1968 and 1973.[3] It was shaped something like a large "S" and extended from within the north balk of D.2 southward into and halfway across D.3. Its east-west dimensions cannot be known since it began to the east of D.2, but we do know that it extended well into B.7. In 1974 only a small portion of the pit remained to be dug in the east half of D.2. The nature of the soil, a reddish-tan color with chunks of *nari,* and the strongly dominant Late Roman ceramics with only a few Ayyūbid/Mamlūk sherds suggested a Late Roman original deposit, since the debris directly below the pit was of the very same color, consistency, composition, and ceramic contents minus

[1] See L. T. Geraty, "Area D," *AUSS* 13 (1975): 183-211. Below we shall refer to the reports of the respective seasons as *H68* (*AUSS* 7 [no. 2]: 97-239), *H71* (*AUSS* 11 [no. 1]: 1-144), and *H73* (*AUSS* 13 [no. 2]: 101-217 and plates).

[2] *H68,* pp. 197-203; *H71,* pp. 99, 100.

[3] *H68,* p. 211; *H73,* p. 187.

H73	H74
1	1
2	2
3	3
4	4
5	5
6	6
7	7
	8
8	9
9	10
10	11
10	12
10	13
11	14A
11	14B
12	15
	16

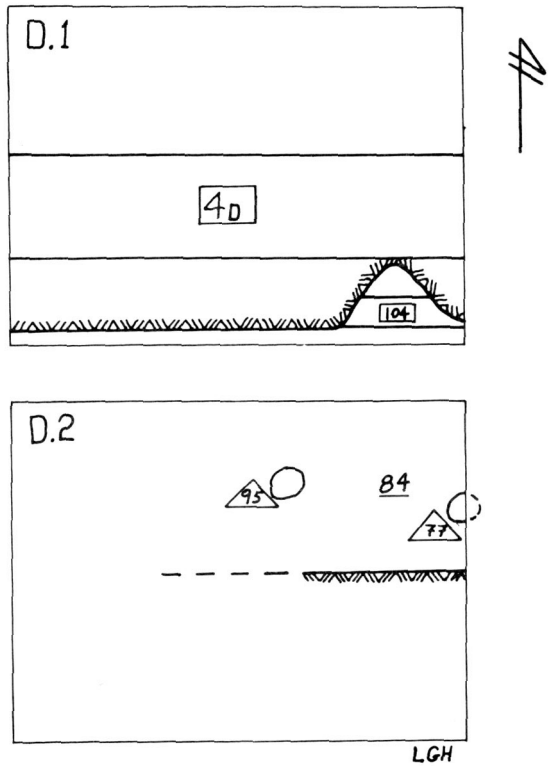


Fig. 14A. Area D strata designations as reported for *H73* correlated with those for *H74*.

Fig. 14B. Schematic plan of Area D's Stratum 14B (scale, 1:100). Levels: Wall D.1:4, ca. 892.25 (founding, ca. 889.25); Bedrock lip just west of Wall D.1:104, 889.00; Surface D.1:84, 881.11; Wall D.1:104, 888.94 (founding, ca. 888.00).

the Ayyūbid/Mamlūk sherds. These observations, indicating that the pit had been dug and quickly refilled with the same soil, along with evidence that the pit edges on the north and southeast followed former wall lines (the bottom courses of Walls D.2:26 on the north and D.2:64 and D.2:55 on the southeast remained) suggested that it was a robber pit probably to provide material for the building activity of Stratum 3 in the 14th century A.D.

Stratum 6[4]

The 1971 excavations in both D.1 North and D.5 stopped at the monumental Pavement D.1:33/34=D.5:11. Since the pavement itself has already been described,[5] it is sufficient to say that on the underside of one of the stones (a re-used architectural fragment) was a nicely inscribed Byzantine cross, one of the first inconographic indications that Christianity was practiced at Ḥesbân (Pl. VII:A). Beneath the flagstones was a series of two or three makeup layers of well-packed, distinctively-colored clay. Stability was further ensured for the heavily used flagstone just outside the threshold in the south wall of the church by constructing a layer of flat stone chinks within the makeup layers.

Directly beneath the flagstones was a series of drains, none of which could be excavated completely since they were partially in balks. The first drain seems to have orginated at the church wall, run south about a meter (in our west balk), made a 90° turn to the east, travelled along our south balk, and emerged as Drain D.5:20 excavated last season.[6] It passed Cistern D.5:5, into the vault of which was a very irregular opening, made after the vault was constructed, for the vault existed prior to the construction of the drain. It seems likely that water flowed through this hole from both the east and west, both flows having utilized the present drain which was apparently sloped so as to drain into the cistern. A second drain was found in the west balk of D.1 North which probably was the continuation of *H73*

[4] See Fig. 7 in *H73*.
[5] *H71*, pp. 91-92, and Pl. IX:A.
[6] *H73*, pp. 193-194 for a description of the drain.

Drain D.1:58 south of Wall D.1:4.Though first built in Stratum 7 it seems to have been re-used in Stratum 6. A series of cover stones which crossed the tops of the drain walls was used to raise the drain to the higher new flagstone pavement of Stratum 6.

The dating of the flagstone pavement has been somewhat problematic with uncertainty vacillating between Umayyad and Byzantine dates. The earlier suggestion[7] that the pavement was built in Byzantine times and perhaps reworked or simply continued in use into Umayyad times was largely borne out by the work in 1974. In both D.1 North and D.5 only one certain Umayyad sherd was found and that came from the mortar between the stones. Otherwise ceramic evidence was solidly Byzantine. Moreover, well sealed in the makeup for the flagstone pavement (or perhaps in the foundation trench for the cover stones of Drain D.1:78) a coin from the time of Tiberius II, A.D. 578-82, was found which suggested that the flagstones may have represented rebuilding following the destruction caused by the Persian invasion of 614.

Stratum 7

In D.1 North this stratum included the "slightly argillaceous poorly indurated dolomitic limestone" tile floor,[8] though it was much more worn in the western sector and even resurfaced with plaster near the gate in the acropolis perimeter wall. North of Wall D.5:27, which ran east-west in D.1's north balk, were the remains of another flagstone pavement, D.5:42, which, like the Stratum 6 pavement, ran up to the south wall of the church and seems to have used the same threshold. This latter pavement was preserved only in patches but its well-worn surface indicated significant use. About 1 m. from the west balk the flagstones gave way to a very hard plaster surface which continued eastward

[7] *H71,* pp. 110-111, where the pavement was given an Ummayad date by the editors. By 1973, however, theories had changed and the Byzantine date of the excavator was being favored. See *H73,* p. 188.

[8] *H71,* pp. 110-111.

to connect with the Stratum 7 surfaces excavated in earlier seasons.

In D.5, immediately under the makeup for Pavement D.5:42, was the tan foundation soil for the church's south Wall D.5:12, which was apparently cut and filled at the beginning of Stratum 7. It extended southward as far as the confines of our sounding, 1.20 m., so the southern limit of the trench was not found but the nature and phasing of the wall masonry (Geraty's description and phasing in his 1973 report[9] was confirmed in every detail) made it clear that we were in foundation material. This stratum's date probably belongs somewhere in the late Byzantine period. We cannot be more specific.

Stratum 8

While the foundation trench of Stratum 7 contained many tesserae and painted fresco fragments, and plenty of Byzantine pottery, the foundation trench soil corresponding to the lowest course of the unhewn foundation stones in Wall D.5:12 contained no fresco bits or tesserae and only a very few Byzantine sherds. It is thus possible that this foundation trench soil represented the founding of the earliest phase of the wall. Stratum 7 would then have been a second phase, when fresco fragments, possibly from the earliest phase of the church, along with tesserae from the tesselated floors were dumped into the foundation trench.[10] Stratum 8 cannot be dated very closely, but it probably existed in early or mid-Byzantine times.

Stratum 9

At the bottom of D.5 just above bedrock was one soil layer which contained only Late Roman pottery. This may have been the soil that was present when the foundation trench for the church wall was dug.[11] This layer as well as the foundation soil

[9] *H73*, pp. 191-192.

[10] Note how this could correspond with the church phases found in Area A; see *H68*, pp. 156-164.

[11] It possibly corresponded to material found outside the foundation trench on the other side of Wall D.5:12 in Area A. See *H73*, pp. 129-130.

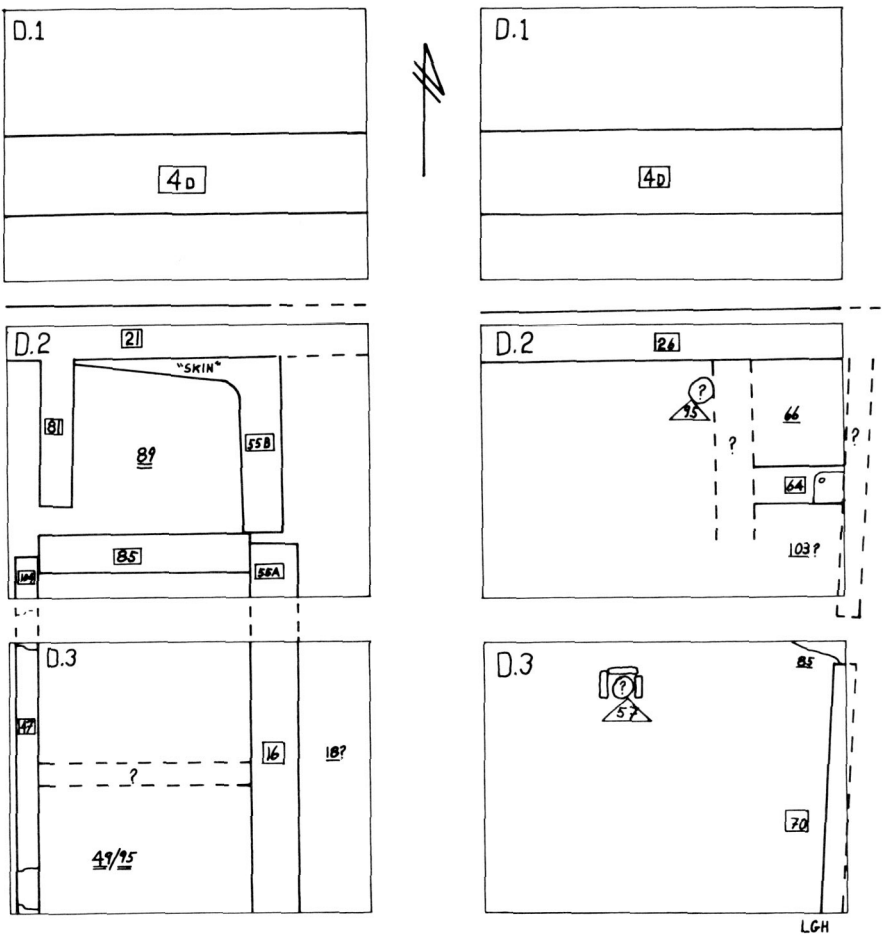


Fig. 15A. Schematic plan of Area D's Stratum 10 (scale, 1:100). Levels: Wall D.1:4, ca. 892.25; Wall D.2:21, 891.09 (founding, 888.80); Wall D.2:55B, 889.22 (founding, 888.11); Wall D.2:81, 889.93 (north), 888.29 (south; founding, 887.15); Wall D.2:85, 888.29 (founding, 887.15); Surface D.2:89, 887.30; Wall D.3:16, 889.95 (bottom so far, 887.22); Wall D.3:47, 887.18 (founding, 886.00); Surface D.3:49/95, 886.50; Surface D.3:18, 890.05 (north), 889.32 (south).

Fig. 15B. Schematic plan of Area D's Stratum 12 (scale, 1:100). Levels: Wall D.1:4, ca. 892.25; Wall D.2:26, 889.52 (founding, 888.56); Surface D.2:66, 889.07; Wall D.2:64, 889.19 (founding, 888.04); Surface D.2:103, 888.68 (north), 888.34 (south); Surface D.3:85, 888.25; Wall D.3:70, 889.50 (founding, 885.89); Silo D.3:57, 884.90 (lip), 885.62 (framing stones).

layers which ran up against Wall D.5:12 also ran up to the vault over Cistern D.5:5, indicating the probability that at least the cistern vault was in existence already at the building of the church, and possibly as early as Late Roman times. There is nothing except the Late Roman ceramic data that suggests placing this soil in Stratum 9, so it may be Stratum 10 as well.

Far more important were the Stratum 9 remains south of Wall D.1:4. Most of this material was excavated in 1973, since it included the Late Roman acropolis stairway found in D.2 and 3.[12] Since the stairway itself, its connection to Wall D.3:16 to the east, and the association of surfaces to the stairway have already been described[13] it only need be said here that the 1974 excavations worked on the eastern portion of Surface D.3:45, which ran up to the southern edge of the bottom step of the stairway. This surface continued south as Surface D.4:64 and probably connected with one of the roadway layers in Area B.

It is clear that Wall D.3:16 was the eastern boundary of the stairway and thus of the Late Roman acropolis ascent. East of the wall Early Roman debris was found 1.60 m. higher than Surface D.3:45. We must thus conceive of our acropolis ascent as having been dug down into the contemporary surface on the east.

Closing out this stratum was the destruction of Wall D.3:16, rock and soil Tumble D.3:84 which was 1.25 m. thick next to Wall D.3:16 and spread out 3.50 m. to the west. Unfortunately, in spite of the wall tumble, no intact material remains were concealed beneath the debris except for large amounts of irreparable fragments of thin glass. For this stratum's date, see the 1973 report.[14]

Stratum 10[15]

Stratum 10 included the most substantial architectural pheno-

[12] For a connection of the two separate stair remains, see *H73*, pp. 198-199.
[13] *H73*, pp. 196-199.
[14] Ibid.
[15] See Fig. 15A.

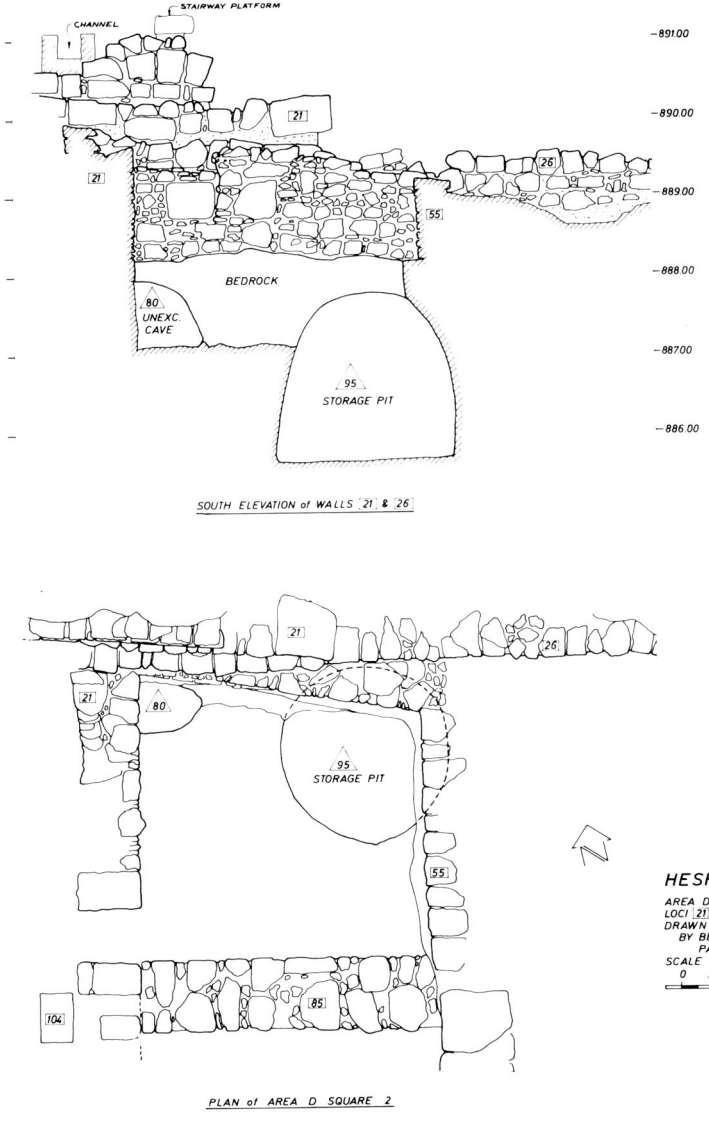


Fig. 16. Plan of room in Square D.2 with south elevation of Walls D.2:21 and 26.

mena found in Area D in 1974. The key to the stratum was the well-constructed north-south Wall D.3:47 parallel and adjacent to the west balk, which wall included two thresholds. During the season we continued the exposure of Surface D.3:49, which ran east from the wall, and found that it ran up to Wall D.3:16. To the north in D.2 a complete room (Pl. VII:B and Fig. 16) was excavated which apparently was connected with the southern structure by Wall D.2:104, the northward continuation of Wall D.3:47.

In D.2 all walls but one (the east) were solidly built of two rows of semi-hewn stones. The room's south wall, D.2:85, was founded on bedrock, and its western end, which butted up against Wall D.2:104, contained the ashlar southern jamb for a doorway leading out to the west. The room's western wall D.2:81 contained the ashlar north jamb of the door, was also founded on bedrock, and extended north to bond into Wall D.2:21, the room's north wall. At some point, probably when the room was constructed, a leveling of the bedrock took place which resulted in a bedrock cut of about 1 m. in height at the north wall of the room. This cut ran from west of the west wall to the east wall. An earlier wall, D.2:26, already ran in this general direction, upon which later builders set Wall D.2:21 and then aligned everything with the bedrock cut by constructing a "skin" against the two walls. When viewed from the south it seemed to be one homogeneous wall.

The east wall of the room, D.2:55B, extended south from the "skin" of the north wall and stopped when it reached the southern wall.[16] Here again a cut had been made to level the bedrock surface, but only two courses of the wall were preserved. Like the north wall it was battered against the soil behind it and had no surviving east face. But unlike the other walls of the room it was only one row thick, though in its unpreserved higher courses it

[16] Though seemingly on a line with Wall D.2:55A, the two were apparently different walls: A was wider than B; A had a clear surviving east face while B had none.

may have utilized the rock tumble against which it was battered as the footing for a second row. Surface D.2:89 connected all four walls and continued through the doorway into the west balk. The surface was laid just above bedrock and no objects were found to indicate the function of the room. From the bedrock cuts and the Early Roman and Hellenistic soil layers into which the room was cut on the north and east (possibly as much as 3 m. of Early Roman deposits had existed to the east) it would appear that the structure was in part subterranean (on the east and north).

The northern and eastern bedrock cuts intruded into two phenomena. The first was Silo D.2:95 in the northeast corner over the debris of which they simply laid their surface. The second was probably a cave (unexcavated as yet) which they walled up along the line of Wall D.2:21. All the above walls, certainly to be attributed to Stratum 10, have so far yielded no indication of having been built in Late Roman times. Indeed, all pottery so far removed from three walls points to an Early Roman date for the construction of the walls, but no surfaces were found to go with them. The Stratum 10 builders may have made the bedrock cuts and so wiped out earlier surfaces (see below, Stratum 11).

Wall D.3:47 also continued south into D.4 as Wall D.4:83 and may have cornered to the east just inside that Square. Moreover, Wall D.3:16, the eastern wall of the D.3 structure, also continued into D.4 as Wall D.4:32, but it stopped about 2 m. south of D.4's north balk.[17] If Wall D.4:83 turned east it would have been another east-west wall along with D.2:85 and D.2:21 which connected the two north-south walls D.3:47 and D.3:16. Though the threshold in Wall D.3:47 next to the north balk of D.3 is our only clue, another east-west wall might be found under the remains of Stairway D.3:39 (Stratum 9). If so, we would have here a row of three rooms, all partly subterranean on the east

[17] See the Area B report for a fuller description.

(but probably not in the west), which ran from north to south and which communicated to the west. All the walls of these rooms, except possibly the one in D.2, were of such strength that at least a second story could have been added, but Wall D.2:21, preserved to a height of 3.50 m., showed no signs of a second floor. Unfortunately, none of the surfaces yielded any objects which indicated the functions of the rooms.

Some of the D.3 white layers excavated in 1968[18] east of Wall D.3:16 possibly ran up to unpreserved higher courses of the wall and thus may have been part of the Stratum 10 acropolis ascent (see below, Stratum 11).

In two isolated places where bedrock was not directly beneath the surfaces there were pockets of leveling fill. In D.2 it consisted of the top two layers of fill debris in Silo D.2:95 just beneath Surface D.2:89. In D.3 it was the debris (average depth, 0.20 m.) which separated Surface D.3:95 from the bedrock irregularities below. Since this leveling marked the beginning of Stratum 10 it is of interest to note the striking difference in the ceramic remains from the debris below the surface, which, while still Late Roman, were typologically of an earlier horizon. Stratum 10 must have thus existed for some time since no signs of abandonment were noted which could account for the ceramic differences. A date of A.D. 150 would not be far wrong.

The exact stratigraphic relation of Wall D.3:16 to the stratum is unclear. That it was later than the 2 m. thick Stratum 11 layers to the east is clear from the foundation trench, though Stratum 11 Surface D.3:19/67 on top of the debris may have run up to it (either the Stratum 3 pit or the wall's foundation trench cut the connection). Late Roman material (Stratum 10) was found against the west side of the wall (where the founding level has not yet been reached) so we know that the wall was in existence by then. A future season should show us to which stratum its construction belonged.

[18] *H68*, pp. 214-216.

Stratum 11

Some Stratum 11 materials may possibly belong to Strata 12 or 13. Directly beneath the Byzantine layers in D.1 North we found Early Roman material. Problematic was the crude Drain D.1:80 (= *H73* D.1:61 south of Wall D.1:4) running northeast-southwest. All ceramic evidence directly associated with the installation, its foundation trenches, and the surface from which it was dug were Early Roman, but above it no Early Roman surface was found and the crude construction of the drain was too weak to have survived if exposed (Pl. VIII:A). Perhaps it was related to Surface D.1:44 which was found in the east sector of the Square in 1971 but of which no trace in the west was found in 1974. This surface was of a proper level (891.17) to be served by the drain (891.03).

Drain D.1:80 was dug from Surface D.1:81/82, which was not hard packed and possibly was only temporarily exposed in the construction of Drain D.1:80. This accounted for the fact that no corresponding surface was apparent in the eastern part of the Square. No more surfaces were found in the Square and Early Roman leveling fill inside Wall D.1:4 lay ca. 0.75 m. deep over bedrock. In holes in the bedrock where no occupation had disturbed them were hard pockets of bright red virgin soil.

The sector east of Wall D.3:16 had not been excavated since 1968. Left for us to remove were parts of the white layered Surface D.3:19 (our D.3:67), the last of the "roadway"[19] layers found in Areas B and D during the last three seasons. The ceramic evidence from both the 1968 and 1974 seasons points to an Early Roman date. At first it was hypothesized that this white layer extended westward to join the earliest white layer of Area B,[20] though no direct stratigraphic linkage could be seen since later pitting completely severed the connections. It is interesting to note: 1) Area B's white layer was level and did not slope in any direction; 2) In D.3, 8 m. to the east, Surface D.3:67 was

[19] See Sauer's discussion in *H71*, pp. 48-50.

[20] Stratum 12 in Area B. See *H71*, p. 63.

ca. 2.25 m. higher than the B.3 layer though in the 1.30 m. east-west dimensions of the layer, no east-west slope was noted. It would thus appear that Area B's Stratum 12 "roadway" should *not* be given an east-west stratigraphic connection with Surface D.3:67.

Possibly the connection may still be observable on the south. Though Surface D.3:19=67 did not slope in an east-west direction, it went from 888.72 m. in the south of the Square to 889.82 m., 6 m. away in the north. As seen above, in Stratum 10 there was no acropolis ascent where the later one was built in Stratum 9. Therefore it may be that the white layers found in the eastern part of D.3 were the remains of an acropolis ascent prior to the construction of the monumental stairway farther to the west.[21] If so, it would appear that this ascent ramp would have begun near the southeast corner of the Area B/D white layers[22] and would have ascended northward to the acropolis. Unfortunately all remains of this stratum have been lost to the Stratum 3 pit in D.2, so at present it cannot be traced northward.

The function of Wall D.2:21 and possibly also of Wall D.2:26 (discussed above, see Stratum 10) may be seen in conjunction with the proposed acropolis ascent ramp. Presuming that the ramp led straight up toward the acropolis perimeter Wall D.1:4, it would have met the wall near its southeast corner. The original Early Roman gate through the perimeter wall may have stood at that point, but it is just as likely that the Early Roman gate was situated in the center of the acropolis south perimeter wall. If it was there, it would have been necessary to connect the top of the ramp with the gate by a road built along the edge of a steep slope. A retaining wall would thus have been necessary to support the roadway's southern side. This would also explain the 1.50-2.00 m. of soil between the perimeter wall and Wall D.2:21, which had an apparent function as fill.

[21] If so, it is possible that the yet undiscovered Early Roman gate through Wall D.1:4 may lie just east of our excavations.

[22] Here interpreted as a plaza.

To put more of the Area in context we need to view our structures from Area B since Wall D.3:16 cut so many Area D layers. If Surface D.3:19=67 can be equated with the earliest white layer in Area B we note that that layer ran up to Curb Stones B.3:31.[23] These would have formed the eastern boundary of an Early Roman plaza in Area B. East of the curbing was another white layer which was probably a narrow street bordering on the Early Roman phase of Wall D.3:47. If Wall D.3:47 and its Early Roman Surface D.3:52 were thus connected to the ramp we have indications of structures having lined the ramp to the west. Further, if Wall D.3:47 belonged to this stratum it may have bounded a series of structures similar to that of Stratum 10. This hypothesis could explain the solid Early Roman ceramic remains in the walls of D.2 (see Stratum 10).

If Surface D.3:19=67 was an ascent ramp to the acropolis the deep debris beneath the Surface, which consisted of many layers full of small pieces of pottery, ash pockets and loose dirt, might be considered as the makeup for the ramp. Thus the three coins from the early 1st century A.D. (two of Aretas IV, 9 B.C.-A.D. 40, and one of Pontius Pilate, ca. A.D. 30) which came from that makeup would help give a *terminus post quem* for the building of the ramp in the late Early Roman III period, the middle of the 1st century A.D.

Stratum 12[24]

As mentioned above, the Stratum 3 pit robbed out the tell-tale remains of the acropolis ascent ramp in D.2, making the sequence between Strata 11 and 12 uncertain since Stratum 12 was found only in D.2. This seems to have been a re-use of Stratum 13 with the addition of Wall D.2:64, a one row wall made of very large semi-hewn stones in its one surviving course. Laid up to and slightly over the interior lip of the wall's threshold (next to the east balk) was Surface D.2:66 which lay to the north and seems

[23] See Sauer in *H71*, pp. 63-64.
[24] See Fig. 15B.

to have continued up to the second phase of Wall D.2:26. It appeared that these two walls were the north and south boundaries of a room. Its east wall lay outside the limits of our excavation and the west wall was probably robbed by builders of Wall D.2:55B who also robbed the western end of Wall D.2:64.

The sector south of Wall D.2:64 was problematic as no surface was found to go with the wall use, though it is possible that there was re-use of the Stratum 13 surface, 0.40 m. deeper. It is difficult to date Stratum 12, but to place it in the first half of the 1st century A.D. would probably not be far wrong.

Stratigraphically disconnected from but possibly associated with the end of Stratum 12 were the fill layers in two subterranean installations, the function of which will be discussed below with Stratum 14. The installations had been dug about 2 m. deep into bedrock in a cistern-like shape and now stood filled with debris which contained pottery homogeneous with that of the Stratum 11 ramp (one of them, Silo D.3:57, contained an Aretas IV coin, as did the Stratum 11 debris. The construction date of the installations is unknown though a similar one (D.2:77) clearly belonged to the Late Hellenistic period (Hasmonean). D.2:95 was found in the northeast corner of the D.2 room where the bedrock cuts for Walls D.2:55B and D.2:21 had intersected the installation. A very similar installation, D.3:57, was found near the north balk of D.3. Remarkable was the debris in it which included 55 full pails of pottery and almost 1,000 registered bones (clearly a garbage dump).

Also unclear in stratigraphic relations was Cave D.3:83. It was left unexcavated, but a meter tape could be slid into its spaces for at least 5 m. down and east.

Stratum 13

Wall D.2:26, the north wall of the Stratum 12 structure, was founded in this phase with no visible foundation trench. After a destruction it was re-used in Stratum 12. Surface D.2:74, cut by Wall D.2:55B on the west, was laid over Hellenistic debris and

seems to have extended southward under Wall D.2:64 and into D.3 as Surface D.3:85, which was laid up to Wall D.3:70, a rather frail one row, four course wall, which ran north-south right along our east balk line. Plastered Surface D.3:85 was preserved only in a very small patch in the northeast corner of D.3, since its extent southward seems to have been cut possibly by a pit, the origin of which we do not yet know. The north end of Wall D.3:70 stood 0.40 m. south of the north balk of D.3 in typical doorjamb or corner masonry, that is, the ashlar blocks making up the doorjamb or corner were much larger and more carefully laid than the unhewn stones of the remainder.

If this was all the architectural evidence from this stratum which survived, a reconstruction of its extent and function would be impossible without guesswork. As for a date, we suggest the first half of the 1st century A.D. for its destruction. Construction may have been around the turn of the era or in the late 1st century B.C., Early Roman II.

Stratum 14A

Stratum 14, Phase A, was found only in the northeast corner of D.2 and its original horizontal extent remained unknown. A clear layer composed of white decayed straw extended from a vertical cut in bedrock northward, but it could not be traced farther than the north and east balks, and west to Wall D.2:55B, which cut it. The nature of the surface composition indicated that it was a sunken, open storage bin. Ceramic evidence was dated to the Late Hellenistic period (Hasmonean).[25]

Stratum 14B

Stratum 14, Phase B, (Fig. 14B) was very similar to Stratum 14, Phase A. We have made a distinction only because Silo

[25] The ceramic evidence led me to suggest a slightly more advanced horizon than the Hellenistic pottery found at Beth-zur. (See Paul W. Lapp, *Palestinian Ceramic Chronology* [New Haven, Conn., 1961]). A date in the early 1st century B.C. would thus be favored.

D.2:77 was in use with Phase B, while the surface of Phase A sealed over it. Surface D.2:84, a very hard dark gray clay, was laid tightly on the smoothly cut bedrock. On top of this were many very thin colorful layers of decayed straw (each were ca. 0.003 m. thick) lensing in and out. The total thickness was about 0.06 m. and its extent was the same as that of Phase A, limited in lateral extent for the same reasons.

Extruding from the east balk was the round mouth of a cistern-like facility now common at Ḥesbân, D.2:77 (compare the similar structures D.2:95 and D.3:57). Cut into bedrock, its bell shape was ca. 2 m. deep and 2 m. in diameter at the bottom. The earlier identification of these structures as cisterns had always been questioned because of the absence of plaster linings. With the discovery of this installation, perfectly preserved with virtually no post-abandonment accumulation (unlike the others), our conclusion was made nearly certain. The unplastered walls and the large numbers of solution cavities which were clearly in existence prior to the cutting of the installation led the geologist to the conclusion that they could not have held water for an extended period of time.[26] The remarkably well-preserved state of D.2:77 (kept clear of later debris by a sealing cover stone) supported this, since no hint of any water lines was visible on the side walls. Indeed, the walls looked as if they had been freshly carved. Moreover, at the very bottom, where a small bit of rain water had periodically gathered, the soft *nari* bedrock was extensively stained, and the tool marks, which elsewhere had been clearly evident, were hardly visible because of the solution activity. Certainly this particular installation had never held water and probably was dug with another intent. What then was its function? On the bottom of D.2:77 was one layer of soil, about 0.01-0.04 m. of decayed straw like the surfaces surrounding the mouth of the installation. This pointed to a grain

[26] See Harold E. James, Jr., "Geological Study at Tell Ḥesbân, 1974," in the present issue, pp. 168-169.

or straw storage facility. Upon the floor of the silo were fourteen pyramidal clay weights (Pl. VIII:B), which indicated the possible weighing out (selling?) of the stored material. Therefore we have begun to call this type of facility a "silo."

If one presumed that the Stratum 14 surfaces went through the north balk and were laid up against the bedrock cut in D.1 South, the diagnosis of a sunken grain storage depot would emerge. Moreover, since the northern bedrock cut extended westward it might be presumed that the southern one also did so before it was cut by the later D.2 room builders. Thus Silo D.2:95 could very easily have been part of the same storage complex.

Apparently sealed and forgotten at this time was the probable Stratum 16 cistern which the northern bedrock cutters intersected and filled. If we presume that Wall D.1:104, one row wide and two to four surviving courses high, was built both to block the mouth of this cistern and to continue the vertical face of the bedrock cut (it was perfectly aligned), it may be concluded that the construction of the wall was contemporary with the cutting of bedrock. The debris within the cistern and upon which the wall was founded bore this out, though very Late Hellenistic sherds were found.

As the stratigraphic connections cited above seemed weighty one was led to a conclusion regarding Wall D.1:4 similar to that of the 1973 excavators, namely that the acropolis perimeter wall was Hellenistic in origin, since Hellenistic soil was sealed against its lowest outside courses. On the other hand if one leaned more heavily on the ambiguous ceramic evidence (all sherds that seemed more Early Roman than Hellenistic were body sherds) one had a stratigraphic anomaly, not the least of which was that a Hellenistic surface would appear to have been placed on top of a horizontal shelf cut into bedrock in Early Roman times!

Stratum 15

Though most of the layers within the D.1 South cistern seem to have been Hellenistic, above the bottom soil layer was one that contained only late Iron II pottery, Layer D.1:63E. Perhaps this was deposited during that period, or more likely by Stratum 14 occupants from a source containing only Iron II pottery, since it was laid against soil containing Hellenistic sherds.

Stratum 16

The bottom soil layer inside the cistern was different from all those above it in that it was spread over the complete floor of the cistern and was composed of very fine soil typical of cistern silt. It seemed clear that this was the soil layer reflecting the use of the cistern. Since the ceramic evidence pointed to an Iron I date, the cistern had apparently been sealed well during the Iron I period and subsequently forgotten until the bedrock cutters of the Hellenistic period accidently cut into it. Given the parallel of Silo D.2:77 in Stratum 14B, which remained closed and empty for more than 2000 years, this was deemed likely.

AREAS E, F, and G.10

JAMES H. STIRLING
Loma Linda University
Loma Linda, California

In 1974, exploration of tombs that had been begun in 1971, was continued. In Area F, on the southwest slope of Tell Ḥesbân, five possible tomb sites were located, taking the presence of marks in the rock face or the existence of caves under overhanging ledges as cues. These were designated Squares 19 to 23. In the course of clearing these caves some evidence of human or animal occupation was noted, but no trace of human burial was found. Ceramic evidence suggested that primary utilization of the caves surrounding the *tell* were by Byzantine and Ayyūbid/Mamlūk occupants, probably as occasional shelters or animal pens.

In Area E, on the east flanks of the hills immediately to the west-southwest of the *tell,* four caves and tombs were excavated and explored in anticipation of finding evidence of burial use.

Tomb E.2

The first of these, a chamber off Tomb E.2, which had been investigated in the 1971 season and had been thought worthy of further study, was entered and partly cleared. A horizontal shaft was dug westward to ascertain whether there might have been a larger cave in the vicinity of this "side chamber." No evidence of occupation was found beyond a few Roman and Byzantine sherds which were thought to have been washed in by water erosion.

Tomb E.4

Tomb E.4 had an entrance that had been cut northward into the rock face. Investigators found it to be a natural cave that had been filled with debris from hillside water runoff.

Tomb E.5

In anticipation of a tomb here a number was cut for identification into the rock face at the beginning of excavation, but it turned out not to have any underground cavity and digging was soon terminated.

Tomb E.6

Tomb E.6 had not been disturbed by tomb robbers, at least in recent times. Its presence was detected through a cave-in of the roof during the previous winter's rains. A probe on the hillside came upon an entrance that had been carved westward into the rocky substratum. A rectangular stone slab had been placed in the entryway to block it shut. Sitting to the left of the doorway was a Herodian-type Early Roman lamp with two nozzles and a high central column (Pl. XVI:E). Past the entryway the excavators found a single-locus "Type 2" tomb.[1] No human bones were found in this tomb, nor any grave goods except for a few Byzantine sherds and two Early Roman pots. The pots contained soil like that of the rest of the tomb.

The association of these three slightly broken Roman ceramic objects—the double-nozzled lamp and the two cooking pots—posed some interesting problems. According to John Reeves, who was one of the excavators, and who searched the literature for references to other double-nozzled lamps, no other lamp of this type with a secure provenance has been reported. Though there are some uncertainties as to the place of its manufacture, its date seemed quite certainly to be Early Roman. The style and manufacture of the two pots also seemed to place them in the Early Roman period. That they should be resting on a surface dated by some Byzantine sherds seemed to indicate either that the tomb was disturbed in Byzantine times or that this was an instance of archaism, in which Byzantine-age people held these specimens of old pottery in special regard when they put them in the tomb.

[1] S. Douglas Waterhouse, "Heshbon 1971: Areas E and F," *AUSS* 11 (1973): 120.

Another interesting aspect of the tomb and its contents was the question of their function. Why would a tomb have these three objects and yet no skeletal remains? Possibly the pots held ashes when they were put into the chamber, but were filled with dirt later from water seepage which had resulted in the filling in of the entire tomb. If so, the presence of the ashes with the dirt went unnoticed when the pots were emptied. If the pots held ashes from the cremation of a human being there is abundant precedent for the practice in Early Roman culture. In Roman times cremation was almost universally practiced in the Empire; but around the turn of the era a change of attitude favoring burial came about. Nock examined a number of possible explanations for the change, and finally concluded:

> It was a change of fashion. . . . We mean the habits of the rich, which gradually permeated the classes below them. Burial seems to have made its appeal to them because of itself in the form of the use of the sarcophagus. This was expensive and gratified the instinct for ostentation. The richest could build mausolea. Many whose resources would not suffice for that could afford sarcophagi, which might well appear a more solid and adequate way of paying the last honors to the dead. . . . The sarcophagus reestablished the popularity of burial, and burial then came into its own right to be the dominant custom of the poor.[2]

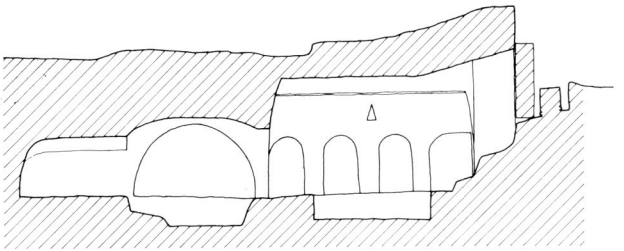
Nock also noted an instance in which a cinerary urn had been found with a lamp and without ashes in it, at a cemetery in Harit, or Theadelphia.[3]

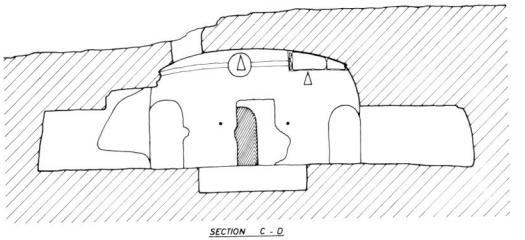
Tomb G.10

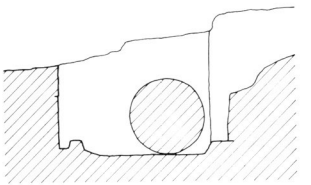
About two kilometers northwest of Tell Ḥesbân is a limestone outcropping which was recommended to us as a possible tomb site by Helmi Musa, a villager working with the expedition. He pointed out a half-exposed disk of stone which closely resembled the slab that closed the opening to "Rolling Stone Tomb" F.1, which had been excavated in 1971. G.10 turned out to be another of this type, and only the second example to be found in Jordan.

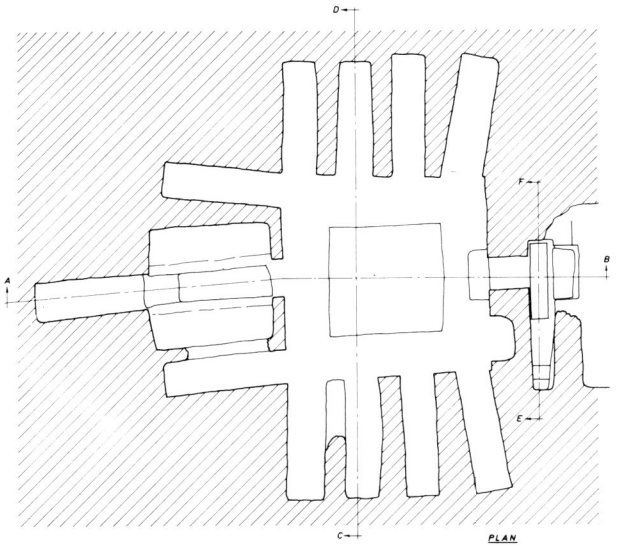
[2] Arthur Darby Nock, "Cremation and Burial in the Roman Empire," *HTR* 25 (1932): 321-359.

[3] Ibid., p. 328.









HESHBON 1974
AREA G.10 "ROLLING STONE TOMB"
DRAWN AUGUST 9 1974
BY BERT DEVRIES
SCALE METERS
0 40 80 120 160 200

Fig. 17. Plan and sections of "Rolling Stone Tomb" G.10 ca. 2 km. northwest of Tell Ḥesbân.

Tomb G.10 had an access hole in the roof about 1 m. wide by 3.5 m. long, apparently produced by recent tomb robbers. It was used as access for our excavation work, leaving the door *in situ* for its value as an exhibit of tomb door construction and placement. This tomb corresponded to Waterhouse's Types 1 and 3, for it had a central chamber and four loculi radiating out from the north and south walls, and three more from the east wall. One of those in the east wall had two arcosolia flanking it and an additional loculus attached to its east end (see Fig. 17). A square pit, serving apparently as a sump, occupied the center of the chamber floor as in Tomb F.1.[4]

It was unfortunate that the tomb had been visited by grave robbers. Bodies and grave goods had originally been placed in all the loculi in Early Roman times, and dirt had apparently been brought in from the surrounding land to cover the bodies. While robbers had not entered through the rolling stone doorway—for the sherds in its track were all from Roman times—they had taken advantage of the break in the roof to rifle the contents and rake the soil from the end of each loculus to the central chamber. Thus no bones were articulated and no grave goods were found associated *in situ* with them. In the process of excavating the mound of soil in the central chamber, however, a fragment of a Herodian lamp, a faience bead, and bones from several persons (including 9 left radii) were recovered. These individuals had ranged from infants to arthritic aged persons and included both males and females.

As the loculi were excavated, additional scattered grave goods came to light: a gold earring, a bronze fibula, a Nabataean (Rabbel II, A.D. 71-106) coin, a fragment of a pin, an iron nail, and many fragments of glass (Pl. IX:B). An unexploded hand grenade was possible evidence for the way in which modern tomb robbers do their work. Scattered bones from more individuals were found.

[4] Waterhouse, "Areas E and F," p. 115.

As the tomb was cleared of its contents the architectural style of the interior became more visible, and evidence of considerable care in its workmanship was indicated by the presence of three wall niches for lamps and a decorative band of carving on the walls near the ceiling.

In the process of excavating outside in front of the tomb and the doorway, more objects were found, including three Herodian lamps and a spindle whorl. The door was provided with a rock base slot in which to roll, and a slot had been cut into the rock left of the doorway to accommodate the stone when it was rolled away from the opening (Pl. IX:A).

AREA G.5

LARRY G. HERR
Harvard University
Cambridge, Massachusetts

Ever since 1968 the Ḥesbân excavators had noticed a large rectangular (72 × 49 m.) depression in the valley east of the *tell*, across the Na'ur-Madaba road (Fig. 1). In 1974 it was arranged to attempt to date the remains and to test the hypothesis that it was a reservoir similar to others in Jordan such as those at Jerash, Umm el-Jamal, the various desert castles, and "Solomon's Pools" on the West Bank. For this purpose four Squares (each 2 × 6 m.) were laid out end to end (east to west) on the east side of the depression extending from the lowest part of the depression to two column drums lying on the upper bank about 10 m. east of the depression's lip. Later two other Squares were opened to confirm the nature of the structure's walls. In the end our hypothesis that the depression was a reservoir was confirmed, and we were able to isolate two phases of use: Ayyūbid/Mamlūk and Byzantine.

Phase 1

Ayyūbid/Mamlūk sherds were found in the soil inside the depression all the way down to the first cement layer, a beautiful light gray surface perfectly smooth and level except in one place where it was cracked and slightly decomposed (Pl. X:A). Near the reservoir wall the cement sloped upwards and was smoothed into the rise of the reservoir wall (see Fig. 18). Within the cement itself two or three Ayyūbid/Mamlūk sherds were found. In our limited section through the reservoir wall we could find no evidence for two phases, so it seemed possible that the Phase 1 builders simply re-used the walls they found standing from the earlier Phase 2. No architecture was found outside the reservoir wall (the columns must have come from elsewhere), but three layers of soil (unfortunately, no laid surface) which contained

Ayyūbid/Mamlūk pottery were found. It would thus appear that Phase 1 reflected a reservoir utilized at some time during the 13th to the 15th century.

Phase 2

Beneath the makeup for the cement surface of Phase 1 was another cement surface, darker and with a makeup bed laid on virgin soil. The reservoir wall, which must have been built originally during this phase, was somewhat problematic, but given the evidence from the two additional Squares it would seem that the wall's inner face of four courses and two to three rows was stepped inward much like an upside-down stairway (Fig. 18). We can cite no parallels for such a precarious construction. An alternate explanation would suggest earthquake damage. The east face of the wall (outside the reservoir) was apparently battered against the very hard red virgin soil of the region. In the soil layers outside the wall the layer just above virgin soil contained no Ayyūbid/Mamlūk pottery—only Byzantine, and one Byzantine sherd was found in the Phase 2 cement. It thus appeared that the reservoir was used in two periods, Byzantine and Ayyūbid/Mamlūk.

One other ground surface find should be mentioned. South of our Squares a large monolithic trough (for watering?) was found halfway buried in the earth. Unlike the columns, this may have been used with the reservoir.

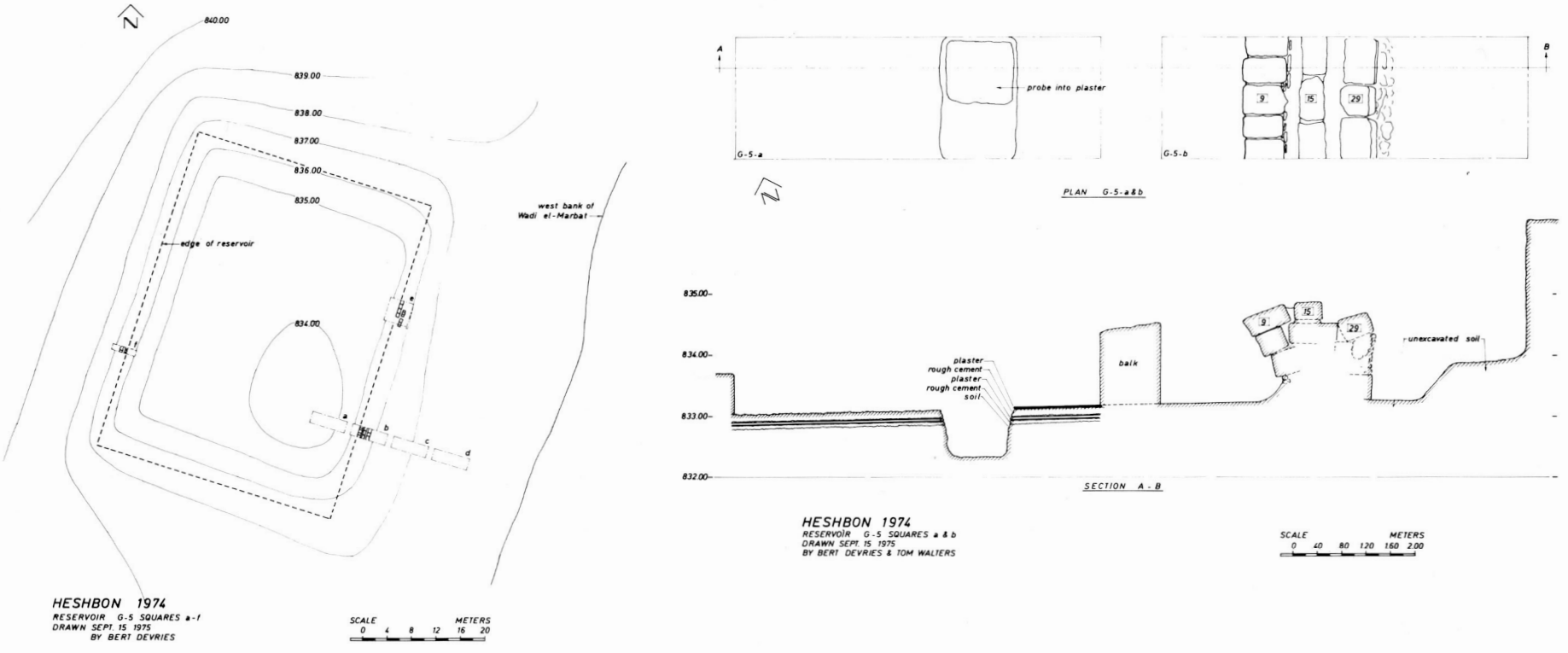


Fig. 18. Plan of Reservoir G.5 across the Madaba Road to the east from Tell Ḥesbân, with plan and section of Squares G.5a and b.

AREA G.6, 7, 9

W. HAROLD MARE
Covenant Theological Seminary
St. Louis, Missouri

Sounding G.6

Description. Sounding G.6 was opened to the west down from Area C on the east bank of the Wadi el-Majarr (see Fig. 1) to investigate the significance of a wall (G.6:8) extending north-south in the sector and examine its relationship, if any, with classical-type column drums and capitals visible about 25 m. to the north. Square G.6 was 2.00 m. (north-south) × 2.70 m. (east-west) on the east of Wall G.6:8, and 3.74 m. west of it. The highest level was 848.02 m. at the south-east corner and the lowest, 845.91 m. at the southwest corner.

All loci except one or two in G.6 were dated Ayyūbid/Mamlūk, with inclusion of Umayyad, Byzantine, Roman, and some Iron Age materials.

East of Wall G.6:8 the loci ranged in content from natural deposits to ash pockets and pits such as those for fires and cooking. G.6:15, 18, 20, and 21 were pits in this sector. G.6:16, 0.30 m. deep, was probably a natural erosion deposit, and G.6:17, loosely packed brown soil but harder near the balk lines, was probably a surface into which Pit G.6:18 was cut. This roughly square pit, an oven with ash pockets, showed remains of plaster lining and contained a large fragment of a heavy coarse baking dish. In a small pit (G.6:20) at bedrock were found Byzantine sherds; and G.6:21A and B consisted of deposits of brown soil with Byzantine sherds located in the weathered pit and in cracks in the bedrock. The sector produced very few bone fragments.

Wall G.6:8, surviving five courses high and built of biomicrite and *nari* stone, had a well dressed east face but was left rough on the west. The wall was exposed only 2.00 m. long, but was 0.41 m. wide and 2.03 m. high, with the bottom course set on bedrock.

G.6:24-26, 29, and 30 constituted fill between and under the stones there. G.6:30 yielded predominantly Byzantine sherds with, however, some possible Umayyad fragments.

Vault G.6:9, of rough hewn blocks of *nari* and biomicrite, 0.90 m. west of Wall G.6:8 (with subsidiary Wall G.6:32 between them), and 1.42 m. east of the west balk, was an arching course of stones beginning from a line of springer stones (G.6:27) on the south and arching up northward to its peak, then extending into the north balk (top level, 846.87 m.; bottom, 845.57 m.). The subsidiary Wall G.6:32, extending south of Vault G.6:9, produced Byzantine and Roman sherds. Below Wall G.6:32 and between Vault G.6:9 and Wall G.6:8 were G.6:28, 31, and 33, natural deposit layers, G.6:33 being a deep layer of soil, limestone, cobbles, and flintstone that helped fill up a bedrock shelf back of Vault G.6:9. West of Wall G.6:8 was G.6:27, the springer stone formation for Vault G.6:9, extending 1.00 m. west from the vault, being 0.50 m. wide. Layer G.6:35 over bedrock, in the northwest of the sector west of Wall G.6:8, consisted of a small stone cobble surface over a hard packed brown soil.

Interpretation. The east sector of G.6 produced evidence of Ayyūbid/Mamlūk habitation, although Loci G.6:20 (a small pit), 21A, and 21B showed Byzantine sherds. The same Ayyūbid/Mamlūk date was posited for the material in Wall G.6:8, except for Locus G.6:30 with its Byzantine sherds around and under the lowest course of Wall G.6:8 on bedrock. This Byzantine material seemed to indicate a limited amount of Byzantine habitation in this sector before the Ayyūbid/Mamlūk period.

The material in Vault G.6:9 and the loci probed west of it produced evidence of Ayyūbid/Mamlūk habitation. Vault G.6:9 in its lower segment was built almost up against a shelf of bedrock, which shelf was filled in with small stone rubble (G.6:33), probably at a time later than the vault's construction. (Evident tip lines showed the way the rubble was put in at a steep angle.) Comparing modern use of other vaulted structures for animal shelters and storage purposes as seen on the west slope of the

wadi, west of G.6, it seemed likely that Vault G.6:9 was used in the Ayyūbid/Mamlūk period as some kind of storage or shelter facility, with the small bedrock shelf at the back, or east, of Vault G.6:9 being used for small storage items.

Certainly there is no evidence that the classical columns and capitals lying on the ground surface soil some 25 m. north of G.6 had any connection with materials excavated here.

Sounding G.7

Description. Sounding G.7, 3 m. (east-west) × 6 m. (north-south), at a top level (southeast corner) of 843.33 m., was located westward down the slope from Area C about 100 m. north of Sounding G.6. It was undertaken because of some visible walls there.

Excavation proceeded chiefly in the north half of the Square, northward from the north face of Wall G.7:6. This wall, 0.40 m. wide, extending east-west the 3 m. width of G.7, was exposed to three of its courses (0.32 m. high) of dressed stone. Wall G.7:4, 0.30 m. wide, was exposed to two courses (0.30 m. high) of dressed stone, beginning at a point 2 m. south of the north balk and extending west from the east balk for 1.60 m. before a turn south for 0.90 m. to meet Wall G.7:6. Wall G.7:7, 0.20 m. wide, survived three courses high of poorly dressed stone, beginning 2.50 m. south of the north balk, extending west from the east balk for 0.70 m., but with no visible connection with other walls. Vandalism hindered the further analysis of these walls, and without foundation trenches located yet, dates for the walls could not be determined. However, G.7:5, a soil and rock tumble layer between Walls G.7:4, 6, and 7 indicated a Byzantine deposit, with Late and Early Roman sherds also appearing.

Interpretation. Wall G.7:4 and the rubble fill south of it to Wall G.7:6 indicated that this structure possibly enclosed a manger or other animal installation. No surface or floor was found. Wall G.7:6 extended in rectangular shape farther south in G.7, but the nature and function of this structure was not detected.

The sherds found north of Wall G.7:6 dated the sector to the Ayyūbid/Mamlūk period, except for Byzantine G.7:5, which needs further investigation.

Sounding G.9

Description. Sounding G.9, 2 m. (east-west) × 4 m. (north-south), was located near the wadi southwest of the *tell* about 100 m. south of G.6. It was undertaken for a few days to see whether this location might produce evidence of a Roman road that might have connected with a Roman road that ran nearby down to Livias in the Jordan Valley.

G.9:1-4, the loci probed, were all dated to the Ayyūbid/Mamlūk period, except possibly for G.9:4, which showed Byzantine sherds and only one possibly Ayyūbid/Mamlūk piece. G.9:2 also contained sherds of the Umayyad, Byzantine, and possibly Late Roman periods, along with a Roman coin (Constantine I, A.D. 306-309), arrowheads, and other objects. G.9:3 included sherds of those and the 'Abbāsid periods and a Byzantine coin fragment. G.9:1-3 produced a number of sheep-goat bone fragments.

Interpretation. Probing G.9, 0.75 m. to 1.00 m. deep, produced no firm evidence for a Roman road, so the sounding was stopped. G.9 had produced only field soil, a few small stones, and sherds from the Ayyūbid/Mamlūk period, together with 'Abbāsid, Ummayyad, Byzantine, and Late Roman material.

AREA G.8 (UMM ES-SARAB)

ROBERT IBACH, JR.
Grace Theological Seminary
Winona Lake, Indiana

During the second half of the 1974 season the archaeological survey team carried out a sounding at one of the sites discovered in 1973. It was hoped the sounding would illuminate the history of the site chosen, as well as test the validity of the surface sherding that had been conducted in the Ḥesbân region. Umm es-Sarab (Site 54, ref. 2292.1379), a low hill 4.5 km. north-northeast of Tell Ḥesbân, was selected because of its accessibility and because some relatively rare pottery had been found there (namely, Hellenistic and Middle Bronze/Late Bronze).

The excavation, designated Area G, Square 8, began July 23, 1974, and was concluded August 7. Two Squares were laid out extending north-south on the northwest side of the hill and measuring 2 × 6 m. each with a one-meter balk between them. Both Squares were excavated to bedrock, the depth of soil averaging only about 0.75 m.

Square G.8A

Square G.8A was located on the upper terrace edge of the site. Three basic soil layers were discerned, with two burials embedded in the lower layer and two installations in bedrock. No architecture or occupation surfaces were encountered. The uppermost layer (Locus 1) was the root-disturbed top soil; it contained pottery of the Byzantine, Early Roman, Hellenistic, and Iron II/Persian periods.

Locus 2 below it was a soil layer averaging 0.17 m. in depth and extending over the entire Square. Since there was no equivalent layer in Square G.8B, Locus 2 must have lensed out in the balk where bedrock drops sharply to the lower terrace. The

pottery was predominantly Early Roman with some possible Iron Age body sherds. Below this locus, Early Roman was the latest pottery in all loci. (In Locus 4 there were a "few possible" Byzantine sherds and in Locus 10, "one possible Byzantine body sherd." If these few doubtful sherds are disregarded, all the material below root soil in Square G.8A dated to the Early Roman period.)

Locus 4 overlay bedrock and bedrock installations in the southern three quarters of the Square. Pottery was Early Roman, with some possible Iron Age and possible Bronze Age sherds. Within Locus 4 were two burials—Locus 6, a male about 25 years old (Pl. X:B), and Locus 9, a female of about the same age. The burials were oriented east-west at the same level, and were placed about 1.4 m. apart. No equipment was found with the skeletons and efforts to discern burial pits failed. It seemed, therefore, that these were shallow burials of poor people in the Early Roman period.

In the southeast corner of the Square below Locus 4 there appeared a pit in bedrock (Locus 8) which by its symmetry seemed to be artificial. Three Early Roman sherds were found in the soil within the pit. A very tentative interpretation is that this pit was a receiving vat for a wine press, the treading basin of which would have been south of the Square. (Present land use of the site includes a fine vineyard/orchard across the summit.)

Almost directly beneath burial Locus 9 was a shaft (Locus 10) cut in bedrock and measuring 0.61 m. (north-south) × 1.5 m. (east-west), and 1.54 m. deep. On the south side of the shaft at the bottom was a flat blocking stone with a nearly intact Early Roman oil lamp placed at its upper west corner. Removal of the blocking stone revealed a very small (0.68 × 0.40 m.) burial niche (Locus 12), which was almost empty. Within the 0.03 m. of dark soil on the bottom of the chamber were found four teeth, fragments of thin cranial bones, and a small bronze ring. No pottery was found within the loculus. The small size of the niche suggested a child burial and indeed the thin cranial bones and deciduous teeth indicated a maximum age of twelve for the person buried there.

Robbing of the tomb took place perhaps in the Early Roman period, yet sufficiently long after burial for the bones to be brittle, resulting in teeth and skull fragments being left behind.

Square G.8B

Lying north of, and downhill from, Square G.8A on a lower terrace, there were four soil layers in Square G.8B, quite distinct from those in Square G.8A because of the abundance of Byzantine pottery in all but three pails. Locus 1 was the ground surface soil and in two of the three pails of sherds from this layer the latest pottery was Early Roman—quite surprising in view of the fact that all loci below contained Byzantine ware. Locus 3, a soil layer, extended over the entire Square. Its latest pottery was Byzantine but both soil layers below it yielded a few Ayyūbid/Mamlūk sherds.

Locus 5 was hard-packed, light colored soil found over the whole Square. It yielded one Ayyūbid/Mamlūk sherd, Byzantine, Late Roman, Early Roman and two possible Bronze Age sherds. It lay over bedrock in the southern two-thirds of the Square and over Locus 7 in the northern part. Locus 7 was characterized by rock tumble amid loose, light brown soil. Its pottery was Ayyūbid/Mamlūk, Byzantine dominant, and Roman. Locus 11 was a line of stones within Locus 7 and was founded on bedrock. It was 1.8 m. long and two courses high. The small size and crudeness of the stones make it unlikely that it was a wall but rather a stone fence at best.

Thus Square G.8B presented almost an inversion of material: at the lowest level Ayyūbid/Mamlūk well-attested, Byzantine dominant, with Early Roman lightly represented; at the upper level Ayyūbid/Mamlūk and Byzantine all but absent, with Early Roman dominant. It seemed, therefore, that this debris was dumped in a leveling operation which left Early Roman levels exposed in Square G.8A uphill, and produced the flat top on the site that today supports an orchard. This operation must have taken place in Ayyūbid/Mamlūk times or perhaps even later.

Conclusions

One of the objectives of the sounding was to test the validity of surface sherding; that is, do the sherds collected from the ground surface correlate closely with materials found through excavation below the ground surface? Table 1 shows that the ground surface collection did anticipate the pottery excavated.

	Ayyūbid/Mamlūk	Umayyad	Byzantine	Late Roman	Early Roman	Hellenistic	Iron Age	Iron II/Persian	Iron I	Bronze Age	LB/MB	Middle Bronze	Early Bronze
SURVEY		X	X	X	X	X	X		X	X	X	X	X
SQUARE G.8A			X		X	X	X	X		X			
SQUARE G.8B	X		X	X	X	X	X	X		X			

Table 1. Distribution of Umm es-Sarab pottery by periods, from the archaeological survey and the soundings.

The only difficulties were the general absence of Ayyūbid/Mamlūk sherds which appeared in small quantities in Square G.8B, and the lack of distinct Iron II/Persian ware, although some of this was probably included in "Iron Age" sherds. The ground surface material yielded a broader spectrum in terms of Umayyad and Iron I pottery and more distinct readings on Bronze Age sherds.

Sherding the site in six separate sectors also provided significant information. The collection from the northside of the upper terrace, unlike sherds from all other sectors, contained no Byzantine and only a few possibly Late Roman sherds. There Square G.8A was laid out but it yielded only a few questionably Byzantine and no Late Roman sherds. The lower terrace collection, however, had both Byzantine and Late Roman well attested and both ceramic periods were encountered in Square G.8B at that location.

Although no surfaces or clear architecture came to light in the soundings, the pottery, which was found all the way to bedrock, indicated that Umm es-Sarab was occupied especially in Byzantine

and Early Roman times. No loci were found which could be dated to earlier periods, although Hellenistic, Iron Age, and Bronze Age sherds appeared in mixed contexts. Thus the elusive Middle Bronze/Late Bronze pottery, which was found on the ground surface and which is so uncommon in Trans-jordan, could not be clarified in context.

ARCHAEOLOGICAL SURVEY OF THE ḤESBÂN REGION

ROBERT IBACH, JR.
Grace Theological Seminary
Winona Lake, Indiana

For the first three weeks of the 1974 season a team of four members[1] undertook to complete the archaeological survey of the region surrounding Tell Ḥesbân begun in 1973.[2] In the 1973 season 103 sites had been identified and most of the territory within a 10 km. radius of Tell Ḥesbân had been examined. However, there were several sectors that required additional attention with the result that 22 more sites were identified in 1974.[3]

For purposes of the survey, any significant artifact or group of artifacts in close proximity to one another would be designated a site. Thus a site could be as small as a single, fragmented milestone, or as large as a major *tell.* These sites have been designated with Arabic numerals consecutively through the 1973 and 1974 seasons and have been located on the map of Jordan by means of an eight-digit grid reference.[4] All of the pottery collected at these sites was washed, read by Dr. James A. Sauer, registered, and disposed of along with the pottery from Tell Ḥesbân.

[1] The survey team was composed of Robert Ibach, Jr., supervisor, Theadore Chamberlain, Patricia Derbeck, and Richard Mannell. Occasional assistance was also rendered by Abdel Samia' Abu-Dayya, Omar Daud, and Mogahed Mohaisin.

[2] See S. Douglas Waterhouse and Robert Ibach, Jr., "Heshbon 1973: The Topographical Survey," *AUSS* 13 (1975): 217-233.

[3] Rather than being confined to a strict 10 km. radius around Tell Ḥesbân, the survey region was bounded by obvious landmarks—modern roads for the most part (see map, Fig. 19). There were several points at which the survey was carried beyond these boundaries, and one sector east-northeast of Tell Ikhtanū could not be examined because of military restrictions. As in 1973, the survey employed the 1:25,000 map of the Hashemite Kingdom of Jordan.

[4] There were seven sites (62, 75, 76, 77, 78, 81, 90) for which grid references cannot be given. These references had been established by their relationship to 'Ain Sumiya before it was discovered that the 1:25,000 map had mislocated 'Ain Sumiya at 2206.1356; the correct reference is 2230.1362.

With over 20,000 sherds gathered from 125 ancient sites, one could begin to sketch the patterns of occupation in the region of Tell Ḥesbân. To provide a simple overview, Table 2 shows the number of sites where pottery of each period was attested.

Period	*No. of Sites Occupied*
Modern	30
Ottoman	13
Ayyūbid/Mamlūk	49
ʿAbbāsid	2
Umayyad	17
Byzantine	108
Roman	79
Hellenistic	14
Iron Age	91
Late Bronze	2
Late Bronze/Middle Bronze	1
Middle Bronze	9
Early Bronze	46
Chalcolithic	9

Table 2. Distribution of 125 sites surveyed according to periods attested by pottery.

Islamic Periods

Pottery of the Modern era was found at 30 sites and from the Ottoman period at 13 sites (but only one sherd each at four of those sites). Ayyūbid/Mamlūk pottery appeared at 49 sites and was the dominant ware at six of those sites. At many of the sites yielding large quantities of Ayyūbid/Mamlūk pottery there was noticed a common characteristic—the sharply undulating surface of the sites. Small mounds were interspersed with depressions, apparently the result of arches, vaulted buildings, semi-subterranean rooms and caves—architecture characteristic of the Ayyūbid/Mamlūk period. The collapse of many vaulted or arched roofs is responsible for sharp depressions in the surface of a site.[5]

[5] The excavations at Tell Ḥesbân have shown that vaulting and arching were common in Ayyūbid/Mamlūk times. Vaulted buildings found in both Areas C and D have been dated to this period, as has an arched building in G.6. The use of vaulting appeared to have affected the contours of Tell Ḥesbân.

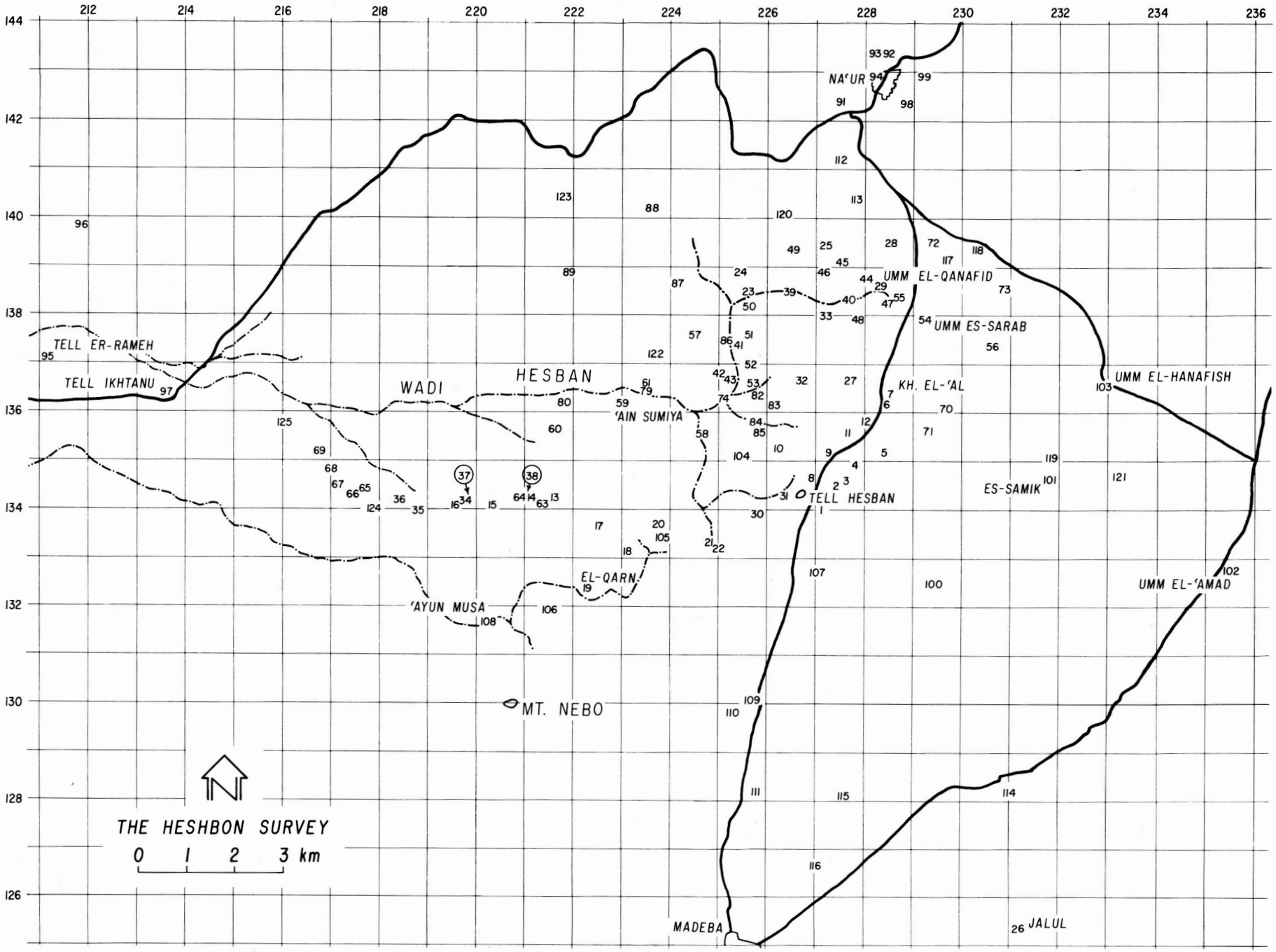


Fig. 19. Location of the 125 archaeological sites within a 10 km. radius of Tell Ḥesbân, surveyed in 1973 and 1974. Cartographer: Robert Ibach, Jr.

Pottery of the 'Abbāsid period is virtually absent in the region of Ḥesbân, appearing only at Sites 95 and 97, both in the Jordan Valley. Umayyad sherds were found in very small quantities at 17 widely-scattered sites.

Byzantine Period

Results of the 1973-1974 survey have re-confirmed the observations of many scholars that Transjordan was very heavily occupied in the Byzantine period. Of the 125 sites identified around Ḥesbân, 108, or 86%, yielded pottery of this period. In fact, at 21 of those sites Byzantine was the dominant ware.

Sites 1 to 4, on the hills just to the east of Tell Ḥesbân, were dominated by Byzantine pottery, and these may be regarded as having been suburbs of Byzantine Esbus. Of the many robbed-out tombs noted at Site 1, at least 17 were of a type which seemed to belong to the Byzantine or Roman period, namely, vertical shaft with burial recesses at the base and ledges halfway down the shaft to receive covering slabs.[6] Site 117 (Beddih, map ref. 2297.1392) is another cemetery with 75 robbed-out tombs visible from the ground surface. The style of these tombs was the same as that at Site 1. Only 33 sherds were found at Site 117, but Byzantine material was dominant, with a few possible Roman body sherds and a few Iron Age sherds. Byzantine ware was also dominant at neighboring Sites 72, 73, and 118.

The church uncovered at Tell Ḥesbân is just one of numerous churches known from this period in Transjordan. Site 73 (Jumeian, ref. 2309.1386) gave evidence of a possible Byzantine church at the summit of the hill. Six column bases were found *in situ,* 12 tesserae were collected, and the pottery was dominantly Byzantine. Since the bases are only 0.60 m. square, they cannot have supported a very large building; there was no evidence of an apse.

[6] S. Douglas Waterhouse, "Heshbon 1971: Areas E and F," *AUSS* 11 (1973): 114, 123-125.

Roman Period

There appeared to have been heavy occupation in the Roman period, although not as extensive as in the Byzantine era. Roman pottery was found at 79, or 63%, of the 125 sites. At 43 of these sites Early Roman pottery was distinguished, while Late Roman was distinguished at 35 sites.

Two important roads in the Ḥesbân region dated to this period, the *via nova* (of Trajan) running north-south, and the Esbus-Livias road extending westward from Ḥesbân. This latter was traced in 1973 for over 11 km. from Tell Ḥesbân toward Tell er-Rameh.[7] In 1974 this road was traced for an additional kilometer ending at Site 125 where two *rujms* or circular watchtowers were found.[8] Nothing of the *via nova* has been found within the survey region.

Hellenistic Period

Pottery of the Hellenistic period was gathered at 14, or 11%, of the 125 sites surveyed. It should be noted, however, that only one sherd was found at Site 31, "few" at Site 29, and three sites (36, 59, and 109) had "possible" Hellenistic pottery. This meager representation corresponded to Tell Ḥesbân where occupation in the Hellenistic period was rather light.

Iron Age

Of the 125 sites examined 91, or 73%, were occupied in the Iron I and/or Iron II/Persian periods. Where distinctions were possible 22 sites yielded Iron I, four produced Iron II, and 42 sites produced Iron II/Persian pottery.

Among the sites that appeared to have been significant in the

[7] Waterhouse and Ibach, "Topographical Survey," pp. 217-228.

[8] These circular foundations cannot, at present, be dated with certainty to the Roman period (Byzantine pottery as well as Roman is usually associated with them). Twelve of these *rujms* have been found along the Esbus-Livias

Iron Age are: Site 5, el-Mudwara (ref. 2284.1352);[9] Site 7, Khirbet el-'Al (2285.1364);[10] Site 29, Umm el-Qanafid (2284.-1386);[11] Site 102, Umm el-'Amad (2355.1328);[12] Site 103, Umm el-Hanafish (2329.1366);[13] Site 108, 'Ayūn Mūsā (2202.1317);[14] and Site 26, Jalul (2312.1254).[15]

road, but it is only assumed they are related to the road. Similar structures have been found at places that are distant from any possible road (e.g., Site 106, where six *rujms* were found scattered over a low hill).

[9] This is a prominent, dome-shaped natural hill with Iron II/Persian pottery dominant. It was referred to as *Madowerat el-'Al* by C. R. Condor (*Survey of Eastern Palestine* [London, 1889], p. 183).

[10] Pottery at *Khirbet el-'Al* suggested occupation in the following periods: Ayyūbid/Mamlūk, Byzantine, Roman, Hellenistic, Iron II/Persian, and Iron I. The occupational history was thus very similar to that of Tell Ḥesbân, strengthening the long-held identification of these sites as the sister cities of Elealeh and Heshbon of the Old Testament.

[11] The area of Umm el-Qanafid was heavily occupied in the Iron Age. Not only were Iron II/Persian and Iron I well attested at Site 29, but Iron I was also dominant at neighboring Sites 47, 40, 44, and 45. The only attempted biblical identification of this site is with Minnith (Jgs 11:33; Eze 27:17) (cf. F.-M. Abel, *Géographie de la Palestine* [Paris, 1938], 2:388). But on the basis of Eusebius (*Onomastikon*, ed. Erich Klostermann [Hildesheim, 1904], 132: 1-2), Umm el-Hanafish (Site 103) would be a better candidate for Minnith; Iron II/Persian and Iron I sherds were found there also.

[12] At this large site on a natural hill were found Ottoman, Ayyūbid/Mamlūk, Byzantine, Late Roman, Early Roman, Iron II/Persian, and Iron I sherds. Umm el-'Amad has frequently been identified with the Levitical city of Beṣer (cf., e.g., A. H. Van Zyl, *The Moabites* [Leiden, 1960], pp. 91-92; J. Simons, *The Geographical and Topographical Texts of the Old Testament* [Leiden, 1959], p. 207; and Nelson Glueck, *Explorations in Eastern Palestine* [*AASOR* 14; Philadelphia, 1934], 1: 33).

[13] This site yielded Ottoman, Ayyūbid/Mamlūk, Byzantine, Late Roman, Early Roman, Iron II/Persian, and Iron I pottery. Cf. above, n. 11.

[14] Iron I pottery was dominant at 'Ayūn Mūsā along with Byzantine, Roman, and Iron II/Persian. A building with heavy walls surviving to two or three courses measured about 10 x 15 m. This may have been the building inside the "Moabite fortress" sketched by Nelson Glueck (*Explorations in Eastern Palestine* [*AASOR* 15; New Haven, 1935], 2: 110 and pl. 22).

[15] Jalul is a large and probably significant *tell* 5.5 km. east of Madaba. All six pails of pottery produced both Iron II/Persian and Iron I sherds while the later periods (Ayyūbid/Mamlūk, Byzantine, Roman) and the earlier periods (Late Bronze, Middle Bronze, Early Bronze) were all represented by "few" sherds. Since 1,248 sherds were collected from all parts of the *tell* one concluded that an extensive Iron Age city is to be found at Jalul.

The presence of some Iron II/Persian pottery at Site 59, 'Ain Sumiya (2230.1362), may lend a little weight to the identification of this site with biblical Sibmah (note also the similarity of name and the presence of lush vineyards, cf. Jer 48:32) as opposed to identifying el-Qarn as Sibmah.[16] Another identification that has been strengthened was Tell er-Rameh (Site 95) with Livias/Beth-haram. In spite of Glueck's failure to find "a single sherd that can be ascribed to any period earlier than Roman,"[17] the 1973 survey team found Iron II/Persian, Iron II, and Iron I pottery.[18] A repeat visit in 1974 produced additional Iron II/Persian ware plus some Early Bronze pottery.

Middle and Late Bronze Ages

The survey showed that a very small population must have occupied the region during most of the Middle and Late Bronze ages. Of the 125 sites examined only nine bear evidence of MB/LB occupation.[19] Such a situation corresponded not only to the data from Tell Ḥesbân, that is, absence of Bronze Age material, but also to the general conclusions of Nelson Glueck concerning MB/LB in Transjordan.[20]

One of the sites from which Glueck acknowledged MB/LB pottery was Jalul (Site 26).[21] Among the 1,248 sherds collected there by the Ḥesbân survey team, two were possible Late Bronze and one was possible Middle Bronze. Tell Ikhtanū (Site

[16] Simons (*Geographical and Topographical Texts,* p. 118) placed Sibmah at el-Qarn on his map IIIa and says of Sibmah "Ḫirbet qarn el-qibsh is at any rate archaeologically possible." The evidence, however, shows el-Qarn to have been occupied exclusively in the Early Bronze period. Glueck's findings confirmed this although some of his remarks have, perhaps, been misconstrued (*Explorations in Eastern Palestine,* 2: 111).

[17] *Explorations in Eastern Palestine* (*AASOR* 25-28; New Haven, 1951), 4: 391.

[18] Cf. Waterhouse and Ibach, "Topographical Survey," p. 227.

[19] Three of these nine, 82, 85, and 91, were specifically Middle Bronze I and two, 26 and 97, were specifically Late Bronze.

[20] *Other Side of the Jordan* (Cambridge, Mass., 1970), pp. 140-142; *Explorations in Eastern Palestine,* 4: 423.

[21] *Explorations in Eastern Palestine,* 1: 5.

97, ref. 2137.1364) yielded possible Late Bronze, probable Middle Bronze I, Early Bronze, and Chalcolithic.[22] At Umm es-Sarab (Site 54, ref. 2292.1379) there appeared a small quantity of sherds identified as "possible Middle Bronze/Late Bronze."

Es-Samik (Site 101, ref. 2318.1346) is a small but rather unusual site, primarily because of a tower-like structure at the summit. Measuring 14 x 14 m. and constructed of large, undressed boulders, it survived to at least three courses. Other architecture was evident nearby. The date of these structures is unknown at present; sherds collected there have been read as: Modern, Ayyūbid/Mamlūk, Byzantine, possible Early Roman, Iron II/Persian body sherds, Iron I, Middle Bronze, Early Bronze, and undistinguishable.

William L. Reed made minor excavations at Khirbet el-'Al (Site 7) in 1962 and found Early and Middle Bronze sherds in mixed contexts.[23] The Ḥesbân survey team, however, collected 803 sherds at Khirbet el-'Al with nothing earlier than Iron I.

Early Bronze Age

Quite unlike the Middle and Late Bronze Ages there seems to have been a substantial population in central and southern Transjordan during the Early Bronze Age. Pottery of this period was found at 46, or 37%, of the 125 sites, and was dominant at eight of those sites.

The 1973 survey had found large quantities of Early Bronze pottery at Site 19, el-Qarn (ref. 2223.1324),[24] yet some scholars have proposed this site as the Old Testament Sibmah (Num 32:3,

[22] Limited excavations at this site by Kay Prag have revealed stratified materials of the period she terms Intermediate EB-MB ("The Intermediate Early Bronze-Middle Bronze Age: An Interpretation of the Evidence from Transjordan, Syria, and Lebanon," *Levant* 6 [1974]: 69-116).

[23] "The Archaeological History of Elealeh in Moab," in *Studies on the Ancient Palestinian World, Presented to Professor F. W. Winnett*, ed. J. W. Wevers and D. B. Redford (Toronto Semitic Texts and Studies, no. 2; Toronto, 1972), p. 27.

[24] See Waterhouse and Ibach, "Topographical Survey," p. 232, n. 54, where it is spelled el-Garin.

38; Jos 13:19; Isa 16:8, 9; Jer 48:32).[25] A return visit in 1974 produced predominantly Early Bronze pottery plus one Early Roman sherd and a few Byzantine body sherds. The identification with Sibmah thus seemed to be ruled out.

Early Bronze pottery was more abundant in the wadies and low-lying sectors than on the plateau (i.e., east of the Na'ur-Madaba road). Only a handful of Early Bronze sherds has turned up at Tell Ḥesbân.[26]

Chalcolithic Period

The Chalcolithic period is very lightly represented in the Ḥesbân region. Nine sites of the 125 had evidence of Chalcolithic occupation. Sherds of this period appeared at Tell Ikhtanū (Site 97), a site also occupied in EB and MB I. Tell Ikhtanū is about 6.5 km. east-northeast of the Chalcolithic site Teleilat Ghassul.

Site 122 (ref. 2237.1372) was the most notable Chalcolithic site to be found. Occupational debris—sherds, flints, and burial chambers (?) carved in boulders—was scattered among small bluffs in the Wadi Ḥesbân opposite 'Ain Sumiya. The sherds were dominantly Chalcolithic with one possible Early Bronze and a few Byzantine pieces. This was the site identified by C. R. Conder as el-Kalûå.[27]

[25] See n. 16 above. Cf. also Abel, *Géographie*, 2:458.

[26] This situation may be in keeping with the observation of Van Zyl: "We must draw attention to the fact that the majority of Iron Age cities were not built on sites, [*sic*] at which Bronze Age settlements had been" (*The Moabites*, p. 96; cf. also Glueck, *Explorations in Eastern Palestine* [*AASOR*, 18, 19; New Haven, 1939], 3: 179-181).

[27] *Survey of Eastern Palestine*, p. 125. Conder gives location, measurements, and sketches of dolmens near el-Kalûå (pp. 126-133), but the Ḥesbân survey team was unable to find any of them.

GLASS FRAGMENTS FROM TELL ḤESBÂN
A Preliminary Report

SIDNEY M. GOLDSTEIN
The Corning Museum of Glass
Corning, New York

Quantities of glass fragments were sent to The Corning Museum of Glass from the 1968-74 seasons at Tell Ḥesbân.[1] This note is a preliminary report on the initial sorting of the material and is simply meant to alert colleagues in the field to an interesting body of glass that can be documented from the site of Heshbon. A more thorough report with a proper catalogue and glass profiles will appear in the future. The largest body of material was excavated in 1968 but little of this was recorded with respect to its locus or pail number. It is this material, unsorted and unstratified, which gives an impression of the quantity of glass at the site.

Preliminary study suggests that glass vessels were used at Heshbon during the Hellenistic period from the first century B.C. through the Ayyūbid/Mamlūk period of the 14th century. Thus utilitarian vessels are represented in virtually every major period of habitation. The 1968 material consisted of characteristic fragments such as rims, bases, and handles along with quantities of vessel walls, usually without decoration. A small amount of cullet or chunks of non-vessel glass was also excavated. This was a curious addition as there seems to be no evidence that glass was made at Heshbon. The amount of cullet was small, less than a pound of glass, and there were virtually no characteristic droplets or drippings which are associated with hot glass. Nor were there any of the glassblowing wastes which accumulate around a workshop and are usually remelted periodically along with the cullet.

[1] I should like to thank Drs. Siegfried H. Horn and Lawrence T. Geraty for making this material available to me and for discussing the Heshbon site on several occasions; they have been most helpful in matters archaeological and editorial.

Most of the unstratified glass fragments from the 1968 excavation were found in Area C. Some material was kept separate, coming from Cistern C.4:7 and a limited amount of glass was recovered from Areas B and D.

As of the writing of this report, the stratified glass excavated during 1971 had not been seen by this author. A small amount of unstratified material from this season is now at Corning; some of the Islamic trail decorated fragments (Pl. XII:C) are illustrated.

During the 1973 and 1974 seasons, a concerted effort was made to carefully record the glass fragments excavated. During the summer of 1975, Mr. Wesley Scott, an undergraduate working in our Museum program, cleaned and numbered almost 500 fragments and noted the excavation data on catalogue cards. A simple numbering system (i.e. 1-73a or 24-74b) was instituted for ease of identification. This consists of a running catalogue number which is followed by -73 or -74 indicating the year of excavation. When the locus was known, this was added and underlined if additional information could be found on the card. This system allows easy handling of the fragments; the underscored locus simply alerts the researcher that a particular fragment has a stratigraphic context.

Hellenistic Glass. The Hellenistic period at Heshbon is represented by over twenty fragments of typical shallow bowls. They are decorated with interior wheels-cut grooves or exterior molded ribs or both (Pl. XI:A). Bowls were made of colorless, amethyst, light green, green, and amber glass. Vessels of this type have been studied recently by Dr. Gladys Weinberg at two sites in Upper Galilee—Tel Anafa[2] and the area around Kibbutz Hagoshrim.[3] Each site has yielded a large series of subconical bowls with ribs and wheel-cut grooves. It is interesting to note that there is

[2] Gladys D. Weinberg, "Hellenistic Glass from Tel Anafa in Upper Galilee," *Journal of Glass Studies* 12 (Corning, New York, 1970): 17-27.

[3] Gladys D. Weinberg, "Notes on Glass from Upper Galilee," *Journal of Glass Studies* 15 (Corning, New York, 1973): 35-51.

a paucity of first and second century glass among the fragments except for these bowls.

The vessels fall into three groups with virtually ninety-five percent of the material belonging to the Roman/Byzantine and Islamic periods. This large group can be equally divided between Roman/Byzantine glass of the late third through the late sixth century and Islamic glass of the eighth through the fourteenth century. The balance of material, less than five percent, may be attributed to the shallow bowls of the late Hellenistic period.

Roman/Byzantine Glass. The later Roman/Byzantine glass is almost entirely utilitarian in nature and there is no indication of window glass. Two tesserae, one of gold glass and one of blue (Pl. XI:B, top row), imply the existence of wall mosaics. More interesting and worthy of intensive analysis are two fragments of an ingot or cake (Pl. XI:B, bottom row) fashioned of yellow green glass with a thin layer of gold foil sandwiched between two layers. Such units were scored and broken up into gold glass tesserae. The presence of this material provides interesting documentation for the technique of mosaic gold glass installation at Heshbon.

The vessel material indicates a wide range of bottles, cups, bowls, and lamps utilized by the inhabitants. For the most part, vessels were undecorated but there is some limited evidence for mold-blown and applied decorative elements. The report of the second Heshbon campaign[4] illustrates eight complete vessels from Area C.1 and Tombs F.6 and F.8. Most of these vessels are represented among the fragment material with the exception of the "sprinkler" bottle from Tomb F.6. This type of ledge or collar rim and the characteristic constriction at the neck has not been noted.

There is no single form which may be selected and presented as a popular or characteristic late Roman/Byzantine glass from Heshbon. Rather, the fragments illustrated in Pls. XI:C and XI:D

[4] "Heshbon 1971," *AUSS* 11 (1973): Pl. XIII:A.

indicate only some of the many vessel types preserved. Plate XI:C illustrates a series of rims—the upper left, a large bowl with an outfolded rib and collar rim of the late 4th century; below are two outfolded rims of the 3d-4th centuries A.D., the smaller cup retaining part of a vertically ribbed handle applied along the rim. To the right is a simple rounded rim of a shallow bowl, perhaps late 3d century. On the bottom row are two bottle fragments—at the left a storage bottle with rounded rim and wide cylindrical neck of the 4th century and on the right, a globular bottle with infolded rim and cylindrical neck of the late 3d-4th century. The three remaining fragments are of Islamic date.

Plate XI:D illustrates bases of Roman date—the pushed-in goblet base on the upper left is a standard 3d-4th century form; the thickened base and lower portion of a beaker with pattern molded ribs on the bottom row may be a slightly earlier form. The rounded base of an unguent bottle, top row, second from the left, is a simple tubular form which can be attributed to the late 2d to 4th century.

Although the remaining fragments are primarily Islamic, the small wick tube, top row, third from left, probably represents a form which spans the period from Byzantine to Islamic. These wick tubes are found in beaker-shaped lamps with high kicked bases. These in turn developed from 5th to 6th century lamps of simple bowl shape with multiple handles and a central thick wick tube.[5] Examples of such vessels at Heshbon must be post-7th century and should be grouped with a series of shallow bowl-shaped lamps with long solid beaded stems. Fragments of these units can be found in the Heshbon material and are documented at Gerasa.[6] These lamps were usually suspended in groups of three or more from circular bronze polycandelon holders and the solid

[5] Grace M. Crowfoot and Donald B. Harden, "Early Byzantine and Later Glass Lamps," *Journal of Egyptian Archaeology* 17 (1932): 201; pl. XXVIII, 7-9.

[6] P. V. C. Bauer, "Glassware," in C. H. Kraeling (ed.), *Gerasa, City of the Decapolis* (New Haven, 1938), pp. 519-520, pl. CXLI, fig. 17, where they are dated fifth and sixth century.

stem provided anchoring and stabilization for the otherwise top heavy form.

Islamic Glass. The later glass from Heshbon appears to be more evenly distributed between Islamic chronological boundaries. The rims and bottle necks (Pl. XI:C, bottom row, second and third from the left as well as top row, right side) are to be associated with simple containers probably produced before the 8th century. These vessels are still easily associated with eastern Roman products of the late period and have not been transformed into the characteristic shapes associated with Islamic forms. The well preserved bowl of yellow green glass (Pl. XII:A) should probably be dated to the transitional period of the 8-9th centuries. The general shape of the shallow, footed bowl (rim diameter, 19 cm.) has been embellished by pattern molded vertical ribbing and a deeper green trail of glass applied to the rim. Between the 10th and 12th centuries, the two techniques employed on this bowl were perfected and utilized separately.

Plate XII:B illustrates the range of mold-blown patterns found at Heshbon. Ribs are blown vertically, horizontally and in zigzag patterns. The network pattern has many variations in cup, dish, and bottle fragments. Pincer decorated fragments with concentric circles and central bosses are also illustrated in the top row, third from the left. Small cups and occasional bowls and bottles with this decoration are assigned to the 8-9th centuries.

Trailing on threads of contrasting colors, usually opaque white on amethyst, deep green, or blue background, was a favorite decorative technique of the later period. A simple contrasting trail of white applied at the rim of a deep green bowl (Pl. XII:C, top row center) soon became an elaborate system of zigzags, checkerboards or diamond shape dashes on beakers, bottles, and bowls as documented by the remaining fragments on Pl. XII:C. Additional fragments with variation in the technique were illustrated in the report on the 1968 season at Heshbon.[7]

Plate XI:D illustrates two utilitarian vessels which should be

[7] "Heshbon 1968," *AUSS* 7 (1969): Pl. XXI:B.

considered as post-10th century—the characteristic "spearhead" flask, top right, and the flared rim beaker with applied trail at the foot, bottom row, center and right.

Finally, it should be mentioned that a large number of bracelet fragments were excavated. Perhaps the material at Heshbon will shed some light on the chronology of these simple objects. Even bracelet manufacture utilizes spiral twisting and trailing on contrasting colors in order to achieve elaborate surfaces. Plate XII:D provides a representative sample of the excavated types, and a few complete bracelets were discovered in some of the tombs. It is clear that these tombs were often early Roman in construction but were reused over long periods.[8] It would be most useful if these bracelets could be more precisely dated within the Roman/Byzantine and Islamic context. Heshbon may prove to be one of the sites where this will be possible.

[8] "Heshbon 1971," pp. 115, 123-25, Pl. XV:B, Tombs F.1 and F.4.

COINS FROM THE 1973 AND 1974 EXCAVATIONS AT HESHBON

ABRAHAM TERIAN
Andrews University

Coins from the 1973 Excavations

The third season of excavations at Heshbon[1] yielded the smallest number of coins: 35. Yet among them was found the long awaited city coin of Esbus (no. 249), minted during the reign of Elagabalus (A.D. 218-222), who elevated the city to municipal status.[2] This coin is undoubtedly the best specimen of its rare type.[3]

Other interesting finds of the same year include a *denarius* or *drachma* (no. 247) of Trajan (A.D. 98-117) and a *stater* or *tetradrachm* (no. 248) of Caracalla (A.D. 211-217). The italicized words are familiar to Bible students: the one (*dēnarion*) as the ordinary pay for a day's work[4] or as the "tribute money,"[5] the other (*statēr*), the equivalent of four *denarii* or a *shekel*, as for paying the temple dues for two.[6]

No Islamic coins of particular importance were found.

The 35 coins are catalogued as follows:[7]

[1] The numismatic reports on the first two seasons: 1968 and 1971, appeared in *AUSS* 9 (1971): 147-160 and 12 (1974): 35-46 respectively. These earlier reports are referred to by the years in which excavations were made.

[2] The coins of Esbus, like those of most other cities in the Province of Arabia, are our only source of information on this status. See Michael Avi-Yonah, *The Holy Land* (Grand Rapids, Michigan, 1966), p. 117.

[3] See George F. Hill, *Catalogue of the Greek Coins of Arabia, Mesopotamia and Persia* (London, 1922), pp. xxxiii, 29-30, Pl. V, no. 2.

[4] Mt 20:2, 9, 10, 13. The *denarius* was worth 18 cents, devalued to 8 cents during the reign of Nero (A.D. 54-68). Rev 6:6 may betray the inflationary prices of a later time when about a quart of wheat was sold for a *denarius*. Cf. Mk 6:37; Mt 14:21, where a *denarius* is estimated as enough to buy bread for more than 25 people.

[5] Mt 22:19.

[6] Mt 17:27.

[7] Six coins are not included in this catalogue because of their very poor and hardly recognizable condition. Of these, nos. 263-267 (1517, A.6:3; 1526, D.6:59; 1538, B.2:80; 1540, A.7:61; 1541, Tomb F.16:5) are possibly Late Ro-

Phoenician

234. (1644—B.4:88, yellow-brown, crumbly, clayish soil.) Tyre, 96/5 B.C. Similar to no. 1 in the 1968 report.

Maccabean

235. (1515—A.5:61-62, cleanup debris above bedrock.) Alexander Jannaeus, 103-76 B.C.
Similar to no. 47 in the 1971 report.

236. (1523—B.4:124, soft, moist, brown soil.) Antigonus Mattathias, 40-37 B.C.
Obv. Double cornucopias; around, from l. below and between horns: [מתתיה]/כהן גד־/חבר היהד־־
Rev. Ivy wreath; around, from l. above: BACIΛEΩC [ANTIΓONOY].

Nabataean

237. (1646—B.3:72, loose brown soil with rocks of various sizes.) Aretas IV, 9 B.C.-A.D. 40.
Similar to no. 2 in the 1968 report.

238. (1645—B.4:120E LC, over an E-W wall split into two sections by bedrock.)
Similar to the preceding.

239-244. (1650-1655—Tomb F.18:8, western half of the chamber to the floor, under Locus 7 and over 9.)
Similar to the preceding.

245. (1528—D.1:53, probe trench in SW corner of square.) Uncertain.
Obv. Head r., laureate; border.
Rev. Horn of plenty r.; ear of barley or wheat l., with pomegranate (?) above.[8]

Provincial Roman

246. (1524—D.6W:56B, NS wall in SW corner of square.) Judaea; Pontius Pilate, A.D. 31/2.
Similar to no. 5 in the 1968 report.

247. (1647—D.2:36, continuation of substructure from stair 32.) *Denarius* (2.93 gm.) of Trajan, *ca.* A.D. 105.[9]
Obv. Head of Trajan (98-117) r., laureate; around: IMP TRAIANO AVG GER DAC P M TR P; plated.
Rev. Fortuna standing l., draped, holding rudder or prow in r. hand and cornucopias in l.; around: COS VP P S P Q R OPTIMO PRINC; plated.[10]

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man, belonging either to the reign of Valentinian II, A.D. 375-392, or to that of one of his contemporaries. No. 268 (1649, Tomb F.18:8) is worn beyond recognition.

[8] Identical with Hill, *Arabia,* Pl. XLIX, no. 9, except that l. and r. objects on the rev. are reversed, owing perhaps to a printing error there in mirror image.

[9] See Harold Mattingly, *Coins of the Roman Empire in the British Museum,* vol. 3: *Nerva to Hadrian* (London, 1966), p. 30n.

[10] Referring to the reigns of Nerva to Hadrian, Mattingly says, "In this period they [plated *denarii*] usually offer irregular combinations of types and

248. (1521—B.3:49, over fallen rocks and soil from E balk.) *Stater* (13.22 gm.) of Caracalla, A.D. 211-217.
Obv. Head of Caracalla, laureate; around: ΑΥΤ. ΚΑΙ. ΑΝΤΩΝΙΝΟ (*sic*) CEB; border of dots.
Rev. Eagle with wings spread, head r., holding wreath in beak, standing on thunderbolt; two stars in field; around: ΔΗΜΑΡΧ. Ε.Ξ. ΥΠΑΤΟC ΤΟ Γ (Gaza ?);[11] border of dots.

249. (1522—B.4:113, red soil with *huwwar* bits.) Esbus (Heshbon); Elagabalus, A.D. 218-222.
Obv. Bust of Elagabalus r., laureate and draped; around: AVT C M AVR ANTONINVS.
Rev. Within a temple showing four columns, central arch and flat roof to wings, city-goddess stands l., wearing turreted crown and short chiton; her r. foot rests on small figure, l. hand rests on spear or standard and r. holds another small figure; inscr. above the temple wings: A V; in exergue: ECBOVC (Aurelia Esbus).

Late Roman

250. (1539—B.5:8, reddish-brown soil with *huwwar* flecks, along N balk of square.) Constans I, A.D. 343-350.
Similar to no. 60 in the 1971 report.

251. (1525—D.3:24, top layer E of and level with Locus 21.) Valentinian II, A.D. 375-392.
Similar to no. 12 in the 1968 report.

252. (1529—Tomb F.16:4, Arcosolium W of shaft over Locus 5.) Honorius, A.D. 395-423.
Similar to no. 15 in the 1968 report.

Byzantine

253. (1531—G.1:5, tan soil, speckled with limestone pieces.) *Follis* of Anastasius I, A.D. 498-518.
Similar to no. 17 in the 1968 report; official code no. A instead of Є.

254. (1643 D.1:43, reddish mortar.) *Follis* of Justinian I, A.D. 539/40.
Obv. Bust of Justinian I (527-565) facing, wearing cuirass, plumed helmet with diadem from which two pearls hang on either side; r. hand holds *globus cruciger;* shield showing horseman on l. shoulder; cross in r. field; around: DNIVSTINI ANVSPPAVC; border of dots.
Rev. M (prominent mark of value—40 *nummi);* within: A (official code no.); above: cross; l. segment: ANNO; r. segment: X-II-I (539/40; in exergue: KYZ (Cyzicus); border of dots.

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other peculiarities, and may be attributed confidently to the work of the false moneyer. We can be certain that they were not issued by the regular mints. It is less certain whether there may not have been irregular local mints in the provinces issuing imitations of imperial coins which might be tolerated . . . in general circulation" (ibid., p. xix).

[11] See George F. Hill, *Catalogue of the Greek Coins of Palestine: Galilee, Samaria and Judaea* (London, 1914), p. lxxviii, though no such coin is illustrated in the plates.

Ayyūbid (1171-1342)[12]

255. (1533—G.1:9, along N balk, a wide wall.) Aẓ-Ẓāhir Ghāzī (Ḥalab branch), 1186-1216.
Similar to no. 68 in the 1971 report.

256. (1642—G.3:12, topsoil.) Al-'Adil, 1196-1218.
Similar to no. 28 in the 1968 report.

257. (1530—G.1:1, topsoil.) Uncertain.
Obv. Within two horizontal lines across the field: *Al-Malik;* traces of borders, the outer dotted.
Rev. Arabesque; traces of border.

Mamlūk (1250-1517)[13]

258. (1520—A.6:4, two monolithic stones [pillar column and architrave].) Uncertain.
Obv. . . ./*Ḍuriba bi-Dimashk;* traces of border.
Rev. Obliterated.

259. (1519—A.6:4, see no. 258.) Al-Ashraf Sha'bān, 1363-1377.
Obv. Obliterated.
Rev. *Aṣ-Sulṭān al-Ma*[*lik*]/*al-Ashraf Nā* [*ṣir*] . . .

260. (1518—A.6:4, see no. 258.) Aẓ-Ẓāhir Barḳūḳ, 1382-1399.
Similar to nos. 91-94 in the 1971 report; pierced.

261. (1527—D.4:1, topsoil.)
Similar to the preceding.

262. (1532—G.1:5, tan soil, speckled with limestone pieces.)
Similar to the preceding.

Except for the Esbus coin, none of the coins hitherto found bears any of the ancient mint names of Transjordan. The Nabataean coins were presumably struck at Petra.[14] The rest of the non-Islamic coins still represent an extensive geographical range of provenance. Of the Islamic coins, the *Mamlūk fulūs* (nos. 257, 259-261, like nos. 41, 45 in the 1968 report and nos. 84-86, 91-94 in the 1971 report), were struck at Damascus. The coin evidence so far does not alter the conclusions on the occupational history of Heshbon made in the 1968 report.

Coins from the 1974 Excavations

The 1974 coins, 38 in number, add two significant points to the earlier reports. The first coin in this catalogue (no. 269) is the oldest coin hitherto found at Heshbon, dating from 246-221 B.C. and belonging to the reign of Ptolemy III Euergetes. Another

[12] End of the Ḥamāh branch.
[13] Baḥrī Mamlūk (1250-1382), Burḏjī Mamlūk (1382-1517).
[14] Hill, *Arabia,* p. xii.

coin (no. 278), besides the Esbus coins (no. 249 in the 1973 report and no. 280 in this report—the 2nd being in extremely poor and hardly recognizable condition), is the first to mention any of the ancient mints of Transjordan. It is a coin of *Arabia Provincia,* founded in A.D. 106, after the fall of the Nabataean Kingdom. The coin belongs to the reign of Hadrian (A.D. 117-138) and was probably struck at Bostra, which at first issued coins for the entire province with the province name—APABIA—on the reverse.[15]

As might be expected in the lower strata, fewer Islamic and more pre-Islamic coins were found in the last two years. Among some observations, one may note the ever increasing number of Nabataean coins, 20 to this date, which may warrant a special study.

An Umayyad *fils* (no. 291), like no. 21 in the 1968 report, was struck at *Aelia* (Jerusalem). Among the Mamlūk coins, two silver *dirhamayn* and a *half-dirham* were found (nos. 296, 298, 301). The mint names on these, as on most other Islamic coins, fall outside the flan.

The 38 coins are catalogued as follows:[16]

Ptolemaic

269. (2050—D.3:93, a very sandy, gravelly soil layer.) Ptolemy III, 246-221 B.C.
Obv. Head of Zeus Ammon r.
Rev. Two eagles on thunderbolts, facing l.; inscr. l.: [ΠΤΟΛΕΜ]ΑΙΟΥ; r.: obliterated [ΒΑΣΙΛΕΩΣ]; between legs of eagle on l.: Θ; border of dots.

Maccabean

270. (1730—C.5:66, hard light brown soil with plaster sherds and ash pockets.) Uncertain.
Obv. Obliterated.
Rev. Traces of two cornucopias.

[15] Ibid., pp. xxii-xliv, 14-44.

[16] Some discernible marks made the following identifications of very poor coins possible: no. 302 (2105, C.5:81) is Late Roman, similar perhaps to no. 16 in the 1968 report; no. 303 (2057, D.4:62) is Umayyad, owing to some traces of the Moslem profession of faith in *Kufi;* nos. 304-305 (1711, A.9:10 and 2039, G.9:3) are Byzantine *folleis* showing traces of large M; no. 306 (1733, C.3:59) is worn beyond recognition.

Phoenician

271. (1768—B.4:211, blackish-brown, thick clay layer.) Tyre, A.D. 64-109.[17]
Obv. Similar to no. 1 in the 1968 report.
Rev. Palm tree with two bunches of fruit; obliterated inscr. in the field.

Nabataean

272. (1947—C.6:15, a double wall connecting Wall 2 and Wall 4.) Aretas IV, 9 B.C.-A.D. 40.
Similar to no. 2 in the 1968 report, but 3d line of rev. inscr. off the flan.

273. (1739—D.3:67, hard surface of *huwwar*.)
Similar to the preceding, but rev. inscr. obliterated.

274. (1805—D.3:80, predominantly brown soil layer in the eastern third of the square [NS].)
Similar to the preceding, but 3d line of rev. inscr. off the flan.

275. (1740—D.3:57c, 2d uncontaminated layer in Locus 57, cistern.)
Obv. Bust of Aretas Philopatris r., laureate, with long hair; border of dots.
Rev. Two crossed cornucopias; one or two unintelligible letters between them.

276. (2101—G.10:14, brown soil, loose on top, firmer toward bottom.) Rabbel II, A.D. 71-106.
Obv. Busts of Rabbel and Gamilath (his sister and queen) r.
Rev. Similar to no. 3 in the 1968 report.

Provincial Roman

277. (1767—D.3:78, soil layer semi-arbitrarily separated from Locus 71.) Judaea; Pontius Pilate, A.D. 30-32.
Similar to no. 5 in the 1968 report, but obv. inscr. and rev. obliterated.

278. (1743—D.4:41, some *huwwar* rocks, fairly loose, with loose brown soil sloping to W balk.) Arabia; Hadrian, A.D. 117-138.
Obv. Bust of Hadrian r., laureate, undraped; around: [AVTOKPAT KAICAP T]PAIANOC ADPIANOC C; border of dots.
Rev. Bust of Arabia r., wearing turreted crown and flowing mantle; each arm holding a small seated figure of a child; in exergue: APABIA; traces of border.

279. (1713—D.2:44, clearing debris of winter erosion.) Aelia Capitolina; joint principate of Antonius Pius and Marcus Aurelius, A.D. 146-161.
Obv. Bust of Pius (138-161) r., bearded, laureate, and draped; obliterated inscr. around.
Rev. Bust of Aurelius (161-180) r., bareheaded and draped; around: AVRELIO CAES AVG; in exergue: CA[C] (Colonia Aelia Capitolina).[18]

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[17] Hill, *Catalogue of the Greek Coins of Phoenicia* (London, 1910), pp. 258-259.

[18] Cf. Hill, *Palestine*, p. 88, nos. 34, 35.

280. (2104—B.1:13, variegated brown-black soil covered by a *huwwar* surface of varying thickness, extending over the square.) Esbus (Heshbon); Elagabalus, A.D. 218-222.
Similar to no. 249 in the 1973 report, but in extremely poor condition. With the exception of part of the rev. (exergue: [ECB]OVC), inscr. is obliterated.

Late Roman

281. (1710—C.5, bulk trim.) Gallienus, A.D. 267.[19]
Obv. Bust of Gallienus (253-268) r., radiate and draped; around: [GA]LLIENV[S . . .]; border of dots.
Rev. Mercury standing l., holding purse and caduceus; around: FIDES A[VG]; in exergue: PXV (Tribunician year [A.D. 267]).

282. (1702—A.7:97, hard packed, light brown, gravelly soil on which mosaic foundation, Loci 94-96, was set and into which *ṭabun* foundation pit was cut.) Maximian, A.D. 296-305.
Obv. Bust of Maximian r., radiate and draped; around: IMP C M AV MAXIMIANV[S . . .].
Rev. Emperor standing r., holding *paragonium,* receiving Victory on globe from Jupiter, standing l., holding scepter; around: CONCONCOR[DIA MI]LITVM; in the field: KA (mark of value).[20]

283. (1731—G.9:2, hard packed, grayish brown, gravelly soil layer.) Constantine I, A.D. 306-337.
Obv. Bust of Constantine I r., laureate and draped; around: IMP C CONSTANTINVS P F AVG.
Rev. Three standards; around: S P Q R OPTIMO PRINCIPI.

284. (1736—G.5B:31, soil layer W of Wall 15 and running up to it.) Valens, A.D. 364-378.
Obv. Bust of Valens r., with pearl diadem and cuirass; around: D N VALEN. . . .
Rev. Emperor advancing r. with standard in l. hand and dragging a captive with the r.; around: GLORIA ROMANORVM.

285. (2058—G.5F:1, arbitrary soil layer all over the square above rock tumble from reservoir wall.)
Similar to the preceding, but inscr. is obliterated.

286. (1701—A.5:77, hard packed, light brown, gravelly soil on which mosaic 73 installation was founded, Loci 74-76, into which foundation pit for *ṭabun* A.7:73 was dug, extending down to bedrock.) Theodosius I, A.D. 378-395.
Obv. Traces of bust, r.
Rev. Victory advancing l., dragging a captive; around: [SALV]S REIP[VBLICAE]; in exergue: SMAN (Antioch).

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[19] See Percy H. Webb, *Valerian to Florian,* vol. 5, pt. 1 of *The Roman Imperial Coinage,* ed. by Harold Mattingly et al. (London, 1962), 184-185, no. 607.
[20] Cf. ibid., pt. 2, p. 610, nn. 1, 2.

287. (2059—C.3:53, reddish-brown soil with chunks of *huwwar.)* Uncertain.
Obv. Bust r., laureate and draped; blundered inscr. around.
Rev. Sol standing l., radiate head, draped, holding a crown (?); around: SOLI INVICTO [COMITI]; obliterated inscr. in exergue.

Byzantine

288. (2042—A.9:76, hard packed white plaster surface, with red dirt, small stones, and limestone chips, SW corner of square.) *Nummus* of Justinian I, A.D. 527-565.
Obv. Bust of Justinian I r., with pearl diadem and cuirassed.
Rev. *Chrismon.*

289. (1811—D.1:74, reddish brown to almost tan, firmly packed soil.) *Follis* of Tiberius II, A.D. 580/1.
Obv. Bust of Tiberius II (578-82), facing, wearing consular robes and regalia, crown with a cross and two pearls hanging on either side; r. hand holds mappa, l. scepter with eagle surmounted by a cross; around: [D]M] TIbCONS. TANTPPAV [I]; border.
Rev. M (prominent mark of value—40 *nummi*); above: cross; l. segment: ANNO; r. segment: U-II (year 7 from his becoming co-emperor in 574); in exergue: CON (Constantinople).

Umayyad

290. (1737—A.8:1, surface and top soil, rock tumble, across entire square.)
Obv. Obliterated.
Rev. Central dot surrounded by a semicircle and three serrate circles.

291. (1946—C.7:34, medium brown, hard packed soil layer with *huwwar* chunks.)
Obv. *Lā ilah illā 'llah/waḥda/h Aīlīā;* border.
Rev. *Muḥammad/Rasūl/Allah;* border.

292. (2062—C.8:3, light brown subsoil under C.8:2.)
Obv. Similar to no. 26 in the 1968 report, but no traces of border.
Rev. Obliterated.

Ayyūbid (1171-1342)[21]

293. (1769—C.6:11, loose, powdery gray soil.) Al-'Azīz 'Uṯmān (Egyptian branch), 1193-1198.
Obv. *'Uṯmān/al-Malik al-'Azīz;* ornament beneath; border with illegible margin.
Rev. *suf* (continuation of the last line) */Bin al-Malik an-Nāṣir* (last two consonants downward)/*Yū* (continued as the 1st line); border with illegible margin.

294. (1738—E.4:4, light grayish brown, very loose lens.) Al-'Adil, 1196-1218.
Obv. . . . */ad-Dīn/al-Malik al-'A*[*dil*]/ . . .; border of dots; traces of obliterated margin.
Rev. . . . */Abū Bakr Bin* . . . / . . .; border of dots; traces of obliterated margin.

[21] End of the Ḥamāh branch.

295. (2061—C.8:3, light brown sub-soil under C.8:2.) Uncertain.
Obv. Obliterated.
Rev. Arabesque within circle.

Mamlūk (1250-1517)[22]

296. (1735—A.9:7, fill dirt, sterile, in SW corner of square, with evidence of a doorway in extreme SW corner.) *Dirham* (2.61 gm.) of an-Nāṣir Muḥammad, 1293-1294, 1299-1309, 1310-1341.
Obv. . . ./[*Muḥamm*]*ad Rasūl Allah*/[*ār*]*salahu bi-'l-hudā*/ . . . .
Rev. *As-Sulṭān al-Malik*/*an-Nāṣir Nāṣir ad-Dunyā*/*wa 'd-Dīn Muḥammad* . . . .

297. (1741—B.7:10, loose brown soil under Locus 3.)
Obv. *Allah* (continuation of 2d line) /*wa mā an-naṣr* [*illā min 'ind*] (continued as the 1st line) /*lā ilah illā* ['*llah Muḥammad*]/ . . . ; traces of border.
Rev. . . . /*Nāṣir ad-Dunyā* [*wa*]/*'d-Dīn Muḥammad Bin Ḳa*[*lāūn*]/ . . . .

298. (1924—A.9:34, hard packed brown dirt, with charcoal and white granules, SW corner of square.) *Dirham* (3.22 gm.) of An-Nāṣir Ḥasan, 1347-51, 1354-61.
Obv. . . . /[*Lā*] *ilah illā 'llah*/[*Muḥammad*] *Rasūl Allah ā*/*rsalahu bi-'l-hudā*.
Rev. [*As-Sul*]*ṭān al-Malik*/[*an-Nā*]*ṣir Nāṣir ad-Dun*[*yā*/*wa 'd-*]*Dīn Ḥasan* [*Bin*] *al-Mal*[*ik*].

299. (2063—C.6, balk trim.) Al-Manṣūr Ṣalāḥ ad-Dīn Muḥammad, 1361-1363.
Obv. Obliterated.
Rev. [*As-Sulṭā*]*n al-Malik*/[*al-Manṣū*]*r Muḥammad*; traces of border.

300. (1712—C.6:22, hard packed brown soil with lighter brown clay, some orange soil, some *huwwar* and small stones.)
Similar to no. 41 in the 1968 report.

301. (1960—A.9:34, see no. 298.) *Half-dirham* (0.90 gm.). Uncertain.
Obv. . . ./. . . *illā 'llah Muḥammad*/. . . *Allah ārsalahu*/. . .
Rev. *Aẓ-Ẓāhir* . . ./ *as-Sulṭān al-Malik*/. . .

The 1974 coins yielded not only the oldest coin found at Heshbon (no. 278), but also two more specimens from the ancient mints of Transjordan (nos. 278, 280). No new conclusions on the occupational history of Heshbon through the coin evidence are in sight. A final report is planned to follow the excavations scheduled for the summer of 1976.

[22] Baḥrī Mamlūk (1250-1382), Burǰī Mamlūk (1382-1517).

HESHBON OSTRACON X

LAWRENCE T. GERATY
Andrews University

Ostracon X was found at Tell Ḥesbân on July 23, 1974, in Area C, Square 5, Locus 70, along with other potsherds assigned to Pail 233. It was first given the pottery registration no. 24067X, then the object registration no. 1890, and finally the Andrews University Archaeological Museum acquisition no. 74.224.

The ostracon's excavator described its context (Locus C.5:70) as a 10 cm. deep "hard ashy dark brown soil layer with pebbles and tesserae" in the southwest corner of the square's northern portion (the only portion excavated in 1974). Along with the other sherds which were predominantly Byzantine but included some Late Roman and a few Early Roman, the locus contained bones from sheep, goats, a pig, a cow, and a donkey, and was interpreted to be the bottom soil layer in a Byzantine dump just to the west of an Early Roman tower in Squares C.1 and 5.

The ostracon itself was probably already broken in antiquity on all four sides leaving a trapezoid-shaped sherd whose dimensions are roughly 4 x 5 cm. (and nearly 4 mm. thick). The light red (Munsell 2.5YR 6/8)[1] slipped sherd may have come originally from an Early Byzantine open bowl of fine ware[2] whose interior concave surface may have carried the full painted inscription. In any case, when the bowl (or large sherd containing the inscription) was broken, only the final two letters, with part of a third, remained on the ostracon discovered in Square C.5.

The remaining letters, all in the upper left corner of the sherd, each nearly 2 cm. high by 1 cm. wide in weak red paint (5R 4/4), read: . . . [N]HΣ, perhaps the genitive ending of a name like Ιωαννης, John (see Fig. 20 where these letters are traced in black).

[1] The color readings in this report were taken from *Munsell Soil Color Charts* (Baltimore: Munsell Color Co., 1971) in normal daylight on an overcast day when the ostracon was dry.

[2] Since it is only a body sherd, the author cannot rule out the possibility of a Roman date for the sherd.

An unusual feature of this ostracon is that these fine formal letters are themselves painted over the identical letters executed in a more cursive hand in pinkish white paint (7.5YR 8/2) (in Fig. 20 these letters are indicated by stippling where heavier concentrations of dots represent thicker paint; cf. Pl. XV: C).

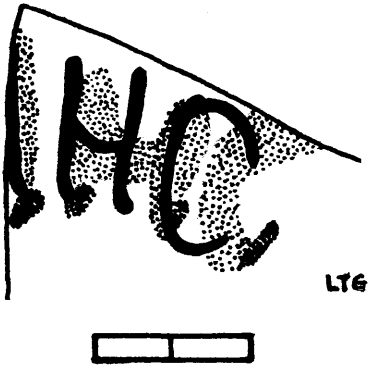


Fig. 20. A tracing of upper left corner of Heshbon Ostracon X.

Palaeographically, the weak red letters were painted carefully; they are large in terms of size and definable by a rectangle. The *eta* was executed with three successive brush strokes, each ending in a blob of paint. The *sigma* was completed in two curved strokes, the first starting at the upper right and arching to the upper left, and the second crossing it at the upper left in a downstroke that then curved up to finish at the lower right. The underlying pinkish white letters were painted more cursively; they are squatter in terms of size, the *eta* definable by a square but the *sigma* by a rectangle. The *eta* was executed with two strokes, the first being the left downstroke, and the second the curved crossbar which moved up to the right and then down again (without lifting the brush from the surface) into the right downstroke—each ending in a paint blob. The *sigma* was completed in only one stroke which began at the upper right (where the ostracon is broken) but angled into a thick downstroke at the upper left shoulder and then finished off at the bottom with an upward flourish to the right.

The best parallels for these letter forms are found in documents broadly dated between the 3d and 5th centuries A.D.;[3] it would be hazardous to assign an absolute date on the basis of only two letter forms but an Early Byzantine date in or near the 4th century A.D. for Heshbon Ostracon X would not be far wrong.

[3] Though parallels could be cited in numerous palaeographical handbooks, examples of the outside limits in terms of dating can be conveniently compared in Richard Seider, *Paläographie der griechischen Papyri*, vol. 1 (Stuttgart, 1967). P. Berl. 11532 from Theadelphia (plate 26 opposite p. 83) illustrates comparable formal and cursive hands of the 3d century A.D. P. Oxy. 1130 from Oxyrhynchus (plate 34 opposite p. 99) illustrates comparable hands from the 5th century A.D. A formal hand which is very close to that of Heshbon Ostracon X is the one found in P. Chester Beatty IV [961] from Aphroditopolis in Middle Egypt (vol. 2 [Stuttgart, 1970], plate 29 opposite p. 148) dated to the 4th century A.D.

HESHBON OSTRACON XI

FRANK MOORE CROSS, JR.
Harvard University
Cambridge, Massachusetts

An additional ostracon inscribed in the peculiar Ammonite script was found in the excavations of the 1974 season at Heshbon. Of the small corpus of inscriptions, now eleven in number, known from Heshbon, the newly-found ostracon is second in interest only to Ostracon IV.[1]

Ostracon XI is small, measuring at its maximum dimensions only 8.4 x 5.4 cm. The right side (with its margin) and the bottom side probably belong to the original ostracon; the break at the top is more recent, perhaps modern, so that a considerable portion of the text must be reckoned as missing. The left side of the ostracon is uncertain. It is clear, however, that the ink on the left third of the surviving ostracon was rubbed away almost without trace. Ostracon XI, Registry No. 2092, came from Area B, Square 2, Locus 126, described by the excavator as an Iron II/Persian ceramic context. Like Ostracon IV, this ostracon was made from the body sherd of a heavy storage jar.

The primary text reads as follows:

1. t'n [ ]
2. t'n mn [ ]
3. b'rm [ ]
4. ḥblm [ ]

Translation:

1. figs [ ]
2. figs from [ ]
3. beasts of burden [ ]
4. ropes [ ]

[1] See F. M. Cross, "Ammonite Ostraca from Heshbon: Heshbon Ostraca IV-VIII," *AUSS* 13 (1975): 1-20; Pl. I; cf. also the two ostraca in cursive Aramaic, "An Ostracon from Heshbon," *AUSS* 7 (1969): 223-229; Pl. XXV:B (Heshbon Ostracon I), and "Heshbon Ostracon II," *AUSS* 11 (1973): 125-131, Pl. XVI:A.

Fig. 21. A tracing of Heshbon Ostracon XI.

The text appears to be some kind of inventory. As is the case with Ostracon IV, the text no doubt included numbers of quantity, and perhaps also specification by place of origin or by a personal name.

Line 1. In the margin preceding the letters *t'n* are a series of marks, for the most part vertical strokes. One or two can be taken as letters; one could also call many of the strokes numbers. However, the marks are secondary to the larger, thicker script, and may be no more than doodling. In any case, they cannot be read. The word *t'n* is probably complete, a collective equivalent to Hebrew *t'nym*. One may compare Canaanite *tyn* (the *yod* is consonantal), Ugaritic *tyt* (from **tayyintu*), for example, in an inventory: *ḫmšt kkr tyt*, "five talents of (dried) figs."[2]

Line 2. *t'n*, "figs" is repeated followed by what appears to be *mn*, "from . . .", presumably followed in turn by a place name, or possibly a personal name. An alternate, less likely reading is *kk[r]* plus number.

Line 3. The *m* of *b'rm* may or may not belong to the word. *B'r* or *b'rm* concretely refer to beasts of burden, donkeys or possibly camels. We note that Heshbon was upon the main caravan routes, which crossed there.[3]

Line 4. *Ḥblm* most likely means "ropes" rather than "pledges" or "sailors"(!). Once again compare the reading in a Ugaritic inventory: *ṯmn ḥblm*, "eight ropes."[4]

The script of Ostracon XI is very much like that of Ostracon IV from Heshbon.[5] *'Alep* is virtually identical, as are *taw* and *nun*. *Beṯ* and *'ayin* are more open at the top. *Reš* too is farther open. *Lameḏ* is unusually high. These latter traits are more developed, and appear to be moving in the direction of Aramaic. *Mem* still retains the archaic Ammonite form. Particularly characteristic is the cursive *ḥeṯ*, a *"reversed-'n'"* form which appears in

[2] Gordon Text 1130:17; 2101:26.
[3] See my comments in "An Ostracon from Heshbon," p. 228.
[4] Gordon Text 1128:30, 31.
[5] See the script chart, fig. 2, in "Ammonite Ostraca from Heshbon," p. 15.

Ostracon IV. If our dating of Ostracon IV is correct (end of seventh or beginning of the sixth century B.C.), Ostracon XI should be perhaps a generation later, in the early sixth century, contemporary with the lapidary script of the 'Amman Theater Inscription,[6] ca. 575 B.C. Thus it is the latest of our inscriptions in Ammonite. By 525 B.C. at latest, Ammonite came to be written in the cursive Aramaic of the Persian chancellery, to judge from Ostraca I and II from Heshbon.[7]

[6] Ibid., pp. 11, 12.
[7] See "An Ostracon from Heshbon," pp. 228, 229.

A RHODIAN POTTER'S DATE-STAMP

JAMES J. C. COX
Andrews University

In the process of excavating a Late Hellenistic pool[1] during the 1974 campaign at Tell Ḥesbân, workmen under the direction of Area Supervisor James A. Sauer unearthed, along with a number of datable ceramic sherds, mostly of the Late Hellenistic period (198-63 B.C.),[2] an amphora handle (H74 2095) impressed with a finely executed and remarkably well-preserved Rhodian potter's "date-stamp."[3]

This rectangular stamp bears the Greek formula ΕΠΙ ΑΡΙΣ-ΤΕΙΔΑ ΣΜΙΝΘΙΟΥ (preposition, eponym, and name of the month) which formula was probably intended to indicate the date of the license which permitted the potter involved to manufacture and sell his wares according to specific governmental regulations regarding capacity, etc.[4] Consequently, this stamp is probably intended to be understood as indicating that the license which permitted the production and sale of the amphora on which it was impressed was secured, literally, "in the time of (or, in the year

[1] See James A. Sauer's unpublished locus description for Locus B.4:249; and "Area B and Square D.4," pp. 29-62 above.

[2] Especially sherds 11689-11691 and 11784-11793. Some of the sherds in Locus B.4:249 were from the Iron and Persian periods; none were from periods later than the Hellenistic. The Hellenistic sherds themselves represent, in the main, the Late Hellenistic period (198-63 B.C.). See also L. T. Geraty, "The Excavations at Tell Ḥesbân, 1974," *American Schools of Oriental Research Newsletter* No. 5 (1974): 5.

[3] A photograph by Eugenia Nitowski appears in Pl. XV:B.

[4] See Virginia Grace, "Stamped Amphora Handles Found in 1931-1932," *Hesperia* 3 (1934): 197-99; "Standard Pottery Containers of the Ancient Greek World," *Hesperia: Supplement* 8 (Commemorative Studies in Honor of Theodore Leslie Shear; Athens, 1949), pp. 177-78; and *Amphoras and the Ancient Wine Trade (Excavations of the Athenian Agora: Picture Book,* 6; Princeton, 1961), pp. 10-11.

of)[5] Aristeidas,[6] in the month Sminthios",[7] or, more idiomatically,

[5] The preposition ΕΠΙ followed by a "personal genitive" in formulae such as this one normally connotes "in the time of." See e.g., H. W. Smyth, *Greek Grammar* (revised by G. M. Messing; Cambridge, Mass., 1963), § 1689b. Since the Rhodian priests of Helios usually carried their priestly responsibilities for one year, we may rightly understand the preposition ΕΠΙ in this particular case to connote "in the year of" or "in the year in which X was priest of Helios." According to Grace ("Standard Pottery Containers," p. 177), "A name accompanied by *epi*, 'in the term of,' is the principal expression which has been recognized as a date." See also Grace, *Amphoras*, p. 10.

[6] That the form ΑΡΙΣΤΕΙΔΑ is to be understood as a genitive is clear. It is formed on the analogy of those proper names of the first declension masculine whose stems end in α, which, in the genitive singular, contracts α-(ι)ο to α in both Aeolic and Doric. See Smyth, *Greek Grammar*, §§ 211 and 214D, and W. W. Goodwin, *Greek Grammar* (revised by C. B. Gulick; Boston, 1958), §§ 193 and 196c. Compare the form ΛΕΟΝΤΙΔΑ in the formula ΕΠΙ ΛΕΟΝΤΙΔΑ ΑΡ[ΤΑ]ΜΙΤΙΟΥ ("in the time of Leontidas, in the month Artamitios") which occurs on a Rhodian amphora handle found in the Baths of Placcus in Gerasa (see C. B. Welles, "The Inscriptions," in *Gerasa: City of the Decapolis* [ed. C. H. Kraeling; New Haven, Conn., 1938], p. 460, item 244); and the form [ΑΡ]ΧΙΛΑΙΔΑ in the formula ΕΠΙ [ΑΡ]ΧΙΛΑΙΔΑ ΚΑΡΝΕΙΟΥ ("in the time of Archilaidas, in the month Karneios") which occurs on a Rhodian amphora handle found in Field I, Locus 279, during the 1957 excavations at Beth-zur (see O. R. Sellers *et al.*, *The 1957 Excavation at Beth-zur* [*AASOR*, 38; Cambridge, Mass., 1968], p. 81), and on the left handle of a Rhodian amphora (CMC 199) of the early 2d century B.C. housed (as of 1949) in the Cyprus Museum, Nicosia (see Grace, "Standard Pottery Containers," pp. 186-187); and the same form in the formula ΕΠΙ ΑΡΧΙΛΑΙΔΑ ΑΓΡΙΑΝΙΟΥ ("in the time of Archilaidas, in the month Agrianios") which occurs on a Rhodian amphora handle found in Field I, Locus 296, also during the 1957 excavations at Beth-zur (see Sellers *et al.*, *Beth-zur*, p. 81).

[7] The names of the Rhodian months are ΑΓΡΙΑΝΙΟΣ, ΑΡΤΑΜΙΤΙΟΣ, ΒΑΔΡΟΜΙΟΣ, ΔΑΛΙΟΣ, ΔΙΟΣΘΥΤΟΣ, ΘΕΣΜΟΦΟΡΙΟΣ, ΘΕΥΔΑΙΣΙΟΣ, ΚΑΡΝΕΙΟΣ, ΠΑΝΑΜΟΣ, ΠΕΔΑΓΕΙΤΝΥΟΣ, ΣΜΙΝΘΙΟΣ, ΥΑΚΙΝΘΙΟΣ, and the intercalary month ΠΑΝΑΜΟΣ ΔΕΥΤΕΡΟΣ. See Grace, "Stamped Amphora Handles," p. 307.

The month Sminthios occurs on a stamped Rhodian amphora handle found during the 1908-1910 excavations at Samaria (see G. A. Reisner, *et al.*, *Harvard Excavations at Samaria 1908-1910* [Cambridge, Mass., 1924], I, p. 314); on another found in the Forum at Gerasa (see Welles, *Gerasa*, p. 460, item 245); and on yet another found recently (in Stratum IV [Hellenistic Period]) during archaeological excavations carried out by the Department of Antiquities of Jordan on the Citadel at Amman. The stamp of the latter reads, ΕΠΙ [ΑΡΧΙ] ΒΙΟΥ ΣΜΙΝΘΙΟΥ ("in the time of Archibios, in the month Sminthios"). See F. Zayadine, "Recent Excavations on the Citadel of Amman," *ADAJ* 18 (1973): 31. It also occurs on a stamped Rhodian amphora handle in the Benachi collection, Alexandria, dated to the late 2d century B.C. (See Grace, "The Eponyms Named on Rhodian Amphora Stamps," *Hesperia* 22 [1953]: 126, item 109).

"in the year in which Aristeidas served as priest of Helios,[8] in the month Sminthios."

That this stamped handle belonged to an amphora that was produced on the island of Rhodes is highly probable. In the first place, as far as its ceramic *fabric* and *finish* are concerned, it consists of a fine pink ware[9] finished with a smooth pink slip[10] both of which are characteristic of the fabric and finish of the amphorae produced on the island of Rhodes;[11] in the second, as far as its *form* is concerned, it is contoured in that abrupt angular fashion (see Fig. 22) so distinctive of the stamped handles of the amphorae fabricated on the island of Rhodes;[12] in the third, as far as the *stamp* it bears is concerned, it is distinguished by both (a) its location (impressed upon the upper surface of the handle at a slight remove from its exterior angle)[13] and (b) the formula (preposi-

[8] Rhodian amphorae are regularly dated according to the annually changing priests of Helios. Aristeidas was one such priest. See Grace, "Standard Pottery Containers," p. 177; "Rhodian Jars in Florida," *Hesperia* 17 (1948): 144; and "Eponyms," p. 120.

Grace observes that "on Rhodian jars . . . the eponym is frequently qualified by the title 'priest'." For example, compare the formula ΕΠ (I) ΙΕΡΕΩΣ Θ[Ε]ΡΣΑΝΔΡΟΥ ("in the time of Thersandros, priest [of Helios]") on a Rhodian amphora handle found in the Forum at Gerasa and dated to the 4th quarter of the 3d century B.C. This example is reported by Welles, *Gerasa*, p. 460, item 241.

For other examples, compare the formula ΕΠ (I) ΙΕΡΕΩΣ ΑΡΙΣΤΩΝΙΔ[Α] ("in the time of Aristonidas, priest [of Helios]") on a Rhodian amphora handle (SS 240 [E]) found in the Agora in Athens and dated to the end of the 3d century B.C.; the formula ΕΠ (I) ΙΕΡΕΩΣ ΞΕΝΟΦΑΝΤΟΥ ("in the time of Xenophantos, priest [of Helios]") on a Rhodian amphora handle (SS 258 [A-HD]) found also in the Agora in Athens and dated to the last quarter of the 3d or the 1st quarter of the 2d century B.C.; and the formula ΕΠ(I) ΙΕΡΕΩΣ ΕΥΠΟΛΕΜ[ΟΥ] ("in the time of Eupolemos, priest [of Helios]") on a Rhodian amphora handle in the Benachi collection, Alexandria, dated to the 1st century B.C. For these examples see Grace, "Stamped Amphora Handles," p. 225, and "Eponyms," p. 126, item 84.

[9] *Munsell Soil Color Charts* (Baltimore, Md., 1971), hue 7.5YR 7/4. The readings were made in daylight under an overcast sky.

[10] Hue 7.5YR 8/4.

[11] See Grace, "Stamped Amphora Handles," p. 203.

[12] See Grace, "Stamped Amphora Handles," pp. 203, 218-20.

[13] See Grace, "Stamped Amphora Handles," pp. 201-206 and Pl. II.5. On Thasian amphorae, for example, the stamp occurs on the exterior curve of the handle.

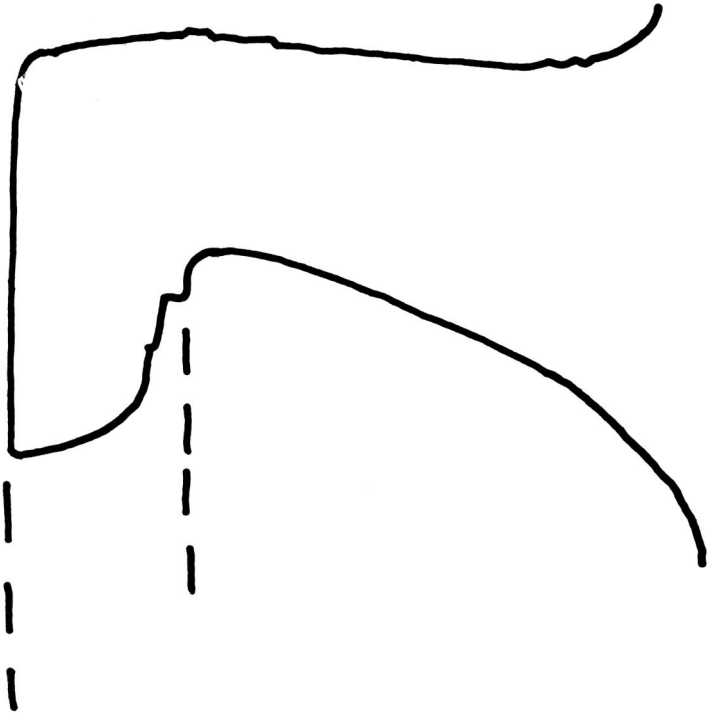


Fig. 22. The angular profile of Rhodian Amphora Handle H74 2095 (actual size).

tion [ΕΠΙ], eponym [ΑΡΙΣΤΕΙΔΑ], and name of the month [ΣΜΙΝΘΙΟΥ]) which it bears[14] both of which are typical of the date-stamps of the amphorae manufactured on the island of Rhodes; and, finally, as far as the *eponym* (ΑΡΙΣΤΕΙΔΑΣ) by which it is dated is concerned, it occurs again and again in the date-stamps of amphorae made on the island of Rhodes.[15]

And that this stamped handle belonged to an amphora that was made sometime during the latter part of the 3d or the early part of the 2d century B.C. is also highly probable. Firstly, the *form* of the handle (its rather abrupt angular profile) is typical of Rhodian amphora handles of that period;[16] secondly, the *priest* whose name it bears and during whose term of office it purports to have been manufactured is most probably to be identified with that Aristeidas, priest of Helios, who fulfilled his term of priestly service sometime within the four decades between ca.220-180 B.C.[17]

[14] See Grace, "Stamped Amphora Handles," p. 204.

[15] See footnote 17 below.

[16] See Grace, "Stamped Amphora Handles," pp. 203, 218, esp. 220. Grace notes, "Not earlier than the third quarter of the third century begins the angular type and the angle sharpens in the early second century." See also Grace, "Eponyms," pp. 119-20.

[17] See Grace, "Stamped Amphora Handles," p. 204; "Timbres amphoriques trouvés a Délos," *Bulletin de correspondance hellénique* 76 (1952): 528; "Eponyms," p. 122; and J. W. Crowfoot, "Potters' Stamps," in J. W. Crowfoot, *et al., Samaria-Sebaste III: The Objects from Samaria* (London, 1957), p. 381. There was another Aristeidas who was priest of Helios on the island of Rhodes sometime during the last quarter of the 4th or the 1st quarter of the 3d century B.C.

D. G. Lyon, "Excavations in 1908," in Reisner, *et al., Samaria 1908-1910*, 1:18, lists two Rhodian amphora handles discovered at Samaria during the 1908 excavations which bear the name ΑΡΙΣΤΕΙΔΑΣ in the formula, proposition [ΕΠΙ], eponym [ΑΡΙΣΤΕΙΔΑ], and name of the month [ΑΡΤΑΜΙΤΙΟΥ (1); and Σ[ΜΙ]Ν[Θ]ΙΟΥ (1)]; and Reisner, "Archaeological Material (1909-1910)," in Reisner, et al., *Samaria 1908-1910*, 1:314, lists nine Rhodian amphora handles found at Samaria during the 1909-1910 excavations which bear the name ΑΡΙΣΤΕΙΔΑΣ in the formula, preposition [ΕΠΙ], eponoym [ΑΡΙΣΤΕΙΔΑ], and name of the month [ΑΓΡΙΑΝΙΟΥ (4); ΑΡΤΑΜΙΤΙΟΥ (2); ΒΑΔΡΟΜΙΟΥ (1); ΠΑΝΑΜΟΥ (1); and ΣΜΙΝΘΙΟΥ (1)]. Crowfoot, "Potters' Stamps," p. 381, lists seven Rhodian amphora handles unearthed during the 1931-1933 and 1935 excavations at Samaria which bear the name ΑΡΙΣΤΕΙΔΑΣ. Presumably all of these occur in the regular formula: preposition, eponym, name of the month. Unfortunately, it is not possible to tell from Crow-

This dating harmonizes well with that reached on the basis of the stratigraphic evidence from Tell Ḥesbân (and indeed contributes to its confirmation) for that evidence strongly infers that the stamped amphora handle under discussion was discarded at Esbus (the contemporary Greek name of Tell Ḥesbân)[18] sometime during the Late Hellenistic period.[19] As already indicated, it was discovered along with ceramic sherds, the latest of which are identified as representing the Late Hellenistic period, in a gray-black clay layer (Locus B.4:249) which filled a Late Hellenistic pool, a layer that was covered first by a Late Hellenistic soil layer (Locus B.4:229) and then by an Early Roman soil layer (Locus B.4:228), both of which were sealed by "several thin Early Roman plaster and red soil layers" (Loci B.4:227 and 226).[20]

We may therefore conclude with some confidence that a potter (unfortunately we do not know his name)[21] produced on the

foot's list of eponyms whether or not the eponym ΑΡΙΣΤΕΙΔΑΣ was accompanied by the name of a month and if so, which month. We cannot be sure as to which Aristeidas these amphora handles found at Samaria belong. Crowfoot states, "As to the dating of our handles I have to confess that we did not pay the proper attention to their shape and technique; like our predecessors we contented ourselves with recording the find spots and the contents of the stamp. . . . And the stratification at Samaria, as we shall see, has not given us any close indications." P. M. Fraser and G. E. Bean (*The Rhodian Peraea and Islands* [Oxford, 1953], p. 6) make reference to an inscription (no. 8) which is dated in the term of Aristeidas.

[18] See W. Vyhmeister, "The History of Heshbon from Literary Sources," *AUSS* 6 (1968): 164-65, esp. n.42. The Greek name continues to be used in the Roman period. It occurs again on coins minted at Esbus in the time of Elagabalus (A.D. 218-222). See A. Terian, "Coins from the 1973 and 1974 Excavations at Heshbon," pp. 133-142 in this number.

[19] Cf. Geraty, "Tell Ḥesbân, 1974," p. 5.

[20] See Sauer's unpublished Area B locus list and "Area B and Square D.4," pp. 29-62 above.

[21] Rhodian amphorae regularly had two handles both of which were customarily stamped—the one bearing the name of the priest during whose term of office the potter's license to manufacture such items was obtained and dated, and the other bearing the name of the potter. See Grace, "Stamped Amphora Handles," p. 204; "Rhodian Jars in Florida," p. 144; "Eponyms," p. 117, n.3; and Crowfoot, "Potters' Stamps," p. 379. Grace remarks, "A comparatively large number of complete Rhodian amphorae is preserved. This is particularly fortunate, because the information is regularly divided between the two handles, one giving, for instance, the fabricant's name, the

island of Rhodes an amphora (the handle of which was found at Tell Ḥesbân on August 5, 1974) sometime between the years ca. 220-180 B.C., that he dated it in the customary fashion ("in the year in which Aristeidas served as priest of Helios, in the month Sminthios"), and then sold it to a wine merchant who, in turn, having filled it with Rhodian wine,[22] shipped it to Esbus where its dated handle eventually became part of a soil fill laid down in the Late Hellenistic period (198-63 B.C.).[23]

other that of the eponym or official naming the year, who in this case is the priest of Helios, plus that of the month, a feature peculiar to Rhodian seals" ("Stamped Amphora Handles," p. 204); and, with respect to the fabricant, "One is not, however, to imagine a craftsman, like the men who signed Attic vases, but a person responsible for an output of standard products, perhaps a pottery operator appointed as a commissioner, as we know bankers sometimes served as coin magistrates" ("Standard Pottery Containers," p. 177).

[22] Though the pottery of Rhodes was fine, its wine was poor. See Grace, "Stamped Amphora Handles," p. 199; and *Amphoras*, p. 12. I assume that the amphora under consideration was employed to transport and store wine. However, it may have been used for other purposes. While most Rhodian amphorae were employed for the transport and storage of wine, many were used for the transport and storage of oil, preserved fish, pitch, water, and the like. See Grace, *Amphoras*, p. 1.

[23] The Rhodian amphora handle described above is to be housed in the Museum of the Department of Antiquities, Amman, Jordan.

TWO EARLY ARABIC GLASS WEIGHTS

JAMES KRITZECK
University of Notre Dame
Notre Dame, Indiana

When two small glass objects of rather similar size and appearance were uncovered during the 1974 Campaign at Tell Ḥesbân, it was justifiably assumed, from the contexts of their discovery, that they could be regarded as relatively minor finds, and that they would hold no special mysteries for scholars of such objects.[1] Indeed, it was reported, "Two beautiful glass seal impressions came from Umayyad contexts.... Each contains a short inscription in early Arabic script."[2]

From the very beginning of their more careful scrutiny, however, a perplexing set of problems and a wide variety of alternative and plausible solutions to them emerged.

Of course a great many varieties of glass weights and measure stamps dating from the Umayyad and 'Abbāsid periods had long been known to scholars; but it was the monumental study of the superb collection of Egyptian examples in the Corning Museum of Glass by the late George C. Miles in 1971 which set an excellent and most useful standard for their identification and dating.[3] However, very little remains known about Syro-Palestinian examples.

[1] The author is deeply grateful to the Director and members of the staff of the 1974 Tell Ḥesbân Campaign for according him the privilege of studying these objects. Without the assistance of Miss Eugenia Nitowski, who provided all manner of necessary background material, excellent photographs and drawings, as well as constant encouragement, the study could not have been accomplished.

[2] L. T. Geraty, "The Excavations at Tell Ḥesbân, 1974," *Newsletter No. 5, American Schools of Oriental Research* (1974), p. 7.

[3] "Umayyad and 'Abbāsid Glass Weights and Measure Stamps in the Corning Museum," *Journal of Glass Studies* 13 (1971): 64-76, including the exhaustive bibliography on 76. The author will remain forever grateful that Dr. Miles had an opportunity to examine the objects from Tell Ḥesbân before his death in 1975, and that his successor at the American Numismatic Society, Dr. Michael L. Bates, has provided him with every assistance since.

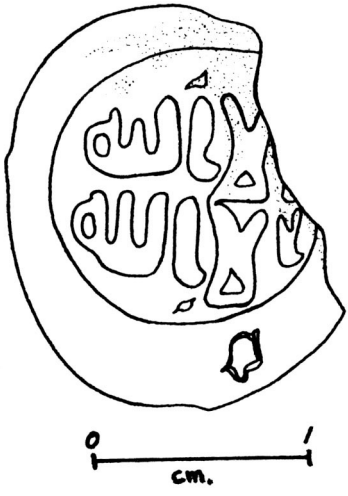


Fig. 23. Handcopy of Glass Weight H74 2106.

Fig. 24. Handcopy of Glass Weight H74 2060.

In illustration of the enigmas they present, it is best to begin with a description of the objects.

Glass Weight–H74 2106 (AUAM 74.413) – cf. Fig. 23 and Pl. XVI:A.

Findspot: G.6, Locus 29.

Condition: a broken (by modern workmen?) inscribed glass weight with a filed back (old because of the condition of the patina).

Color: translucent blue-green glass.

Size: 19 x 16 x 3 mm.

Weight: 1.3012 gm. (after cleaning).

Inscription: *lâ ilâha ill-allâh* (There is no god but God).

Glass Weight–H74 2060 (Department of Antiquities of Jordan) –cf. Fig. 24 and Pl. XVI:B.

Findspot: A.9, Locus 54.

Condition: a whole inscribed glass weight, highly pitted.

Color: translucent green glass.

Size: 17 x 16 x 3 mm.

Weight: 1.2535 gm. (after cleaning).

Inscription: *ill-A* (decorative sign) *-llâh* (but God, the second half of the first part of the *shahâdah*); this reading is uncertain.

The inscriptions are an acceptable place to start enumerating the difficulties. Specifically, the inscription on H74 2106, familiar as it is throughout the Islamic world on innumerable objects of all periods, is, to the knowledge of all experts queried, unparalleled on glass objects of this type. The epigraphical style dates the object with fair certainty to the later Umayyad period.[4]

The other object, H74 2060, is probably somewhat later; Dr. Bates has even suggested, "but without much assurance," that

[4] Dr. Miles' card index and the manuscript catalog of Paul Balog's collection, an incomparable ensemble, were thoroughly examined by Dr. Bates for this study. Cf. Balog, "Quelques estampilles en verre arabes du huitième siècle A.D. avec les noms de drogues," *Journal of the Economic and Social History of the Orient* 6 (1963): 219-227.

it could be as late as early Fāṭimid. The fact that the pottery readings in both squares include Ayyūbid/Mamlūk would certainly not rule out a Fāṭimid date, despite the dominant Umayyad.[5] The inscription is a difficult one. The first word could be *al-imām* provided the tiny lump on the right is not an *alif*. That would likewise support a later dating. The rest of the inscription is very unclear. Above all, no glass objects with a one-line inscription like this one have been located elsewhere.

Thus neither of the objects could be described as simply a "seal impression" in the customary sense. They are both rather exactly similar in fabric to Egyptian glass coin weights. The inscriptions, however, are apparently anomalous, leading to an initial doubt whether these objects were, indeed weights or rather tokens or amulets, and also whether they are Egyptian or of local manufacture.

Dr. Balog has advanced the theory that some glass objects of a roughly similar date but otherwise quite unlike them served as currency or a substitute therefor. The fact that many coins of all of these periods bear the inscription of H74 2106 (on occasion) can hardly be advanced as evidence for coinage; the mere fact of the use of glass would support only the "token" or "substitute" explanations.[6] The suggestion that they were amulets or decorative ornaments can virtually be disregarded.

The best solution was reached by this author when he asked the question: "But why must we consider the objects merely as glass? Would we not learn more about their usage, and something to explain their anomalous inscriptions, by examining their reverse sides much more closely?" This proved to be a very rewarding line of investigation.

At first glance to the naked eye, the only difference between

[5] On the question of the existence of Tell Ḥesbân in 'Abbāsid times, cf. the references in James A. Sauer, "Area B and Square D.4," *AUSS* 13 (1975): 139, n. 6.

[6] Balog, op. cit., passim; cf. Miles, "Islamic Coins," in F. O. Waagé, ed., *Antioch-on-the-Orontes*, 4, 1 (Princeton, 1948): 109-124. Abraham Terian's reports on the coins from the previous campaigns at Tell Ḥesbân should also be consulted.

the reverse sides of H74 2106 and H74 2060 is simply that the former is quite smooth (extremely so to the thumb), with no ridge at all, obviously the result of the filing, and the broken edge is in no way unusual. The latter is quite rough, with visible traces of bluish color; the obverse, by the way, is stamped with the utmost perfection.

Wondering what a closer—indeed the closest possible—examination of the objects as a whole, but particularly their reverse sides, would reveal, the author applied for assistance to two of his colleagues in metallurgy and chemical engineering. An intensive experiment was performed upon the objects, with results which permit a few statements of greater accuracy about them than otherwise would have been possible.[7]

The experiment had its almost mystical side for the author. Beneath the highest-powered metallurgical microscopes, the objects (particularly the reverse of H74 2060) immediately took on the appearance of a riotously-colored universe of stars. One by one the galaxies were identified by the scientists.

Meaningful answers began to form. It appeared that both of these objects had been applied to metal surfaces, almost certainly bronze, by means of an enamel to which dyes had been added, during the final hardening of the enamel. Only the portion of the larger metal object need have been enameled upon which the glass seal was to be attached. It was considered possible, but unlikely, that a similar process, employing the application of porcelain, might have been used on another substance. Evidence of this was just as visible on H74 2106 as on H74 2060. Intensive chemical analysis of the components of the enamel or porcelain was thought to be too lengthy and expensive a process to warrant undertaking at this time. No unanimous hypothesis concerning the filing of the reverse of H74 2106 was reached.

The hypothesis was favored that these objects were, indeed,

[7] The author records with appreciation the generous advice and help of George C. Kuczynski, professor of metallurgy, and James J. Carberry, professor of chemical engineering, both of the University of Notre Dame.

but in a novel sense, glass weights. They were probably attached to smooth pyramidal metal masses of standard weight. It was allowed that they might also have been attached (by the same method) to vessels of standard measurement. They were, indeed, marks of the official authenticity of the weights (and/or measures) to which they were attached.

In this sense, they were not unrelated to the types of coin weights, ring weights, disk weights, and vessel stamps so well studied by Dr. Miles and others.[8]

Yet these glass weights stand out far more sharply than other official marks on fired clay vessels, or heavy weights used literally to measure out cotton-seed oil, ointments, hair dye, honey, and white cumin. The "full measure" (*wāf*) was not mentioned on them; they were not dated or "ordered" by the "financial director" of the Caliph. Apparently they were more like hallmarks.

It is to be hoped that more of their kind will come to light.

POST-NOTE

Further evidence favoring local manufacture (rather than Egyptian), and incidentally confirming the connection with enamel work, is provided by a reference in Al-Tha'ālibi al-Naysābūri (961-1038), *Lata'if al-Ma'ārif*, ed. P. de Jong (Leiden, 1867), p. 95. He remarks that the glass industry "of Sidon, Tyre and other Syrian towns" was "proverbial for its clarity and thinness." Philip K. Hitti, *History of the Arabs*, 10th ed. (New York, 1970), p. 346, adds: "In its enamelled and variegated varieties Syrian glass as a result of the Crusades became the forerunner of the stained glass in the cathedrals of Europe. Glass and metal vases of Syrian workmanship were in great demand as articles of utility and luxury. Sconces of glass bearing enamelled inscriptions in various colours hung in mosques and palaces." The character of our examples, however, suggests anything but decorative purposes, and the hypothesis still stands.

[8] "Umayyad and 'Abbāsid Glass Weights," passim.

AN INSCRIBED MAMLŪK SHERD

EUGENIA L. NITOWSKI
Andrews University

Among the many inscribed objects found in the four seasons of excavations at Tell Ḥesbân is an Arabic inscribed sherd from the 1974 campaign. It is not properly called an ostracon because the inscription was added at the time of manufacture and not after the vessel was broken.

The fragment is a portion of the base of a bowl, measuring 7.0 × 3.8 × 2.9 cm., whose ware is white, coarse, granular, and very soft. The interior surface (and slightly on the exterior) is decorated with black-painted designs with a cobalt-blue spot under a colorless, crackled, decaying, transparent glaze, over a white slip, with an unglazed ring base, which has the diameter of 9 cm. (Fig. 25). The Arabic inscription, also in black under the glaze, is incomplete due to the break. Its position on the outside body, just above the ring base, is upside-down (Fig. 26).

The extant portion of the inscription is to be read as: ...*wa arba'ah* ("and four"). That it should be read as "forty" is impossible, since it would then have to be *arba'ûn* (in colloquial Arabic, *arba'în*). The last letter is unquestionably the final *hā* often used for the *tā marbūṭa* (the "tied" *tā*). The numerals 3 through 10 have *tā marbūṭa* in the masculine case and none in the feminine. This reversal of normal gender endings is found in other Semitic languages and is called polarity. The gender of the singular of the counted noun determines the gender of the numeral.[1] Why is "and four" on the base? It could be a date or a commemorative number, or perhaps, a number of measurement; however, the latter seems unusual on so ornate a piece.

As for dating, the sherd comes from a dominant Ayyūbid/Mamlūk context. Its locus is described as being possibly the

[1] My thanks to Dr. James Kritzeck, Professor of Islamic History at the University of Notre Dame, for his very gracious help with the translation of the inscription.

patio to rooms of that period.[2] This particular sherd is typical of Syrian ware from the Mamlūk period.

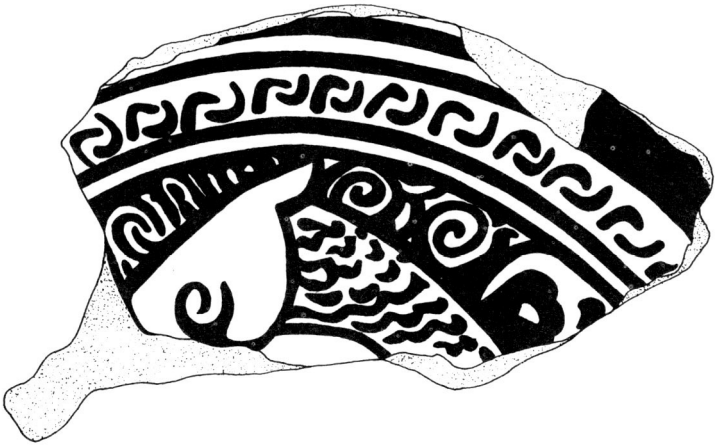
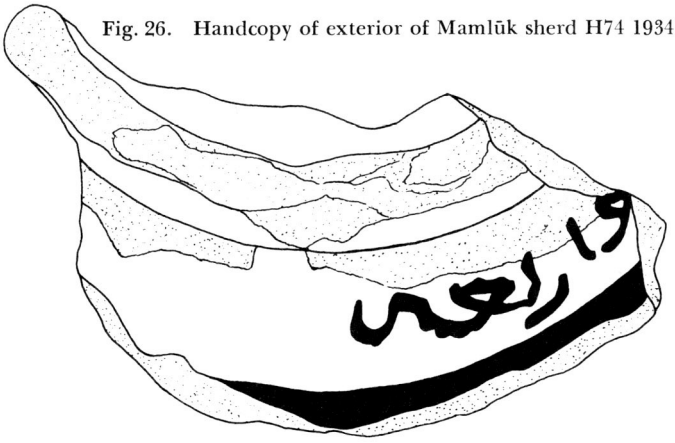


Fig. 25. Handcopy of interior of Mamlūk sherd H74 1934.

Fig. 26. Handcopy of exterior of Mamlūk sherd H74 1934.



[2] The sherd was found on July 23, 1974, in Area C, Square 6, Locus 16, Pail 29, with the dominant associated pottery coming from the Ayyūbid/Mamlūk period; there were also some Byzantine sherds. Its registration number is H74 1934, and it now belongs to the Department of Antiquities of Jordan.

GEOLOGICAL STUDY AT TELL ḤESBÂN, 1974

A Preliminary Report

HAROLD E. JAMES, JR.

Geoscience Research Institute, Andrews University

The permanent or semi-permanent occupation of a given site by a human population as at Tell Ḥesbân had significant, even dramatic, effects on the geology of the inhabited area. Some changes were humanly purposeful whereas others were natural responses of delicately balanced, interrelated geological processes which moved toward equilibrium with changing conditions. In turn, these changes may have influenced certain decisions and actions of observant inhabitants.

Typical of the purposeful changes of surface morphology were erection of buildings, excavation for building sites and building materials, construction of roadways and excavation of chambers for various purposes. By contrast, the collapse of cave roofs or buildings during earthquakes at least temporarily rendered people the servants, not the masters, of natural events. The distribution and movement of water were purposefully controlled by means of channels and conduits which were constructed to minimize the accumulation of water in some locations or to concentrate and store water in other areas. At the same time some roadways probably diverted water from pre-occupation drainage routes, and the open framework of some walls provided numerous conduits for water to percolate through the accumulating sediment. Some subterranean chambers were excavated or modified to control the distribution of water, whereas the effects of others on water distribution may have been quite unimportant to the inhabitants. The apparently simple accumulation of occupation debris changed the nature of the sediment in the area of occupation and also affected the nature and volume

of sediment transported by wind, water, and gravity on, beneath, and in the vicinity of the occupied site. Awareness of these changes could have influenced inhabitants to locate cisterns and dumps in such a manner that sedimentation rates within the cisterns and discomfort due to blowing dust would be minimized.

What geological criteria are proving useful in detecting changes and interpreting the practices and purposes of the inhabitants at Tell Ḥesbân?

Tell Ḥesbân is located in a carbonate terrain that is dominated by limestone, chalky limestone, and marl.[1] These, along with the resistant, weathered product *nari* and loose red residual soil, covered the surface when Tell Ḥesbân was first occupied. A portion of the loose residual soil was washed into subterranean passages to form pre-occupation fill composed of soft, red sand containing granules of *nari* and limestone with varying amounts of silt and clay. Fragments of carbon generated gray-colored sediment after human occupation of the site. This color change appears also in the post-occupation fill within subterranean passages.

Proper interpretation of this washed sediment is essential both for understanding its origin and for interpreting the complex history of some caves. The excavation of new caves or the trimming of the walls in existing caves exposed the washed fill on fresh surfaces. Where debris accumulated in caves, varying amounts of water-washed material may be present. Debris from dumping or occupation usually contains much larger fragments and a significantly higher proportion of silt and clay, all of which render it more poorly sorted than the sediment transported by water. Remnants of this poorly sorted debris in caves are distinguishable from the water-washed fill and provide one of the clearest geological evidences for the filling and clearing of

[1] Reuben G. Bullard, "Geological Study of the Heshbon Area," *AUSS*, 10 (1972): 129-141. F. Bender's *Geology of Jordan* (Berlin, 1974) is an English translation of his 1968 *Geologie von Jordanien*, which provides a regional setting for the geology of Tell Ḥesbân.

existing caves. Tool marks that extend across both cave fill remnants and limestone indicate some trimming of the cave walls at the time of, or subsequent to, cave clearing. Corresponding differences in the sorting of materials permits discrimination between mortar with clay or silt and plaster which contrast sharply with sediment washed through drains and some open framework walls. In addition, mortar and plaster often contain striated tubes where plant fragments served as binder.

Importation of quartzose sand and sandstone, marble and basalt further changed the nature of the accumulating sediment. The marble and basalt are very resistant to disintegration, but friable quartzose sandstone provided a ready source of sand for use in plaster, bricks and pottery. The ease with which the sand could disperse and its absence from the bedrock and pre-occupation soil make it relatively easy to determine when inhabitants began to import a significant quantity of sand to Tell Ḥesbân. This determination has not yet been made.

Occasional strata up to one centimeter thick with slopes in excess of seven degrees contain coarse sand and granules. The slope appears excessive for deposition by running water. Furthermore the gradational contacts at the tops and bottoms of these strata and lack of sedimentary structures are problematic for water deposition on such slopes. Nevertheless, the good sorting of the sediment and consistent thickness of the layers require the operation of sorting process unless this sediment originally had very special qualities – a rather unlikely possibility. On modern surfaces near Tell Ḥesbân a similar texture forms where the loose surficial sediment is subjected to limited agitation by foot traffic and fine material is winnowed away by the wind. The location of the buried strata on the west side of Tell Ḥesbân, which is subject to westerly summer winds,[2] makes this interpretation particularly attractive.

Subterranean chambers range from irregular caves of various

[2] Bender, *Geology of Jordan*, p. 15.

sizes to plastered cisterns. One type of chamber is generally more symmetrical, between one and three meters in diameter with depths between one and two meters. Access was through circular holes at the tops of the chambers. Did these chambers serve as cisterns? Very careful cleaning of the rock surfaces is necessary to insure that all fill has been removed for study of the detailed configuration of the chamber walls and floors. Because of solution, numerous tubes and irregular passages are present on these surfaces. Limited resistance to the passage of air blown into many of these passages suggests that they would drain fluids from the chambers in a very short time. The identity of tool markings on the walls of solution passageways and the associated chamber walls suggests that these pasages were fully developed at the time of tooling.

It is possible that chambers were trimmed after solution had formed the passages. Often tool markings are preserved in fine detail but around the mouths of some cisterns the markings have been altered to varying degrees by abrasion or solution. In one case water several centimeters deep has stood in the bottom of a chamber with the result that tool markings are deeply etched by solution. Excellent preservation of many tool marks, and limited solution where water has been present, render it highly unlikely that the numerous passages could have formed in the relatively short time during which the chambers would have been in use as cisterns. Furthermore it is not clear why late wall trimming would be necessary in such small chambers.

Occasional chamber enlargment is present as though the chamber had intersected a larger, horizontal, lentil-shaped cavity. Cavities of this shape develop where a portion of a given carbonate layer is more susceptible to solution than the adjacent carbonate rock.

Larger chambers might have reduced water loss by increasing the ratio of volume to surface area. Most proven cisterns were much larger than the chambers under discussion and all known

cisterns have one or more layers of sealing plaster. These factors plus the presence of tool marks in solution passageways, preservation of detail on tool marks, and probable cutting of chambers through lenticular solution cavities indicate that the chambers were intended for purposes other than water storage.

The inhabitants of Tell Ḥesbân probably utilized the most accessible source of quartz sand available for the manufacture of bricks and plaster. Whether pottery was imported or manufactured locally is not yet clear. If it was imported the quartz sand found at Tell Ḥesbân probably came from more than one source. The closest known source is eight kilometers west and slightly north of Tell Ḥesbân in Wadi Ḥesbân below Ain Sumiya. In this vicinity the stream gradient increases abruptly in a series of falls, and the valley narrows significantly where Lower Cretaceous sandstones[3] form very steep valley walls. If the steep climb at Ain Sumiya was too inconvenient, a more distant source may have been utilized. Geological and extra-geological criteria will be useful in evaluating this possibility

[3] Bullard, "Geological Study," Pl. XII, p. 136.

THE MOLLUSCA OF TELL ḤESBÂN

PATRICIA CRAWFORD
Brandeis University
Waltham, Massachusetts

The molluscs are a part of the ecology of an area. They are an element of the faunal assemblage which can indicate the age of the deposit, the presence or absence of certain types of water sources, as well as give a picture of both general and local climatic conditions (Sparks 1969; Evans 1972).

The study of the molluscs is especially interesting for a site like Tell Ḥesbân where the marine and freshwater sources are accessible but not located in the immediate vicinity. This implies that the aquatic specimens which are present must have been carried in from the outside. In this way, the molluscs can provide information about contacts with other groups of people and geographical areas as well as about possible diet customs.

In calcareous soils such as those of Ḥesbân, the mineral matter of the shell, which is calcium carbonate, is better preserved than in areas where soils are either more basic or acidic. Nevertheless, many difficulties may be encountered in the specific identification of the shells. In spite of the relatively good conditions for preservation, many specimens are found in a fragmentary state. The diagnostic colorings and markings may also have been obliterated or disguised by the erosive action of time and the elements. The identification of the land snails is especially problematical in that there is a great diversity of shapes and sizes as well as markings within the same species. There are also many species that are identical on the outside and can be identified only by examination of the fleshy parts of the live animal (operculum, radula, mouth parts, etc.).

Therefore, the following identifications for the most part have

been confined to the generic level. This level of identification is sufficient, however, for the purposes of this report (see Table 3).

Table 3. Molluscs Identified from Tell Ḥesbân[1]

COMMON NAME	QUANTITY	GENUS	FAMILY
Freshwater			
Pearly freshwater mussel	10	*Unio* Retz. sp.	Unionidae
Freshwater snail	1	*Melanopsis* sp.	Melaniidae
Marine			
Cowry (venus shell)	2	*Cypraea* L. sp.	Cypraeidae
Money cowry	1	*Cypraea moneta* L.	Cypraeidae
Murex	4	*Murex* L. sp.	Muricidae
Clam	10	*Glycimeris* Lam.	Glycymeridae
Wedge clam	2	*Donax* L.	Donacidae
Terrestrial (Land snails)[2]			
	35	*Helix (Levantina) caesareana*	Helicidae
	13	*Helix salomonica*	Helicidae
	11	*Helix (Euparypha) seetzeni*	Helicidae
	494	*Buliminus (Petraeus) halepensis*	Pupidae
	146	(tiny, immature land snails—unidentifiable)	

At Ḥesbân, eleven different species of mollusc remains, in the form of shells or shell fragments, have been found. These remains can be divided into three different groups: (1) freshwater, (2) marine, (3) terrestrial (land snails).

The freshwater specimens appear to be mainly from one group. Fragments of *Unio*, or pearly freshwater mussel, are present. The fact that the shells are fragmented and not especially numerous or concentrated in any specific area may indicate that they were probably not used as food. The heavy lining of the

[1] Space and the scope of this paper does not permit a listing of these specimens according to area, square, and locus. Interested readers may obtain this information by writing to Patricia Crawford or Øystein Sakala LaBianca, c/o Lawrence T. Geraty, Andrews University, Berrien Springs, Michigan 49104.

[2] For a discussion and classification of landsnails of the Middle East, see Louis Germain 1908.

shiny substance known as mother of pearl may account for the limited collection of and interest in these shells. This iridescent substance has been used as inlay in decorative items. The other freshwater mollusc present is a single specimen of the small freshwater snail *Melanopsis*.

The marine fauna is represented by five species. They presumably originated in one of the several marine areas accessible to Ḥesbân—the Mediterranean Sea, the Gulf of Aqaba and the Red Sea, or even the Indian Ocean. Because of the considerable distances involved and the perishability of seafood in a warm climate, we can assume that these specimens were probably not carried inland as items of food. The paucity of each type might indicate that they were brought to the area as singular items of interest, much as a person today might carry home some especially attractive shells as souvenirs or merely as objects that were pleasing to the eye. The cowries, clams, and murexes are all such aesthetic items.

The molluscs of the family Muricidae from the Mediterranean area were used as sources of dye in ancient times. The substance which was used to produce the lovely Tyrian purples is extracted from the soft parts of the animal. The shells were ground up and mixed with soda, then evaporated to the desired strength to make the dyes. Since the specimens are so few in number, it is unlikely that the people of Ḥesbân used it for this purpose (in spite of the fragmentary nature of three out of the four shells).

The one intact specimen may have been used as a personal ornament as implied by the presence of a square, unnatural looking hole through which a cord might have been strung, enabling it to be worn around the neck. It should be noted that investigators have reported mounds of murex shells, in some cases dating back to 1600 B.C., which have holes in exactly the same location as our specimen. These holes were probably made by a punch or stamp in such a way as to extract the dye gland of the animal without damaging the shell (Webb 1948:9). Perhaps our shell was carried back to Ḥesbân from such a site.

Holes present in the clams and cowry shells may indicate that these items were also strung and used for adornment, whether they were originally made by predators boring through to the fleshy parts of the animal or by man. The cowry shells especially are naturally highly polished and often very colorful. They are known to be used to decorate saddles as well as for personal adornment. The money cowry has been used as a medium of exchange in many parts of the world since ancient times. There are references to it in a 7th century Hindu arithmetic (Rogers 1908:128).

The land snails are by far the most numerous among the mollusc remains from Ḥesbân. It is possible that they may have been used as sources of food. Charles Reed (1962) deals with two of the groups (*Helix levantina* and *Helix salomonica*). He tested them as items of diet and found them both acceptable, although he found the *H. salomonica* more palatable. The *H. salomonica* closely resembles the *Helix pomatia* or Roman snail, the gastronomic delight of European countries.

Land snails as items of diet could possibly account for their numbers. However, the snail *Buliminus* which shows the highest population, is probably too small to have been painstakingly extracted and eaten. Their presence in the landscape today within their natural habitat means that they were not necessarily transported from the outside to the Ḥesbân area. Their numbers therefore could be a natural phenomena and have nothing to do with diet.

Land snails, however, may be used as indicators of local climatic conditions, their numbers and proportionate populations changing with fluctuations in rainfall, moisture conditions, and temperature over a long period (Evans 1969; Reed 1962). Careful analysis of their remains as well as their ecological characteristics and habits today may reveal environmental information about the conditions of the past.

The specimens examined, especially the marine and freshwater specimens, are too few in number to be of any great significance in interpreting the history of Ḥesbân. They are interesting how-

ever as indicators of travel to and from the marine and riverine areas. The terrestrial specimens, though more numerous, do not reveal any important aspects of culture. Taken alone as ecological indicators, they do not provide conclusive information. However, taken in conjunction with all the other separate observations about environmental indicators, they may eventually aid in elucidating important and specific aspects of the natural and cultural history of Ḥesbân.

BIBLIOGRAPHY

Evans, J. G. 1969. "Land and Freshwater Mollusca in Archaeology: Chronological Aspects," *World Archaeology* 1 (2): 170-183.

———. 1972. *Land Snails in Archaeology,* New York: Seminar Press.

Germain, Louis. 1908. *Mollusques Terrestres et Fluviatiles de Syrie,* Voyage Zoologique D'Henri Gadeau de Kerville en Syrie (Avril-Juin, 1908), Vol. 20, 30, Paris: J. B. Bailliere et Fils, 1921.

Reed, Charles. 1962. "Snails on a Persian Hillside," *Postilla* No. 66, pp. 1-20, New Haven, Conn.: Yale Peabody Museum of Natural History.

Rogers, Julia. 1908 (1936). *The Shell Book,* Boston: Charles T. Branford Co.

Sparks, B. W. 1969. "Non Marine Mollusca and Archaeology," in *Science and Archaeology,* ed. Brothwell and Briggs, New York: Praeger.

Webb, Walter F. 1948. *Handbook for Shell Collectors,* rev. ed., Wellesley Hills, Mass.: Lee Publications.

THE FLORA OF ḤESBÂN

A Preliminary Report

PATRICIA CRAWFORD AND ØYSTEIN SAKALA LABIANCA
Brandeis University
Waltham, Massachusetts

Environmental inquiries constitute an important activity in the cultural ecological analysis of the interrelationship of productive technology and the local environment at Ḥesbân (LaBianca 1976). Cumulative and systematic study of the flora at Ḥesbân can ultimately reveal information about (1) the prevailing soil and climatic conditions; (2) the nature of the local botanical association and the floral climax; and (3) the kinds of stress that the local human and animal population place on the natural environment—such as that produced by overgrazing, soil depletion, and deforestation. An understanding of the present environment is also crucial for reconstructing the history of the natural environment at Ḥesbân as well as for assessing its future potential (see for example Zohary 1962:iii). This report of the procedures employed in studying plant specimens, and on the identification and uses of the 34 specimens studied, illustrates the kinds of information yielded by flora studies to date and suggests directions for future research.

Phytogeography

The nature of the plant community in an area is closely related to its soil types and conditions. Around Ḥesbân the soils consist of terra rossa and light colored rendzina (Zohary 1962:8-9; Feinbrun and Zohary 1955:7-9). The terra rossa soil, which is the most characteristic soil of Mediterranean Palestine, is a fertile calcareous soil. Having been produced by the weathering of limestones and dolomites formed in early geological periods, terra rossa soil has a 15-30% calcium carbonate content and a high silt and clay content (Zohary 1962:11). The rendzina soils, also

derived from the weathering of calcareous formations, are gray to grayish white. Since these rendzina soils are even better for agriculture than the terra rossa soils they have been used more; thus they show the effects of man and erosion more and their characteristic vegetation has been destroyed to a greater extent (Zohary 1962:11).

The climate around Ḥesbân is generally classified as Mediterranean, with mild, rainy winters and hot, dry summers. However, since the precipitation is from 300 to 400 mm. annually from November to March, the area has the characteristics of both Mediterranean (750 to 350 mm.) and Irano-Turanian (350 to 150 mm.) climatic variations (Feinbrun and Zohary 1955:12).

The phytogeographical areas (areas which are defined by the distribution of species of flora over the landscape, and by their relationships to each other and their physical environment) follow the soil and rainfall patterns of the region (Feinbrun and Zohary 1955; Zohary 1962; Eig 1933:472). Since the rainfall pattern in the Ḥesbân area is not singularly representative of either the Mediterranean or Irano-Turanian climates, the vegetation of Ḥesbân should not be exclusively representative of either region.

It has the Mediterranean batha and garigue characteristics (of low and dwarf evergreen shrubs) combined with the typical dense coverage of Irano-Turanian dwarf shrubs and herbs. There is no forest climax (Feinbrun and Zohary 1955:14).

The Origin and Nature of the Materials

The specimens described in this report were collected in an attempt to study the present-day flora of the Ḥesbân region. They were gathered during the first week of August 1974 from within the area of the village of Ḥesbân, Tell Ḥesbân, and the donkey trail which runs parallel to Wadi Ḥesbân beginning at Ḥesbân and ending at ʿAin Ḥesbân (about five miles).

Since the specimens were gathered by persons untrained in field botany, they had to be studied independent of the standard scientific apparatus of the field botanist. For example, no records

were kept of which plants were found in association with each other; what soil conditions and exposure to heat and sunlight were present; or which specimens were gathered in areas near dwellings, cultivated fields, ditches, roadsides, pasturage, etc. It is also impossible to tell how complete or representative the samples are. The roots were not included in any samples, nor were the plants properly mounted or preserved. It is possible that some flower parts were separated from their diagnostic leaves, and some species were probably past their flowering stage, in which case the fruits would have been needed to expedite identification.

Yet, despite the unsatisfactory samples and sampling process, the specimens collected have resulted in initiating an inquiry into the botanical environs of the Ḥesbân region. In this respect, they have served a useful purpose.

Methodology

Most of the specimens had been stored in plastic bags for almost one year. However, a few of the samples had been pressed between paper in the field to preserve their form. In order to facilitate identification, each specimen was drawn on a file card with as much attention to detail as possible. This was sometimes difficult, since the leaves and flowers in some cases were badly desiccated and curled, making them very fragile and difficult to handle.

All samples were taken to the Gray Herbarium at Harvard University where they were fumigated and identified (as accurately as the remains allowed) by Dr. Peter Stevens, who enlisted the advice of Dr. Uzi Plitmann, a more experienced authority on the flora of the Palestinian region. Without this initial identification, the remainder of the work would have been impossible.

Once the samples were identified, general and specific literature was consulted to determine the common English and Arabic names, as well as general and local uses that might be known

for each specimen. Identification was assisted by the basic sources on Palestinian flora by Boissier (1867-1888), Feinbrun and Zohary (1955), Löw (1926), Post (1932), and Zohary (1972). Common English names were derived from Polunin (1969), Feinbrun-Dothan (1960), and Post (1932). Arabic names were supplied by Boulos (1966) and Post (1932) as well as by local informants. Some uses were gotten from *Sturtevant's Edible Plants of the World* and Zohary (1962).

The Flora of Ḥesbân (see Table 4)

Although ethnographic inquiries in the village of Ḥesbân are needed to establish the exact uses of these specimens in that village, some preliminary information about the common uses of many of them will help raise questions for specific inquiry.

Many of the 34 species listed are useful to man. Wheat, chick-pea, lentil, and in some cases fig, are cultivated as food for man and animals. Lady's thistle, blue eryngo, and centaury are found in the wild, and their leaves and shoots are consumed raw in salads or cooked as greens. Blackberries are also collected and eaten. The leaves of the aromatic, herbaceous mint are boiled to make a fragrant tea. Honey is produced mainly from the species included in the daisy family (Compositae)—especially centaury—as well as the blossoms of plants in the rose family, such as the blackberry and burnet (Zohary 1962:216).

Many of these wild flora also have medicinal uses (Zohary 1962: 216). Extracts from the leaves and fruits of lady's thistle, turnsole, peganum, horsetail knotweed, oleander, and eryngo may be employed medicinally. The fruits of the fig are used as a laxative, and when roasted may be applied as poultices for wounds.

Other uses are found for some of the grasses and reeds. Wheat may be used as a basis for starch making and distillation, as well as for straw for mats, wrappers, and thatching (Polunin 1969: 530). The flat leaves of the reedmace and common reed may also be used in making mats. A woody specimen, thorny burnet, is used as fuel in lime kilns. The white milky juice of the oleander,

which is poisonous to man, may be used as an insecticide or rat poison.

Conclusions

1. The flora collected at Ḥesbân indicate the regional soil and climatic conditions. The thorny burnet (*Poterium spinosum* L.), which is the most characteristic plant of the calcareous terra rossa soils, is found in conjunction with species which exist in conditions of temperature and rainfall diagnostic of both the Eastern Mediterranean and Irano-Turanian regions.

2. The nature of the local botanical association and floral climax is deduced from inspection of the species list. Thorny burnet and common ballota along with their associated species (alkanet, blue eryngo, and centaury) are the principal elements of batha and garigue, an Eastern Mediterranean botanical association. Species of tamarisk, thistle, and centaury represent the Irano-Turanian element. Pigweed, horsetail knotweed, and lady's thistle are bi- or pluri-regional species (i.e. characteristic of more than one phytogeographical region). Instances where regional associations of plants overlap indicate an encroachment by the Irano-Turanian species into the Eastern Mediterranean landscape (Zohary 1962:50).

3. The presence of the Mediterranean batha and garigue is an indication of environmental stress. Its range was at one time more limited than it is now. Since we can assume that the gross climatic conditions of the area have not changed appreciably in the last 10,000 years, we must look to other elements such as man to account for the present distributions of flora. The batha and garigue plant communities are considered either stages in the progression toward more wooded elements or retrogression toward complete bareness. In the case of retrogression, this community of plants is especially important in preventing soil erosion in the hilly areas. The wanton destruction of woody plants (e.g. thorny burnet which is used for fuel) and overgrazing by animals has caused serious erosion problems and resulted in man-made deserts in Jordan today (Mountfort 1964). This has been the

case in much of the Mediterranean area in the past as well (Hughes 1975) and perhaps may be considered a problem of both the past and the present in the vicinity of Ḥesbân.

Table 4. List of Ḥesbân Flora
(17 Families, 34 Species)

LATIN NAME	ENGLISH NAME	ARABIC NAME
Amaranthaceae		
Amaranthus graecizans L.	Tumbleweed	
Amaranthus retroflexus L.	Pigweed, green amaranth	
Apocynaceae		
Nerium oleander L.	Oleander	*dilfah*
Boraginaceae		
Anchusa strigosa Labill.	Prickly anchusa, alkanet	*hamham*
Echium sp.	Bugloss	
Compositae		
Genus unknown		*alk khel*
Centaurea iberica Trev. ex Spreng or *C. hyaloplepis* Boiss.	Centaury, star thistle	*shawk ud dardar*
Cirsium acarna (L.) Moench	Thistle	*shawk ul far*
Echinops sp.	Thistle	
Silybum marianum (L.) Gaertn.	Lady's thistle, holy thistle, milk thistle	*khurfaysh ul jimal*
Cyperaceae		
Cyperus longus L.	Sweet cypress, galingale	*se"ed*
Euphorbiaceae		
Chrozophora plicata (Vahl) A. Juss.	Plaited leaved croton	
Chrozophora tinctoria (L.) Juss.	Turnsole	*fakkus ul hamar, ghubayrah*
Euphorbia sp.	Spurge	*halablub, halib ul bum*
Gramineae		
Phragmites communis (L.) Trin.	Common reed	*ghab, bus*
Stipa capensis Thunb.	Twisted needle grass	
Triticum aestivum L.	Wheat, bread wheat	*hintal, kamh*
Labiatae		
Ballota undulata (Fresen) Bth.	Horehound, common ballota	
Mentha microphylla C. Koch/*M. incana* Willd.	Mint	*nah nah moye*

Leguminosae		
Cicer arietinum L.	Chick pea, Egyptian pea	*hummus*
Lens culinaris Medik.	Lentil	*'adas*
Melilotus dentata L.	Melilot	*handakuk*
Melilotus sp.	Melilot	
Moraceae		
Ficus carica L.	Fig	*tīn*
Polygonaceae		
Polygonum equisetiforme Sib. + Sm.	Horsetail knotweed	*kuddab*
Rosaceae		
(Sarco) Poterium spinosum (L.) sp.	Thorny burnet	*billan*
Rubus sp.	Bramble	
Rubus sanguineus Frivaldsk	Holy bramble, blackberry	*al lig*
Solanaceae		
Capsicum sp.	Pepper	*fel fel*
Solanum sp.	Cherry (?) tomato	*bandura haye*
Tamaricaceae		
Tamarix sp.	Tamarisk	*tarfah*
Typhaceae		
Typha angustifolia L.	Lesser reedmace, narrow leaved cattail	*halfa*
Umbelliferae		
Eryngium creticum Lam.	Syrian eryngium, blue eryngo	*shawk ul 'arkabani, kurs 'anni*
Zygophyllaceae	Common peganum	*harmal, ghalkat ud dib*
Peganum harmala (L.)		

Bibliography

Boissier, Edmond. 1867-1888. *Flora Orientalis*, 5 vols. and suppl., Basil: Apud H. Georg Bibliopolam.

Boraas, Roger S. and Siegfried H. Horn. 1969. "The First Campaign at Tell Ḥesbân," *AUSS* 7:97-239.

Boulos, Loutfy. 1966. "Flora of the Nile Region in Egyptian Nubia," *Feddes Repertorium*, Band 73, Heft 3:184-215.

Eig, Alexander. 1933. "Ecological and Phytogeographical Observations on Palestine Plants," *Beihefte Botanisches Centralblatt* 50:470-96.

Feinbrun, Naomi and Michael Zohary. 1955. "A Geobotanical Survey of Transjordan," *Bulletin of the Research Council of Israel* 5D:5-35.

Feinbrun-Dothan, Naomi. 1960. *Wild Plants in the Land of Israel*, Israel: Hakibbutz Hameuchad Publishing House, Ltd.

Hedrick, U.P., ed. 1972. *Sturtevant's Edible Plants of the World*, New York: Dover Publications, Inc.

Hughes, J. Donald. 1975. *Ecology in Ancient Civilizations*, Albuquerque, N.M.: University of New Mexico Press.

LaBianca, Øystein. 1973. "The Zooarchaeological Remains from Tell Ḥesbân," *AUSS* 11:133-144.

——. 1976. "The Diachronic Study of Animal Exploitation at Ḥesbân," forthcoming paper.

Löw, Emmanuel. 1926. *Flora der Juden*, 4 vols., Vienna: R. Lowit.

Mountfort, Guy. 1964. "Disappearing Wildlife and Growing Deserts in Jordan," *Oryx* 7:229-232.

Polunin, Oleg. 1969. *Flowers of Europe*, New York: Oxford University Press.

Post, George. 1932. *Flora of Syria, Palestine, and Sinai*, 2d ed. rev., 2 vols., John Dinsmore, Beirut: American Press, (Original, 1896).

Zohary, Michael. 1962. *Plant Life of Palestine*, New York: The Ronald Press Co.

——. 1972. *Flora Palestina*, 2 vols. texts, 2 vols. plates, Jerusalem: Israel Academy of Sciences and Humanities.

THE FLOTATION REMAINS
A Preliminary Report

PATRICIA CRAWFORD, ØYSTEIN SAKALA LABIANCA, AND ROBERT B. STEWART

Brandeis University
Waltham, Massachusetts

Sam Houston State University
Huntsville, Texas

The introduction of the "flotation method" as a procedure for isolating and collecting microscopic and larger organic and inorganic remains from randomly selected archaeological deposits at Tell Ḥesbân has enabled us to identify more precisely the contents of the soil unearthed routinely during our excavations. This report will describe briefly the procedure and discuss some of the findings to date.

The flotation apparatus employed was devised by Larry G. Herr. It was a replica of one he had seen developed at Tell Hesi by Professor Robert B. Stewart. The apparatus was constructed from an old metal barrel (measuring approximately 3 feet long by 2 feet wide) which had had one of its ends removed so that it could be used as a tank. The water with which the tank was routinely filled was purchased locally as it had to be "clean"; it came from the new pipeline which now supplies the village with fresh water.

The sieve which was used for collecting the flotation samples, which would surface after a bucket of soil had been dumped into the tank, consisted of a pan (1 foot across by 3 inches high) with a perforated bottom. The perforation allowed the water to escape through the tiny holes leaving the flotation sample as a foamy, slimy substance in the base of the pan.

The floated substance was subsequently removed from the pan and placed on a plastic sheet next to a slip of paper containing the information about its archaeological context. Finally, when the substance had dried and become powder-like, it was

placed in a plastic bag and stored until it was reopened in the laboratory.

Analysis of the flotation samples from Ḥesbân revealed both ancient and modern (contaminants) remains.[1] There were specimens of seeds, insect pupa cases, snails, ash, cow and goat dung, and wood charcoal. This report, however, deals primarily with the botanical remains since they are in the majority and therefore yield the most information at this time.

The ancient remains represent six cultigens: one type of barley, two types of wheat, and three pulses (vetch, broadbean, and lentil). Olive, apricot, date, grape, and a possible specimen of

Table 5. Ancient Plant Remains Identified from Ḥesbân Flotation Samples[2]

COMMON NAME	QUANTITY	SPECIFIC NAME
barley[3]	42	*Hordeum* sp.
six rowed barley	51	*Hordeum vulgare*
wheat[3]	9	*Triticum* sp.
common wheat	68	*Triticum aestivum*
emmer wheat	13	*Triticum dicoccum*
pulses		
bitter vetch	22	*Ervum ervilia*
broad bean	3	*Vicia faba*
lentil	9	*Lens culinaris*
wild grass		
olive	122	*Olea europa*
apricot	1	*Prunus armenica*
date	3	*Phoenix dactylifera*
grape	13 (5 whole)	*Vitis vinifera*
cornellian cherry (?)	1	*Cornus mas*

[1] The analysis and identification of the flotation remains was done by Professor Robert B. Stewart at Sam Houston State University in Huntsville, Texas.

[2] Space does not permit a listing of these specimens according to area, square, and locus. Interested readers can obtain this information by writing to the authors c/o Lawrence T. Geraty at Andrews University, Berrien Springs, Michigan 49104.

[3] The condition of the material made positive specific identification of some of these samples impossible. However, these samples are most likely of the same species as those which are positively identified.

cornellian cherry are indicated. These are kinds of fruit which are still exploited today.

The remains of cultivated plants may be interpreted as items of diet either for man or domesticated animals. We cannot necessarily assume, however, that these remains represent the complete vegetable diet of the earlier inhabitants of Ḥesbân. There are many wild plants found in the area today which have potential for and are occasionally used for food sources: blackberry, thistle, eryngo, and mint. Assuming that the characteristic natural vegetation of the area has not changed appreciably over the past 4,000 years, we may speculate that these plants were available and perhaps exploited to some extent as diet supplements.

In order to interpret better the findings from the flotation samples, one must place them in their contextual framework. Does the concentration of a single item in an area indicate a specific type of storage area? Is there ceramic and/or architectural evidence to support such a conclusion? Does the presence of many different probable food items in one area indicate a midden, a kitchen floor, or perhaps a living or eating area? For example, Locus A.5:81 contained evidence of common wheat (6), barley (22), olive (23), lentil (6), bitter vetch (19), broadbean (2), and grass, in quantities that are high in proportion to the overall findings.

Flotation information must be combined with soil analysis and floral and faunal analysis as well as contextual evidence of the material culture in order to be more accurately interpreted. An efficient means for examining these data and all new data must be devised. Storage and tabulation by computers would be an excellent means of handling the complex problem and would make the data accessible for many different types of problems and approaches.

THE VILLAGE OF ḤESBÂN: AN ETHNOGRAPHIC PRELIMINARY REPORT

ØYSTEIN SAKALA LABIANCA[1]
Boston, Massachusetts

Ethnographic inquiries in the village of Ḥesbân were carried out on a larger scale during the 1974 season than during previous seasons (See LaBianca and LaBianca 1975:236).[2] The data upon which this report is based was gathered by the author and Asta Sakala LaBianca during the 1973 season and by Douglas Fuller and Shirley Finneman—with the author's supervision—during the 1974 season.[3] Principal informant/translators were Muhammed Said during the 1973 season and Barakat Abdel-Karim, Saud Daud, and Rima Hazboun during the 1974 season.[4] A research design stating the purpose, scope, and methods to be employed and outlining ten areas of specific investigation provided each of the investigators during the 1974 season with specific questions and goals for their work.

This report presents an overview of the physiography, demography, social organization, material culture, and economy of the village of Ḥesbân; its aim is to report in summary fashion what we have seen and heard during two summers of fieldwork in the village and to isolate problems requiring further study.

[1] The author gratefully acknowledges his indebtedness to Douglas Fuller and Shirley Finneman for the ethnographic information which their dedicated and skillful efforts produced during the summer of 1974. Other individuals whose assistance he appreciates are Adelma Downing for the transcription, editing, and typing of tapes; Patricia Crawford for preparing the map (Fig. 27) for publication; and, as always, Asta Sakala LaBianca for assistance with the editing and typing of this manuscript.

[2] For a statement of the rationale and conceptual framework which undergirds ethnographic research at Ḥesbân, see LaBianca 1976.

[3] "Long reports" by Douglas Fuller and Shirley Finneman are on file with the Heshbon Expedition records at Andrews University.

[4] With the exception of Rima Hazboun who came from the neighboring town of Madaba, the other informant/translators were residents of Ḥesbân.

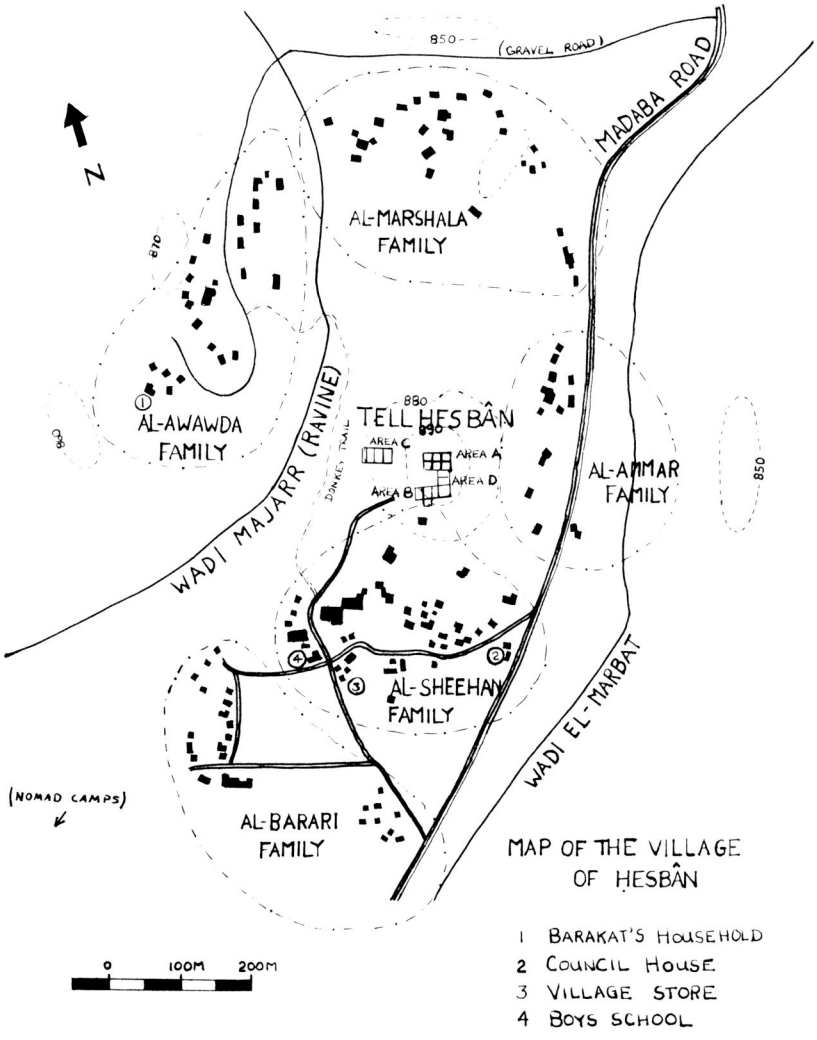


Fig. 27. Map of the Village of Ḥesbân. Mapping: Douglas Fuller; Cartography: Patricia Crawford.

Physiography

The village of Ḥesbân is situated on several small hills and along the expanse where the government-constructed "Madaba Road" is located.[5] As the map in Fig. 27 indicates, dwellings are clumped together north of the *tell* on the slopes west of the Wadi el-Majarr (the Al-Awawda family), along the east-west axis between Wadi el-Majarr and the "Madaba Road" (the Al-Marshala family), on the eastern slopes of the *tell* along the "Madaba Road" (the Al-Ammar family), on the southern slopes of the *tell* (the Al-Sheehan family), and extending southeast (the Al-Barari family), in each case west of the "Madaba Road." The rapid southwestward decline of the Wadi el-Majarr has the effect of physically separating the Al-Awawda family from the Al-Sheehan and Al-Barari families. Thus, though all of the settlements are connected by crude roads (which allow limited automobile travel) linked to the "Madaba Road," the steep ravine of the Wadi el-Majarr can be traversed only via winding and steep donkey trails.

Demography

The inhabitants of Ḥesbân can be classified as belonging to the rural sedentary population of Jordan. This class comprises 50.5% of the population of Jordan, the rest being either fully urban (43.9%) or scattered tent dwellers (5.6%) (see Fisher 1972).

An estimate of the population size of Ḥesbân can be obtained by multiplying the total number of dwellings, 127 (obtained from Fig. 27), by the mean size of households, 8.25 (obtained from Table 6). The result is 1048 persons. Villagers give varying estimates—800, 900, 1000, more than 1000—but until more reliable statistics are available, a population figure of approximately 1000 seems plausible.

Estimates based on observations of the village population and demographic data for the country of Jordan (Fisher 1972) can

[5] For a description of the natural environment of present-day Ḥesbân, see Bullard 1972; LaBianca 1973:8-19; Crawford and LaBianca 1976.

be tentatively stated relative to the population composition at Ḥesbân. The population appears to be a young one. Juveniles (aged 0-14) can be seen almost everywhere and they constitute nearly half of the hired workforce of the archaeological expedition. Statistics on the population of Jordan sustain this estimate: juveniles (aged 0-14) constitute 45.4% of the total population, the working population (15-59) constitutes 47.7%, and the elderly (60+) constitute only 6.9%.

In the country of Jordan as a whole, males outnumber females in most age cohorts (Fisher 1972:210). The situation at Ḥesbân is probably the reverse, however. This is because 80 males, or 8% of the estimated village population are serving in the armed forces of King Hussein. Fisher notes that Jordan has "a metropolitan primacy"—there is a male predominance in the largest towns, and Amman "has developed as the dominant town of the country by a considerable margin" (1972:212-213). This situation tends to affect the young males in smaller towns like Ḥesbân, since they are the more mobile sex (1972:213). The exact nature of the effect on Ḥesbân of Jordan's metropolitan primacy needs further investigation, however.

Though families of 7 to 8 children are the estimated norm for Jordan (Fisher 1972:214), this estimate is higher than the numbers yielded by Table 6; the average number of children per household at Ḥesbân is about 5.

The population at Ḥesbân is Moslem with no known exceptions. Although future verification is necessary, it seems reasonable to suppose that they are Sunni Moslems, since the large majority of Jordanians (81%) are Sunni Moslems (Fisher 1972:211).

The female population is employed in the traditional role of wives—keeping house, rearing children, gardening, and assisting with field crop cultivation; the occupations of the male population are more varied. Although the majority of males are still employed full or part time at agriculture, other occupations—such as construction work, hospital work, social service work, civil

service work– are pursued in neighboring towns by perhaps one dozen males from Ḥesbân. Army service and university studies at the University of Jordan in Amman are pursuits followed by perhaps 100 village males.

We know very little about the history of the population at Ḥesbân. Whenever I have asked about this, I have been told that "the big family" originally came from Saudi Arabia, about 100 years ago (some say even earlier). There is also agreement about the claim that the ancestors were tent-dwelling nomads.[6]

House-hold	*First Generation*	*Second Generation*	*Third G.*	*Size*	*Juve-niles*
H.1	1 married couple	3 sons, 1 daughter		6	(4)
H.2	1 married couple	5 sons, 1 daughter		8	(6)
H.3	1 married couple	2 married couples (sons and daughters-in-law)	5 sons, 1 daugh-ter	12	(6)
H.4	2 married couples (sons and daughters-in-law)	4 sons, 3 daughters; 1 son, 5 daughters		17	(13)
H.5	1 widow	2 married couples (sons and daughters-in-law) 2 unmarried sons	2 sons, 4 daugh-ters	13	(6)
H.6	1 man, 2 wives	4 children		7	(4)
H.7	1 widow	3 married couples (sons and daughters-in-law)	4 chil-dren	11	(4)
H.8	1 married couple	1 son, 5 daughters		8	(6)
H.9	1 married couple	4 children		6	(4)
H.10	1 married couple	1 daughter		3	(1)
H.11	1 married couple	1 daughter		3	(1)
H.12	2 unmarried brothers, deceased brother's widow	2 children		5	(2)
			Totals	99	(57)

Table 6. Composition of twelve households (abbreviated as H.) and number of juveniles in each. Generations refer to contemporaries, not necessarily peers.

[6] The physical anthropologist, W. Shanklin, has shown that "the majority of the Transjordanian Bedouins . . . show the same index curve as the Syrian desert Bedouins" (see Ariens Kappers 1934: 72). Shanklin's findings which were based on studies of "cephalic indecies of 53 Howeitat Bedouins" are of interest because they sustain the inference that sedentary rural populations in Transjordan were formerly nomads.

The village population is not exclusively constituted by members of the aforementioned five families. There are many villagers who, reportedly, do not belong to any of the local families. Living in one of the most conspicuously wealthy homes among the Al-Sheehan families is the government-appointed agronomist whose duty is to educate the villagers in improving their farming methods. Another family whose members have very dark skin, kinky hair, and negroid features may be of mixed African and Arab descent. It is possible to speculate that this family is of Egyptian origin as "the spread of the Egyptian population in Transjordania and Palestine" is attested to by both historians and physical anthropologists (Ariens Kappers 1934:73).

Social Organization

The principal social unit at Ḥesbân is the household. As illustrated in Table 6, households are constituted by a variety of persons who are related either consanguineously or by marriage. Although monogamous marriages predominate, polygyny occurs (as in H.6). In four instances married brothers live together in the same household (H.3, H.4, H.5, H.7). In three instances widows live with their married sons or brothers-in-law (H.5, H.7, H.12).[7] The estimated mean size of households—based on the data in Table 6—is 8.25 persons and the average number of juveniles per household is 4.75.

Households are always headed by an adult male, although not always the oldest.[8] The responsibility for the socialization of the youngest children is primarily the mother's. Socialization of the older children is shared by all members of the household and sometimes other relatives. Sex roles are taught early as boys

[7] This arrangement illustrates the response of kinsmen to relatives requiring social security. Social welfare at Ḥesbân is primarily the responsibility of kinsmen.

[8] Douglas Fuller reported one case where the youngest adult male in a household of three married brothers was the head. This situation can possibly be explained by the fact that the youngest male was the only one with a university education, and also, he was the school teacher at Ḥesbân, a position with considerable status.

are taught to help their fathers and girls their mothers. Schooling is available primarily for boys in the school for boys at Ḥesbân (see Fig. 27). Recently, however, also girls have been enrolled in schools, but their schooling is frequently interrupted by early marriages since girls tend to get married as soon as they reach puberty.

It is common practice among members of households to think of themselves as members of one or the other of the five patrilineal families at Ḥesbân (see Fig. 27). The strength of this arrangement is demonstrated each year when at the beginning of the archaeological excavations on the *tell* a representative from each of the families is responsible for negotiating labor contracts for all the male members of his family. Each of these individuals, called a "mukhtar," is paid a salary (which exceeds the salaries paid to other workers) in exchange for his services, which primarily amount to being present during excavations to ensure that "his men" are working and being treated fairly.

The mukhtar is selected by the members of "his family." Individuals chosen are usually selected on the basis of their acumen—intellectual and political, their ability to resolve conflicts, and their wealth and standing in the family. The mukhtar's principal role is as a member of the village council (see Fig. 27) where such matters as village security and crime, village dealings with the government and other "outsiders," inter-family conflicts, etc., are discussed and usually resolved.

Information about the size of each of the five families is still very tentative. However, counts of the number of dwellings shown on the map for each family yielded the following statistics: Al-Awawda, 24; Al-Marshala, 23; Al-Ammar, 14; Al-Sheehan, 41; Al-Barari, 25. It is noteworthy that statistics—obtained from the local tax-collector in 1973—about the number of households in the Al-Awawda and the Al-Barari families gave 28 for the former and 25 for the latter. The fair consistency between the tax collector's figures and those yielded by the map tends to support

the impression given by the map that family members dwell in close physical proximity to each other and on discrete family territory.[9]

The historical relationship of the five families to each other is said to be by descent from a common ancestor. Furthermore, Ḥesbân's "big family" (the "Al-Shuraigiin") is said to belong to a tribe, the Ajarma,[10] with members living in such neighboring towns as Na'ur, el-'Al, Salt, Madaba, and Amman. To date, however, no genealogies have been produced by the villagers to support this claim.

Material Culture

Most of the dwellings at Ḥesbân resemble each other in construction and design. The basic building materials are stone—mostly quarried locally, and cement—imported from Amman either as cement blocks or as powder. The typical Ḥesbân dwelling is usually constructed with only two 3 x 4 m. rooms. One room is used for guests and as a living room for the adult males; the other is used by the entire household, but especially by the women, as a place for cooking, eating, sleeping, and socializing. Variations from this pattern are the few two-story houses where the family lives on the top floor and the animals are kept on the bottom floor. Typically the dwellings have few, if any, windows and tend therefore to be somewhat dark inside. This situation is somewhat alleviated by the whitewashed walls and ceilings.

Furnishings vary considerably from dwelling to dwelling and

[9] The high figure given for the Al-Sheehan family needs to be qualified. The households in this area are reportedly among the youngest at Ḥesbân, the oldest being those of the Al-Awawda. It seems plausible to speculate that recent arrivals in the village—especially subsequent to the completion of the adjacent "Madaba Road" in 1968—would settle in the Al-Sheehan territory, and also the Al-Ammar territory, as these territories were settled by younger households, and hence less powerful ones.

[10] Peake Pasha (1958: 253) identifies the "Ajarmeh" as one of the tribes living northeast of the Dead Sea in his Tribal Map (No. 2) of the Kerak District. Unfortunately, no mention is made of this tribe elsewhere in his book.

are often an index of wealth. Typically, one encounters a combination of European-type chairs, tables, or beds, and Arabic strawmats, carpets, and decorations. The same is true for clothing; one encounters a mixture between the traditional garb and Western clothes. Typically, the young are more often seen wearing the latter.

Electricity is now available but rarely afforded. Hence refrigerators, electric sewing machines, electric lights, kitchen stoves, television sets, etc., can be found in the village, but only in isolated cases. An exception is the battery-run radio, which is heard everywhere. Plumbing, likewise, is available but rarely afforded; hence, most women still haul water from nearby cisterns.

The dwellings are usually surrounded by earthen yards varying in size depending on the amount of property owned. Stone or cement fences are used to enclose the yards and thus protect from exposure to child's play or roving animals. Only a few automobiles have been sighted in the village.

The agricultural implements employed at Ḥesbân range from crude hand plows to modern diesel-operated combines; such ancient implements as wooden-bladed hoes and picks, wooden and twine hand-sieves, and donkey-powered hand plows with wooden blades are employed by some while others use John Deere tractors, diesel combines, thrashers, and balers, engine-run rotatillers and cultivators, tractor-pull steel-bladed plows, wooden and steel pitchforks, steel hoes, picks, and sickles, and modern sprayers for insect control.

Economy

Cultivation of land and raising sheep and goat remain the principal economic enterprises at Ḥesbân. The large majority of the villagers are engaged full time in these enterprises which are the source of most of the villagers' dietary needs.

Land, most of which is located within a few kilometers of the village, is cultivated in various ways: 1) dry-land farming—

based on non-irrigated winter and summer crops such as wheat, barley, millet, maize, potatoes, lentils, beans, peas, and vetches; 2) gardening–based on the cultivation of tomatoes, watermelons, squash, and sometimes tobacco; and 3) fruit growing–including figs, olives, grapes, pears, and mangoes.[11]

Animal husbandry favors sheep and goat raising by a large margin, but includes the keeping of cows, horses, donkeys, camels, and poultry such as chickens, geese, and turkey.[12] Cats and dogs eek out their own existence in the village feeding on garbage and whatever else comes their way. Dogs are used mainly for protection and cats for rodent control. The contribution of hunting to the diet is insignificant as the wildlife of Jordan is seriously threatened by extinction (Mountfort 1964).

Although some of the land used for agriculture is owned by individual villagers, a large share of it–perhaps more than 50%–is owned by the wealthy Nabulsi family who do not now reside in the village, but who lease land to village farmers. Villagers who lease land return 50% of its yield to the Nabulsi estate at the end of each harvest.

Property inheritance is regulated by rules which favor the sons as is typical in the Moslem societies of the Middle East. Thus, although the wife and daughters of a deceased man may inherit a certain small portion of the property, the son(s) inherit the largest portion. In the end, they make the decisions as how to use theirs as well as the women's portions. It should be noted, however, that brothers sometimes fail to resolve the question of who should get what portion, and, as a result, they end up sharing the property and even sharing in the same household (see Table 6, H.3, H.4, H.5, H.7).

The extent to which the villagers participate in the market

[11] The extent to which wild herbs gathered in the surrounding fields by the women contribute to the diet is uncertain, but that they do contribute something is clear from our ethnographic data.

[12] The scope of this report does not permit an extensive account of the husbandry practices in the village. For more about this, see LaBianca 1973, 1975.

economy of Jordan and the Middle East is a question which can merely be tentatively answered. We have already noted that in addition to those serving in the army about one dozen males from the village are employed full time as wage-earners in government and private concerns outside the village.[13]

As there are no industries at Ḥesbân, the villagers are limited to the marketing of agricultural and other domestically produced products.

Crops which are sometimes grown for cash are melons, tobacco, sunflowers, tomatoes, cucumbers, and corn. Douglas Fuller reported that in the case of one farmer he knew, such crops were hauled to Amman for further shipment to Kuwait. It should be noted that there are no market places in Ḥesbân and that there is only one village store (see Fig. 27).

There are many situations where money is the principal or exclusive method of payment. For example, transportation from or to Ḥesbân from neighboring towns is via "service-taxi" which costs money. Modern utilities such as electricity and telephone service cost money. Visits to hospitals, clinics, and similar agencies in Amman and elsewhere for the ill or invalid—and sometimes for mothers who wish to deliver their first child in a hospital—cost money. The same is true of modern medications which are beginning to be used quite widely in the village. Peddlers who visit the village regularly with their assortment of household goods and similar wares are usually paid with money.

Finally, mention must be made of the sheep, goat, and camel-herding-nomads ("Bedouins") who appear with their tents on the hillsides or in the open fields southwest of the village (see Fig. 27), then disappear after short periods of time. These pastoralists, many of whom reportedly belong to a tribe called "Jahlin," are given grazing and watering privileges in exchange for their dairy products—leban (yogurt), curdled cheese, etc. They also pur-

[13] Another source of wage-labor for the villagers is the Andrews University Heshbon Expedition which has contributed about $10,000 in cash to the village each season of excavation in 1968, 1971, 1973, and 1974.

chase grain and other cultigens from the villagers. Further inquiries are needed to establish the impact of this arrangement on the village economy. This question and other stated and unstated questions raised in and by this report illustrate the kinds of questions that must be dealt with by future inquiries at Ḥesbân.

BIBLIOGRAPHY

Ariens Kappers, C. U. 1934. *An Introduction to the Anthropology of the Near East in Ancient and Recent Times,* Amsterdam: Noord-Hollandsche Uitgeversmaatschappij.

Bullard, Reuben G. 1972. "Geological Study of the Heshbon Area," *AUSS* 10: 129-141.

Crawford, Patricia, and Øystein Sakala LaBianca. 1976. "The Flora of Ḥesbân: A Preliminary Report," *AUSS* 14: 177-184.

Fisher, W. B. 1972. "Jordan: A Demographic Shatter Belt," in J. I. Clarke and W. B. Fisher (eds.), *Populations of the Middle East and North Africa. A Geographic Approach,* New York: Africana Publishing Corporation, pp. 202-219.

LaBianca, Øystein. 1973. "The Zooarchaeological Remains from Tell Ḥesbân," *AUSS* 11: 133-144.

LaBianca, Øystein Sakala. 1973. "A Study of Post-Cranial Remains of Sheep and Goat from Tell Ḥesbân, Jordan," unpublished manuscript, Harvard University, Anthropology 207 (May 24).

————. 1976. "The Diachronic Study of Animal Exploitation at Ḥesbân," forthcoming paper.

LaBianca, Øystein Sakala, and Asta Sakala LaBianca. 1975. "Heshbon 1973: The Anthropological Work," *AUSS* 13: 235-247.

Mountfort, Guy. 1964. "Disappearing Wildlife and Growing Deserts in Jordan," *Oryx* 7: 229-232.

Pasha, Peake. 1958. *A History of Jordan and Its Tribes,* Coral Gables, Florida: University of Miami Press.

HUMAN SKELETAL REMAINS FROM TELL ḤESBÂN, 1974

JAMES H. STIRLING
Loma Linda University
Loma Linda, California

At Heshbon people had been buried not only in the tombs but also in the vicinity of the homes and other buildings. As excavators on the *tell* would uncover human bones they would send for someone from the anthropological team who would help with the exposure of the bones and their preparation for photography and recovery.

While exposing the bones and then lifting them out for transport to the laboratory, the physical anthropologist would do his best to decide on the age and sex of the individual for the area supervisor's records. When some of the bones seemed very fragile and in danger of disintegrating, the physical anthropologist would sometimes coat them with diluted white glue to aid in their preservation. Otherwise they were usually taken out without preservative.

In the laboratory the bones would be spread on a table for inspection and cleaning and labeling. Every bone in salvageable condition would receive the number of the locus and pail which was represented in the original find spot. After making notations on readily observable pathologies and conditions, the anthropologist would prepare the specimens for packing to take overseas for further study at Loma Linda University. Bones which seemed too fragile for such a trip, or too fragmentary to be useful for diagnostic purposes, would be set aside for reburial. Such bones were interred in an excavated tomb and covered with soil.

At Loma Linda the bones were unpacked and put on tables in a laboratory for the inspection of several medical and dental specialists. Their observations were dictated on recording machine cassettes and then transcribed by a typist for later review by the

anthropologist, who took these notations and added to them his observations and measurements. This study is not yet finished, but the following report includes what has so far been determined.

Four recognizable burial or secondary inhumations with articulated bones were found at Tell Ḥesbân, and three at the Umm es-Sarab sounding, called G.8. In addition, other unrelated occasional human bones also were recovered in the main excavations, such as metatarsals, phalanges, vertebrae, teeth, and a clavicle and scapula. In Tomb E.4 a single finger bone was found. Because so few individual burials were found, it is difficult to make many generalizations about the populations represented in the site or the prevalence of disease.

Two of the burials (in A.9) were not associated with the ancient structures or artifacts, but were evidently intrusive additions in recent times. The first of these, in A.9:14, presented an interesting set of problems. The skull was found first propped up among rocks outside a wall; the mandible was found inside the wall, in what turned out to be the pelvic region of the rest of the skeleton. The main part of the skeleton was buried in a supine position. In the laboratory we found that the axis vertebra fitted the condylar surfaces of the skull, and the toothwear pattern on the mandible matched that on the maxilla; thus we ascertained that they had been associated as part of the same individual. The person was a male, and had long femurs. His third molars had erupted and showed some evidence of wear; so he would seem to have been over twenty-five. Yet his epiphyses had not fused on the radius, ulna, or humerus, nor the head of the femur, nor the iliac ridge, hence he would seem to have been considerably under nineteen. It appeared as if he had giantism; however, x-ray photos of his skull did not show evidence of pituitary enlargement.

The second of these recent burials, in A.9:19, lay directly under the first, about 0.20 m. lower. It was of a woman who showed every evidence of being a young adult, but whose third molars had not erupted. She also had been laid in a supine position, with her right hand over her thigh and her left over her

pelvis. A ring on the third finger of the right hand had stained not only the phalange but also the femur under it. Inside the crook of the left arm had been placed a mirror, and this was still present, though in fragmentary condition. In neither of these two cases was the cause of death evident, nor was there evidence of disease.

Farther down on the *tell*, in Areas C and D, other skeletons came to light (also possibly of recent origin). One of these, in C.5, yielded only fragments of a skull and some long bones, and some vertebrae, on which arthritic lipping was present. Another, in D.4:8, was a woman who had buck teeth and who had suffered from tooth decay, abscesses, and loss of some teeth. Her incisors showed evidence of hypoplasia, the result of disease or nutritional stress in her childhood. An opening in her skull suggested the possibility that a tumor had caused a thinning of the bone.

Carbon 14 analysis (at the University of California, Riverside, Radiocarbon Laboratory) of the ribs from the D.4:8 burial indicated that it had occurred within the past 150 years.

Three burials were found in G.8 at Umm es-Sarab 4 kilometers from Ḥesbân. One of these, in G.8:12, was of a child younger than six, whose molars and canines had lost their roots from resorption. Only a few fragments of the skeleton were recovered. This child had been placed in a tiny shaft tomb 2 m. down from the surface. The other two burials, in G.8:6 and in G.8:9, were of adults, one male and the other female, in unassociated deposits. The male, in G.8:6, had some missing teeth with healed bone, and a cavity in a molar, as well as some evidence of arthritis of the spine.

Among the scattered bones recovered from the G.10 "rolling-stone" tomb were more evidences of tooth decay, missing teeth, and partially or fully healed sockets, as well as some resorption of the bone of the mandible in one individual. The age at death of the persons who had been interred ranged from newborn infants to elderly, nearly toothless persons, and included both males and females. Two right iliums of matching size and from children

about 4 years of age attested to some possible childhood tragedies.

In conclusion we can say that the human remains for the 1974 season at Tell Ḥesbân speak of people who suffered the same kinds of illness that people in any country experience today, except that there seems to have been somewhat less distress from tooth decay and a higher rate of infant mortality. People seem to have had less trouble with impacted wisdom teeth than most do today. A person with a bad tooth who got desperate enough apparently could find someone who would pull it out, but he could not find help with fillings or other restorations. Arthritis and rheumatism must have plagued people in their later years as much as they do now.

Table 7. Preliminary Physical Measurements on Skeletons from Tell Ḥesbân, 1974

INDEX	INDIVIDUALS			
	A.9:14	A.9:19	D.4:8	G.8:6
Cranial	81.45	79.25		77.46
Cranial Module	143.16	139.16		140.16
Cranial Length-Height	79.63	79.25		82.09
Cranial Breadth-Height	97.76	100.00	107.78	105.97
Mean Height	87.77	88.43		92.52
Frontal-Parietal	67.53	66.40	74.31	67.75
Total Facial			181.17	
Upper Facial		53.27	111.37	
Nasal	45.09	48.48	46.29	
Orbital	88.57	84.61	94.59	100.00
Maxillo-Alveolar	58.18	100.00	92.03	
Palatal	90.42	78.16	77.89	

Reference: Bass, William M., *Human Osteology: A Laboratory and Field Manual of the Human Skeleton.* (Columbia, Mo.: University of Missouri, 1971.)

DOMESTIC ANIMALS OF THE EARLY ROMAN PERIOD AT TELL ḤESBÂN[1]

ØYSTEIN SAKALA AND ASTA SAKALA LABIANCA
Boston, Massachusetts

Introduction

The 597 bones analyzed here were unearthed from a subterranean installation (Locus D.3:57a-f) variously referred to by the excavators as a "cistern," "cave," and "storage-silo." Its shape was bell-like, and it measured ca. 2.00 m. deep and 2.20 m. in diameter. Its mouth measured approximately 0.30 m. in diameter.[2] The suggested date for the construction of the installation is the Late Hellenistic period (198-163 B.C.).[3]

The contents of the installation were excavated sequentially, beginning with the two clean-up layers a and b, and ending with the bottom layer e. The excavated material from layers a and b included 4 large rocks; metal, glass, bead, and flint objects; a stone measuring cup fragment; a limestone bowl fragment; a bronze pin; a date seed; five pails of predominantly Early

[1] The authors gratefully acknowledge their indebtedness to the Department of Sociology and Anthropology, Loma Linda University, for financial backing of the zooarchaeological enterprise during the 1974 season. Thanks are also due to Michael Toplyn, Ralph Stirling, Patricia Derbeck, Jennifer Groot, Dick Dorsett, Glenn Bowen, and John Lawlor for their diligent and thorough work in the bone laboratory. Computer programming and data processing was possible thanks to the tireless efforts of Paul Perkins.

[2] These dimensions are almost identical to the dimensions of some of the rock-cut cellars described by James B. Pritchard in *Winery, Defenses, and Soundings at Gibeon* (Philadelphia, 1964; Museum Monographs, The University Museum, University of Pennsylvania), pp. 1-27. The cellars at Gibeon appear to have been used as storage cellars for wine.

[3] Most of the data discussed in this Introduction is based on the information found in the field notes of the square supervisor, John Lawlor, and in the area report of the area supervisor, Larry Herr. Our reason for discussing these data here is so that the archaeological record of this particular deposit will be complete enough to allow future investigators to draw their own conclusions from the archaeological and zooarchaeological data reported here.

Roman pottery; and 132 bone fragments of which 79 (60%) were saved (See Table 8).

Layer c was the first uncontaminated layer, and its contents were sifted (as were those of layers d, e, and f). This more compact layer of soil yielded 4 glass objects, 1 worked stone, 1 iron object, 1 iron axe head, 2 Roman pottery juglets, 1 Roman cooking pot, 1 clay spindle whorl, 1 bronze Aretas IV coin (9 B.C.-A.D. 40), a large quantity of pottery (discussed below), and 671 bone fragments of which 395 (59%) were saved.

Layer d—which had more clay-like dirt than layer c—contained 4 glass objects, 1 limestone measuring cup fragment, 1 Roman pottery juglet, 4 emmer wheat seeds, and 1489 bone fragments of which 827 (56%) were saved.

Layer e—which was more compact than the above layers and which consisted of a mixture of gray ash and rust colored pockets—contained 1 stone weight, I glass button, 1 metal object, 1 glass bowl rim, 1 metal coin, 1 worked stone, 3 common wheat seeds, and 454 bone fragments of which 290 (64%) were saved.

Locus D.3:57 f—which consisted of less compact material—was not really a layer, but a small deposit discovered by the excavators while they were drawing balks. It contained no objects, seeds, or bone fragments.

According to the excavators, the contents of layers c, d, and e were almost certainly deposited during the Early Roman period (63 B.C.-A.D. 135). This inference is based on the fact that from

A. RAW COUNTS	a	b	c	d	e	N	B. PERCENTAGES	a	b	c	d	e	C.
CHICKEN	1	0	13	11	3	28	CHICKEN	3.6		46.4	39.3	10.7	1.0
SHEEP-GOAT	10	11	63	278	109	471	SHEEP-GOAT	2.1	2.3	13.4	59.0	23.1	17.0
LARGE MAMMAL	2	7	17	39	33	98	LARGE MAMMAL	2.0	7.1	17.3	39.8	33.7	3.5
TOTAL SAVED AND STUDIED	13	18	93	328	145	597	TOTAL SAVED AND STUDIED	2.2	3.0	15.6	55.0	24.2	21.6
SAVED, NOT STUDIED	0	17	209	170	20	416	SAVED, NOT STUDIED		4.1	50.2	40.9	4.8	15.0
DISCARDED	25	28	276	662	164	1155	DISCARDED	2.2	2.4	23.9	57.3	14.2	41.8
TOTAL FOUND	38	63	578	1160	329	2168	TOTAL FOUND	1.7	2.9	26.6	53.5	15.2	

Table 8. A. Raw counts describing the occurrence rates of animal remains from Locus D.3:57, layers a-e, for each of seven bone aggregates. B. Percentages—computations based on totals in column N—describing the proportion of each bone aggregate in each layer. C. Percentages describing the proportion of each of the seven bone aggregates relative to the total number of bones found.

these three layers, 50 pails of pottery were recovered, of which the most recent and "the vast majority" was Early Roman. The presence of discernable layers in the installation would suggest that the contents were not accumulated all at once, but periodically over time.

The Nature of the Bone Material

Counts of all bone fragments saved and discarded indicated that 2765 bone fragments were unearthed from Locus D.3:57a-e. The 1155 (42%) discarded bones were mostly splinters of the domestic animal bones discussed here. "Scrap" such as this was discarded principally for strategical reasons.[4]

Table 8 shows raw counts and proportions describing the bone material found in D.3:57a-e. Whereas the "total saved and studied" is the sum of the chicken, sheep-goat, and large mammals saved, the "saved and not studied" pertain to bones which could not be identified as belonging to the above named bone aggregates —fish, wild birds, wild mammals, and reptiles. The latter are awaiting further study; and, hence, they are not reported in detail here. Suffice it to say that this aggregate includes a partially articulated fish skeleton with about 200 constitutent bones from c along with a number of other fish, rodent, and small mammal remains (including 1 dog vertebra from e) from the other layers.

Tables 9, 10, and 11 present the raw counts for the occurrence of the various skeletal remains of the domestic animals reported here. The scientific names of these animals have been reported elsewhere[5] as has the process whereby these data were gathered.[6]

[4] For an explanation of the strategical aspects of the zooarchaeological process at Tell Ḥesbân, see Øystein Sakala LaBianca, "Pertinence and Procedures for Knowing Bones," *Newsletter of the American Schools of Oriental Research*, No. 1 (July, 1965).

[5] Øystein LaBianca, "The Zooarchaeological Remains from Tell Ḥesbân," *AUSS* 11 (1973): 134.

[6] LaBianca, "Pertinence and Procedures."

Some Observations Pertaining to Tables 8-10

Table 8. 1) Chicken bones are most numerous in the upper layer c. Large mammal bones are most numerous in the bottom layer e. The chicken bones are extremely light, the large mammal bones quite heavy. *2)* Sheep and goat bones constitute the largest proportion of the animal bones studied. *3)* Layer d, which had relatively little pottery, had the largest quantity of bones.

	a	b	c	d	e	N
BONES OF THE SKULL	2	0	5	8	14	29
HORN CORE				2	2	4
MAXILLA	2				5	7
MANDIBLE			3	3	2	8
TEETH			1	1	3	5
INDETERMINATE			1	2	2	5
VERTEBRAE	2	1	16	82	26	127
ATLAS		1	2	3		6
CERVICAL			3	4	4	11
THORACIC			2	44	2	48
LUMBAL	1		3	17	11	32
SACRAL			1	2	5	8
INDETERMINATE	1		5	12	4	22
BONES OF THE BREAST	0	2	2	70	27	101
RIB		2	2	70	27	101
BONES OF THE SHOULDER	0	0	1	13	3	17
SCAPULA			1	13	3	17
BONES OF THE FORELIMB	1	1	5	33	6	46
HUMERUS			1	14	2	17
RADIUS	1	1	2	14	2	20
ULNA			1	5	1	7
METACARPAL			1		1	2

	a	b	c	d	e	N
BONES OF THE HIP GIRDLE	1	0	2	10	7	20
PELVIS	1		2	10	7	20
BONES OF THE HINDLIMB	2	2	15	38	11	68
FEMUR	1		4	16	1	22
TIBIA	1		3	11	6	21
ASTRAGALUS			4	6	1	11
CALCANEUS			2	5		7
METATARSAL		2	2		3	7
OTHER LIMB BONES	2	4	6	6	9	27
METAPODIAL			2			2
LONGBONE	1	3	1	1	1	7
PHALANX I	1	1	1	3	2	8
PHALANX II			2	2	5	9
PHALANX III					1	1
INDETERMINATE		1	11	18	6	36
INDETERMINATE		1	11	18	6	36
GRAND TOTAL	10	11	63	278	109	471

Table 9. Raw counts describing the occurrence rates of various sheep and goat remains from Locus D.3:57, layers a-e (N = sum of a + b + c + d + e).

Table 9. 1) The most numerous bones are vertebrae (27%), ribs (21.5%), hind limbs (14.4%) and fore limbs (9.8%). 2) There is a conspicuous absence of atlases and calcanea in layer e; of metacarpals and metatarsals in layer d; of maxillae and horn cores in layer c. *3)* The meat rich bones of the axial skeleton, shoulder, hip girdle, humerii, radii, femurs, and tibiae comprise 73% of the total bone corpus.

Table 10. Vertebrae and ribs predominate. Longbones and teeth are also numerous.

		a	b	c	d	e	N
BONES OF THE SKULL		0	2	1	3	6	12
HORN CORE	BOS					2	2
MANDIBLE	BOS				1		1
	MAM					1	1
TEETH	BOS		2	1		2	5
	SUS					1	1
INDETERMINATE					2		2
VERTEBRAE		0	0	5	4	16	25
CERVICAL	MAM				1		1
THORACIC	MAM					1	1
LUMBAL	MAM			1		1	2
INDETERMINATE	MAM			4	3	14	21
BONES OF THE BREAST		1	0	3	9	2	15
RIB	MAM	1		3	9	2	15
BONES OF THE SHOULDER		0	0	1	7	1	9
SCAPULA	BOS				2		2
	MAM			1	5		6
	ASS					1	1
BONES OF THE FORELIMB		0	1	1	3	1	6
HUMERUS	BOS			1	1		2
	SUS		1				1
RADIUS	BOS				1		1
	ASS				1		1
ULNA	MAM					1	1

		a	b	c	d	e	N
BONES OF THE HIP GIRDLE		0	0	2	1	2	5
PELVIS	BOS			1		1	2
	MAM				1	1	2
	CAB			1			1
BONES OF THE HINDLIMB		0	0	1	1	0	2
TIBIA	MAM				1		1
METATARSAL	CAB			1			1
OTHER LIMB BONES		1	2	3	6	2	14
PHALANX I	BOS			1	1		2
PHALANX II	BOS				3		3
PHALANX III	BOS				1		1
METAPODIAL	CAM			1			1
LONGBONE	MAM	1	2	1	1	2	7
INDETERMINATE		0	2	0	5	3	10
INDETERMINATE	BOS				3	1	4
	MAM		2		2	2	6
GRAND TOTAL		2	7	17	39	33	98

Table 10. Raw counts describing the occurrence rates of various large mammal remains from Locus D.3:57, layers a-e (N = sum of a + b + c + d + e; BOS = cattle; MAM = large mammal; SUS = pig; ASS = donkey; CAB = horse; CAM = camel).

	a	b	c	d	e	N
INDETERMINATE	1		1			2
CLAVICLE			2		1	3
FEMUR			2		1	3
FIBULA			1	1		2
LUMSACRAL VERTEBRAE			1			1

	a	b	c	d	e	N
CARPOMETACARPUS				1		1
TARSOMETATARSUS			4			4
STERNUM				3		3
TIBIOTARSUS			2	3	1	6
ULNA				3		3
GRAND TOTAL	1	0	13	11	3	28

Table 11. Raw counts describing the occurrence rates of various chicken bones from Locus D.3:57, layers a-e (N = sum of a + b + c + d + e).

The Number of Different Animals Represented

Since in vertebrates the various bones of which the skeleton is constituted occur in predictable frequencies—i.e., sheep have only one right femur—it is possible to ascertain the minimum number of individuals of different animals represented by their skeletal remains. When dealing with zooarchaeological remains, however, care must be taken to ensure that such counts are based on unambiguous data. Thus, in the case of fragmented femurs—or any other fragmented longbone—one must tabulate the frag-

ment which occurs most frequently—right or left, fused or unfused, proximal or distal end, proximal or distal epiphysis. Similarly, pelves and scapulae can be counted only if the specific identity of their fragments are known.

Estimates of the number of different animals represented are also affected by the archaeological situation. Thus, as a general rule it will be observed that as the discrimination of contextual units increases, so does the estimated minimum number of individuals. This is because increased discrimination by the excavators results in fewer fragments per contextual unit, and hence, less duplication of like skeletal parts. Table 12 shows the outcome of counts of the minimum number of animals represented by the data from D.3:57a-e. Note that in the case of camels and pigs, there is a discrepancy between the data contained here and that presented in Table 10. The additional ones (1 camel in d, 1 pig in c, and 1 pig in d) were obtained from "bone reading records"—as is also the case with the fish, small mammal, and rodent remains—which do not contain information about bone types.

There is an approximate 1:1 correspondence between the totals shown in Table 12 and those in Table 8.A and B. By dividing the totals for each layer in Table 12 into the totals for each layer in Table 8.A, we can obtain an estimate of the average number of bones from individual skeletons in each layer: for layer a we get 10.5; layer b, 15.7; layer c, 50.0; layer d, 72; layer e, 36.5.

	a	b	c	d	e	N		a	b	c	d	e	N
SHEEP			2	4	1	7	PIG		1	1	1	1	4
GOAT				1	1	2	CHICKEN	1		4	3	1	9
SHEEP OR GOAT	1	1				2	DOG					1	1
CAMEL			1	1		2	SMALL MAMMAL				1	1	2
CATTLE		1	1	1	1	4	RODENT			1	1		2
LARGE MAMMAL	1	1	1	3	1	7	FISH	1		1			2
DONKEY					1	1							
HORSE			1			1	TOTAL	4	4	13	16	9	46

Table 12. Estimates—based on counts of most frequently occurring discrete elements of each animal group—of the number of different animals represented in Locus D.3:57, layers a-e (N = sum of a + b + etc.).

The Sheep and Goat Remains

We have already observed that contents of Locus D.3:57a-e are Early Roman. This situation makes it possible to lump the sheep and goat data and thus permits us to make additional statistical summaries and generalizations about it. Table 13 summarizes the anatomical characteristics of the 471 skeletal elements of sheep and goat.[7] The large number of whole bones in this corpus (20 or 4.2%) is of interest because it is consistent with a similar discovery pertaining to an Ayyūbid-Mamlūk cistern (D.6:33) where whole bones accounted for 5.89% of the bone corpus.[8] This phenomena is probably the result of the comparatively protected context of bones from subterranean installations.

Previous studies of sheep and goat bones from Tell Ḥesbân have shown that the size of bone fragments may be a function of culture, or of the physical context of bones, or both.[9] For this reason, each fragment was measured for size on a scale consisting of an 8½ x 11 inch sheet of paper with lines drawn across at 5mm. intervals and with incremental numbers (1-54) at the end of each line. These absolute measurements are useful when the respective humeri of sheep and goat from one period, for example, are compared to the humeri of those animals from another period.

The illustration in Table 14 shows the average size of fragments of sheep and goat from Locus D.3:57a-e. Note that the shortest fragment—2nd phalanges—are at the top, and the longest—horn cores—are at the bottom, with the other fragments ranked in between according to size. Sixteen out of the twenty

[7] Readers are referred to our report on "The Anthropological Work," *AUSS* 13 (1975): 243-245 for a clarification of many of the categories employed and for the purpose of comparison with bone data from other deposits at Tell Ḥesbân.

[8] Øystein LaBianca, "A Study of the Post-Cranial Remains of Sheep and Goat from Tell Ḥesbân, Jordan," unpublished manuscript, Harvard University, Anthropology 207 (May 24, 1973): 54.

[9] Ibid., pp. 53-54, and LaBianca, "The Zooarchaeological Remains," pp. 240, 245.

BONES OF THE SKULL	
HORN CORES	4 TOTAL
MAXILLAE	7 TOTAL; 3 R.; 2 L.
MANDIBLES	8 TOTAL; 2 R. AND 1 L. RAMUS; 1 L. HORIZONTAL RAMUS; 3 L. HORIZONTAL RAMUS WITH EVIDENCE OF SYMPHYSIS; 1 WHOLE MANDIBLE
TEETH	5 TOTAL; 1 INCISOR; 2 PREMOLARS OF THE MAXILLA; 1 MOLAR OF THE MANDIBLE
INDETERMINATE	3 TOTAL

AXIAL SKELETON: VERTEBRAE	
ATLASES	6 TOTAL
CERVICLE VERTEBRAE	11 TOTAL; 1 CENTRUM; 2 NEURAL CANAL WITH SPINE AND WING REMNANTS; 3 VERTICALLY SPLIT CENTRUM; 1 ARTICULATING STRUCTURE; 4 WHOLE
THORACIC VERTEBRAE	48 TOTAL; 5 CENTRUM; 15 SPINE; 22 NEURAL CANAL WITH SPINE AND WING REMNANTS; 1 ARTICULATING STRUCTURE; 3 WHOLE
LUMBAR VERTEBRAE	32 TOTAL; 3 SPINE; 17 NEURAL CANAL WITH SPINE AND WING REMNANTS; 3 VERTICALLY SPLIT CENTRUM; 5 ARTICULATING STRUCTURES; 4 WHOLE
SACRAL VERTEBRAE	8 TOTAL
INDETERMINATE	22 TOTAL

AXIAL SKELETON: BONES OF THE BREAST	
RIBS	101 TOTAL; 23 R. AND 29 L. PROX. ENDS; 49 SHAFTS

BONES OF THE SHOULDER	
SCAPULAE	17 TOTAL; 4 BLADES WITH EVIDENCE OF SPINE BUT NO GLENOID; 3 BLADES WITH NO EVIDENCE OF SPINE OR GLENOID; 1 PROX. END WITH GLENOID ONLY; 3 R. AND 2 L. F. DIS. ENDS WITH GLENOID AND SPINE PRESENT (SHEEP); 1 L. U. DIS. END WITH GLENOID AND SPINE PRESENT (GOAT)

BONES OF THE FORELIMB	
HUMERI	17 TOTAL; 2 L. U. PROX. ENDS (SHEEP); 1 L. U. PROX. SHAFT; 1 F. PROX. END; 1 U. PROX. EPIPHYSIS; 7 R. F. DIS. ENDS (2 SHEEP, 1 GOAT); 1 R. SHAFT; 1 R. WHOLE BONE, F. BOTH ENDS (SHEEP); 1 R. WHOLE BONE, U. PROX. END (SHEEP); 1 L. WHOLE BONE, F. BOTH ENDS (SHEEP); 1 L. WHOLE BONE, U. PROX. END (SHEEP)
RADII	20 TOTAL; 2 R. F. PROX. ENDS; 5 L. F. PROX. ENDS (SHEEP); 1 F. PROX. END (GOAT); 1 R. U. DIS. SHAFT; 1 R. U. DIS. EPIPHYSIS; 2 L. U. DIS. SHAFTS; 1 L. U. DIS. EPIPHYSIS; 3 U. DIS. SHAFTS; 1 L. U. SHAFT; 2 L. WHOLE BONES, U. BOTH ENDS (SHEEP)
ULNAE	7 TOTAL; 1 R. F. PROX. END; 2 R. U. PROX. ENDS; 1 L. F. PROX. END; 1 L. U. PROX. END; 2 SHAFTS
METACARPALS	2 TOTAL; 1 R. WHOLE BONE (SHEEP), F. DIS. END; 1 R. WHOLE BONE, U. DIS. END

BONES OF THE HIP GIRDLE	
PELVES	20 TOTAL; 1 R. AND 1 L. ILLIUM, NO EVIDENCE OF PIT; 1 R. AND 1 L. ISCHIUM, NO EVIDENCE OF ACETABULUM (1 SHEEP); 2 R., 1 L. U. AND 3 L. ILLIUM, EVIDENCE OF PIT (4 SHEEP, 1 GOAT); 1 L. U. ISCHIUM, EVIDENCE OF ACETABULUM (1 GOAT); 2 R. AND 2 L. PUBIS, EVIDENCE OF ACETABULUM; 3 R. F. ACETABULUM, EVIDENCE OF ILLIUM AND ISCHIUM (3 SHEEP); 1 R. F. and 1 L. F. FRAGMENT WITH UNFRAGMENTED FORAMEN OBTURATUM AND EVIDENCE OF ACETABULUM (2 SHEEP)

BONES OF THE HIND LIMB	
FEMURS	22 TOTAL; 3 R. F. AND 1 L. F. PROX. ENDS (3 SHEEP, 1 GOAT); 1 R. U. AND 4 L. U. PROX. SHAFTS; 1 R. U. AND 2 L. U. PROX. EPIPHYSES; 2 U. PROX. BALLS; 2 R. F. and 3 L. F. DIS. ENDS; 1 R. U. DIS. EPIPHYSIS; 1 SHAFT; 1 L. WHOLE BONE, F. DIS. END (SHEEP)
TIBIAE	21 TOTAL; 1 R. F. and 1 L. F. PROX. ENDS; 1 R. U. AND 4 L. U. PROX. SHAFTS; 1 R. U. and 1 L. U. PROX. EPIPHYSIS; 2 R. F. AND 3 L. F. DIS. ENDS; 2 L. U. DIS. ENDS; 3 R. U. AND 2 L. U. DIS. EPIPHYSIS
ASTRAGALI	11 TOTAL; 6 L. AND 1 R.
CALCANEUM	7 TOTAL; 3 R. F. AND 3 L. F. (5 SHEEP, 1 GOAT); 1 L. U.
METATARSALS	7 TOTAL; 1 R. F. PROX. ENDS; 3 L. F. PROX. ENDS; 2 F. DIS. ENDS (SHEEP); 1 R. WHOLE, U. DIS. END

OTHER LIMB BONES	
PHALANX I	8 TOTAL; 1 R. AND 4 L. F. PROX. ENDS; 1 R. AND 2 L., INDETERMINATE FUSION
PHALANX II	9 TOTAL; 2 R. AND 6 L. F. PROX. ENDS; 1 L., INDETERMINATE FUSION
PHALANX III	1 L. WHCLE BONE
METAPODIALS	2 TOTAL; 1L. F. PROX. END, 1 U. DIS. EPIPHYSIS
LONGBONES	7 TOTAL
OTHER BONES	36 TOTAL

Table 13. Raw counts and descriptions of 471 fragments of sheep and goat from Locus D.3:57 layers a-e (R = right; L = left; F = fused; U = unfused; PROX = proximal; DIS = distal).

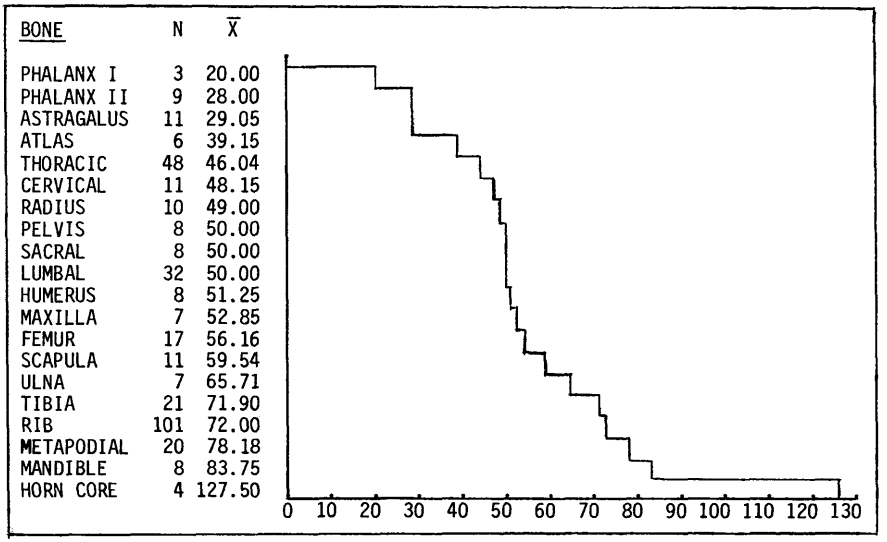


Table 14. Average size of fragments of sheep and goat bones from Locus D.3:57 a-e (N = number of bones; X = mean, in millimeters).

fragments have measurements clustered between 50 and 85 mm. The mean size for all the fragments is 59 mm.

The procedure for estimating the age of animals at the time of their death has been described elsewhere.[10] Table 15 presents the raw data on counts of fused versus unfused epiphyses among sheep and goat bones from Locus D.3:57a-e. Because the data available yield relatively small counts, the figures in groups B and C along with those in D and E have been combined. Of

GROUP	BONE	FUSED	UNFUSED	N.A.
A. EPIPHYSIS FUSING WITHIN 1 YEAR	PROXIMAL RADIUS	8	2	0
	DISTAL HUMERUS	11	0	6
	SCAPULA (TUBER.)	5	1	11
	PELVIS	5	2	13
B. EPIPHYSIS FUSING AFTER ABOUT 1.5 YEARS	PHALANX I	8	0	1
	PHALANX II	5	0	3
C. EPIPHYSIS FUSING AFTER 2 YEARS	DISTAL TIBIA	5	2	5
D. EPIPHYSIS FUSING AFTER 2.5 YEARS	DISTAL METAPODIAL	3	2	6
E. EPIPHYSIS FUSING AFTER ABOUT 3-3.5 YEARS	PROXIMAL FEMUR	4	6	5
	DISTAL FEMUR	6	0	1
	DISTAL RADIUS	0	9	2
	PROXIMAL TIBIA	2	5	2

Table 15. Raw counts of fused versus unfused epiphyses among sheep and goat bones from Locus D.3:57 a-e (N.A. = not applicable).

[10] Ibid., p. 239.

the bones in Group A, 29 out of 34 (85%) were fused; in Group B+C, 18 out of 20 (90%) were fused; in Group D+E, 15 out of 37 (40%) were fused. These findings suggest that 90% of the animals from D.3:57a-e reached an age of at least two years, and from among these that survived, only 40% reached an age of three years or older.

Interpretive Conclusions

Having limited this report to the analysis of data from one isolated deposit, we have attempted to achieve strengthened control over the available data as well as greater accuracy and thoroughness in reporting our findings. It is with much caution and even hesitation that we venture the subsequent interpretive conclusions which will be based, then, on our analysis principally of 597 bones from five Early Roman strata unearthed from a subterranean installation at Tell Ḥesbân.

The archaeologist's interpretation that D.3:57 was probably a dry storage area—possibly for the storage of grains or wine—is supported by this study in that the 2765 bones that were excavated were extremely well preserved. Although they were somewhat fragile upon reaching the light of day, this condition is accounted for by the dampness of the deposit.

The agents responsible for depositing the materials described here were principally human beings. This can be inferred from the observation that the bones were highly selected—meat rich bones constituted 73% in the case of sheep and goat. Similarly, the deposition remains of artifacts such as pottery, metal, glass, bead, and flint objects, as well as such food remains as date seeds and grain can perhaps most easily be attributed to human agents. There was no instance of an articulated skeleton of sheep, goat, or other large mammal having been deposited as a result of an inadvertent accident whereby the animal fell into the installation.

Dogs may also have been responsible for depositing certain remains. The presence of a number of bones of "unclean" animals

such as donkey, horse, and dog in the deposit is best attributable to dogs, since human beings tend to avoid contact with the remains of these animals.

We have seen that it has been possible to infer from the presence of distinct strata that the excavated materials were deposited over time and not all at once. The history of deposition is further illuminated by the fact that there is a significant variance between the strata as to the quantity of bone in each. Thus, layers a and b produced very meager amounts when compared to layers c and e. Especially noteworthy is the large quantity of bone found in layer d. The fact that this layer contained comparatively little pottery raises an interesting question for future study: Is there a predictable relationship between bone and pottery in certain deposits?

The post-depositional history of the excavated materials is also illuminated by our findings. It seems apparent that the bone material from this subterranean installation was comparatively better protected against the elements, man, and animals because of the enclosure provided by the deposit. This can be inferred from the presence of many more whole bones and also from the high state of preservation of the entire bone corpus—an observation which is reflected in the percentage of bones saved. Similarly, the mean size of fragments (59 mm.) is greater for these bones than for bones from unprotected fill areas.[11]

The observation that light bones, such as chicken bones, were most abundant in the upper layer c and that heavy bones, such as large mammal bones, were most abundant in the lowest layer e, presents an interesting situation if this phenomenon could be determined to be the result of post-depositional factors. The situation would raise the question of whether the weight of bones must be reckoned with in determining the circumstances of their original deposition.

Finally, our investigations have illuminated certain aspects

[11] Ibid, pp. 240-241.

pertaining to the animal husbandry and meat preparation practices of the ancients at Tell Ḥesbân during the Early Roman period. Thus, sheep and goat emerge here, as during the other periods of occupation at Tell Ḥesbân,[12] as the principal source of red meat, followed closely by cattle. Camel and pig, along with poultry (principally chicken) and fish were also eaten. We have already observed that most of the sheep and goat were slaughtered between the ages of two and three years. Because most of the bones of the animals eaten as food were meat rich ones, it seems reasonable to conclude that the meat which was consumed was purchased in pre-cut sections rather than slaughtered and eaten in the same location. This inference is also borne out by the observations that in no instance was a complete skeleton found, and that the average number of bones from individual skeletons was estimated to be far smaller than would be expected were the bones those of complete skeletons.

[12] Øystein Sakala LaBianca, "The Diachronic Study of Animal Exploitation at Tell Ḥesbân," forthcoming paper.