

**THE WADI EL ḤASA
ARCHAEOLOGICAL SURVEY 1982:
A PRELIMINARY REPORT**

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Introduction

The Wadi el Ḥasa Archaeological Survey was in the field for its third and final season between May 2 and June 11, 1982. The first infield season was carried out in October-December, 1979 (McDonald, Banning, Pavlich, 1980) while the second season was in the field April-June, 1981 (MacDonald, Rollefson, Roller, 1982).

Survey team members for the 1982 season were Burton McDonald, Gary O. Rollefson, Edward B. Banning, Brian F. Byrd, and Cesare D'Annibale. Nabil Baqa'in served as representative of the Department of Antiquities of Jordan, while Abu Arif was cook. The team members stayed at a rented house in Al Ḥasa on the Desert Highway during the six-week, infield season. Rollefson was the lithic analyst for the season while James A. Sauer, President of the American Schools of Oriental Research, read the pottery for the first half of the season while Burton MacDonald, Edward B. Banning, and Vincent A. Clarke completed the pottery reading for the final half of the season.

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Nova Scotia.

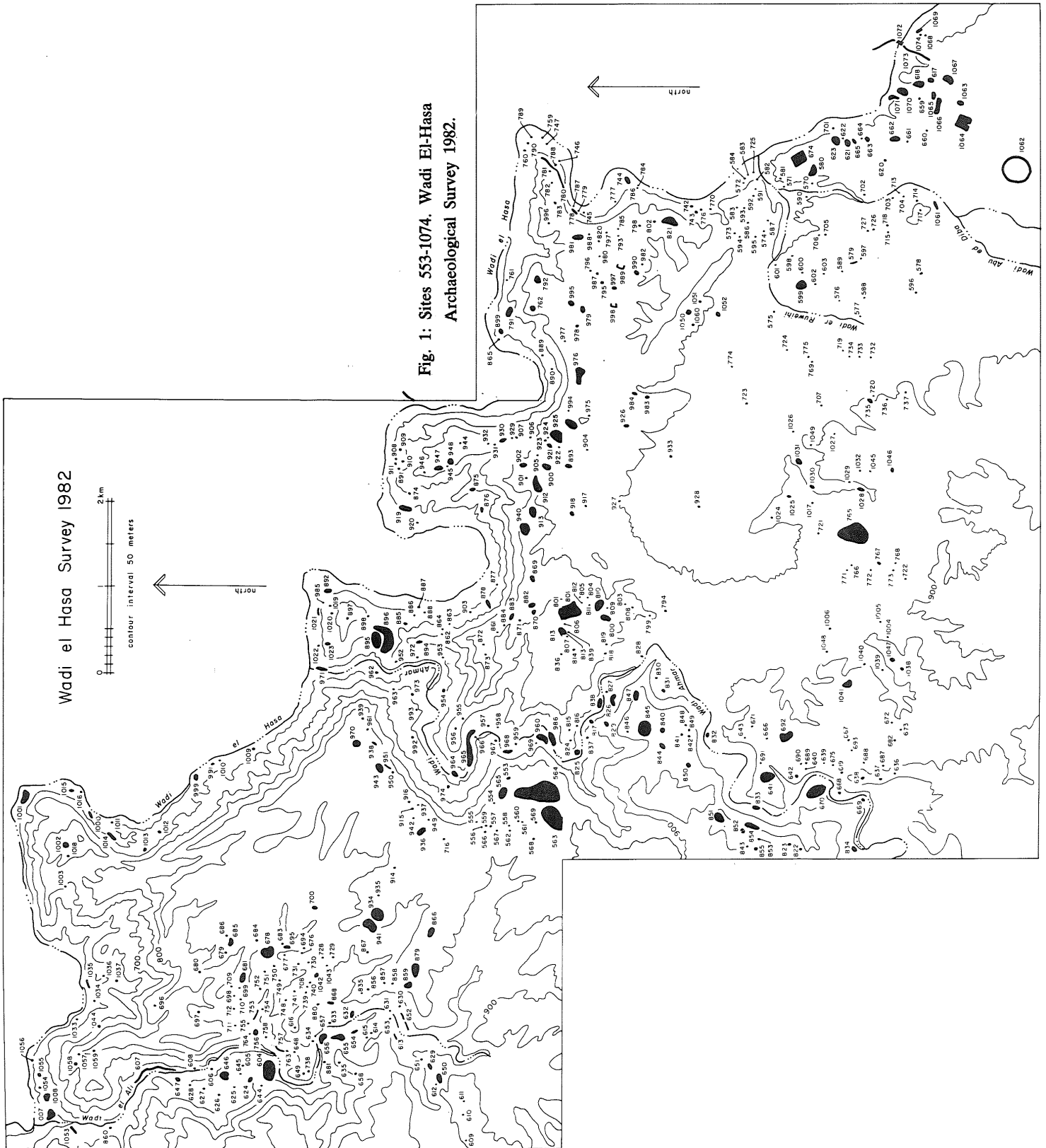
The territory surveyed in the 1982 season was from where the 1981 season had left off, that is, from the Wadi el 'Ali on the west to the region around Qal'at el Ḥasa, close by the Desert Highway, on the east. As in previous seasons the Wadi el Ḥasa served as the northern boundary while the southern boundary was from 2 to 8 km. south of the Wadi. As the survey team worked further to the east the territory to the south became more and more a flood plain and it was disturbed badly by gravel-pitting activity. During the 1982 season approximately 69 km² were surveyed (Fig. 1). This was less than in the previous two seasons but the work was done more intensively. In the territory 522 archaeological sites were surveyed (Fig. 1) making a total of 1074 sites for the three-year project. The main *awdiyah* (wadis) other than the Wadi el Ḥasa surveyed during the 1982 season were the Wadi el 'Ali (Pl. LXIX,1), Wadi Aḥmar, Wadi er Ruweiḥi, and Wadi Abu ed Diba. Their associated ridges, slopes, and plateaus were also surveyed.

Objectives of the Survey

The main object of the Survey was to locate all evidence of human presence in the area from earliest times down to the modern period or until A.D. 1918, the time when the Ottoman Turks were expelled from Jordan. All surveyed sites were plotted on 1:25,000 scale maps.¹ They

¹ Map sheets at the scale of 1:25,000 used in the 1982 season were Muhai (225/035) and Qal'at el Ḥasa (225/025). These maps were prepared for the Ministry of Economy and the U.S.A. Operation Mission to Jordan. Stereo-compiled by Hunting Aerosurveys Limited from aerial photographs dated 1953 with existing data supplied by the Department of Lands and Surveys, reproduced

and printed by 42 Survey Engineer Regiment May 1959. At the scale of 1:50,000 Map Sheet 3151 I Series K737, 'Aina, was used. It was prepared by the Army Map Service (AMTV), Corps of Engineers, U.S. Army, Washington, D.C. and compiled in 1959 from the best available large scale sources. Planimetric detail revised by photoplanimetric methods. Map not field checked.



were described, photographed, and sketched where feasible. The sites were "sherded" using a purposive or total collection method for lithics, sherds, glass, coins, beads, and so forth. These artefactual materials helped determine dates of occupation and were used to work out settlement patterns for the various prehistoric and historic periods.

Each site was evaluated on a scale of 1-100 so as to suggest to the Department of Antiquities of Jordan, and to other interested parties, which sites have, in the survey-team's estimation, the greatest potential and/or need for further research and/or excavation.

The final objective of the project is the writing of a preliminary archaeological history of the area.

Methodology

During the 1982 season we employed a combination of statistical sampling and purposive survey for the location of sites. For the purposes of sampling the eastern third of the Wadi el Ḥasa's south bank, we selected borders for the sampling universe running from the coordinates 2390/0280 (Palestine Grid) south to 2390/0260, west to 2300/0260, north to 2300/0320, west to 2270/0320, and north to 2270/0380. The channel of the Wadi el Ḥasa formed the northern boundary both of the sampling universe and of the purposive survey area. Originally we had planned to walk systematic transects over the entire sampling universe, coincident with the north-south lines of the Palestine Grid at half-kilometre intervals, each transect being walked by a team of six, spaced at intervals of approximately 15-50-15-50-15 metres, making a total transect width of about 145 m. Unfortunately, by the second week, it became apparent that at our average pace we would not be able to finish the systematic sample within six weeks. In order to ensure that we would have some statistical basis for analysis of the site distributions, we divided the one-kilometre squares of the Palestine Grid among two strata, "Ḥasa gorge" and "plateau," and randomly selected three squares from the former and eight from

the latter using a spatial design. This provided representation from each stratum roughly proportional to its areal extent. The southwest corners of the squares selected are at the coordinates 2320/0320, 2360/0320, 2370/0310, and 2270/0350, 2280/0350, 2310/0310, 2320/0310, 2330/0280, 2350/0280, 2350/0290 and 2370/0280. Within each of these squares we walked one north-south transect through the centre and one more centred on its west edge, using the same spacing between team members as on the unfinished systematic sample. All the transects from the systematic and random sampling total 69 km. in length and were completed in about fifteen field days. We spent the remainder of the field season doing purposive survey, on foot, in areas where sites were known, where Sites could be expected, or where the random and unfinished systematic samples had left large gaps.

Our operational definition of "site" was any scatter of lithics or sherds which showed notably higher density than the surrounding "back-ground" of occasional isolated sherds or flints. By this definition sites could occur where there were very few sherds or lithics, as long as they seemed to cluster in a density which contrasted with their surroundings (particularly where the background scatter had a density of 0). In some cases, particularly on the plateau west and south of Rujm Bakher, Site 716, the background was very high, so that the "sites" are nodes or high-density clusters in what is a huge and continuous scatter of flints. Alternatively loci exhibiting evidence of architecture were counted as sites. In general, we did not record any sites which were obviously post-Ottoman unless there appeared to be earlier occupation as well.

On each site, whenever possible, we collected small purposive samples of sherds or lithics, attempting to include as many diagnostics as possible. In the case of lithics we emphasized cores, flakes or blades with intact platforms, and tools. In the case of ceramic scatters we attempted to find rims, handles, bases and decorated sherds whenever possible. This strategy improved our ability to date the sites

accurately, but the samples are not necessarily representative of the lithic and sherd assemblages as a whole. The counts given with the "readings," then, are only a guide to suggest when a particular period is represented by only one or two artefacts, or by a dense scatter.

Lithic Sites of the 1982 Season

Introduction

Lithics samples were collected from 298 of the sites located during the 1982 survey season. Dating of the samples was based on time-specific diagnostic elements when they were present. In the absence of such typological or technological markers, general chronological determination could be tentatively assigned within certain lithics samples based on relative patination, abrasion, and associations with other, non-lithic artefacts such as potsherds.

As was the case in the 1981 season (MacDonald, *et. al.*, 1982), many of the samples consisted solely of flakes and/or blades, with tools and cores either rare or absent. Although certain time periods are characterized by specific technological features, other manufacturing traditions are shared across cultural-temporal boundaries. Consequently, in some cases only the most general assignments could be made, such as "Paleolithic" (Lower, Middle, or Upper Paleolithic) or "Late" (Late Upper Paleolithic through Early Bronze Age.) In samples with very few chipped stone artefacts, even this breakdown was not possible, and the "unidentifiable" category was the only safe characterization. In many instances, however, somewhat finer distinctions could be determined, and collections or parts thereof could be assigned to Lower/Middle Paleolithic, or Middle/Upper Paleolithic,... Epipaleolithic/Early Neolithic, etc.

Chronology

Table 1 provides a summary of the distribution of lithics samples collected this season. Among the 298 sites with chipped stone material, fully 749 separate cultural-

temporal subsets were discernible. Of the total number of sites, 79 (26.5%) were single-period occupations, with the remaining 219 sites containing two or more episodes of prehistoric habitation.

Table 1

Absolute and relative frequencies of sites containing aretfacts from specific and general cultural periods.

<i>Period</i>	<i>n</i>	<i>%</i>
Lower Paleolithic	30	10.1
Lower/Middle Paleolithic	50	16.8
Middle Paleolithic	188	63.1
Middle/Upper Paleolithic	35	18.6
Upper Paleolithic	63	21.1
Upper/Epipaleolithic	20	6.7
Epipaleolithic	7	2.3
Epipaleo/Early Neolithic	17	6.0
Early Neolithic	48	16.1
Pottery Neolithic	2	0.7
Chalcolithic	1	0.3
Chalcolithic/Early Bronze	5	1.7
Early Bronze	18	6.0
Late	172	57.7
Paleolithic	11	3.7
Unidentifiable	82	27.5

Total number of lithics collections: 298

Definite presence of Lower Paleolithic habitation was found at thirty sites this season. At 10.1%, the relative frequency of occupation compares closely with the 1981 survey season (10.9%). The Late Acheulian is the most prominent stage in this period, accounting for all but one of the sites. The lone candidate for earlier occupation is Site 801, which includes three very crude Abbevillian bifaces, indicating a Middle or Lower Acheulian age. Late Acheulian at the site is demonstrated by a finely worked Micoquian biface as well as a thick amygdaloid piece. That at least two periods of the Lower Paleolithic are represented here is suggested by differential patina on the bifaces, supported by similar differences among the cores and flakes in the sample. Unfortunately, the site is entirely deflated, so there is no possibility of locating

stratified artefacts to resolve the issue.

The use of the Levallois technique for the production of flakes, blades, and points characterizes the Late Acheulian of southern Jordan (Rollefson, 1981) as well as the whole of the Middle Paleolithic. For this reason, when bifaces were not present among a sample containing Levallois pieces, it was sometimes difficult to assign the artefacts to either the Lower or Middle Paleolithic. Thus in fifty instances (16.8% of the site total) collections could be dated only to the Lower/Middle Paleolithic.

During the preliminary analysis, there was a growing subjective feeling that among the Levallois pieces, temporal distinctions between the Lower and Middle Paleolithic might be associated with decreasing size (especially width) and increased attention to platform preparation and symmetry. A similar temporal trend has been detected within the Middle Paleolithic of the southern Levant (Jelinek, 1981; 1982), and the collections from the 1981 and 1982 seasons in the Wadi el Hāsa survey, combined with other collections from southern Jordan, might demonstrate whether this trend continues into the Lower Paleolithic. A detailed metric and technological analysis of this material is planned and the results will be reported in the near future.

The Middle Paleolithic (Levantine Mousterian or Levallois-Mousterian) occupations dominated the lithics samples by far, occurring at 63% of the sites. A similar figure was noted for the middle section of the Wadi el Hāsa drainage in 1981 (65%). As has been pointed out above, the Levallois technique dominated this period of cultural development in southern Jordan, and cores and flakes indicating a non-Levallois technology are relatively rare.

Several *in situ* Middle Paleolithic base camps were discovered this season, including three, Sites 621, 622, and 623, along the shore of a Pleistocene lake near the eastern edge of the survey area. Another, Site 634, is located in a small rockshelter in the Wadi el 'Ali. Charcoal and preserved bone are evident at Site 621. The potentials these sites have for understanding human exploitation of the

area are thrilling to contemplate.

The transition from the Middle Paleolithic to the Upper Paleolithic is also well attested by the evidence from the 1982 season. Emireh elements (points and blades with thinning retouch on the interior surface of the proximal end) were found at six sites, including the lakeshore *in situ* Sites 621 and 623. In addition to the Middle Paleolithic layers at these two sites, there are also undisturbed Upper Paleolithic (Aurignacian) occupations stratified above the earlier material, adding further excitement to the area.

Upper Paleolithic habitations are well-represented in the eastern portion of the Wadi el Hāsa survey area being distributed over roughly one-fifth of the prehistoric sites. In addition to the two sites mentioned above, two other undisturbed lakeshore settlements, namely Site 1062 and 1067, contain enormous quantities of Aurignacian and Aurignacian/Kebaran tools, cores, and debitage. Site 1062 is very large (perhaps 3-4 hectares in extent), situated at the mouth of a small wadi where it debouches into the former Pleistocene lake. In addition to the extraordinary density of artefacts along the wadi slope and along a long but shallow rockshelter, copious amounts of charcoal, ash, and bone are visible. Site 1067, located in the lake marls to the east of Site 1062, may be associated. The amount of disturbance Site 1067 has suffered can be determined only by excavation, but its location within the lake marls indicates a shrinking or vacillating lake surface.

The typological distinctions between late Upper Paleolithic and early Epipaleolithic occupations were rarely present among the lithics samples, and for twenty sites artefacts could be assigned only to the Upper/Epipaleolithic classification. The thick deposits at Site 1062 may, in fact, include a transitional series in the development from the earlier to later cultural traditions.

Epipaleolithic sites were found in relative abundance this season compared to the evident absence of such habitations in the 1981 survey area. A collapsed rockshelter, Site 784, near the eastern end

of Wadi el Ḥasa contained dense numbers of Geometric Kebaran artefacts, including rectangular and trapezoidal microliths. Although no bones or ash were visible at the exterior edge of the collapse, it is possible that such material is preserved *in situ* beneath the tumbled stone.

Two Natufian sites were located this season which provide additional exciting potentials for future research. Site 895 (Pl. LXIX, 2) is an *in situ* village (ca. 80 m. in diameter) located in a protected basin at the confluence of the Wadi Aḥmar and the Wadi el Ḥasa. The moderate presence of Helwan retouch on lunate microliths indicates that the occupation occurred in the earlier part of the Natufian period. A Natufian "outlier," Site 1020, is located several hundred metres to the south of Site 895, and it appears to represent a chipping station rather than a semi-permanent habitation. Erosion at both sites has revealed several stone-lined cysts which may be Natufian burials.

Since microliths are the most distinctive elements of the Epipaleolithic period, it is tempting to use the presence of unretouched bladelets and microblade cores to date collections when retouched tools are not present. However, since microblades are also produced in Early Neolithic contexts, one is left with assigning seventeen sites to the Epipaleolithic/Early Neolithic.

The Early Neolithic is well-represented in the 1982 collections, occurring at forty-eight sites (16.1%). While many of these were diffuse scatters disturbed by deflation and erosion, Site 892 is evidently an *in situ* hamlet or small village on the bank of the Wadi el Ḥasa. This site contains exposed patches of ash and bone in association with typical PPNB artefacts. No evidence of permanent structures are visible at this site, but some hut circles may exist at Sites 1007 and 1008, at the juncture of Wadi el 'Ali and Wadi el Ḥasa. The latter sites are deflated, but there is a dense distribution of artefacts over ca. 1-2 hectares at each location. Four projectile points from Site 1008 are made in a style not familiar in other areas of Jordan: a short narrow tang is formed by two corner notches, and two

opposed lateral notches are formed just above the tang. The remainder of the inventory is typical Early Neolithic, but whether this is PPNA or PPNB is not certain.

Six specialized camps attributed to the PPNB (Betts, 1982; Rollefson, et. al., 1982; Rollefson and Frohlich, 1982) were found this season. These "burin sites" are a curious feature in that the vast majority of the tools are burins (normally on truncations), and sometimes they are the only implements found at a site. As was the case with the burin site cluster in the 1981 survey area, the six sites this year are all located at higher elevations overlooking a major drainage (Sites 559, 561, 564, and 565 are above the Wadi Aḥmar; Site 610 is above the Wadi el 'Ali, and Site 924 overlooks the Wadi el Ḥasa). One projectile point typical of the PPNB was found at Site 610 which provides tentative chronological assignment for this site type (but see Rollefson and Abu Ghaneima, n.d.).

Pottery Neolithic sherds were found at two sites which also contained lithic artefacts; since the lithics are non-diagnostic (originally classified as "Late"), they have been assigned a Pottery Neolithic age on the basis of the associated ceramic evidence. The dating of other non-descript lithics to specific periods is also based on the association of potsherds: one collection is tentatively dated to the Chalcolithic, five samples to Chalcolithic/Early Bronze, and eighteen collections to various parts of the Early Bronze Age. In some instances these associations are very tenuous, but in other cases the correlation is quite strong, especially when the sample represents a single period occupation ("Late") located in and among permanent and semi-permanent structures.

In a large number of cases, however, the corroborative evidence provided by datable ceramic samples did not exist with lithic scatters of undiagnostic artefacts, and as a result the residual "Late" category is large (172 samples). Probably a majority of this material is attributable to transhumant Chalcolithic/Early Bronze Age groups. The lithics samples associated with potsherds from this season hold much

promise for detecting diagnostic features of the chipped stone artefacts through intensive metric and technological analysis. The research holds a high priority for future work in view of the substantial distribution of these as yet poorly understood "Late" sites.

Summary and Observations of the Lithic Material

A comparison of the percentages in Table 1 with the results of the 1981 season reveals a fairly close correspondence for the Paleolithic periods, although the Upper Paleolithic occupations are somewhat more frequent (in a relative sense) in the 1981 survey area; however, this is not statistically significant in Chi-Square tests. While Epipaleolithic occupations were not definitely detected in 1981, several good sites were found in 1982. In the later periods, the relative frequencies of occupations in the various periods is also generally equivalent except for the Early Bronze Age. In this case the difference is probably due less to an implied Early Bronze vacuum in the 1981 survey area than to the increased occurrences of permanent and/or semi-permanent habitations in the 1982 survey sectors, particularly on the high ridges above the Wadi el Ḥasa. In these hamlets and villages more evidence was available to date lithics which would otherwise have been included in the "Late" category.

A major difference between the two survey areas involves the higher incidence of *in situ* sites for specific periods found in 1982. Only a few instances of relatively undisturbed Neolithic or later period sites were found in 1981, all along the terraces and banks of major drainages. While this pattern also applies to the easternmost section of the survey area, *in situ* sites range through all of the prehistoric periods except the Lower Paleolithic and the Chalcolithic.

The location of extensive *in situ* Middle Paleolithic, Upper Paleolithic, Epipaleolithic, and Early Neolithic sites along an ancient lakeshore and the major wadi confluences promises to provide an immense wealth of information concerning

varying methods of exploiting varying environmental circumstances. These sites also will contribute greatly to resolving a number of problems raised recently concerning the geological history of the Hasa Basin and formations along the Wadi el Ḥasa (Vita-Finzi, 1966; Copeland and Vita-Finzi, 1978).

The numbers of sites located in the 1982 season precluded a detailed study of settlement patterns throughout the occupational history of the area under the time constraints for this preliminary report. Work will progress on this facet in the coming year, however. Some subjective impressions remain to be tested by more intensive research dealing with differential exploitation through time.

Briefly, Lower Paleolithic sites appear to be confined basically to the plateau and ridges high above major *awdiyah* (wadis), although this may be a feature attributable to severe erosion of early sites lower down in the drainage systems. For the Lower/Middle Paleolithic sites, there is also an impression that the middle ranges of elevation are characterized by very temporary occupations, while on the plateau both relatively long occupations took place (base camps) as well as shorter ones (chipping stations and temporary camps). Levallois points are found in relatively high numbers at the lower elevations (particularly notable at the *in situ* lakeshore sites), while these hunting implements appear to occur less frequently on the plateau and high ridges.

Upper Paleolithic and Epipaleolithic base camps may also be more characteristic of the lower elevations, while Neolithic base camps occur both along the wadi banks and in the highlands. Transient stop-overs for all three major periods occur sporadically throughout the survey area. Chalcolithic sites are absolutely rare, as they were in 1981, but Early Bronze Age sites constitute a more intensive occupation (possibly on a semi-permanent basis) in the eastern survey area compared to the 1981 season. Early Bronze Age hamlets and villages are confined primarily to the highland areas.

Large areas of the systematic and purposive survey transects were virtually

void of any prehistoric presence, but it appears that this is primarily due to "archaeological visibility" factors than a true absence of occupation. This observation pertains to immense alluvial fans and smaller seasonal mudpans, where recently accumulated sediments have probably obscured earlier evidence of habitation.

In contrast, other sections of the 1982 survey area provided severe challenges to the detection of distinct occupational episodes. This was particularly the case for the plateau between Wadi el 'Ali and Wadi Aḥmar, where the entire highlands area was characterized by a nearly continuous distribution of chipped stone artefacts. Under these circumstances, collections were made at obvious lithic concentrations, such as the dominant Lower Paleolithic Site 970, but such distinctive artefact clusters were rare. Consequently, lithics samples were collected around irregularly spaced artificial features, such as tower/tomb structures, that stretched in an arc from Site 616 (Pl. LXX,1) overlooking the Wadi el 'Ali to Site 939 high above the Wadi Aḥmar.

Overall, the 1982 season provided an unprecedented array of information concerning Jordan's prehistory, virtually uninterrupted through the last half to three-quarters of a million years. Certainly, there is so much information contained in the *in situ* sites alone that a large number of prehistorians will be kept very busy for a generation or more to clarify human cultural (and physical?) development in this area of the Near East which has not captured much professional interest in the past. The preliminary results produced in the three years of briefly investigating the southern Wadi el Ḥasa and tributary drainages has already provided an intriguing set of hypotheses for this area, and implications for the settlement and exploitation of the rest of Jordan promise to be richly rewarding.

Ceramic Sites of the 1982 Season

Introduction

A total of 6,059 pottery sherds were collected from 206 or from 37% of the 522 sites surveyed. These sites span a period of

time from *ca.* 4750 B.C. to A.D. 1918. However, not every historic period was represented by ceramic materials during the 1982 season. There are some periods which are not represented at all by any artefactual material.

Chronology

No definite Middle Neolithic (*ca.* 6000-4750 B.C.) ceramic sites (characterized by dark burnished ware in Syria) have been found in Jordan. Late Neolithic (*ca.* 4750-4250 B.C.) pottery was found in the survey area during the 1981 season and again this season. Late Neolithic pottery was found at two sites, namely Sites 857 and 870, with the possibility of sherds from the same period at two additional sites, namely Sites 1028 and 1061. Site 857 is a tower-site located on the ridge to the east of the Wadi el 'Ali while Site 870, also a tower-site, is located on the northern edge of the plateau overlooking the Wadi el Ḥasa. The number of sherds, fifteen and seven respectively, is small at each site.

Chalcolithic period (*ca.* 4250-3300 B.C.) pottery was collected at five sites, namely Sites 616, 647, 858, 915 and 939 with a total of thirty-one sherds. All these sites are located either in the Wadi el 'Ali, on the ridge immediately east of the Wadi, or on the plateau between the Wadi el 'Ali and the Wadi Aḥmar to the east. Besides these sites Chalcolithic-Early Bronze I (*ca.* 4250-2900 B.C.) pottery was found at five sites, namely Sites 630, 644, 810, 883, and 856, yielding a total of twenty-six sherds. Here again three of these sites (Sites 630, 644, and 856) are located in the Wadi el 'Ali or just to the east of Site 810 is located in the Jebel el Kutuf region east of the Wadi Aḥmar while Site 883 is located on the ridge high above the Wadi el Ḥasa just to the north of Pottery Neolithic Site 870.

Besides the Early Bronze I period pottery found in association with Chalcolithic period pottery, Early Bronze I pottery was found at fifteen sites which yielded a total of ninety-eight sherds. These Early Bronze I sites are generally small and the number of pottery sherds from the period collected at the sites is small as well. These sites are terrace-walls, camps, hamlets, and stone enclosures. Hamlet sites, namely Sites 688, 782, 783,

791, 855, and stone enclosures. Hamlet sites, namely Sites 688, 782, 783, 791, 855, 869, and 989, yielded Early Bronze I pottery. These sites are generally small and consists of remnants of foundation walls, buildings constructed of unhewn, field-stones, and structures which are probably enclosures. These sites are found, generally speaking, along the south bank of the Wadi el Ḥasa but also east (Site 688) and west (Site 855) of the Wadi Aḥmar. They are generally located on the ridges above these *awdiyah* (wadis) rather than in the wadis themselves. A number of Early Bronze I sites had associated terrace-walls, e.g., Sites 653, 728, and 1031. Moreover, Early Bronze Age (*ca.* 3300-1950 B.C.) pottery was found at seven sites, namely Sites 568, 604, 688, 728, 830, 855, 892. All this evidence indicates that there was a very definite Early Bronze presence in the survey area.

No sherds or other identifiable artefactual material was found in the survey area which indicates either a Middle Bronze period (*ca.* 1950-1550 B.C.) or Late Bronze period (*ca.* 1550-1200 B.C.) presence in the area. Such is not surprising after the findings of the previous two-field seasons (MacDonald, *et. al.*, 1980; 1982).

What is possibly Iron Age I period (*ca.* 1200-918 B.C.) pottery was found at only one site, namely Site 604, Al Mabra. This site is a large village situated on the west slope of the Wadi el 'Ali. It is definitely an Iron Age site and could possibly date from the beginning of the period. Fifty possibly Iron I sherds along with eighty-eight Iron Age sherds were

collected at the site. Immediately to the

north of this site and on the same side of the Wadi nine Iron Age sherds were collected at Site 624, a small site which may be a farm. To the northwest of Site 604 is a looted tomb, Site 644, from which

found at a village site, Site 615, on the west side of the Wadi el 'Ali in an agricultural area. This site is located approximately 1 km. southeast of Site 604. Four Iron Age sherds were found at a probable farm, Site 654, immediately to the northeast of Site 615. Moreover, five probable Iron II sherds were found at Site 648, another probable farm on the east side of the Wadi el 'Ali but in the same general area as the above-mentioned Iron Age sites. Thus there appears to have certainly been an Iron Age presence, especially during the Iron II period, in the Wadi el 'Ali. There is some Iron Age presence immediately east of the Wadi at Site 616, Al Qasr, where four sherds from the period were found. This site provides an excellent view of the Wadi el 'Ali both north and south as well as the surrounding country to the east and west. East of the Wadi el 'Ali there is virtually no Iron Age presence. Three Edomite ware sherds were found at Site 732, a sherd scatter, west of the Wadi er Ruweiḥi, in the eastern segment of the survey area. At Site 601, on the south bank of the Wadi er Ruweiḥi, one Iron II sherd was found. Finally, on a terrace on the south side of the Wadi el Ḥasa eight possible Iron I-II sherds were found at Site 1015. Otherwise, the area east of the Wadi el 'Ali is devoid of Iron Age presence. This seems to indicate that the people of the Iron Age period settled no further east than this Wadi and that Sites 616, Al Qasr, and 647 may be an indication of their eastern frontier.

As in previous survey seasons not a sherd from the Persian Period (*ca.* 539-332 B.C.) was found in the survey area.

Alexander the Great conquered the Persians in 332 B.C. and the area became part of the Greek world. A surprising amount of Hellenistic period (*ca.* 332-63 B.C.) pottery was found in the survey area.

predominantly an Iron Age site, eleven Hellenistic and fifty-five Late Hellenistic sherds were collected. At Site 605, a cemetery-site, just to the north of Al Mabra, two of the four sherds collected were read as Late Hellenistic. At Site 680, a tower/tomb complex, located on the ridge overlooking the Wadi el 'Ali, eleven sherds were collected and they were all Late Hellenistic. This site is positioned above and to the northeast of both Sites 604 and 605. At Site 967, on the west bank of the Wadi Aḥmar, at what appears to be an Nabataean camp, six Hellenistic sherds were collected. One and two Late Hellenistic sherds were found at Site 620, a Nabataean caravanserai, and at Site 623, a lithic and sherd scatter respectively. Both sites are located in the same general region to the west of the Wadi el Ḥasa.

In southern Jordan the Nabataeans, who are generally believed to have settled down near Petra during the Persian period, avoided the Greek armies and remained independent throughout the period.

Nabataean sites, as in the previous two seasons, were numerous. Forty-five sites had Nabataean pottery, nine sites yielded Nabataean-Roman pottery, Nabataean/Roman pottery was collected at five sites, while Nabataean-Byzantine pottery was found at one site. These sites were found throughout the survey area.

An important Nabataean site is Site 620 which appears to be a caravanserai. The main structure at the site measures *ca.* 50.00 (N-S) x 60.00 (E-W) m. There appears to have been a courtyard within the structure and pieces of alabaster were collected there. An alabaster quarry, Site 1046, was found 3.5 km. west of the caravanserai and seventeen Nabataean sherds were found there. This could be the source for the alabaster found at Site 620 and Site 725, Umm Hraga, (Pl. LXXI, 1) where seven Nabataean sherds were collected. One km. north of Site 620 and just to the south of Site 725, Umm Hraga, where seven Nabataean sherds were collected. One km. north of Site 620 and just

to the south of Site 725, Umm Hraga is the large Nabataean fortress of Er Ruweihi, Site 674 (Pl. LXXI, 2), located at the confluence of the Wadi el Ḥasa and the Wadi er Ruweihi (Glueck, 1934: 69, 77; 1935: 106).² The major part of the site appears from a distance to be in the form of an inverted triangle. This part of the site is located on the southwest-facing slope and is hidden from view from the north and the east. A large stone platform is located to the north at the highest point of the site. It is probably a tower and it provides an excellent view in all directions. This fort could have been associated with a caravan route going east-west and perhaps another route going northwest along the Wadi el Ḥasa. Another large Nabataean site is located on a terrace immediately west of the Wadi el Ḥasa. This is Site 892 where 198 Nabataean sherds plus sherds from the Nabataean to Byzantine periods were collected. It was probably a village.

Other Nabataean sites were found throughout the Wadi el 'Ali, the Wadi Aḥmar, the Wadi Abu ed Diba' as well as along the Wadi el Ḥasa and the Wadi er Ruweihi. Terracing, especially in the Wadi el 'Ali and the Wadi Aḥmar, e.g., Sites 753, 756, 965, and 1053, could possibly be the result of Nabataean activity. Tower/tomb Sites 616, 858, 859, 869, 976, and so forth on ridges and plateaus are also probably associated with Nabataean presence in the survey area.

Pompey conquered Syria-Palestine in 64-63 B.C. In southern Jordan, the Nabataeans avoided conquest in 63 B.C. and they remained independent of Rome until A.D. 106, when they were annexed by Trajan. All of Jordan then became a part of the Roman province of Arabia, with the exception of the eastern desert areas, where Arabic-speaking Thamudic and Safaitic tribes were located.

Besides the Roman period (*ca.* 63 B.C.-A.D. 324) pottery found in association with Nabataean pottery, Early Roman (*ca.* 63 B.C.-A.D. 135) pottery was found at two sites, namely Sites 665 and 870, Late Roman pottery at ten sites,

² Er Ruweihi is located incorrectly on the map Qal'at Ḥasa (225/025). It is located on the map as

being north of the Wadi er Ruweihi rather than south of it where it actually is.

namely Sites 571, 577, 580, 581, 602, 623, 674, 706, 733, and 774, and what we are reading simply as Roman pottery was found at six sites, namely Sites 656, 812, 833, 859, 892 and 992. Moreover, Roman period pottery was found in association with Byzantine period pottery.

The largest number of Roman period sherds was found at Site 892, mentioned above as a predominantly Nabataean site. Along with 198 Nabataean sherds, twenty-four Roman and fifty-one possible Roman sherds, as well as one Nabataean/Roman sherd were collected at the site.

What may be a very large Roman period tower is Rujm Bakher, Site 716 (Pl. LXXII,1) (Glueck 1935: 106-107). Six Late Roman-Byzantine sherds, thirty-three Ottoman, and thirty-two undetermined sherds were found at the site. The tower measures *ca.* 24.00 x 24.00 m. at the base and near the top there is a stepping-in giving the impression of a one-step pyramid. The structure still stands at least three metres high. It is located on the plateau between the Wadi el 'Ali and the Wadi Ahmar. It provides an excellent view in all directions. It can be seen from the *Via Nova*, Site 429, *ca.* 7.5 km. to the west, and the Roman Camp, called Umm Untuli by the Bedouin presently living in the area, located on the north slope of the Wadi el Hasa, *ca.* 4 km. to the east.

For the first time in the three-year history of the project Parthian sherds (2nd-4th centuries A.D.) were found in the survey area, namely at Sites 623 and 662 where one sherd was found at each site. Both sites are located immediately west of the Wadi el Hasa and within 1 km. of each other. They are located in the vicinity of Site 620, a Nabataean caravanserai, and Site 674, Er Ruweihi, a Nabataean fort-site.

Constantine I, a convert to Christianity, founded Constantinople in A.D. 324 as the eastern counterpart to Rome. Throughout the Byzantine period (*ca.* A.D. 324-640), Jordan continued to enjoy the Pax Romana, with the desert frontier still intact and the desert tribes under control.

Besides the Roman period pottery

mentioned above, what we are reading as Late Roman-Byzantine (*ca.* A.D. 135-640) pottery was collected at fourteen sites. Besides the Byzantine pottery associated with Roman and Nabataean pottery, Byzantine Period (*ca.* A.D. 324-640) pottery was found at thirty-four sites. Early Byzantine (*ca.* A.D. 324-491) and Late Byzantine (*ca.* A.D. 491-640) pottery was found at two and three sites respectively, moreover. Byzantine-Umayyad pottery was found at one site and Byzantine-Early Islamic pottery at two sites. Moreover, what is possibly or probably Byzantine pottery was found at a number of sites.

There are no sites in the survey area which have a large and predominant number of Byzantine sherds. A great number of the sites at which Byzantine pottery was found are camp-sites, e.g., Sites 623, 715, 893, 1013, and 1030, sherd scatters, e.g., Sites 724, 726, 734, 756, and 775, hamlet sites, e.g., Sites 656, 755, 763, and 892, and circular or rectangular structures on the plateau between the Wadi el 'Ali and the Wadi Ahmar, e.g., Sites 728 and 1050. The Byzantine material is, therefore, not restricted to any particular type of site or to any definite area within the survey territory. Generally speaking the quantity of Byzantine pottery present at any one site was not large—the largest number was sixteen sherds at Site 647, Er Ruweihi, and Site 859, a circular tower (?) and rectangular structure on the ridge immediately east of the Wadi el 'Ali.

Jordan fell to Islam between A.D. 630 and A.D. 640. Shortly thereafter, Arabic gradually replaced Greek as the dominant language, and Islam replaced Christianity as the major religion.

Very little pottery that is dated to the Early Islamic period (A.D. 640-1187) was found in the survey area. Fatimid period (A.D. 969-1071) pottery was found at three sites, namely Sites 663, 724, and 775 but no more than three sherds from this period were found at any of these sites. One Umayyad/Ayyubid sherd was found at Site 800. The fact that the pilgrimage route to Arabia was located further to the west probably accounts in part for the lack of Early Islamic presence in the area.

The Late Islamic period (*ca.* A.D. 1187-1918) is well represented in the survey area. The Ayyūbid-Mamlūk period (*ca.* A.D. 1187-1516) was supposedly a period of great revival of occupation in Jordan because Jordan was now in a vital position between Egypt and Syria. However, the territory surveyed this season is likely too far east to have benefited or felt the effects of this revival. Pottery from this period was found at five sites and with the exception of Site 662, a cemetery-site and tower-site, where thirty-nine sherds were collected, in very small quantity.

Following the defeat of the Mamluks by the Ottoman Turks in A.D. 1516, Jordan remained in the Ottoman Empire until 1918. During this time Jordan was of interest to the Turks primarily because the pilgrimage route to Arabia passed through it. During this period the old "King's Highway" was found to be too difficult because of the many *awdiyah* (wadis) it intersected. Therefore, a new route was laid out farther to the east, closer to the desert, where the wadis were less pronounced. This route needed to be protected from the Bedouin tribes of the desert, and thus the Turks built forts along its line. Both a segment of this road and one of these forts, Sites 1073 and 1074 (Qal'at el Ḥasa) (Pl. LXXII, 2) respectively, were within this season's survey area. The Ottoman bridge which crosses the Wadi el Ḥasa at Qal'at el Ḥasa was surveyed as Site 1072. Moreover, village-sites, namely Sites 1063, 1064, and 1066, close by Qal'at el Ḥasa, and a huge enclosure measuring *ca.* 240.00 m. in diameter and located to the southwest were all probably associated with the fort and the road to Arabia.

Besides these very large sites, Ottoman Period pottery was found at

fifty-eight sites while what we are reading as Ottoman-Modern pottery was collected at ten sites, Late Ottoman pottery at one site, and Ottoman/Modern pottery at forty-five sites. This last type of pottery is found at many camp-sites throughout the survey area and is more numerous, sherd-count-wise, than Nabataean pottery. However, many of these sites are probably nothing more than Bedouin camps and were inhabited probably only temporarily and perhaps after 1918. Moreover, there are twenty-three sites at which our pottery reading is merely Late Islamic without attribution to any particular period within this four-hundred year period.

Conclusion

More study is required on the sites along with their related lithics, sherds, and so forth of the 1982 season. This work will be undertaken by the team members and other specialists in preparation for a final report. This report will attempt to understand more clearly the relationship among the sites and related artefacts of the three seasons of work along the south bank of the Wadi el Ḥasa. It will set out settlement patterns for the various periods represented in the area and try to understand the environment exploited by the people who lived in the area. The final report will hopefully result in the writing of a preliminary archaeological history of the area. It will point out to interested individuals and parties the rich archaeological remains in the area surveyed by the Wadi el Ḥasa Archaeological Survey.

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