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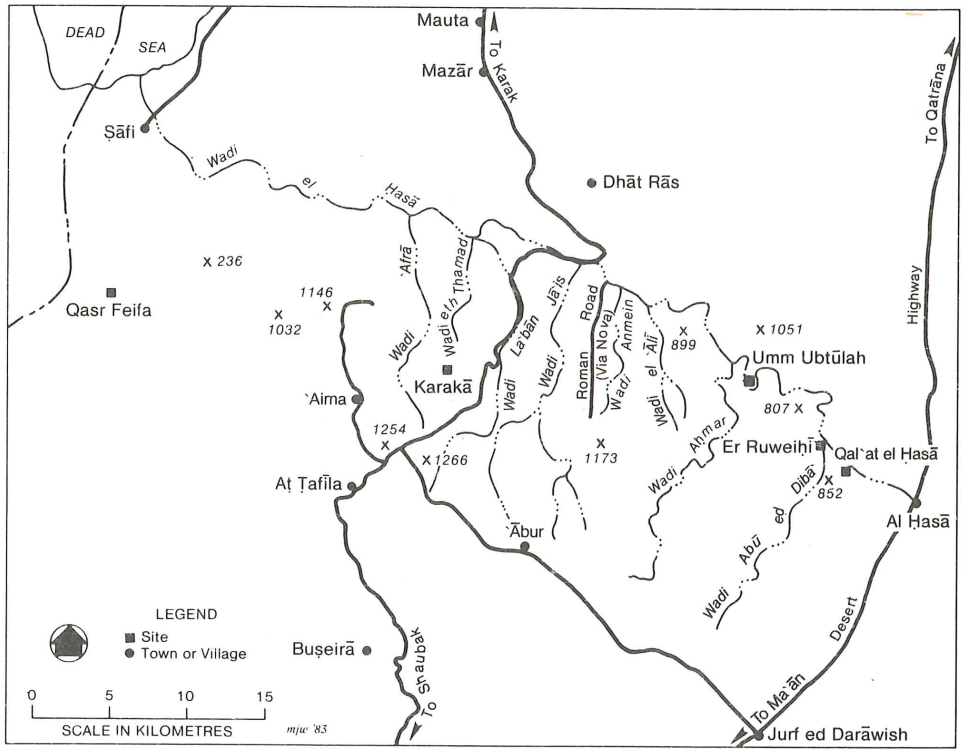
Settlement Patterns Along the Southern Flank of Wadi al-Ḥasa: Evidence from "The Wadi al-Ḥasa Archaeological Survey"

1. Geography and Geology

The "Wadi al-Ḥasa Archaeological Survey (WHS)" was carried out along the south bank of Wadi al-Ḥasa in west-central Jordan. This wadi begins in the eastern Jordan desert and flows in a northwesterly direction until it empties into the southern Ghor or the southeastern plain of the Dead Sea at aṣ-Ṣafi. It served as the northern limits of the survey. The western border was the road that goes along the escarpment from aṭ-Ṭafilah towards 'Aima and then northeastward. The eastern extremity of the survey was at Qal'at al-Ḥasa which is just west of the modern Desert Highway close by the village of al-Ḥasa. The southern boundary was from *c.* 15km in the western segment of the territory to less than 1km in the eastern extremity south of Wadi al-Ḥasa. The western segment of the territory as far east as the ridge overlooking Wadi al-La'ban was covered in the 1979 season; the territory from Wadi al-La'ban to the ridge overlooking Wadi al-'Ali was surveyed in the 1981 season; and the territory from Wadi al-'Ali to Qal'at al-Ḥasa was covered in the 1982 season. The three areas are referred to as the western, central, and eastern universes respectively (FIG. 1).



1. The WHS survey territory.

The survey territory is cut by a number of impressive and deep, south-to-north flowing wadis, namely, Wadi 'Afra (8), Wadi ath-Thamad (7), Wadi al-La'ban (6), Wadi Ja'iṣ (5), Wadi 'Anmayn (5), Wadi al-'Ali (4), Wadi al-Aḥmar (3), Wadi ar-Ruweiḥi (1), and Wadi Abu aḍ-Ḍeba' (1) (FIGS. 1 and 3). The survey area generally includes the total drainage area of the above mentioned tributaries of Wadi al-Ḥasa. These wadis are separated from one another by ridges and mountains. Elevations vary from *c.* 1263m in the southern segment of the western universe to *c.* 150m at the bed of Wadi al-Ḥasa also in the western universe.

The region of the survey is situated on the west side of a physiographic province described by Bender (1974) as the Mountain Ridge and Northern Highlands east of the Dead Sea Rift. This is an area underlain by Proterozoic (Upper Pre-Cambrian; *c.* 800 to 600 million B.P.) through Upper Cretaceous (*c.* 70 million B.P.) rocks. Overlaying this bedrock sequence are unconsolidated Pleistocene and Holocene (*c.* 2 million B.P. to the present) lacustrine, fluvial, and aeolian sediments as well as Pleistocene (*c.* 2 million to 10,000 B.P.) basalt flows. The unconsolidated sediment and basalt have a very patchy distribution. The Proterozoic through Upper Cretaceous units dip to the east and thus become younger to the east. Wadi al-Ḥasa and its tributaries are a long-lived feature in the Highlands of Jordan. Downcutting of the wadi probably began 50 million years ago and, because of repeated fault movement and downdropping of the Dead Sea Rift, has continued up to the present (Donahue and Beynon 1988).

2. Environment

The area is positioned between the Arabian Desert to the east and the Dead Sea Rift to the west. It is marginal for dryland agriculture at present and probably has been so since the end of the Pleistocene. Information about past climates is too sketchy to be very specific, but we do know that there have been long-range fluctuations as well as short-range crises of limited bottom duration. There were centuries with more rainfall than now and probably times with less. Severe and prolonged drought periods are characteristic of desert margins and the Wadi al-Ḥasa region could hardly be an exception. Certainly there is no evidence that the area was really lush since the Epipa-laeolithic although conditions were probably better than at the present at times in the past (Harlan 1988).

3. History of Work in the Area

The most extensive archaeological work done in the territory before 1979 was carried out by Glueck in the 1930's under the auspices of the American Schools of Oriental Research (Glueck 1934; 1935; 1939). He also excavated in the area at Khirbet at-Tannur, WHS Site 229, in 1937 and 1938 (Glueck 1937; 1965; 1978).

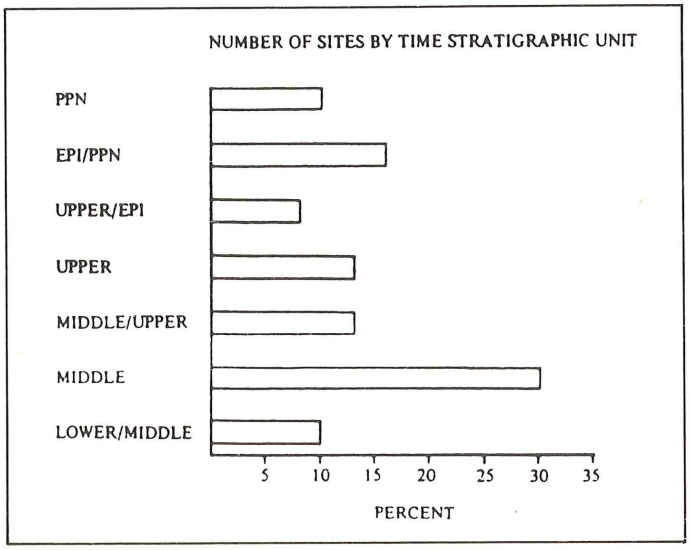
In 1973 a team from the Department of Antiquities of Jordan made a sounding at Khirbet Majadil, WHS Site 6, in the western universe (Ibrahim 1974). In 1974 Weippert made a visit to the western universe of the WHS territory (1975: 30, n. 57).

The WHS was in the field for three main seasons, namely, 1979 (MacDonald, Banning and Pavlish 1980), 1981 (MacDonald, Rollefson and Roller 1982), and 1982 (MacDonald *et al.* 1983). During the course of the infield seasons a total of 1074 sites were surveyed (MacDonald *et al.* 1988). The WHS was directed in all seasons by B. MacDonald. Major funding for the work came from the Social Sciences and Humanities Research Council of Canada and the University Council for Research of St. Francis Xavier University.

The materials from the WHS are stored at the museum of the Department of Antiquities in Karak. The drawn lithic and ceramic materials are stored at the American Center of Oriental Research, Amman and St. Francis Xavier University, Antigonish, Nova Scotia, respectively.

4. Periods Represented

Lithic materials spanning the Lower Palaeolithic to end of the Early Bronze Age (500,000 - 2000 B.C.) were found in all three seasons (FIG. 2). More substantial remains from this time-frame were found at the Mousterian site of 'Ain Difla, WHS 634 (Lindly and Clark 1987); the Epipa-laeolithic site of Ṭabaqa, WHS Site 895 (Byrd and Rollefson 1984); and at Khirbet al-Ḥammam/Abu Ghrab, WHS Site 149, a PPNB village site (Rollefson and Kafafi 1985). Clark initiated the "Wadi al-Ḥasa Paleolithic Project" in 1984 (Clark *et al.* 1988); and Villeneuve began work in 1984 at WHS Sites 253 and 254, Qaṣr and Khirbet adh-Dhariḥ respectively (1984; 1985a, b; 1986). Clark's work in the area involves more intensive surveying and testing of several of the WHS sites (Lindly and Clark 1987).



2. Global site frequencies by time period, from the Lower Palaeolithic to the Pre-pottery Neolithic.

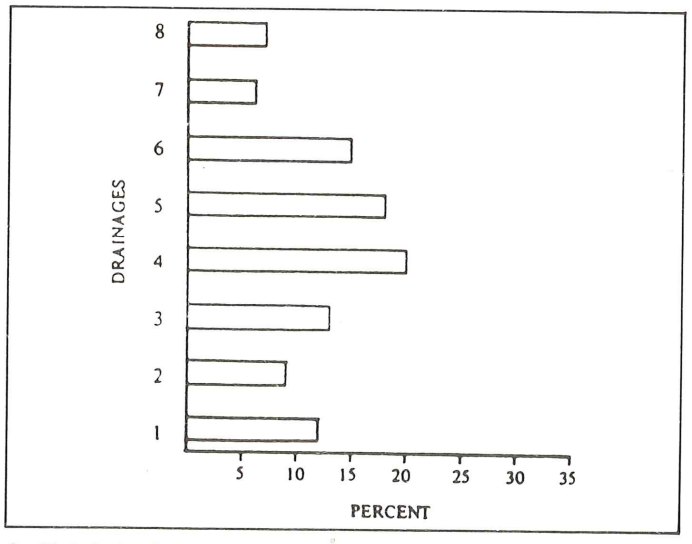
Ceramic materials covering the period from the Pottery Neolithic to the end of the Ottoman domination in Jordan (*c.* 4750 B.C. - A.D. 1918) are also present in the area (TABLE 1). However, not all ceramic periods are present.

Table 1 Ceramic period sites of the WHS.

Period	No. of sites	Percentage
PNL	5	0.47
CHAL, CHAL-EB	16	1.49
EB I-IV	50	4.66
IRON I-II	97	9.03
HELL, HELL/EROM	15	1.40
NAB, NAB-ROM, NAB/ROM	257	23.93
ROM, LROM, LROM-BYZ	106	9.87
BYZ, BYZ-UM, BYZ/UM	130	12.10
EISL	6	0.56
LISL	168	15.64
OTT/MOD, LOTT/MOD	140	13.04
UD	368	34.26

5. History of Occupation and Settlement Patterns

On the basis of the materials collected, occupation in the area is attested for the past several hundred thousand years. Materials for the Palaeolithic periods were organized by seven, time-stratigraphic, analytical units: (1) The Lower/Middle Palaeolithic (undifferentiated); (2) The Middle Palaeolithic; (3) The Middle/Upper Palaeolithic (combined); (4) The Upper Palaeolithic; (5) The Upper/Epipalaeolithic (combined); (6) The Epipalaeolithic/Prepottery Neolithic (combined); and (7) The Prepottery Neolithic (Coinman, Clark and Lindly 1988) (FIG. 2). Coinman, Clark and Lindly (1988) provide global site frequencies by tributary drainages (FIG. 3).



3. Global site frequencies by tributary drainages.

Little evidence of Pottery Neolithic presence was found in the area. The number of Chalcolithic sites seems to indicate an increase in population at this time. This trend towards increased population continues into the EBI. However, it does not continue into the EBII-IV. The Middle Bronze Age seems to be one in which virtually nothing was taking place in the survey area. The Late Bronze Age is also poorly represented in the area. However, there is evidence for the beginning of settlement at the very end of this period. There are further indications of population increase during the Iron Age I. There does appear to be permanent, albeit small, settlements along the south bank of Wadi al-Ḥasa by the 12th century B.C. but only in the western universe. The population increase seems to accelerate during the Iron II. However, even during this period, Wadi al-'Ali seems to be the eastern frontier for sedentary and pastoral occupation. On the basis of the present data, it is impossible to say whether or not there was continuity in the territory between the end of the Iron II and the Hellenistic period. The latter period shows evidence of only a slight population. Nabataean sites are more numerous than those from any other ceramic period. They are found throughout the area and particularly in the wadis. This is especially true in the western and central universes. However, even in the eastern universe, there are important Nabataean forts and/or caravanserais. Roman period sites are also found throughout the territory. Parts of the *Via Nova Traiana*, WHS Site 429, are well preserved in the central universe. Next to the Nabataean, the Byzantine period seems to be the one of greatest population in the area. However, the settlement pattern is changed from the previous one. The Byzantine presence is heaviest in the western universe, especially on the plateau. The Byzantines do not appear to have made as much use of the wadis as the Nabataeans did. Very little evidence of Byzantine presence was found in the central universe. Byzantine presence in the eastern universe is generally associated with Nabataean-Roman sites. Early Islamic evidence is almost completely absent from the area. There are, however, several major Ayyubid/Mamluk sites in the western universe at the beginning of the Late Islamic period. Ottoman-Modern period sites, especially in the form of sherd scatters, are found throughout the area. However, major village sites from the period are found in the western universe. Moreover, there are Ottoman period village sites in the eastern universe associated with the pilgrimage route to Mecca (MacDonald *et al.* 1988).

References

Bender, F. 1974. *Geology of Jordan.* Berlin-Stuttgart: Gebruder Borntraeger.

Byrd, B.F. and Rollefson, G.O. 1984. Natufian Occupation in the Wadi el-Ḥasa, Southern Jordan. *Annual of*

the Department of Antiquities of Jordan 28: 143-150.

Clark, G. *et al.* 1988. Excavations at Middle, Upper and Epipalaeolithic Site in the Wadi Ḥasa, West-Central Jordan. Pp. 209-285 in A. Garrard and H.G. Gebel (eds), *The Prehistory of Jordan*. Oxford: BAR Int. Ser. 396(i).

Coinman, N., Clark, G.A. and Lindly, J. 1988. A Diachronic Study of Paleolithic and Early Neolithic Site Placement Patterns in the Southern Tributaries of the Wadi el-Ḥasa. Pp. 48-86 in B. MacDonald *et al.*, *The Wadi el-Ḥasa Archaeological Survey 1979-1983, West-Central Jordan*. Waterloo, Ontario: Wilfrid Laurier University Press.

Donahue, J. and Beynon, D.E. 1988. Geologic History of the Wadi el-Ḥasa Survey Area. Pp. 26-39 in B. MacDonald *et al.*, *The Wadi el-Ḥasa Archaeological Survey 1979-1983, West-Central Jordan*. Waterloo, Ontario: Wilfrid Laurier University Press.

Glueck, N. 1934. Explorations in Eastern Palestine, I. *Annual of the American Schools of Oriental Research*. 14: 1-113.

——, 1935. Explorations in Eastern Palestine, II. *Annual of the American Schools of Oriental Research* 15.

——, 1937. The Nabataean Temple of Khirbet et-Tannûr. *Bulletin of the American Schools of Oriental Research* 67: 6-16.

——, 1939. Explorations in Eastern Palestine, III. *Annual of the American Schools of Oriental Research* 18-19.

——, 1965. *Deities and Dolphins: The Story of the Nabataeans*. New York: Farrar, Straus and Giroux.

——, 1978. Et-Tannûr, Khirbet. Pp. 1152-59 in M. Avi-Yonah (ed), *Encyclopedia of Archaeological Excavations in the Holy Land*, Vol. 4 Englewood Cliffs, N.J.: Prentice-Hall.

Harlan, J.R. 1988. Natural Resources. Pp. 40-47 in B. MacDonald *et al.*, *The Wadi el-Ḥasa Archaeological Survey 1979-1983, West-Central Jordan*. Waterloo, Ontario: Wilfrid Laurier University Press.

Ibrahim, M.M. 1974. Excavations in Jordan: 1973-1974. *Annual of the Department of Antiquities of Jordan* 19: 16-17 (Arabic Section).

Lindly, J. and Clark, G. 1987. A Preliminary Lithic Analysis of the Mousterian Site of 'Ain Difla (WHS Site 634) in the Wadi Ali, West-Central Jordan. *Proceedings of the Prehistoric Society* 53: 279-292.

MacDonald, B., Banning, E.B. and Pavlish, L.A. 1980. The Wadi el-Ḥasa Survey 1979: A Preliminary Report. *Annual of the Department of Antiquities of Jordan* 24: 169-183.

MacDonald, B., Rollefson, G.O. and Roller, D.W. 1982. The Wadi el Ḥasa Survey 1981: A Preliminary Report. *Annual of the Department of Antiquities of Jordan* 26: 117-131.

MacDonald, B. *et al.* 1983. The Wadi el-Ḥasa Archaeological Survey 1982: A Preliminary Report. *Annual of the Department of Antiquities of Jordan* 27: 311-323.

MacDonald, B. *et al.* 1988. *The Wadi el-Ḥasa Archaeological Survey 1979-1983, West-Central Jordan*. Waterloo, Canada: Wilfrid Laurier University Press.

Rollefson, G.O. and Kafafi, Z. 1985. Khirbet Ḥammam: A PPNB Village in the Wadi el-Ḥasa, Southern Jordan. *Bulletin of the American Schools of Oriental Research* 258: 63-69.

Villeneuve, F. 1984. Première campagne de fouilles à Khirbet edh-Dharib, Wadi Laaban. *Liber Annus* 34: 437-440.

——, 1985a. Deuxième campagne de fouilles à Khirbet edh-Dharib (1985). *Liber Annus* 35: 402-405.

——, 1985b. Khirbet edh-Dharib (1984). *Revue Biblique* 92: 421-426.

——, 1986. Khirbet edh-Dharib (1985). *Revue Biblique* 93: 247-252.

Weippert, M. 1975. The Israelite 'Conquest' and the Evidence from Transjordan. Pp. 15-34 in F.J. Cross (ed), *Symposia Celebrating the Seventy-Fifth Anniversary of the American Schools of Oriental Research (1900-1975)*. Cambridge, MA: American Schools of Oriental Research.