

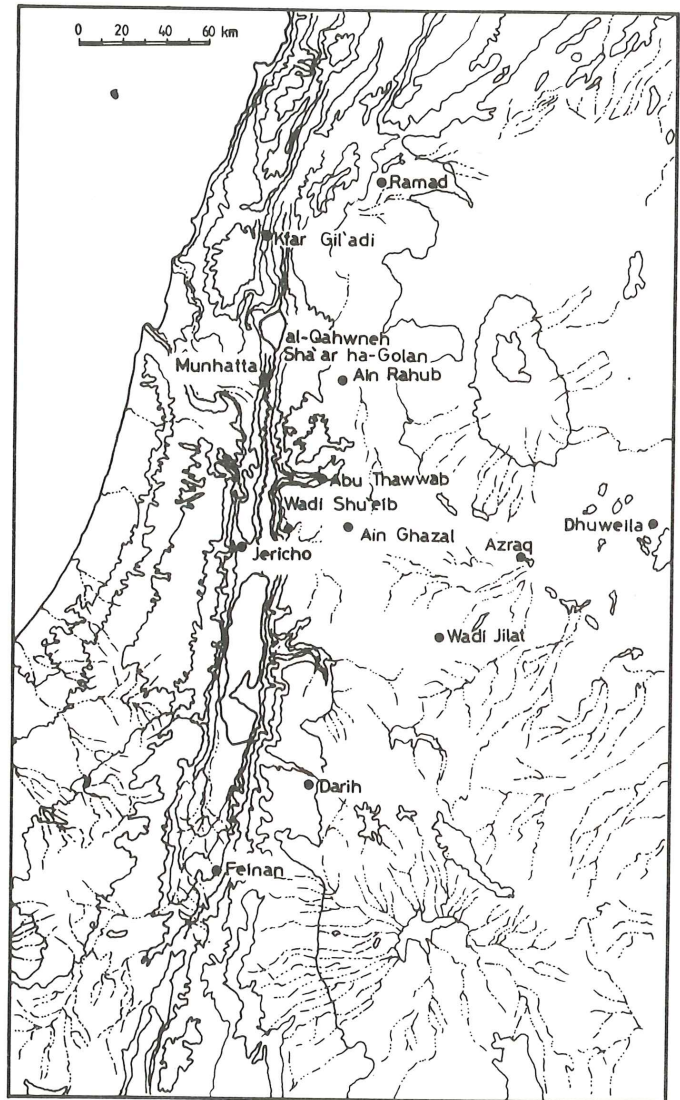
Pottery Neolithic Settlement Patterns in Jordan

It has been suggested by some scholars (e.g. Kenyon 1981; Perrot 1968) that many Neolithic sites in Bilad ash-Sham have Aceramic and Ceramic levels which are separated by a gap of undetermined length. The situation, however, varies from one geographical zone to another. A discussion of the three main geographical zones in Jordan (the Jordan Valley, the Mountain Range and the Desert) is presented below.

Since we have no major excavated Aceramic sites in the eastern part of the Jordan Valley, examples from the western side will be used. Major PPNB sites such as Jericho and Munhatta were abandoned for an undetermined period before they were reoccupied by the Pottery Neolithic people. It has also been suggested that the Jordan Valley experienced a dry period during the early sixth millennium B.C. (Koucky and Smith 1986: 34), and Kirkbride has argued that the hiatus between the Pre-Pottery and the Pottery Neolithic was caused by climatic changes (Kirkbride 1971). The recent excavations undertaken in the Jordan Valley do not contradict the above information.

Recent archaeological excavations on Neolithic sites located on the Jordanian mountain range, e.g. 'Ain Ghazal and Wadi Shu'eib, (FIG. 1) demonstrate that these sites continued to be occupied from the Aceramic to the Ceramic periods without interruption. At 'Ain Ghazal, during the 1984 season, the excavators encountered for the first time Pottery Neolithic cultural remains, including pottery sherds, subterranean pit-dwellings and flint artefacts (Rollefson and Simmons 1986; 1988; Kafafi 1990). During the 1988 season, it was determined that the PPNC (Final PPN) architectural remains were re-used by the Pottery Neolithic inhabitants and new Yarmoukian structures were built directly over the earlier ones. In addition, PPNC cultural remains like small arrowheads and White Ware objects continued to be manufactured by the Yarmoukians (Rollefson, Kafafi and Simmons 1989).

The site of Wadi Shu'eib, located c. 9 km to the southwest of the city as-Salt on the north bank of Wadi Shu'eib (which flows into the Jordan River), yielded archaeological deposits from the Pre-Pottery and Pottery Neolithic Periods. The excavations of the site reported



1. Map showing the major Pottery Neolithic sites in Jordan.

Pottery Neolithic structures built directly over the PPNC remains (Simmons *et al.* 1989).

In summary, the Pottery Neolithic villages found on the mountain range represent either a continuation of Aceramic settlement or newly established villages. These villages are located on banks of wadis or near springs where perennial water is available. And it is possible that the climate of the mountain range was more pleasant for the inhabitants than either the Jordan Valley or the desert areas.

Settlement patterns in the Jordanian desert attest considerable modification during the sixth millennium B.C. The sixth millennium B.C. sites found differ from the earlier sites in size and function. Archaeological excavations and surveys undertaken in the desert indicate that the area was continuously occupied. The large PPNB villages were replaced by seasonal camps used by pastoralists, semi-nomads or nomads and hunters (Garrard *et al.* 1985a; 1985b; 1986; 1988; Betts 1983; 1984). However, no permanent settlements with pottery have been found up till now, except at Dhuweila where A. Betts excavated very few sherds in the top levels (Betts 1988).

The site of 'Ain Abu Nukheileh in the Wadi Ramm area represents one of the seasonal camps inhabited by people who relied heavily on hunting. This site yielded material culture dated to the beginning of the sixth millennium B.C. (Kirkbride 1978: 9).

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Recent archaeological excavations at the site of 'Ain Ghazal indicate that the production of pottery in Jordan was not introduced by newcomers as was previously argued (Mellaart 1975; de Vaux 1966; Anati 1963: 263, 277). Furthermore, as mentioned above, many Pre-Pottery Neolithic B traditions continued into the Pottery Neolithic period. These include rectangular buildings and White Ware objects. In addition to the established sites of the earlier periods in different areas of Jordan, new sites were erected during the sixth millennium B.C. A discussion of the settlement patterns during the sixth and fifth millennia B.C. in the three main geographical zones in Jordan is presented below (cf. TABLE 1).

a. The Jordan Valley and Wadi 'Arabah

1. *The Jordan Valley*: Due to the fact that no representative Pottery Neolithic sites have yet been excavated in the eastern part of the Jordan Valley, examples from the western side are discussed below.

The site of Jericho is one of the important Neolithic villages established in the Jordan Valley during the ninth millennium B.C. The excavations revealed that the site had been abandoned for several hundred years after it flourished during the PPNB (Kenyon 1981). It has been suggested that the new settlers of the site during the Pottery Neolithic period came either from the east (Anati 1963: 277) or from the north or northeast (Mellaart 1975: 138) and brought with them their pottery tradition. Moreover, the Pottery Neolithic settlers of Jericho inhabited subterra-

nean pit-dwellings which replaced the well built houses of the PPNB. In the centres of some of these pit-dwellings (c. 10-12m in diameter) circular huts (c. 3m in diameter) were constructed of bun-shaped mud-bricks on stone foundations (Kenyon 1981; Kenyon and Holland 1982). Similar pit-dwellings were also excavated at Munḥaṭa 2B1 (Perrot 1966). This kind of structure was followed in the Pottery Neolithic B (fifth millennium B.C.) by rectangular houses measuring c. 4 by 9m with clay floors, e.g. Jericho VIII and Munḥaṭa Stratum 2A. At Jericho circular huts from the PNA continued alongside the new rectangular structures.

Elements of the Jericho PNA culture have been excavated at various sites in Jordan; at Dhariḥ (Bossut, Kafafi and Dollfus 1988), Dhra' (Bennett 1980) and Wadi Shu'eib (Simmons *et al.* 1989), and in Palestine at Sheikh 'Ali (Prausnitz 1970), Munḥaṭa (Perrot 1968), Giv'at ha-Parsa (Olami; Burian and Friedmann 1977) and Tuleilat Batashi (Kaplan 1958).

We lack detailed information concerning the economy of the Jordan Valley settlers during the Pottery Neolithic periods. It has been noted, however, that the inhabitants of Stratum 2 at Munḥaṭa used the gazelle (25%), pig (22.3%), cattle (19.9%), wild sheep (19.5%), roe deer (6.7%) and goat (3.3%) for their diet (Ducos 1968; 1969). And the people of the Pottery Neolithic Jericho domesticated sheep and goat (Clutton-Brock 1971). It has been argued that the majority of the Pottery Neolithic settlers in the Jordan Valley practiced herding and hunting, and the mountainous regions on the west and east sides were the hunting and herding grounds (Bar-Yosef 1987: 116).

The analyzed floral remains from Jericho indicate that the inhabitants cultivated *Hordeum distichum* (barley), *Triticum monococcum* (einkorn wheat), *Triticum dicoccum* (emmer wheat), *Bromus* and *Cruciferae* (Hopf 1969: 356). This evidence from Jericho suggests that farming was practiced as well.

2. *Wadi 'Arabah*: Archaeological excavations, soundings and surveys in the area of Wadi 'Arabah, have yielded evidence of human occupation from the sixth millennium B.C. (Raikes 1980; Bennett 1980; Hauptmann and Weisgerber, personnel communication).

Raikes, who explored the whole area, stated that "flint implements and other remains from the Stone Ages are found all over Wadi 'Araba" (Raikes 1980: 40). From soundings at Sites A-D in Wadi Feinan, c. 43 km south of the Dead Sea, Raikes determined that this semi-arid area had been occupied during the sixth millennium B.C. by settlers who practiced the cultivation of crops. Unfortunately, no information about the faunal and floral remains has been published. However, pieces of a basalt quern or grinder and water conduits were noted (Raikes 1980: 44). The sounded sites are small in size (ranging between 1 to 4 acres) and are located on the Wadi Feinan side near springs that served as permanent water sources for the area. The inhabitants lived in houses built of boulders that were either rectangular (Site B) or circular (Site D). Although

Table 1. Investigated Late Neolithic sites in Jordan.

Pottery Neolithic Sites

No.	Site Name	Dates	Area	Fauna	Flora	Architecture	Social Life	Comments
1.	Munḥaṭa	1. Yarmoukian 2. Munhata Phase 2B1 (Jericho PNA) 3. No C14	Stratum 2 - Area is undefined	Gazelle 25% pig 22.3% cattle 19.9% wild sheep 19.5% roe deer 6.7% goat 3.3%	?	1. Pit-dwelling 2. Round semi-subterranean huts, 3-4m in diameter	Herding Hunting Pastoralist	1. Increase of cattle 2. Increase caprinae 3. Presence small caprinae 4. Storage pits.
2.	Jericho	1. PNA 2. PNB	Stratum IX Stratum VIII		H. distichum T. monoccum T. dicoccum Bromus Cruciferae	- Pit-dwelling (PNA+PNB) - rectangular houses (PNB)	- Herders - Pastoralists. - Farmers (PNB)	
3.	Ghrubba	1. PNB 2. No C14	Pit Levels 5-15	?	?	Pit-dwelling	?	- Levels 0-4 are dated to the Chalcolithic
4.	Dhra'	1. PNA 2. PNB 3. No C14	Undefined Areas I+IV	?	?	- Pit-dwelling	?	- PPN flint artefacts
5.	Tell Wadi Feinan	1. Wadi cut 6410±115 BP 5520-5270 BC 2. Excavation 6110±75 BP 5210-4910 BC	The sites extends 100m alongside Wadi Feinan and 50m south	?	?	- Rectangular structures, 'the stones for building the foundation were brought from Wadi Feinan	- Farmers	Hauptmann and Weisgerber (personnel communication)
6.	'Ain Raḥub	1. Yarmoukian 2. C14 date: 7480±90 BP	Sounding 3×1m and 3.3m below present-day surface	?	1. T. dicoccum (emmer wheat) 2. H. distichum (two-rowed hulled barley) 3. Linum usitatissimum (flax) Wood: 1. Deciduous oak 2. Pistacia atlantica 3. Medick 4. Clover 5. Mallous 6. Rye grass	mud-brick debris	?	- Late Natufian occupation
7.	Abu Thawwab	1. Yarmoukian	c. 300×200m	1. Ovis/capra 68% 2. Gazella sp. 15.2% 3. Bos sp. 12.8% 4. Equus sp. 2.4% 5. One piece Canis sp. 6. One piece Sus sp.	a. Cultivated: 1. lentil 2. emmer wheat 3. field pea 4. two rowed barley b. Wood: 1. pistachio 2. almond	1. Rectangular 2. Rounded 3. Storage pits	1. Farmers 2. Hunters 3. Gatherers	Early Bronze I occupation

Table 1 cont.

No.	Site Name	Dates	Area	Fauna	Flora	Architecture	Social Life	Comments
8.	'Ain Ghazal	1. Yarmoukian 2. No C14 dates from the Yarmoukian	Undefined	1. Capra sp. (goat) 70% 2. Gazelle 6.4% 3. Bos (cattle) 9.1% 4. Sus (boar) 10.8% 5. Equus (onager) 1.35%	?	1. Rectangular 2. Apical 3. Sub-terranean pits	1. Farmers?? 2. Pastoralists	1. PPNB and PPNC occupations
9.	Wadi Shu'eib	1. Yarmoukian 2. Jericho PNA 3. No C14 dates	Soundings	?	?	1. Rectangular 2. Sub-terranean pits	1. Farmers??	1. Pottery Neo. burials 2. PPN
10.	Dhuweila	1. Late Neo. 2. No C14 from the LN	c. 240 sq m	- domestic sheep/goat - Gazelle - Wild ass and hare	?	- Elongated structure over 8m long	1. Hunters	PPNB and LN small hunting camp. - Few pottery sherds - C14: 8190±60 BP (6240 BC)
11.	Jilat 23	- Burin site - No C14 date	4500 sq m	?	?	1. Stone circle c. 18m diameter 2. Two small circles, 5m diameter	Pastoralism	Burin site
12.	Jilat 24	- Burin site	390 sq m	?	?	1. A single stone circle 4.5m external 3.5m internal	Pastoralist	Burin site
13.	Azraq 31	- Late PPNB - Late Neo. - C14: 8350±120 BP	4300 sq m	1. Goat and sheep 12.5% 2. Gazelle sp. 3. Lepus cap. 4. Equus sp. 5. Bos primigenius 6. Vulpes sp. 7. Canis lupus 8. Felis sp.	- Cultivated barley (H. Sativum) - Wheat (T. riticum sp.) - Grasses	- Hearths - pavement of angular limestone pebbles	- Pastoralism - Small farming	- Appearance of domesticated goat and sheep
14.	Jabal Na'ja	- Burin site - C14: 7340±100 BP (5480 BC)	?	1. Sheep/goat 2. Hare 3. Gazelle	?	- Three hearths	Pastoralism	Burin site

no C14 dates have been published from the sites reported by Raikes, the flint tool industry and the excavated pottery sherds at Site B date to the second half of the sixth millennium B.C. (Raikes 1980: 44).

The excavations of the joint expedition of the Department of Antiquities of Jordan and the Bergbau-Museum at Bocham/West Germany at the Site "Tell Wadi Feinan" produced Pottery Neolithic archaeological material, i.e. bifacial retouched very small arrow-heads (Najjar *et al.*

1990). The site consists of a small low hill located directly on Wadi Feinan which cuts it on the northwestern side. Excavations have demonstrated that the area continued to be inhabited during the succeeding periods without any interruption.

The following C14 dates from Tell Feinan indicate that the site was occupied during the second half of the sixth and the fifth millennia B.C. (Najjar *et al.* 1990: 32):

a. C14 dates from the cut made by Wadi Feinan

(Profile B):

1. 6410 +/- 115 b.p. (uncalibrated)
5520 - 5270 B.C. (calibrated)
 2. 6360 +/- 45 b.p.
5345 - 5240 B.C.
- b. C14 dates from the Tell excavations:
1. 6110 +/- 75 b.p. (uncalibrated)
5210 - 4910 B.C. (calibrated)
 2. 5375 +/- 30 b.p.
4330 - 4165 B.C.
 3. 5740 +/- 35 b.p.
4675 - 4575 B.C.

Another Pottery Neolithic village that was found by Raikes and sounded by Bennett in the area of Bab adh-Dhra', just to the north of Wadi 'Arabah, is the PNA and PNB site of Dhra'. The site, Dhra', lies on the southern side of Wadi adh-Dhra', near the spring of Dhra'. The soundings revealed that the inhabitants lived in pit-dwellings. Grinding and grounding stones, flint tools and pottery vessels of the Jericho PNA and PNB traditions were excavated (Bennett 1980). Although no faunal or floral remains are published, the excavated cultural remains allow us to argue that the site may have functioned as a farming village.

b. *The Mountain Range (Highlands)*

Scholars of the Near East Neolithic have concentrated their efforts on the Pre-Pottery Neolithic. The Pottery Neolithic received less attention. This is perhaps due to the fact that priority was given to the study of the origins of agriculture. However, during the last few years in Jordan, archaeological research undertaken on the mountain range revealed that the area was heavily occupied during the Pottery Neolithic. The sites of 'Ain Raḥub (Gebel and Muheisen 1985; Muheisen *et al.* 1988), Abu Thawwab (Kafafi 1988), 'Ain Ghazal (Rollefson and Simmons 1988; Simmons *et al.* 1988), Wadi Shu'eib (Simmons *et al.* 1989) and Dhariḥ (Bossut, Kafafi and Dollfus 1988) were excavated or sounded. Some of these sites either continued to be occupied from the Pre-Pottery to the Pottery Neolithic, e.g. 'Ain Ghazal and perhaps Wadi Shu'eib, or were newly established, e.g. 'Ain Raḥub, Abu Thawwab and Dhariḥ.

The site of 'Ain Raḥub, which was sounded in 1985 by M. Muheisen and Hans G. Gebel, is located c. 13 km northwest of Irbid, northern Jordan, on the lower terrace of the west bank of Wadi ar-Raḥub. The soundings revealed Natufian and Pottery Neolithic (Yarmoukian) archaeological remains. The floral remains studied by R. Neef indicate that the Yarmoukian people of 'Ain Raḥub cultivated emmer wheat (*Triticum diococcum*) and two-rowed barley. Only one grain of einkorn wheat (*Triticum monococcum*) was recovered. Flax (*Linum usitatissimum*) was also domesticated. A single C14 date was obtained from the test unit containing the Yarmoukian remains: 7480 +/- 90 b.p. (GrN - 14539) (Muheisen *et al.* 1988: 498).

The argument that the settlers of 'Ain Ghazal had switched from their PPN agricultural life-style (from farmers during the Pre-Pottery) to pastoralists during the Pottery Neolithic based on the shift of economy (Simmons *et al.* 1988: 38) may be acceptable for sites in the desert area, but not for those established sites on the mountain range. At 'Ain Ghazal the economic situation during the sixth millennium remains vague. Faunal and floral remains, and the very small number of excavated sickle blades show a decline in the economy. This decline has been attributed to a change of life-style of the inhabitants from farmers during the PPNB to pastoralists in the Pottery Neolithic period (Simmons *et al.* 1988: 37-39; Rollefson and Simmons 1988: 417; Köhler-Rollefson, Gillespie and Metzger 1988). This deduction is based on a limited amount of material culture excavated from a small area of the site of 'Ain Ghazal during the 1984 season. Results of the 1988 season of excavations at 'Ain Ghazal contradict this argument.

The Pottery Neolithic (Yarmoukian) settlers at 'Ain Ghazal built either apsidal or rectangular permanent houses. Due to the larger excavated area during the 1985 and 1988 seasons, it was determined that the Yarmoukians settled at both the South and Central Fields of the site. Yarmoukian cultural remains including pottery sherds, flint tools and other small objects were found all over the site. The preliminary study of the Yarmoukian pottery from the site indicates that the settlers manufactured a large number of jars for their daily use (Kafafi 1990). This may indicate that the 'Ain Ghazal settlers of the Pottery Neolithic stored their food or products inside those jars. Similar jars were excavated at 'Ain Raḥub and Abu Thawwab.

It seems that the Yarmoukian inhabitants of 'Ain Ghazal practiced different subsistence strategies. They inhabited the site throughout the year. Part of the community cultivated plants and others were herders and hunters. Both domesticated and wild animals are attested in the Pottery Neolithic levels. They domesticated goats (*Capra sp.*, 70.6%) and cattle (*Bos* 9.1%). Bones of boar (*Sus*, 10.8%), gazelle (6.4%) and onager (*Equus*, 1.35%) were found (Köhler-Rollefson, Gillespie and Metzger 1988: 426; TABLE 1). Unfortunately, no information about the Yarmoukian floral remains from the site is published or available yet.

The settlers of the Yarmoukian village of Abu Thawwab (c. 200 by 300 m in size, located on the main road between Şweileḥ and Jarash), were farmers, hunters and gatherers (Kafafi 1988). The water sources of the site and the surrounded area are the perennial Wadi ar-Rumman, which flows into 'Ain Ras al-Ma' and other springs such as 'Ain Umm Karam, 'Ain Umm Rabi' and 'Ain Şafşafa. The Yarmoukian people at Abu Thawwab resided in rectangular or curvilinear houses built of boulders. They stored their crops in storage jars or in pits dug into the earth (Kafafi 1985a).

The inhabitants of Abu Thawwab cultivated lentils (*Lens*

culinaris), emmer wheat (*Triticum dicoccum*), field pea (*Pisum sativum*) and two-rowed barley (*Hordeum distichum*). They gathered pistachio (*Pistacia* sp.) and almond (*Amygdalus* sp.) (Neef, report in preparation).

Domesticated and wild animal bones were excavated from the site. Goat and sheep (*Ovis/Capra* sp.) predominate (68%). There is also gazelle (*Gazelle* sp., 15%), cattle (*Bos* sp., 12.8%) and three bones of onager (*Equus* sp., 2.4%) and one each of boar (*Sus* sp.) and *Canis* sp. (Köhler-Rollefson, report in preparation).

The large number of sickle-blades and grinding and grinding stones indicates the agricultural style of life, while the large quantity of small bifacial retouched arrow-heads indicates that hunting was also widely practiced.

Six other smaller Yarmoukian sites were registered in the area of Abu Thawwab during ar-Rumman survey in 1985 (Gordon and Knauf 1987). Since Abu Thawwab is located in the middle of these sites, larger than all of them and closer to the water sources; this suggests that the site was a central village for the surrounding area.

Other Pottery Neolithic villages, e.g. Wadi Shu'eib (Simmons *et al.* 1989) and Dharih (Bossut, Kafafi and Dollfus 1988) which were founded on the mountain range, are still under investigation. Recent excavations at Wadi Shu'eib uncovered rectangular houses built of stone. Subterranean pits that contained Yarmoukian and Jericho PNA pottery were excavated as well. The site is located near a spring on the northern side of Wadi Shu'eib and c. 9 km to the west of as-Salt (Rollefson 1987). Due to the small area excavated nothing precise can be said about the nature of the occupation. However, the location of the site, the large number of grinding and grinding stones collected from the surface and the permanent water sources suggest a farming community.

Wadi Shu'eib is the only site which has provided us with information about burial customs during the Pottery Neolithic period in Jordan. Two burials excavated in Area II (Nos. 3 and 4) in 1988 assigned to this period indicated that the community continued the PPNB practice of burying the dead in the residential areas (Butler *nd*). Burial 3 belonged to a child about 18 +/- 6 months of age. It was situated to the southwest of a house and was enclosed by a circle of stones. The body was put in a flexed position.

Burial No. 4 was located in the area of Burial 3. It was a secondary burial of an adult. The long bones of the skeleton were arranged parallel to each other and their axes oriented approximately north/south (Butler *nd*).

c. The Desert Area

Archaeological investigations undertaken by Andrew Garrard and Alison Betts in the Desert Area indicate that the inhabitants of the early sixth millennium B.C. lived in seasonal hunting camps, called "Burin Sites" (Garrard *et al.* 1985a; 1986; 1987; 1988; Betts 1983; 1984; 1988). These

sites differ in size, ranging between 4500 sq m at Jilat 23 (Garrard *et al.* 1987:7) and 240 sq m at Dhweila (Betts 1988). It has recognized that the desert dwellers built large stone circles of upright slabs measure c. 18 m in diameter at Jilat 23.

The economy was based mainly on hunting and pastoralism. There is little evidence of cultivation. At Azraq 31, Dhweila and Jabal Na'ja gazelle and hare were hunted. Domesticated sheep and goat were identified at the Site Azraq 31 (Garrard *et al.* 1988: 333) and Dhweila (Betts 1988).

The site of Azraq 31 is the only site in the desert area where barley (*Hordeum sativum*) and wheat (*Triticum* sp.) were cultivated. Grasses, cyperaceae, and legum seed were also collected (Garrard *et al.* 1988: 332).

C14 dates from Azraq 31 (8350 +/- 120 B.P.) and Jabal Na'ja (7340 +/- 100 B.P.) indicate that the burin sites were established during the first half of the sixth millennium B.C. No pottery sherds were excavated at those sites except for the above mentioned ones from Dhweila.

It may be worth mentioning here that many desert sites produced small bifacial retouched arrow-heads. This type of flint tools was encountered at the Pottery Neolithic from other areas in Jordan. Thus, it may indicate that the inhabitants of the Jordanian Desert, during the sixth millennium B.C., were in contact with the farming villages in the other areas of the country. Moreover, burin sites were spreading from the eastern Jordanian desert area to Amman in the mountainous region (Rollefson, Kaechle and Kaechle 1982; Simmons and Kafafi 1988).

Conclusions

To conclude, the Pottery Neolithic cultures of Jordan were diversified by differing bases of food production. During this period there was a strong emphasis on agriculture, especially in the coastal and mountain ranges, though herding of domesticated animals played an important role in the subsistence of the population as well. Gathering of wild fruits and hunting of animals continued to be practiced.

The inhabitants of Jordan manufactured pottery vessels for their daily use. Two pottery traditions are recognizable and perhaps were contemporaneous during the sixth millennium B.C.; the Yarmoukian and the Jericho PNA. These two pottery traditions may reflect different populations. The Yarmoukians settled in the areas of the Jordan Valley from Yarmouk River in the north as far as al-Qahwaneh "Sha'ar ha-Golan", in Wadi 'Arabah at Tell Feinan and in the mountain ranges at sites such as 'Ain Raḥub, Abu Thawwab, Wadi Shu'eib and 'Ain Ghazal.

The Pottery Neolithic A group also settled in the Jordan Valley, as at Munḥaṭa, Sheikh 'Ali and Jericho, and spread in Jordan at Wadi Shu'eib, Dharih (near aṭ-Ṭafilah) and Dhra' just to the north of Wadi 'Arabah.

The Yarmoukians in the Jordan Valley inhabited pit-dwellings as in the cases of al-Qahwaneh and Munḥaṭa.

On the other hand, the Yarmoukians who lived on the mountain ranges built themselves well constructed stone houses as at Abu Thawwab, 'Ain Ghazal and Wadi Shu'eib.

The Pottery Neolithic A people lived in huts and in pit-dwellings. This kind of pit was encountered at the sites of Wadi Shu'eib and Dhra'. The PNA Culture was succeeded on many sites during the PNB (Pottery Neolithic B) by people more developed than their predecessors. Their houses were rectangular in shape and built of bun-shaped mud-bricks as at Jericho. Although the excavations of Tell ash-Shuna North (Gustavson-Gaube 1985; 1986) and the soundings at Ghрубba (Mellaart 1956) revealed archaeological remains of the Jericho PNB tradition (fifth millennium B.C.), and surveys of the different areas in Jordan recorded many sites from the PNB tradition, we still lack excavated sites and detailed information about the nature of the settlement patterns from the fifth millennium B.C.

Bibliography

- Anati, E. 1963. *Palestine Before the Hebrews*. New York: Alfred A. Knopf, Inc.
- Bar-Yosef, O. 1987. Prehistory of the Jordan Rift. *Israel Journal of Earth Science* 36: 107-119.
- Bennett, C. 1980. Soundings at Dhra'. *Levant* 12: 30-40.
- Betts, A. 1983. Black Desert Survey: First Preliminary Report. *Levant* 15: 1-11.
- , 1984. Black Desert Survey, Jordan: Second Preliminary Report. *Levant* 16: 25-35.
- , 1988. The Black Desert Survey. Prehistoric Sites and Subsistence Strategies in Eastern Jordan. Pp. 369-391 in A. Garrard and H.G. Gebel (eds), *The Prehistory of Jordan*. Oxford: BAR Int. Ser. 396(ii).
- Bossut, P., Kafafi, Z. and Dollfus, G. 1988. Khirbet ed-Dharih (Survey Site 49/WHS 524), un nouveau gisement néolithique avec céramique du Sud-jordanien. *Paléorient* 14(1): 127-131.
- Buttler, C. n.d. Burial Excavations at 'Ain Ghazal and Wadi Shu'eib, Jordan: A Preliminary Report on the 1988 Season. Unpublished Report.
- Clutton-Brock, J. 1971. The Primary Food Animals of the Jericho Tell from the Proto-Neolithic to the Byzantine Period. *Levant* 3: 31-41.
- Ducos, P. 1968. *L'origine des animaux domestique en Palestine*. Bordeaux: Dalmas.
- , 1969. Methodology and Results of the Study of the Earliest Animals in the Near East (Palestine). Pp. 265-275 in P.J. Ucko and G.W. Dimbleby (eds), *The Domestication and Exploitation of Plants and Animals*. London: Gerald Duckworth and Co.
- Garrard, A., Harvey, P., Hivernel, F. and Byrd, B. 1985a. The Environmental History of the Azraq Basin. Pp. 109-115 in A. Hadidi (ed), *Studies in the History and Archaeology of Jordan, II*. Amman: Department of Antiquities.
- Garrard, A., Byrd, B., Harvey, P. and Hivernel, F. 1985b. Prehistoric Environment and Settlement in the Azraq Basin. Report on the 1982 Season. *Levant* 17: 1-28.
- Garrard, A., Byrd, B. and Betts, A. 1986. Prehistoric Environment and Settlement in the Azraq Basin. An Interim Report on the 1984 Excavation Season. *Levant* 18: 5-24.
- Garrard, A.N., Betts, A., Byrd, B. and Hunt, C. 1987. Prehistoric Environment and Settlement in the Azraq Basin. An Interim Report on the 1985 Excavation Season. *Levant* 19: 5-25.
- Garrard, A., Betts, A., Byrd, B., Colledge, S. and Hunt, C. 1988. Summary of Palaeoenvironmental and Prehistoric Investigations in the Azraq Basin. Pp. 311-337 in A. Garrard and H. Gebel (eds), *The Prehistory of Jordan*. Oxford: BAR Int. Ser. 396(ii).
- Gebel, H.G. and Muheisen, M. 1988. Note on 'Ain Rahub, a New Late Natufian Site Near Irbid, Jordan. *Paléorient* 11/1: 107-111.
- Gordon, R. and Knauf, A. 1987. Er-Rumman Survey. *Annual of the Department of Antiquities of Jordan* 31: 289-298.
- Gustavson-Gaube, C. 1985. Tell esh-Shuna North 1984: A Preliminary Report. *Annual of the Department of Antiquities of Jordan* 29: 43-89.
- , 1986. Tell esh-Shuna North 1985: A Preliminary Report. *Annual of the Department of Antiquities of Jordan* 30: 69-115.
- Hopf, M. 1969. Plant Remain and Early Farming in Jericho. Pp. 347-355 in P. Ucko and G.W. Dimbleby (eds), *The Domestication and Exploitation of Plants and Animals*. London: Gerald Duckworth.
- Kafafi, Z. 1985a. First Season of Excavations at Jebel Abu Thawwab (er-Rumman). *Annual of the Department of Antiquities of Jordan* 29: 31-43.
- , 1985b. Late Neolithic Architecture from Jebel Abu Thawwab, Jordan. *Paléorient* 11/1: 125-127.
- , 1986. Second Season of Excavations at Jebel Abu Thawwab (er-Rumman), 1985. *Annual of the Department of Antiquities of Jordan* 30: 57-69.
- , 1988. Jebel Abu Thawwab: A Pottery Neolithic Village in Jordan. Pp. 451-471 in A. Garrard and H.G. Gebel (eds), *The Prehistory of Jordan*. Oxford: BAR Int. Ser. 396(ii).
- , 1990. Early Pottery Context From 'Ain Ghazal, Jordan. *Bulletin of the American Schools of Oriental Research* 280: 15-30.
- Kaplan, J. 1958. Excavations at Teluliot Batashi in the Valley of Sorek. *Eretz Israel* 5: 9-25.
- Kenyon, K. 1981. *Excavations at Jericho, Vol. III: The Architecture and Stratigraphy of the Tell*. London: The

- British School of Archaeology in Jerusalem.
- Kenyon, K. and Holland, T.A. 1983. *Excavations at Jericho, Vol. IV: The Pottery Phases of the Tell and Other Finds*. London: The British School of Archaeology in Jerusalem.
- Kirkbride, D. 1971. A Commentary on the Pottery Neolithic of Palestine. *Harvard Theological Review* 64: 281-289.
- , 1978. The Neolithic in Wadi Rumm: 'Ain Abu Nkheileh. Pp. 1-10 in R. Moorey and P. Parr (eds). *Archaeology in the Levant, Essays for Kathleen Kenyon*. Warminster: Aris & Phillips Ltd.
- Koucky, F.L. and Smith, R.H. 1986. Lake Beisan and the Prehistoric Settlement of the Northern Jordan Valley. *Paléorient* 12/2: 27-37.
- Köhler-Rollefson, I., Gillespie, W. and Metzger, M. 1988. The Fauna from the Neolithic 'Ain Ghazal. Pp. 423-430 in A. Garrard and H.G. Gebel (eds), *The Prehistory of Jordan*. Oxford: BAR Int. Ser. 396(ii).
- Mellaart, J. 1956. The Neolithic Site of Ghrubba. *Annual of the Department of Antiquities of Jordan* 3: 24-33.
- , 1975. *The Neolithic of the Near East*. London: Thames and Hudson.
- Moore, A. 1979. *The Neolithic of the Levant*. Unpublished D.Phil. Thesis. Oxford University.
- Muheisen, M., Gebel, H.G., Hanns, C. and Neef, R. 1988. 'Ain Rahub, a New Final Natufian and Yarmoukian Site Near Irbid. Pp. 472-502 in A. Garrard and H.G. Gebel (eds), *The Prehistory of Jordan*. Oxford: BAR Int. Ser. 396(ii).
- Najjar, M., Abu Dayya, A., Suleiman, E., Weisgerber, G. and Hauptman, A. 1990. Tell Wadi Feinan: The First Pottery Neolithic Tell in the South of Jordan. *Annual of the Department of Antiquities of Jordan* 34: 27-56.
- Olami, J., Burian, F. and Friedman, E. 1977. Giv'at Haparsa - A Neolithic Site in the Coastal Region. *Eretz Israel* 13: 34-37.
- Perrot, J. 1966. La troisième campagne de fouilles a Munhatta 1964. *Syria* 43: 49-63.
- , 1968. La Préhistoire Palestinienne. *Supplément au Dictionnaire de la Bible*, pp. 286-446. Paris: Letouzey et Ané.
- Prausnitz, M. 1970. *From Hunter to Farmer and Trader. Studies in the Lithic Industries of Israel and Adjacent Countries (from the Mesolithic to the Chalcolithic Age)*. Jerusalem: Sivan Press Ltd.
- Raikes, T.D. 1980. Notes on Some Neolithic and Later Sites in the Wadi 'Araba. *Levant* 12: 40-61.
- Rollefson, G. 1987. Observations on the Neolithic Village in Wadi Shu'eib. *Annual of the Department of Antiquities of Jordan* 31: 521-524.
- Rollefson, G., Kaechele, Z. and Kaechele, J. 1982. A Burin Site in the Umm Utheina District, Jebel Amman. *Annual of the Department of Antiquities of Jordan* 26: 243-247.
- Rollefson, G. and Simmons, A. 1986. The Neolithic Village of 'Ain Ghazal, Jordan: Preliminary Report on the 1984 Season. *Bulletin of the American Schools of Oriental Research, Research Supplement* 24: 145-163.
- , 1988. The Neolithic Settlement of 'Ain Ghazal. Pp. 393-421 in A. Garrard and H.G. Gebel (eds), *The Prehistory of Jordan*. Oxford: BAR Int. Ser. 396(ii).
- Rollefson, G., Kafafi, Z. and Simmons, A. 1989. The 1988 Season at 'Ain Ghazal: A Preliminary Report. *Annual of the Department of Antiquities of Jordan* 33: 9-26.
- Simmons, A. and Kafafi, Z. 1988. Preliminary Report on the 'Ain Ghazal Archaeological Survey, 1987. *Annual of the Department of Antiquities of Jordan* 32: 27-39.
- Simmons, A., Kafafi, Z., Rollefson, G. and Moyer, K. 1989. Test Excavations at Wadi Shu'eib, a Major Neolithic Settlement in Central Jordan. *Annual of the Department of Antiquities of Jordan* 33: 27-42.
- Simmons, A., Köhler-Rollefson, I., Rollefson, G., Mandel, R. and Kafafi, Z. 1988. 'Ain Ghazal: A Major Neolithic Settlement in Central Jordan. *Science* 240: 35-39.
- Stekelis, M. 1972. *The Yarmoukian Culture*. Jerusalem: Magnes Press.
- de Vaux, T. 1966. Palestine During the Neolithic and Chalcolithic Periods. Pp. 3-43 in Vols. I and II Fascile 47. *Cambridge Ancient History*. Cambridge: Cambridge University Press.