

Jordan in the Seventh and Sixth Millennia BC

Introduction

If the results of recent intensive surveys in several of the major wadi systems in Jordan can be held to be reliably representative, the landscape was only very sparsely dotted with permanent or semipermanent settlements during the ninth and early eighth millennia b.c.¹ Numerous small bands of hunter-foragers probably continued to range across the plateaus, along the wadis, and into the steppe and desert as they had for thousands of years before. Despite the emergence of agriculture by the end of the ninth millennium, Pre-Pottery Neolithic A (PPNA) farming groups were rare in the southern Levant. In Jordan we know them only from small findspots as widespread as 'Irāq 'ad-Dubb in northern Jordan (Kuijt *et al.* 1991) to Dhrā' (Kuijt and Muheisen 1998) and Şabra (Gebel 1988) in the south.² Overall, population probably had not changed appreciably for thousands of years.

But a new threshold lay just over the temporal horizon, and major changes were underway by the end of the eighth millennium. New techniques of lithic manufacture, heralded by the efficient naviform core-and-blade method (Wilke and Quintero 1994), signaled the birth of the Pre-Pottery Neolithic (PPNB) period, which was to witness major transformations in architecture, subsistence economy, religion, and technology. These developments, in turn, led to relatively rapid population growth in the entire southern Levantine region, and Jordan was to celebrate a major cultural florescence throughout the seventh millennium.

But population growth, while spurring on significant advances in sociocultural and economic terms, also had its downside. By then end of the seventh millennium, sustained and severe demands on local resources had upset

the delicate ecological systems, and a serious realignment of population distribution and economic undertaking characterized the ensuing sixth millennium. Jordan and its neighbors began a long environmental recovery, and the people reorganized their relationships both locally and regionally. Small, quiet rural villages interacted with pastoral groups who shepherded their flocks of sheep and goats on a round from the highlands to the steppe and desert and back again. The excitement - and dangers - of the seventh millennium had passed, and a slow rebuilding that set the foundations for the emergence of the Bronze Age was underway.

The Mid- to Late Eighth Millennium

The beginning of the PPNB transformations was unremarkable in terms of its immediate consequences. So far, the Early PPNB period (7,600 - 7250 b.c.) has been identified at only two locations in Jordan: at one temporary settlement in Wādī Jilāt in the eastern steppe (Baird 1994; Garrard *et al.* 1994) and at another in Wādī al-Ḥasa (Rollefson 1996).³ Except for the appearance of new lithic techniques and arrowhead types, lifestyles seem to have changed little, and population remained scanty in Jordan.

But changes became accentuated and increasingly cumulative with the emergence of the Middle PPNB (MPPNB 7,250 - 6,500 b.c.). In contrast to the exaggerated interruptions between settlements in the PPNA and EPPNB, it appears that every wadi system supported at least one MPPNB farming village.⁴ and several settlements could be found in some of the longer drainages. By the end of the eighth millennium, MPPNB farmers were exploiting the entire length of the country from Wādī al-

¹ All temporal references are cited as uncalibrated dates, reflected by the use of lowercase "b.c."

² Zahrat adh-Dhrā' 2, a new permanent settlement probably from the 10th-ninth millennia, has recently been located near al-Mazra'a, not far from Dhrā' (P. Edwards and S. Falconer, pers. comm.).

³ See Kuijt 1997 for a different perspective on the EPPNB.

⁴ For example, aş-Şifiya in the Wādī al-Mūjib (Mahasneh 1997); al-Basiṭ in Wādī Mūsā (Fino 1997); Khirbat al-Ḥammām (Rollefson and Kafafi 1985) and Site 892 (MacDonald *et al.* 1983: 316) in the Wādī al-Ḥasa; Wādī Shu'ayb (Simmons *et al.* 1989); Abu Şuwwān (Simmons *et al.* 1988) and Kharaysin (Edwards and Thorpe 1986) in Wādī Jarash; ar-Rāhib in Wādī al-Yābis (Palumbo 1992: 33-35); etc.

Yarmūk to southern end of the Wādī 'Arabah.

The Seventh Millennium - The Middle PPNB

The seventh millennium witnessed what may be described as the "Classic Neolithic" period, including both the greater part of the MPPNB as well as the Late PPNB (LPPNB, 6,500 - 6,000 b.c.). Most of the information from the MPPNB comes from Bayḍa in the Greater Petra region (e.g. Kirkbride 1966; Byrd 1994) and from 'Ayn Ghazāl (e.g., Rollefson *et al.* 1992; Rollefson 1998a), but new excavations at al-Ghawīr I, at the mouth of the Wādī Faynān, are providing important new data concerning developments in a semiarid zone peripheral to the "core area" of the Jordanian highlands (Simmons and Najjar 1999).

Architecture

In the earliest part of the MPPNB, the residents of Bayḍa continued the use of semisubterranean circular houses; the clustering of rooms suggests that the family structure may have included extended, and perhaps even polygamous, families. But elsewhere, even from the onset of the MPPNB, houses were rectangular and built on the surface; the small size (less than 50 m²) and isolation indicates that the inhabitants were independent nuclear families (Rollefson 1997). Population density in all of the MPPNB settlements investigated so far appears to have been relatively high, since houses were built closely together. Absolute population is difficult to estimate in view of the small areas sampled by excavations, but figures probably ranged from less than a hundred at al-Ghuwayr I (less than a hectare in extent) to several hundred at 'Ayn Ghazāl (perhaps five hectares in the MPPNB).

Subsistence Economy

One reason for the rapid increase in the number of MPPNB settlements is probably related to a more secure subsistence base. The full range of domesticated and cultivated plants (cereals, legumes, fibers) was inherited from earlier times (e.g., Neef 1997), as was the reliance on hunting a broad range of wild animals. But a new alternative was the increasing dependence on goats, which had become fully domesticated by the end of the period (Köhler-Rollefson 1997), and which accounted for half of the meat in the diet early in the period (Köhler-Rollefson *et al.* 1988). It is likely that goats were pastured in the vicinity of the settlements.

Ritual

Small baked clay animal and human figurines played a role in the daily life of the people of Jordan. Imbued with spiritual powers by shamans, they probably served the general public as talismans and as purveyors of good luck and magic (Rollefson n.d. a; Schmandt-Besserat 1997).

Burial practices reveal an ancestry reaching back into the 10th through eighth millennia, but in the MPPNB they also indicate a burgeoning development of social inequality. Evidence from a long-used house at 'Ayn Ghazāl shows that it is likely that one person per generation was buried beneath the floor of the houses, although what happened to the rest of the family remains unclear (Rollefson n.d. a). Some people, perhaps newcomers to the settlement and without any relatives in the community, were discarded in trash deposits, as were most infants under the age of ca. 15 months; several infants, however, appear to have been used as foundation deposits or in other ceremonial aspects (Rollefson *et al.* 1992).

Although the selection criteria for subfloor burial remain obscure (both males and females of a wide range of ages were found), it seems probable that they were part of a widespread ancestor cult that appears to have its roots in the PPNA and perhaps even the Natufian periods. All of the subfloor burials were decapitated; sometimes the skulls were simply buried apart from the rest of the skeleton, but often the skulls received special attention. In some cases the cranium was decorated with red or black pigment (Rollefson 1983; 1986; Rollefson *et al.* 1998), although others were modeled with lime plaster to recreate the face of the departed ancestor (Griffin *et al.* 1998). After a number of generations had passed, the skulls were buried outside the dwelling, replaced with the heads of more recent ancestors.

The greatest extension of the ancestor cult lies in the lime plaster statuary recovered from 'Ayn Ghazāl, Jericho, and Nahal Hemar (Rollefson 1983; 1986; Bar-Yosef and Alon 1988; Schmandt-Besserat 1998; Grissom n.d.; Tubb and Grissom 1995). While the decorated and modeled skulls represented real, known ancestors, the statuary likely portrayed mythical founders of the social and kinship groups in the settlements. It is probable that the statuary was on permanent display in some building(s), but so far no such cult building is known from the MPPNB period.

The Seventh Millennium - The Late PPNB

By the middle of the seventh millennium the landscape had begun to change dramatically. It seems that the land around the settlements in the Jordan Valley and Palestine could no longer support farming families, and settlements that had existed for hundreds of years were abandoned, their populations dispersed into the countryside and up onto the Jordanian plateau (Rollefson 1987; 1989). The migration of new people into the Jordanian countryside placed new pressures on local resources, and although new settlements such as Baṣṭa (e.g., Nissen *et al.* 1987; 1991), 'Ayn Jammām (Waheeb and Fino 1997), and 'Ayn Jahjah (Banning 1998) were founded, older villages continued in use, and new exploitation strategies were nec-

essary.

The Growth of Towns

One of the most notable developments of the LPPNB was the enormous growth of settlements, evidently a "bold experiment" to deal with a rapidly growing regional population. 'Ayn Ghazāl, Wādī Shu'ayb, and Baṣṭa reached 14-15 hectares, and other sites (aṣ-Ṣifiya, 'Ayn Jammām) exceeded 10 has. Architecture reflected some of the necessary accommodations to the new population sizes: two-story houses that could have housed several families (probably as extended family units, pooling their labor and resources) were commonplace at Baṣṭa and 'Ayn Ghazāl⁵ (Nissen *et al.* 1991; Rollefson and Kafafi 1996). Smaller sites were also founded, including Ba'ja, curiously situated in a "naturally fortified" setting to the north of Bayḍa (Gebel and Bienert 1997).

The means to support the LPPNB settlements, both large and small, necessarily entailed some alterations of older food production methods. Habitats of wild animals had been destroyed around the settlements by over-exploitation of wood, farming, and grazing, and the amount of food obtained from hunting declined sharply. Domesticated sheep were adopted in partial compensation (e.g., Wasse 1997; Becker 1991: 64), and increased attention was paid to cattle and pigs.

One of the problems that faced the large population centers was the competition for land for farming and grazing, and one way to resolve the dilemma was to move the ovicaprids into the steppe and desert, where seasonal vegetation was available during the agricultural growing season (Köhler-Rollefson 1988; 1992).⁶ The temporary site of al-Azraq 31 provided some tantalizing but nonetheless elusive suggestions that sheep/goat herders were visiting the al-Azraq pools during the rainy season (Baird *et al.* 1992). Several probable goat horn cores from new excavations at nearby Bawwāb al-Ghazāl appear to substantiate the view that nomadic pastoralism began during the LPPNB (Rollefson *et al.* 1999; Quintero *et al.* n.d.).

Ritual

Burial practices appear to have departed in a substantial way from MPPNB norms. Excavations at LPPNB Baṣṭa, 'Ayn Jammām, aṣ-Ṣifiya, and 'Ayn Ghazāl have produced numerous, mostly intact skeletons, and the instances of decapitated inhumations are rare or absent altogether (Berner and Schultz 1997; Waheeb, pers. comm.; Mahasneh, pers. comm.; e.g. Rollefson and Kafafi 1997).

This suggests a considerable decrease in the importance of the ancestor cult; at least, if the ancestor cult were still in effect, it seems that it was being practiced in a very different manner.

Furthermore, no known plastered skulls are known from the LPPNB, in Jordan or anywhere else in the Levant.

On a higher level of abstraction, there is also no evidence of the continued production of lime plaster statuary that may have "glorified" ancestor veneration into the mythical realm in the MPPNB period. Possibly linked with a growing problem of competition between lineages for productive farmland and pasturage, the centrifugal effects of kinship fealty may have been downplayed in favor of stronger centripetal community identity (Rollefson n.d. b). This, at least, may explain the appearance of the striking cult buildings at 'Ayn Ghazāl.

The cult buildings appear to have taken three distinctive shapes,⁷ including small apsidal buildings, circular "shrines", and larger, two-room rectangular "temples" (Rollefson 1998b). It is unfortunate that so far no other examples of any of these structural types have been found outside of 'Ayn Ghazāl, but this may be an artifact of sampling bias, or it may reflect the central importance of 'Ayn Ghazāl in the sociopolitical organization of north-central Jordan in the LPPNB (Rollefson n.d. b).

Regardless of the uniqueness of the 'Ayn Ghazāl evidence, the absence of any overt symbolism that could be related to specific kinship groups seems to be critically important. The presence of a single, highly stylized and undifferentiated anthropomorphic column in the wall of one of the LPPNB "temples" might be taken to indicate a generalized spiritual depiction, replacing the more specifically oriented representations of the MPPNB statuary.

The Sixth Millennium: The PPNC

The LPPNB centralizing "bold experiment" lasted about 500 years, but in the very long run it proved to be flawed in its design. Packing large numbers into megasites ultimately aggravated the problem of overexploitation, and the farming techniques of the time could not manage to sustain the protracted drain on local soil conservation and fertility.

By 6,000 b.c. the towns of Jordan were being depopulated, and 'Ayn Ghazāl, for example, perhaps lost more than half of its peak number of inhabitants. The same fate appears to have affected Wādī Shu'ayb, and perhaps aṣ-Ṣifiya and 'Ayn Jammām, although other meg-

⁵ "Two-story" buildings existed at Bayḍa in Levels II-III, although there is some question of the age of these layers (Rollefson n.d. a); in any event, the lower "story" was probably a basement and not a normal living area. There is a good possibility that proper two-story dwellings may have occurred as early as the MPPNB at al-Ghawir I (Simmons and Najjar 1999: 4).

⁶ See Byrd 1992 for his views that nomadic pastoralism began when foraging groups in the steppe and desert adopted sheep and goats as an alternative to earlier hunting and gathering traditions.

⁷ The circular "shrines" may be evolutionary descendants of the apsidal buildings (Rollefson and Kafafi 1996).

asites (such as Baṣṭa) and smaller settlements (Ba'ja) were evidently abandoned altogether within a short time of the turn of the millennium.⁸

While sheep and goats may have been taken into the steppe and desert for seasonal grazing and browsing by the middle of the LPPNB period, pastoral nomadism may have been fully established by the PPNC period. This is suggested by the existence of two building types at 'Ayn Ghazāl. In addition to one-room houses with work areas in the adjacent courtyards, there was also a section of the site where semisubterranean storage bunkers (corridor buildings⁹) were constructed atop LPPNB plaster floors. The former buildings appear to have been the residences of full-time farming families who stayed at 'Ayn Ghazāl all year round, while the latter type was used by relatives who were only part-time residents. These people were possibly relatives of the farming families who took the sheep and goats away from the settlement during the rainy season, returning to 'Ayn Ghazāl after the harvest (Rollefson and Köhler-Rollefson 1993; Köhler-Rollefson 1992).

Ritual activity is poorly known for the PPNC period. Small clay animal figurines are relatively at PPNC 'Ayn Ghazāl, but this may be a reflection of the smaller population in comparison to the MPPNB and LPPNB heyday of the settlement. If Levels II-III from Bayḍa do date to the early sixth millennium (see Footnote 9), then there is good evidence for some public structures that may have served in some ritual capacity (Byrd 1994: 656-657). Human burials occurred in courtyards and in abandoned corridor buildings, and skulls were invariably left intact with the rest of the body. Secondary burials, perhaps brought back to 'Ayn Ghazāl from considerable distances, were relatively numerous, and often various elements of pig skeletons were included in the burial pits.

The Sixth Millennium: The Pottery Neolithic

Well-fired pottery was produced as early as the MPPNB (Rollefson and Simmons 1985: 44), but industrial production of ceramics did not take place until near the middle of the sixth millennium b.c. There is good evidence from 'Ayn Ghazāl that the emergence of the Yarmoukian tradition was a local development from PPNC roots and not an import of techniques from outside the region (Rollefson *et al.* 1992: 459-460; Rollefson 1993). The Yarmoukian tradition characterizes most of Jordan, but a partially contemporaneous tradition of pottery manufacture (perhaps somewhat later than the Yarmoukian) – the Pottery Neolithic A – also appeared in Jordan, possibly introduced into the country from west of the Jordan Valley

(Kafafi 1998: 131). PNA pottery is exclusively present at Khirbat adh-Dhariḥ and Dhrā', and it is also found mixed with predominantly Yarmoukian pottery at 'Ayn Ghazāl and Wādī Shu'ayb. Unmixed Yarmoukian assemblages were recovered from Jabel Abū Thawwāb and 'Ayn Rāḥūb (Kafafi 1988; 1989), and Yarmoukian sherds have recently been reported from Tall Jahjah (Banning, pers. comm.).

Except for the pottery styles, there was little difference in the daily lifestyle of the two late sixth millennium traditions. Some established villages, such as 'Ayn Ghazāl and Wādī Shu'ayb, continued to be occupied, although population size and density of these sites was at its lowest since their original founding more than 2,000 years earlier. Many newer villages were founded, all of them small in areal extent and thus in the number of inhabitants. Both rectangular "long-house" and rounded buildings were constructed. Generally, hearths were located outside of the buildings, not inside, and courtyard "kitchen" structures and open-sided 'arisha shaded work areas were common (cf. Kafafi and Rollefson 1995; Kafafi 1988).

The subsistence economy was segregated into full-time farmers, who lived in permanent settlements with locally pastured cattle and pigs, and full-time pastoral nomads with their sheep and goats, who interacted with the villages on a seasonal basis.

Ritual activity for the late sixth millennium is poorly documented. Clay animal figurines maintained a long history of use, and grotesque "cowrie-eye" human figurines appear to have been associated with maternal health and possibly fertility. Human burials are very rare, known in Jordan only from a multiple interment at Wādī Shu'ayb (Simmons *et al.* 1989).

As the sixth millennium came to a close, some of the long-established farming settlements closed down. The fields around 'Ayn Ghazāl, for example – still the location of a strong spring that issued copious amounts of sweet water – could no longer support even a miniscule permanent farming population; the only evidence of human presence were stone foundation rings of temporary circular tents (ancestors of Bedouin tents), used by pastoralists who stopped to take advantage of the water and the vegetation of the abandoned slopes and plateaus around the former town (Rollefson and Kafafi 1994).

Other, newer villages continued in use through the early part of the fifth millennium, slowly setting the foundation for the emergence of the Chalcolithic period and the return to some of the former population densities of the seventh millennium.

⁸ The small (>1 hectare) LPPNB site of 'Ayn Jahjah, in Wādī Ziqlāb, may have withstood the stresses of the late seventh and early sixth millennia; at least, the same site was inhabited in the ensuing ceramic Neolithic period (E. Banning, pers. comm.).

⁹ There is a striking resemblance between the PPNC corridor buildings

at 'Ayn Ghazāl and the "two-story corridor buildings" at Bayḍa. Kirkbride considered that the Bayḍa structures dated to the PPNB period based on some radiocarbon dates, but there is some question as to the reliability of those samples. See Rollefson 1998a: 116.

Bibliography

- Baird, D. 1994. Chipped Stone Production Technology from the Azraq Project Neolithic Sites. Pp. 525-542 in H. Gebel and S. Kozłowski (eds), *Neolithic Chipped Stone Industries of the Fertile Crescent*. Berlin: ex oriente.
- Baird, D., Garrard, A., Martin, L. and Wright, K. 1992. Prehistoric Environment and Settlement in the Azraq Basin: An Interim Report on the 1988 Season. *Levant* 24: 1-31.
- Banning, E. 1998. The Neolithic Period. *Near Eastern Archaeology* 61(4): 188-237.
- Bar-Yosef, O. and Alon, D. 1988. The Excavations. *Atiqot* 18: 1-30.
- Becker, C. 1991. The Analysis of Mammalian Bones from Basta, A Pre-Pottery Neolithic Site in Jordan: Problems and Potential. *Paléorient* 17(1): 59-75.
- Berner, M. and Schultz, M. 1997. The Physical Anthropology of the Late PPNB Population of Basta. *Neolithics* 2/97: 7.
- Byrd, B. 1992. The Dispersal of Food Production Across the Levant. Pp. 49-61 in A. Gebauer and T. Price (eds), *Transitions to Agriculture in Prehistory*. Madison: Prehistory Press.
- _____. 1994. Public and Private, Domestic and Corporate: The Emergence of the Southwest Asian Village. *American Antiquity* 59(4): 639-666.
- Edwards, P. and Thorpe, S. 1986. Surface Lithic Finds from Kharaysin, Jordan. *Paléorient* 12(2): 85-87.
- Fino, N. 1997. Al-Baseet, a New LPPNB Site Found in Wādī Musa, Southern Jordan. *Neo-Lithics* 3/97: 13-14.
- Garrard, A., Baird, D., Colledge, S., Martin, L. and Wright, K. 1994. Prehistoric Environment and Settlement in the Azraq Basin: An Interim Report on the 1987 and 1988 Excavation Seasons. *Levant* 26: 73-109.
- Gebel, H.G. 1988. Late Epipaleolithic - Aceramic Neolithic Sites in the Petra Area. Pp. 67-100 in A. Garrard and H. Gebel (eds), *The Prehistory of Jordan*. British Archaeological Reports-Int. Ser. 396. Oxford: B.A.R.
- Gebel, H.G.K. and Bienert, H.-D. 1997. Ba'ja: Hidden in the Petra Mountains. Preliminary Results of the 1997 Investigations. Pp. 221-262 in H.G.K. Gebel, Z. Kafafi and G. Rollefson (eds), *Prehistory of Jordan II. Perspectives from 1997*. Berlin: ex oriente.
- Griffin, P., Grissom, C., and Rollefson, G. 1998. Three Late Eighth Millennium Plastered Faces from 'Ain Ghazāl, Jordan. *Paléorient* 24(1): 59-70.
- Grissom, C.A. n.d. Neolithic Statues from 'Ain Ghazal: Construction and Form. *AJA* (in press).
- Kafafi, Z. 1988. Jabel Abū Thawwāb: A Pottery Neolithic Village in Jordan. In A. Garrard and H. G. Gebel (eds), *The Prehistory of Jordan. The State of Research in 1986*. British Archaeological Reports 396: 451-471. Oxford: B.A.R.
- _____. 1989. Late Neolithic I Pottery from 'Ain er-Raḥūb, Jordan. *ZDPV* 105: 1-17.
- _____. 1998. The Late Neolithic in Jordan. Pp.127-138 in D. Henry (ed), *The Prehistoric Archaeology of Jordan*. British Archaeological Reports, Int. Ser. 705. Oxford: B.A.R.
- Kafafi, Z. and Rollefson, G. 1995. The 1994 excavations at 'Ayn Ghazāl: Preliminary Report. *ADAJ* 39: 13-29.
- Kirkbride, D. 1966. Five Seasons at the Pre-Pottery Neolithic Village of Beidha in Jordan. *PEQ*: 8-72.
- Köhler-Rollefson, I. 1988. The Aftermath of the Levantine Neolithic Revolution in Light of Ecologic and Ethnographic Evidence. *Paléorient* 14(1): 87-93.
- _____. 1992. A Model for the Development of Nomadic Pastoralism on the Transjordanian Plateau. Pp.11-18 in O. Bar-Yosef and A. Khazanov (eds), *Pastoralism in the Levant*. Madison: Prehistory Press.
- _____. 1997. Proto-Élevage, Pathologies and Pastoralism: a Post-Mortem on Goat Domestication. Pp. 557-565 in H.G. Gebel, Z. Kafafi and G. Rollefson (eds), *The Prehistory of Jordan II. Perspectives from 1997*. Berlin: ex oriente.
- Köhler-Rollefson, I., Gillespie, W. and Metzger, M. 1988. The Fauna from Neolithic 'Ain Ghazal. Pp. 423-430 in A. Garrard and H. Gebel (eds), *The Prehistory of Jordan*. British Archaeological Reports, Int. Ser. 396. Oxford: B.A.R.
- Kuijt, I. 1997. Trying to Fit Round Houses into Square Holes: Reexamining the Timing of the South-Central Levantine Pre-Pottery Neolithic A and Pre-Pottery Neolithic B Transition. Pp. 193-202 in H.G. Gebel, Z. Kafafi and G.O. Rollefson (eds), *The Prehistory of Jordan II. Perspectives from 1997*. Berlin: ex oriente.
- Kuijt, I., Mabry, J. and Palumbo, G. 1991 Early Neolithic Use of Upland Areas of Wādī el-Yabis: Preliminary Evidence from the Excavations of 'Iraq ed-Dubb, Jordan. *Paléorient* 17(1): 99-108.
- Kuijt, I. and Mahasneh, H. 1998. The Early Neolithic Occupation of Dhrā', Jordan: Implications for the Jordan Valley as a Social, Economic and Ritual Focus. *Journal of Field Archaeology* 25: 153-161.
- MacDonald, B., Rollefson, G., Banning, E., Byrd, B. and D'Anibele, C. 1983. Wādī al-Ḥasa Survey 1982: Preliminary Report. *ADAJ* 27: 311-323.
- Mahasneh, H. 1997. As-Sifiya: A Pre-Pottery Neolithic B Site in the Wādī el-Mujib, Jordan. Pp. 203-214 in H.G. Gebel, Z. Kafafi and G. Rollefson (eds), *The Prehistory of Jordan II. Perspectives from 1997*. Berlin: ex oriente.
- Neef, R. 1997. Status and Perspectives of Archaeobotanical Research in Jordan. Pp. 601-609 in H. G. K. Gebel, Z. Kafafi and G. Rollefson (eds), *Prehistory of Jordan*

- dan II. *Perspectives from 1997*. Berlin: ex oriente.
- Nissen, H., Muheisen, M. and Gebel, H. G. 1987. Report on the First Two Seasons of Excavation at Baṣṭa (1986-1987). *ADAJ* 31:79-119.
- 1991. Report on the Excavations at Baṣṭa 1988. *ADAJ* 35: 13-40.
- Palumbo, G. 1992. The 1990 Wādī el-Yabis Survey Project and Soundings at Khirbet Umm el-Hedamus. *ADAJ* 36: 25-41.
- Quintero, L., Wilke, P. and Rollefson, G. n.d. Highland Towns and Desert Settlements: Origins of Nomadic Pastoralism in the Jordanian Neolithic. In H. G. K. Gebel and R. Neef (eds), *Central Settlements in Neolithic Jordan*. Berlin: ex oriente (in press).
- Rollefson, G. 1983. Ritual and Ceremony at Neolithic Ain Ghazāl (Jordan). *Paléorient* 9/2: 29-38.
- 1986. Neolithic 'Ain Ghazal (Jordan): Ritual and Ceremony II. *Paléorient* 12/1: 45-52.
- 1987. Local and Regional Relations in the Levantine PPN Period: 'Ain Ghazal, Jordan, as a Regional Center. Pp. 29-32 in *SHAJ III*.
- 1989. The Late Aceramic Neolithic of the Levant: A Synthesis. *Paléorient* 15(1): 168-173.
- 1993. The Origins of the Yarmoukian at 'Ain Ghazal. *Paléorient* 19(1): 91-100.
- 1996. Abu Hudhud (WHS 1008): An EPPNB Settlement in the Wādī el-Hasa, Southern Jordan. Pp. 159-160 in S. Kozłowski and H. G. Gebel (eds), *Neolithic Chipped Stone Industries of the Fertile Crescent and Their Contemporaries in Adjacent Regions*. Berlin: ex oriente.
- 1997. Changes in Architecture and Social Organization at 'Ain Ghazal. Pp. 287-307 in H.G. Gebel, Z. Kafafi and G. Rollefson (eds), *The Prehistory of Jordan II. Perspectives from 1997*. Berlin: ex oriente.
- 1998a. The Aceramic Neolithic of Jordan. Pp. 102-126 in D. Henry (ed.), *The Prehistoric Archaeology of Jordan*. British Archaeological Reports, Int. Ser. 705. Oxford: B.A.R.
- 1998b. Neolithic 'Ain Ghazal: Ritual and Ceremony III. *Paléorient* 24/1: 43-58.
- n.d. a. Ritual and Social Structure at Neolithic 'Ayn Ghazāl. In I. Kuijt (ed.), *Life In Neolithic Farming Communities: Social Organization, Identity, and Differentiation*. Cambridge: Cambridge University Press (in press).
- n.d. b. LPPNB Social Organization: Tribes or Chiefdoms? In H. G. K. Gebel and R. Neef (eds), *Central Settlements in Neolithic Jordan*. Berlin: ex oriente (in press).
- Rollefson, G. and Kafafi, Z. 1985. Khirbet Hammam: A PPNB Village in the Wadi el-Hasa, Southern Jordan. *BASOR* 258: 63-69.
- 1994. The 1993 Season at 'Ain Ghazal: Preliminary Report. *ADAJ* 38: 11-32.
- 1996. The 1995 Season at 'Ain Ghazal: Preliminary Report. *ADAJ* 40: 11-28.
- 1997. The 1996 Season at 'Ayn Ghazāl: Preliminary Report. *ADAJ* 41: 27-48.
- Rollefson, G. and Köhler-Rollefson, I. 1993. PPNC Adaptations in the First Half of the Sixth Millennium bc. *Paléorient* 19(1): 33-42.
- Rollefson, G., Quintero, L. and Wilke, P. 1999. Bawwāb al-Ghazāl: Preliminary Report on the 1998 Testing Season. *Neo-Lithics* 1/99: 2-4.
- Rollefson, G., Schmandt-Besserat, D. and Rose, J. 1998. A Decorated Skull from MPPNB 'Ain Ghazal. *Paléorient* 24/2: 99-104.
- Rollefson, G. and Simmons, A. 1985. The Early Neolithic Village of 'Ain Ghazal, Jordan: Preliminary Report on the 1983 Season. *BASOR* 23: 35-52.
- Rollefson, G., Simmons, A. and Kafafi, Z. 1992. Neolithic Cultures at 'Ain Ghazal, Jordan. *Journal of Field Archaeology* 19(4): 443-470.
- Schmandt-Besserat, D. 1997. Animal Symbols at 'Ain Ghazal. *Expedition* 39(1): 48-58.
- 1998. 'Ain Ghazal "Monumental" Figures. *BASOR* 310: 1-17.
- Simmons, A., Kafafi, Z., Rollefson, G. and Moyer, K. 1989. Test Excavations at Wādī Shu'ayb, a Major Neolithic Settlement in Central Jordan. *ADAJ* 33: 27-42.
- Simmons, A. and Najjar, M. 1999. Preliminary Field Report of the 1998-1999 Excavations at Ghwair I, A Pre-Pottery Neolithic B Community in the Wādī Faynān Region of Southern Jordan. *Neo-Lithics* 1/99: 4-6.
- Simmons, A., Olszewski, D. and Kafafi, Z. 1988. Abu Suwwan Briefly Revisited: Additional Notes on a Large Neolithic Site Near Jerash, Jordan. *ADAJ* 32: 15-25.
- Tubb, K. and Grissom, C. 1995. 'Ain Ghazal: A Comparative Study of the 1983 and 1985 Statuary Caches. Pp. 437-447 in *SHAJ V*. Amman.
- Waheeb, M. and Fino, N. 1997. 'Ayn el-Jammām: A Neolithic Site Near Ras en-Naqb, Southern Jordan. Pp. 215-219 in H.G. Gebel, Z. Kafafi and G. Rollefson (eds), *The Prehistory of Jordan II. Perspectives from 1997*. Berlin: ex oriente.
- Wasse, A. 1997. Preliminary Results of an Analysis of Sheep and Goat Bones from 'Ain Ghazal, Jordan. Pp. 575-592 in H. G. Gebel, Z. Kafafi and G. O. Rollefson (eds), *The Prehistory of Jordan II. Perspectives from 1997*. Berlin: ex oriente.
- Wilke, P. and Quintero, L. 1994. Naviform Core-and-Blade Technology: Assemblage Character as Determined by Replicative Experiments. Pp. 33-60 in H. G. Gebel and S. K. Kozłowski (eds.), *Neolithic Chipped Stone Industries of the Fertile Crescent*. Berlin: ex oriente.