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The *Limes* and Settlement Patterns in Central Jordan in the Roman and Byzantine Periods

After the pioneering work of Nelson Glueck in the 1930s, little survey of central Jordan was conducted until the 1970s. Since then several projects have intensively surveyed large portions of this region east of the Dead Sea. The recent publication of final reports of two major regional surveys and an interim report of a third now permit some analysis of settlement patterns in central Jordan. This paper offers a preliminary analysis of this new material, aided by other evidence, such as the excavations of a few sites in each survey area. My purpose is to offer a reconstruction in broad outline of human settlement on the plateau east of the Dead Sea from the Late Hellenistic (*c.* 200 B.C.) through Byzantine (to A.D. 636) periods.

The Tell Ḥesban survey (TABLE 1) recorded 148 sites, most within a ten kilometer radius of Ḥesban (Ibach 1987). Ibach notes several methodological limitations about the survey. The survey did not gather chipped stone artifacts, but was concerned only with sites with ceramics and/or visible structures. The survey used no recognized strategy for random sampling nor was it intended to be exhaustive. However, pottery collected by the survey could be assessed against well stratified ceramic sequences from the excavation of Tell Ḥesban (Sauer 1973). Therefore, proposed dating of the survey pottery is probably quite reliable for the periods represented at Tell Ḥesban: Iron Age, Late Hellenistic through Umayyad, and Ayyubid/Mamluk. Unfortunately, no survey pottery appears in the report of the Ḥesban survey. Some is promised in a future volume devoted to pottery.

The Wadi al-Ḥasa Survey, conducted in 1979-82, was in many ways a model for Jordan (MacDonald 1988). It employed a broad interdisciplinary approach, including environmental studies, and a purposeful sampling strategy. An enormous corpus of 1074 sites was recorded along the southern bank of Wadi al-Ḥasa. Representative pottery is published in the final report. This survey had no parallel excavation for control of the surface ceramic evidence. But this is largely compensated for by excavations conducted subsequently in the surveyed region itself or in adjacent areas (cf. Villeneuve 1984).

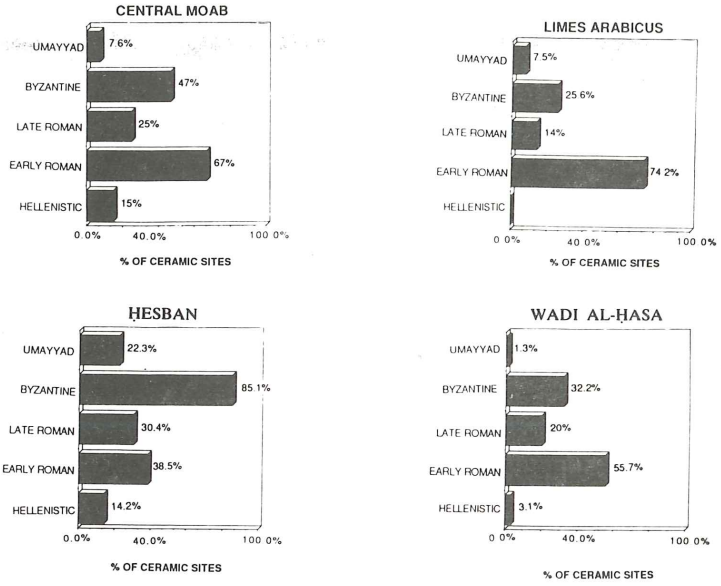

Table 1: Comparison of the results of the four surveys.

The Limes Arabicus Project surveyed in 1980-87 the eastern portion of the Karak Plateau. One survey team covered the upper Wadi al-Mujeb to the Desert Highway (the late Roman *limes*, 442 sites); another team covered the region *c.* 10-15km east of the Desert Highway (the "Desert Survey", 118 sites). Thus the project recorded a total of 560 sites from both surveys. Although all sites noticed were recorded, there was no special search for lithic sites, which consequently are probably under represented in the corpus. The results from all but 54 of these 560 sites are summarized in the interim report, published in 1987 (Koucky 1987b; Clark 1987).[1]

[1]The remaining 54 sites were visited during the 1987 field season and will be published in the project's final report along with a reevaluation of all the survey evidence.

A fourth project has completed its fieldwork but awaits final publication. The Central Moab Survey was conducted in 1978-82. It focused on a region bounded by the Dead Sea escarpment on the west, Wadi al-Mujeb on the north and east, and Wadi al-Ḥasa to the south. Thus it was contiguous with the regions surveyed by the Wadi al-Ḥasa Survey to the south and the Limes Arabicus Project to the east. Like the Ḥesban survey, the Central Moab Survey did not collect chipped stone artifacts. But it still recorded 474 sites. Thus far its results have been published only in preliminary reports (Miller 1979a; 1979b). But its director has generously shared much of his project's data with the present writer.[2]

A comparison of the results of these surveys reveals a remarkable degree of correspondence in the number of settlements occupied in each historical period from the Iron Age to the early Islamic era.

When comparing the number of sites occupied in each period, note that both the Wadi al-Ḥasa and Limes Arabicus surveys included many strictly aceramic lithic sites, sites not recorded by the other two surveys. For example, 118 (21%) of 560 sites recorded by the Limes Arabicus Project were aceramic. The Wadi al-Ḥasa Survey recorded 595 aceramic sites (55% of all sites) among its total of 1074 sites. Inclusion of aceramic sites results in artificially lower percentages of all sites occupied for the Wadi al-Ḥasa and Limes Arabicus surveys when compared to corresponding percentages from the Ḥesban and Central Moab surveys. To compensate for this bias, I have computed percentages for the accompanying table of only *ceramic* sites from the Wadi al-Ḥasa survey (total of 479 ceramic sites) and Limes Arabicus survey (total of 442 ceramic sites).

The Iron Age (1200-539 B.C.) was a period of significant settlement in each region. Some 43% of all sites in the Ḥesban region yielded evidence of Iron Age occupation. Significant numbers of Iron Age sites also appeared in the region covered by the Limes Arabicus Project (163 sites, 37% of ceramic sites). The Wadi al-Ḥasa Survey recorded only 75 Iron Age sites (16% of all sites). The Central Moab Survey recorded 176 Iron Age sites (37% of all sites).

The Persian period (539-332 B.C.) was poorly represented in all surveys. The Hellenistic period (332-63 B.C.) is more problematic. Specifically, how much of the Nabataean pottery found by the three more southerly projects within the borders of the Nabataean kingdom actually dates to the Hellenistic period? We avoid this issue in the Ḥesban region, which lay just outside the Nabataean kingdom. Hellenistic evidence was found at just 21 sites (14% of all sites). This suggests that the region now witnessed the smallest population prior to the medieval Islamic era. Ḥesban itself seems to have been resettled about 200 B.C. The Central Moab Survey recorded 71 Hellenistic sites (15% of all sites). The Wadi al-Ḥasa Survey reported only 15 Hellenistic sites (3% of ceramic sites) while the Limes Arabicus Survey found no Hellenistic evidence at all. The impression from all four surveys is one of low population from the end of the Iron Age until the second or first century B.C. This could change with a better grasp of the chronology of early Nabataean pottery.

The Early Roman period (*c.* 63 B.C.-A.D. 135) witnessed the greatest density of population in the three contiguous survey regions. The Limes Arabicus Survey recorded evidence of this period at 74% of all ceramic sites and 59% of all sites (n=328). The Wadi al-Ḥasa Survey reported Early Roman/Nabataean pottery at 56% of ceramic sites and 25% of all sites (n=267). The Central Moab Survey reported Early Roman/Nabataean sherds at 67% of all sites (n=319).[3] This period was also well represented on the Ḥesban survey, where 39% of all sites (n=57) yielded Early Roman material.

All four surveys suggest that many sites were abandoned by the Late Roman period (*c.* A.D. 135-324). The decline is not pronounced in the Ḥesban region, where the percentage of sites occupied falls from 39% (n=57) in Early Roman to 30% (n=45) in the Late Roman period. But farther south the abandonment of sites is much more dramatic. On the western Karak Plateau (i.e., the Central Moab Survey), the percentage of occupied sites drops from 67% (n=319) in Early Roman to 25% (n=118) in Late Roman. On the eastern plateau (Limes Arabicus Project), the percentage of occupied sites drops from 74% of ceramic sites (n=328) in Early Roman to 14% of ceramic sites (n=62) in Late Roman. South of Wadi al-Ḥasa, the decline in occupied sites is also dramatic, from 56% of ceramic sites (n=267) in Early Roman to just 20% of ceramic sites (n=96) in Late Roman.

Analysis of the Byzantine period (324-636) is complicated by the fact that two of the four projects do not offer more refined dating. Recent publication of coin-controlled, stratified sequences of pottery from several sites in the region justify subdivision into Early (*c.* 324-500) and Late Byzantine (*c.* 500-636; Parker 1987: 525-619). Thus only the evidence from the Limes Arabicus Project is broken down in this fashion. The Central Moab Survey did report "Early" and "Late" Byzantine pottery from some sites, but most of their material is simply described as "Byzantine". The two others merely report "Byzantine" (i.e. fourth-early seventh centuries) pottery.

Nevertheless, it seems clear that the number of occupied sites in all four survey regions rose dramatically in this period. The Ḥesban survey reported that the Byzantine

[2] I am grateful to Professor Miller for kindly sharing these results with me in advance of publication.

[3] The Central Moab Survey differentiated between "Nabatacan" and "Early Roman" pottery. Nabatacan pottery was recovered at 298 sites. Early Roman pottery was found at 148 sites, but all but 21 of these not surprisingly also yielded Nabatacan sherds. The figure of 319 Early Roman sites given in the text is thus obtained by adding the 298 Nabatacan sites with the 21 sites that yielded Early Roman pottery but no distinctive Nabatacan sherds.

period was the best represented of all historical periods, with 87% of all sites (n=126) occupied. On the western Karak plateau the Central Moab Survey recorded an increase from 25% (n=118) in Late Roman to 47% (n=223) in the Byzantine period. The Wadi al-Ḥasa Survey also recorded a significant increase, from 20% of ceramic sites (n=96) in Late Roman to 32% of ceramic sites (n=154) in the Byzantine era. The Limes Arabicus Survey found that the number of occupied sites nearly doubled from 14% of all sites (n=62) in Late Roman to 26% (n=113) in the Byzantine period. Significantly, the vast majority of these Byzantine sites yielded pottery judged "Early" but almost none dated "Late". This suggests that the fourth and fifth centuries witnessed a significant increase in population but that considerable depopulation had occurred by the sixth century. Whether this settlement pattern on the eastern Karak Plateau is paralleled elsewhere is unclear until the pottery is analyzed more closely.

It seems that the densest Byzantine population in central Jordan was in the fourth and fifth centuries, when the Roman *limes* was at its height. The extensive excavations of Ḥesban, for example, suggest that the city reached its peak during strata 9-10 (*c.* A.D. 363-527) and declined thereafter (Storfjell 1983: 54, 112). Dhiban also seems to have flourished in the Byzantine period (Tushingham 1972: 59-74). Recent excavations of Umm ar-Raṣaṣ have revealed a thriving Byzantine town just north of the Mujeb near the edge of the desert. Garrisoned in the fourth century by a Roman cavalry unit,[4] Mefa'a was occupied through the Umayyad period (Piccirillo and Attiyat 1986: 344-351).

Most frontier forts were abandoned by the early sixth century and a real threat was posed by Lakhmid Arab raids.[5] Thus marginal areas on the edge of the agricultural zone were probably abandoned and population shifted either to walled towns, notoriously difficult for Saracen raiders to assault, or to regions deeper within the sedentary zone. This is also suggested by the location of the Byzantine sites recorded by the Wadi al-Ḥasa Survey. The eastern portion, nearest the desert, was practically denuded of occupied sites while the vast majority were located in the western sector, farthest from the desert (MacDonald 1988: 248).

Even if outlying areas on the fringe of the desert were abandoned by the sixth century, the province of Arabia as a whole continued some level of prosperity, as the evidence of church-building in the sixth century suggests. This is attested at several sites, including Mount Nebo, Tell Ḥesban, Madaba, Umm ar-Raṣaṣ, Dhiban, and al-Lajjun.

The surveys suggest that the Umayyad period (*c.* 636-750) witnessed a radical decline in settlement, most pronounced farthest south. Only 1% (n=6) of the ceramic sites of the Wadi al-Ḥasa Survey yielded Umayyad pottery. This rises to 7.5% (n=33) of ceramic sites on the eastern Karak plateau and 8% (n=36) on the western Karak plateau. A significant number of Umayyad sites (22%, n=33) was found in the Ḥesban region. But even here the number of sites occupied represented a 75% reduction from the Byzantine period and was the smallest number occupied since the Hellenistic period.

To summarize, the long-held view that Iron Age population was relatively dense in central Jordan seems confirmed. But the region supported only a small sedentary population in the Persian and early Hellenistic periods (*c.* 539-200 B.C.). An extraordinary rebound in population began sometime in the last two centuries B.C. The Early Roman period witnessed the greatest density of population for any historic period in both the Karak Plateau and south of Wadi al-Ḥasa. Dense occupation is also attested for the Ḥesban region. Why?

One major reason must be the effectiveness of the Roman client kingdoms, especially Nabataea, in restoring security in a formerly troubled land. The region no doubt suffered from the Syrian Wars between the Seleucids and Ptolemies in the third century and the ethnic warfare that accompanied the collapse of Seleucid rule in the second and early first centuries B.C. This included attacks against towns of Transjordan by the Hasmonaeans and nomadic Arabs from the desert. How the Nabataeans restored order east of the Dead Sea is a matter of conjecture. The reoccupation of many Iron Age watchtowers and fortlets in the region suggests a strategy to monitor and regulate nomadic transhumance and thus permit sedentary exploitation of the potential agricultural areas. We know little about the Nabataean army, but limited evidence suggests a strength of *c.* 10,000 men (Parker 1986: 118). Environmental conditions may also have been a factor, since Koucky's climate model suggests wetter conditions prevailing during this period (Koucky 1987a: 24-25).

Perhaps the most interesting result from the surveys is the evidence for abandonment of sites in the Late Roman period, following the Roman annexation of A.D. 106. This phenomenon can also be observed in the Jordan Valley, well west of the frontier (Yassine 1988: 187-207). What can account for this? Koucky suggests a return to drier conditions in the second and third centuries (1987a: 24-25). If so, this could have had two consequences: some marginal sites were no longer viable for sedentary inhabitants and water and grazing in the desert may have become more scarce. This in turn could have led to nomadic raids on the frontier. Bulliet has argued that the development of the North Arabian camel saddle gave the nomadic tribes vital new military capability in the third century (Bulliet 1975: 87-105).

[4]Eusebius, *Onomasticon* 128.21; *Notitia Dignitatum, Or.* 37.19.

[5]Procopius, *Bellum Persicum* 1.17.45-48.

Trajanic policy in newly annexed Arabia included construction of the *via nova Traiana*, completed in 114. It served as a fortified caravan route for luxury traffic between the Red Sea and Decapolis cities and as a military trunk road along the edge of the desert to monitor nomadic movements (Parker 1986: 123-129). Trajan's road to the Red Sea should be associated with clearance of the Nile-Red Sea canal, the continued second century prosperity of the Red Sea port of al-Quṣeir, and development of the fortified road connecting Coptos in Upper Egypt with the Red Sea. Some Red Sea commerce passed up the *via nova Traiana*, as the economic boom in the Decapolis cities suggests. Yet Trajan's road was not designed merely to protect and service this traffic. The road forts of the southern sector are spaced roughly 12 Roman miles (*c.* 20km) apart, not the 30-50km apart one expects for mere caravan stations. In fact, as the recent surveys reemphasize, there was a large sedentary population in central and southern Jordan that had emerged in the Nabataean era but was now under Roman rule. Does the widespread abandonment of sites by the second century imply the inadequacy of security measures or merely that marginal sites were not viable during a dry phase of a climatic cycle? Was there some migration of sedentary population from rural to urban centers as more secure bases from which to exploit the land? The building programs in the second century that adorned the Decapolis cities just to the north suggest continued economic vitality.

Resurgent population in the Byzantine period may be associated with other facts, real or alleged. A massive military buildup in this region in the Tetrarchic period can no longer be seriously questioned. Koucky's climate model (1987a: 24-25), if accepted, suggests a return to cooler, moister conditions. If so, areas on the agricultural periphery could be exploited if a reasonable level of security was maintained. The military zone of forts, watchtowers, and walled towns was manned by several thousand Roman troops, including *legio IV Martia* at al-Lajjun. The fortifications are concentrated at the eastern, desert approaches to the upper Wadi al-Ḥasa and Wadi al-Mujeb. This suggests that this region was a principal Roman concern that mandated constant surveillance (Parker 1987: 804-811). Despite evidence for nomadic raids in the fourth and fifth centuries, the surveys suggest that the *limes* of Diocletian maintained security, even of the peripheral regions. Recent surveys of both the Rift Valley and several major eastern tributaries suggest dense settlement in the Byzantine period (Jacobs 1983: 262-272; Hanbury-Tenison 1984; Banning and Fawcett 1983; Banning *et al.* 1989: 43-58).

The abandonment of the *limes* by the early sixth century, as attested by literary and archaeological evidence, led to the decline of frontier security. This is apparent on the eastern Karak plateau, which was most exposed to nomadic raids (Parker 1987: 819-823). But perhaps this also reflects the fact that the Limes Arabicus Survey broke down its Byzantine pottery into more discrete periods. One hopes that the pottery from the other surveys may be reexamined for this purpose. The sharp decline in occupied sites in the Umayyad period in all the surveyed regions suggests that regional population had fallen sharply at least by the early seventh century.

A more detailed picture of settlement in central Jordan will be obtained from examination of the individual sites, not possible here. But the overall development of settlement patterns from these four surveys in the Roman and Byzantine periods seems clear. A small sedentary population in the Persian and Hellenistic periods grew dramatically in the first centuries B.C. and A.D. under Nabataean rule. This growth into marginal areas along the frontier may have been aided by a cyclical period of wetter climate and by Nabataean ability to improve regional security. There was some abandonment of sites in the second and third centuries after the Roman annexation. Interestingly, this coincides with an alleged cyclical reduction in rainfall and, at least by the third century, increased nomadic pressure on the frontier. A revival of population occurred in the fourth through sixth centuries. This coincided with a Roman military buildup at the beginning of this period combined with possible return of cooler, wetter conditions. But the abandonment of the military frontier by the mid-sixth century and perhaps drier conditions led to renewed vulnerability of marginal zones. This may explain the decline in settlement by the seventh century.

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