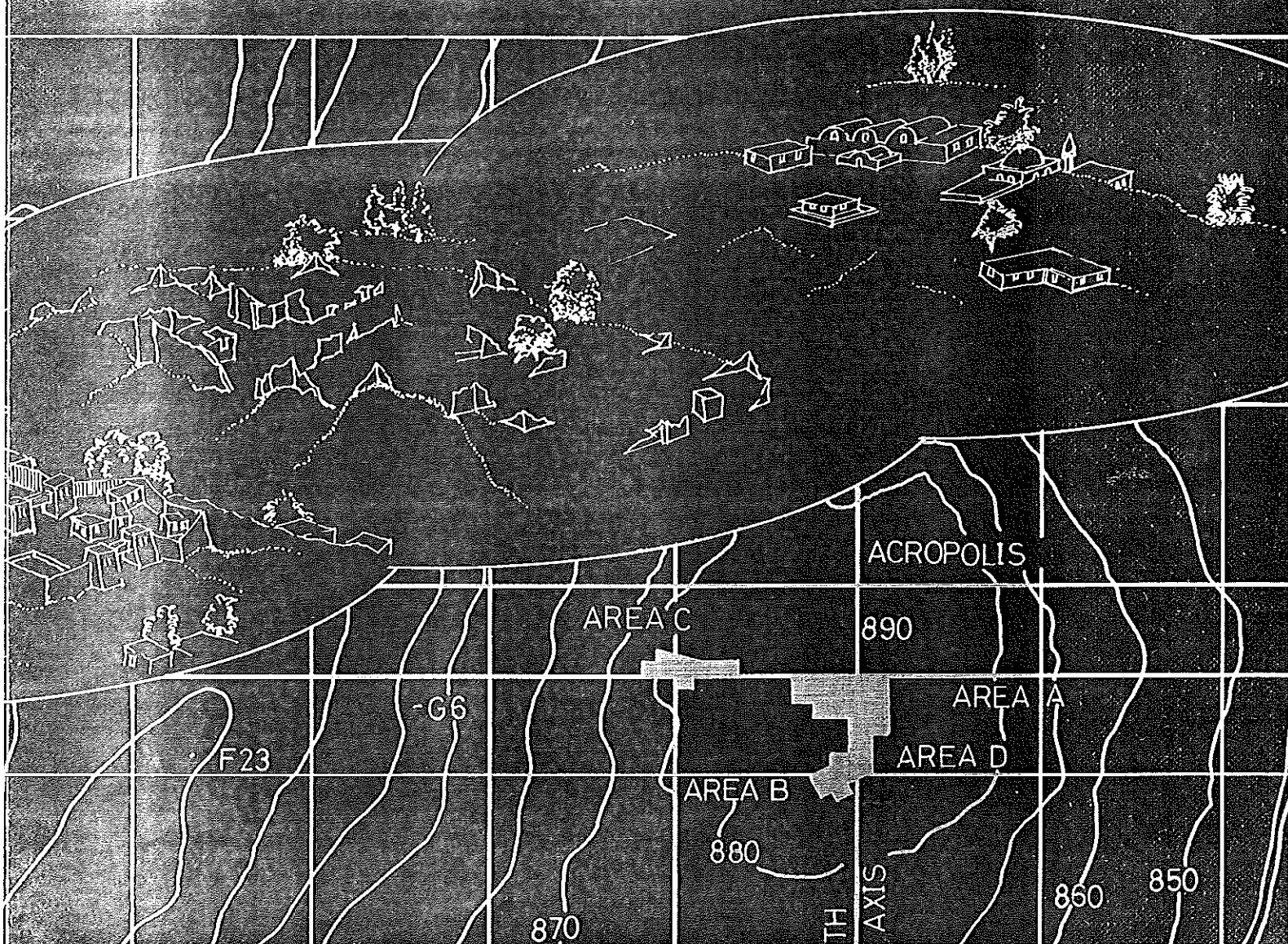


HESBAN 1

Sedentarization and Nomadization

Øystein Sakala LaBianca



HESBAN

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SEDENTARIZATION AND NOMADIZATION:

FOOD SYSTEM CYCLES AT
HESBAN AND VICINITY
IN TRANSJORDAN

by

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Chapter Five

Configurations of the Food System During the Iron Age Millennium: Ca. 1200-500 B.C.

Introduction

Over the 1,000 years between 1500 and 500 B.C., the food system of Hesban and vicinity intensified in spurts until a high point of sorts was reached during the 7th and 6th centuries B.C. Side by side throughout this entire millennium transhumant pastoralists and sedentary cultivators pursued their interdependent quests for food, expediently adjusting their variously constituted agropastoral livelihoods in response to an on-again off-again power drive whereby the center of political gravity was gradually shifted in the direction of urban-oriented intensive agriculture, only to revert back from whence it had been moved away, to the ever-present, ever-ready hands of the nomadic pastoralist tribesmen.

In this chapter some of the archaeological residues which were buried in the dust as this power drive ran its course will be set forth. To this end two lines of evidence will be discussed. On the one hand, changes in environmental, settlement, land-use, operational, and dietary conditions will be examined which attest to the occurrence of a cumulative power drive throughout most of the Iron Age millennium. Specifically, evidence will be presented pointing to a transition from a transhumant configuration at the beginning of the millennium, to one involving mixed production of pasture animals and cereals during Iron I (ca. 1200-1150 B.C.), to a medium-to-high intensity configuration during Iron II (ca. 1150-500 B.C.) based on urban-oriented cultivation of field, garden, and tree crops. On the other hand, the sparse but significant data that bear witness to the activities of the ever-present transhumant population within the project area will also be laid out. But first an introduction is necessary to the sociopolitical context which to a

large degree shaped the various patterns of livelihood which manifested themselves during the Iron Age millennium in this region.

The Sociopolitical Context

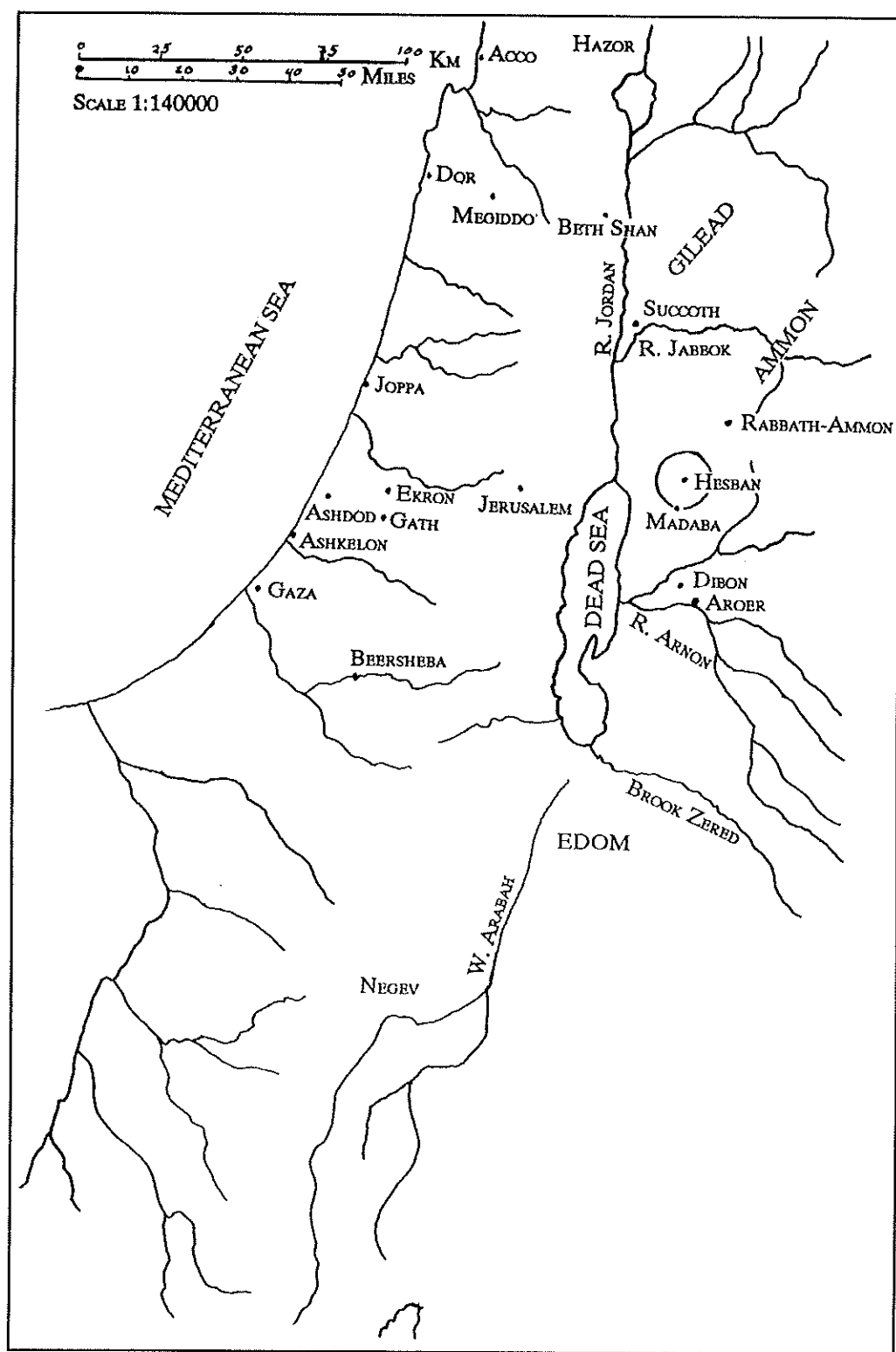
The Wider Sociopolitical Context

In considering the wider sociopolitical context to which daily life in the vicinity of Hesban was oriented throughout the Iron Age (see fig. 5.1), mention must be made of the impact of iron technology on the whole of the ancient world during this period which owes its name to this metal. While heat-treated metal objects appear to have been manufactured on a limited scale long before the dawn of the Iron Age in Palestine (cf. Muhly 1980; Waldbaum 1980; and Heskell 1983), it was not until ca. 1200 B.C. that the manufacture of iron tools and weapons began to become an everyday occurrence in the towns and villages of this region. According to Muhly (1982: 43), it was the collapse of international trade during the waning years of the Late Bronze Age which created the conditions for the development of iron metallurgy.

While copper, which constitutes 90% of the alloy known as bronze, was mined in many localities throughout the ancient world, it was the supply of the distantly obtained tin, which makes up the remaining 10% of this metal, that became in jeopardy by the political upheavals at the end of the Late Bronze Age.

As a result of this disruption of international trade, local communities withdrew into themselves and smiths were goaded into experimenting with locally available iron so as to overcome the technological obstacles which had prevented it from gaining popularity over bronze. As Muhly (1982: 45-46)

Fig. 5.1 Palestine in the Iron Age



explains, it was when the process of carburization of iron was discovered that iron gained an appreciable edge over bronze:

The essential factor in the technological development of iron metallurgy was the introduction of up to .8 percent carbon into the red-hot iron, accomplished by a kind of osmosis through prolonged contact with glowing charcoal in the forging furnace. The introduction of this carbon transformed iron from an exotic, semi-precious metal into a metal that would give its name to the age. For carburized iron (iron to which carbon has been added) is, in fact, steel . . . The basic difference between bronze and iron technology determined, to a very great extent, the ways in which the two metals were used. With bronze it was possible to make large, elaborate and intricate castings from the molten metal in shapes impossible to duplicate by forging a bar of iron. A life-size statue was almost commonplace in bronze, but unheard of in iron. Iron came to be used for objects of rather simple shape and design, requiring great hardness and strength. This meant cutting and chopping instruments such as axes, adzes and chisels, digging instruments such as hoes and plowshares, and, above all, weapons. Because of its hardness and its ability to take and hold a sharp cutting edge or point, iron was ideal for swords, spearheads, knives, daggers, and even arrowheads.

Among the many socioeconomic consequences of the development of iron metallurgy was the emergence of a new pattern of economic exchange, necessitated, on the one hand, by the skills required to shape tools out of iron and, on the other hand, by the greater ease with which fields could be cultivated using steel plows. Writes McNeill (1963: 131):

The fact that metal tools made agricultural work easier and more productive helped to secure a modest surplus to the peasants. Conversely, since the smelting and shaping of metal tools involved special equipment and skills beyond the capacity of any ordinary farmer, the new necessity of buying such tools required the peasants to find such a surplus. . . . [Because of this situation, farmers] were now firmly, if marginally, incorporated within the "great society" which had slowly formed itself around the major urban seats of civilization. Farmers were no longer sufficient unto themselves, as they had been in the fourth millennium B.C.; nor were they simply the victims of their social superiors, supporting the culture of their masters by their own involuntary privation or forced labor, as they had been in the late third and through most of

the second millennium B.C. Instead, the peasants themselves began to enter modestly but significantly into the "great society," exchanging part of their surpluses for iron implements and other goods that were useful or necessary to their improved methods of farming. The result was to allow the humblest class of society to benefit modestly but really from urban-rural differentiation and specialization. This pattern of local exchange provided the Middle East with a new economic base level. Even when political or military events interrupted long-distance trade and forced local regions back upon their own resources, the social and economic structure allowed for a division of labor between town and country, between artisan and peasant. Under these conditions, urban life could never entirely disappear.

The other development which must be singled out because of its far-reaching consequences was the impetus to invasion and plundering of settled areas resulting from the new metallurgy. In *The Rise of the West* (1963) William McNeill explains how the relative abundance of iron, coupled with the spread of the new iron technology, had the effect of "democratizing warfare" in the ancient Middle East. Indeed, in his view "these technical considerations go far to explain the success of the barbarian invasions that punctuated the political history of the ancient Orient toward the close of the second millennium B.C." (1963: 118).

The Local Sociopolitical Context

The first thing which can safely be said about the local sociopolitical context of Tell Hesban and its environs is that throughout the Iron Age it belonged to a region of Jordan which was much in dispute. To the north and east were the Ammonites, to the west were the Israelites (and later the divided kingdoms of Judah and Israel), and to the south were the Moabites and the Edomites. About the history of these tribes and their disputes between each other and with Israel a considerable amount has been written, particularly by biblical scholars and archaeologists. A partial list of some of the relevant studies include Tristram (1865, 1873), Merrill (1881), Thomson (1880), Conder (1889, 1892), Albright (1924), Glueck (1939, 1946), Baly (1957), Gese (1958), Thompson (1958), Harding (1959), Hentschke (1960), Van Zyl (1960), Fohrer (1961), Reventlow (1963), Oded (1971, 1979), Rosner (1976), (Dever 1977), Boraas and Geraty (1978), Sauer (1978b), Horn (1979), Miller

(1980, 1982), Bennett (1982), Redford (1982), Dornemann (1983), Sawyer and Clines (1983), and Hopkins (1985).

Throughout the Iron Age political domination of the project area was rotated among these four neighboring states. Indeed, the traditional boundary between Ammon and Moab runs right through the northern portion of the project area. Thus, geographically, Tell Hesban was actually much closer to the traditional capital of Ammon, namely Rabbath-Ammon or modern Amman, ca. 20 km to the north, than it was to the traditional capital of Moab, namely Qir-hareseth, the present Kerak, ca. 80 km to the south of Tell Hesban (cf. Glueck 1946: 83-125; Baly 1957: 229-233). According to biblical sources, the strife over control of this territory included not only the Ammonites, the Moabites, and the Israelites, but also the Amorites (Josh 2:10; 9:10; 24:8; Judg 10:8, 11:19-20). According to Num 21:26, for example, "the Amorite King Sihon . . . had fought against the former king of Moab and taken from him all his territory as far as the Arnon." Sihon, whose capital was Heshbon, was subsequently "put to the sword" by the Israelites (Deut 2:33); after which "the Reubenites built Heshbon, Elealeh, Kiriathaim, Nebo, Baal-meon . . . and Sibmah" (Num 32:37, 38). To the southwest of Heshbon, at Dhiban and vicinity, the Gadites, another Israelite tribe, built "walled towns with folds for their sheep" (Num 32:34-36; cf. 1 Chr 6:77-81).

It is evident, then, that as seen during the recent past in Chapter Three, the political context during the Iron Age involved complex interactions between several different local sociopolitical entities. Furthermore, during the latter part of the 8th century B.C., the Assyrians and later the Babylonians extended their control into this region as well. Thus, to four centuries of strife between nearby neighbors were added three more centuries of struggle for local autonomy and freedom from the political domination of world powers.

Because of the research cited above, a considerable amount of knowledge has accumulated over the past century about the superficial, rapidly changing history of rulers and nations, of wars and treaties, and of boundaries and fortifications with reference to the Iron Age inhabitants of Hesban and vicinity. Much less is known, however, about the lower undercurrents of activity which represented the daily life of the ordinary people living in

this region. One reason for this, of course, is that the structures of everyday life are much less perceptible in the literary sources, although progress has been made in our knowledge of the pertinent languages (Herr 1978; Jackson 1983).

The scholar who perhaps has gone the furthest toward portraying the daily life of the peoples of Ammon, Moab, and Edom is Oded (1971, 1979). Noting that all three of these kingdoms were located along the "King's Highway," an international caravan route connecting Arabia and Egypt with Syria and Mesopotamia, and that to the east of all three nations lay the desert, Oded sums up the sociocultural situation in Moab thus:

The geographical and economic conditions of Moab made it easy for the Moabites to achieve a suitable blend of their desert heritage with the values of an urban and rural society: this is to be attributed to Moab's position on the border of the desert and to its economy, which was based, on the one hand, upon agriculture, and, on the other, upon cattle raising and trade conducted along the desert routes. Living in a border country, the Moabites, like the Edomites and the Ammonites, were in need of effective defense against sudden attacks by raiders from the desert, as well as against invasion by the regular armies of neighboring countries. For this reason, the Moabites organized themselves into a national kingdom administered from a single center at the beginning of their settlement in Moab; only a permanent and strong leadership was capable of establishing a system of border fortresses, of setting up a permanent force able to match itself against external dangers, and of organizing guards for protection of the section of the "Kings Highway" which passed through Moab (Oded 1971: 191).

As Oded acknowledges, this reconstruction of Moabite culture rests heavily on evidence from "the Middle Iron Age." It is a picture which best fits the culture at the height of its productivity and influence, under its ruler, Mesha, king of Moab, whose achievements he himself summarized on a black basalt stele known as the Moabite Stone (Horn 1979: 751-752). In what follows, an even closer look at the material conditions of the inhabitants of the northern region of Moab is offered, with the dimension of change over time added.

Changes in Environmental Conditions

Given the location of our project area on the western edge of the Arabian Desert, and the vary-

ing patterns of human exploitation of this region since prehistoric times, an important question to consider is whether and to what extent the natural resource base, the stage upon which the drama of the food system transformation occurred in antiquity, was the same as today or different from today. Has the climate changed significantly since the Iron Age in this region? Has human activity in this region fundamentally altered the landscape as a natural habitat for plants and animals? Since both of these important questions have been addressed by specialists collaborating with the expedition core staff (cf. Geraty and LaBianca 1985; LaBianca and Lacelle 1986), our consideration of them here will be brief and in a summary manner.

The matter of climatic change can be considered at two levels: changes in the local climate (microclimate), and changes in the overall climate of the region (macroclimate). As far as the macroclimate is concerned, conditions which existed during the Iron Age appear to have been basically the same as those existing today. Evidence for this is provided by Gilliland's study of the carbonized seeds from Tell Hesban. He writes (1986: 139-140):

The paleobotanical evidence presented here gives no compelling reason to conclude that since the initial Iron Age occupation, the Tell Hesban area has ever been either more or less desert-like than at present. For example, *Amaranthus graecizans* is primarily a desert species . . . and either this species or a close relative of it has been present since the Hellenistic period. This situation is also true of *Malva*. . . . *Polygonum*, another wasteland weed, was part of the Iron Age flora, and is still present today. On the other hand, legumes such as *Lens culinaris* would not likely grow in a desert without irrigation . . . and yet this genus has been present since the Iron Age, and even today is cultivated without irrigation.

Others who have addressed this question on behalf of the Hesban project have reached similar conclusions (Boessneck and von den Driesch 1978a; LaBianca and Lacelle 1986).

But while the macroclimate appears not to have changed much since the Iron Age, local changes in climate, plant, and animal life did take place during this millennium. As a result of the deforestation which preceded the spread of plow agriculture onto the fertile plains of the highland plateau, the communities of oak and pine forests which covered much of the land surface in this region during

earlier millennia were gradually cut back. This removal of the native forests resulted in less protection of the local soils and soft plants from the ravages of torrential rains and intense sunshine. Consequently, hardier species of plants, such as thorny burnet, common ballota, alkanet, blue eryngo, century, and thistle today live where formerly coniferous and oak forests existed. Thus, while man's activities may not have caused desertification in this region, they have "pushed succession backward to an earlier stage" (Gilliland 1986).

Yet, in contrast to the present landscape, the Iron Age landscape had large quantities of trees, especially on hills and slopes where cultivation was not extensive. Thus, better pasture conditions for cattle and sheep were found than can be found today. This situation is reflected in the relatively large proportion of bones belonging to these animals from Iron Age strata. It is also hinted at in biblical references to the Hesban region which describe it as being "good grazing country" on which "the Reubenites and the Gadites had large and very numerous flocks" (Num 32:1, 3, 4).

Better protection for a variety of wild mammals and birds was another result of the presence of extensive forests. Of the more than 100 species of wild birds and mammals identified in the bone remains from Tell Hesban, only a small proportion of these have survived until today. Gone, for example, is the lion, wild pig, ostrich, and blackbird, to mention only a few of the species which once inhabited this region (cf. Boessneck and von den Driesch 1978a).

Changes in Settlement and Landuse Conditions

Intensification of Settlement and Sedentary Life

The first line of evidence suggesting an intensification of the food system of Hesban and vicinity during the Iron Age comes from consideration of the increase in the quantity and location of sites within the project area. As can be seen in figs. 5.2, 5.3, and 5.4, an increase in the quantity of sites occurred from a total of 4 sites during the preceding Late Bronze Age, to a total of 24 sites during Iron I and 51 sites during Iron II. To these can be added an additional 46 sites, most of them very small, which could only be assigned to the Iron-Persian period.

Fig. 5.2 Late Bronze Age sites

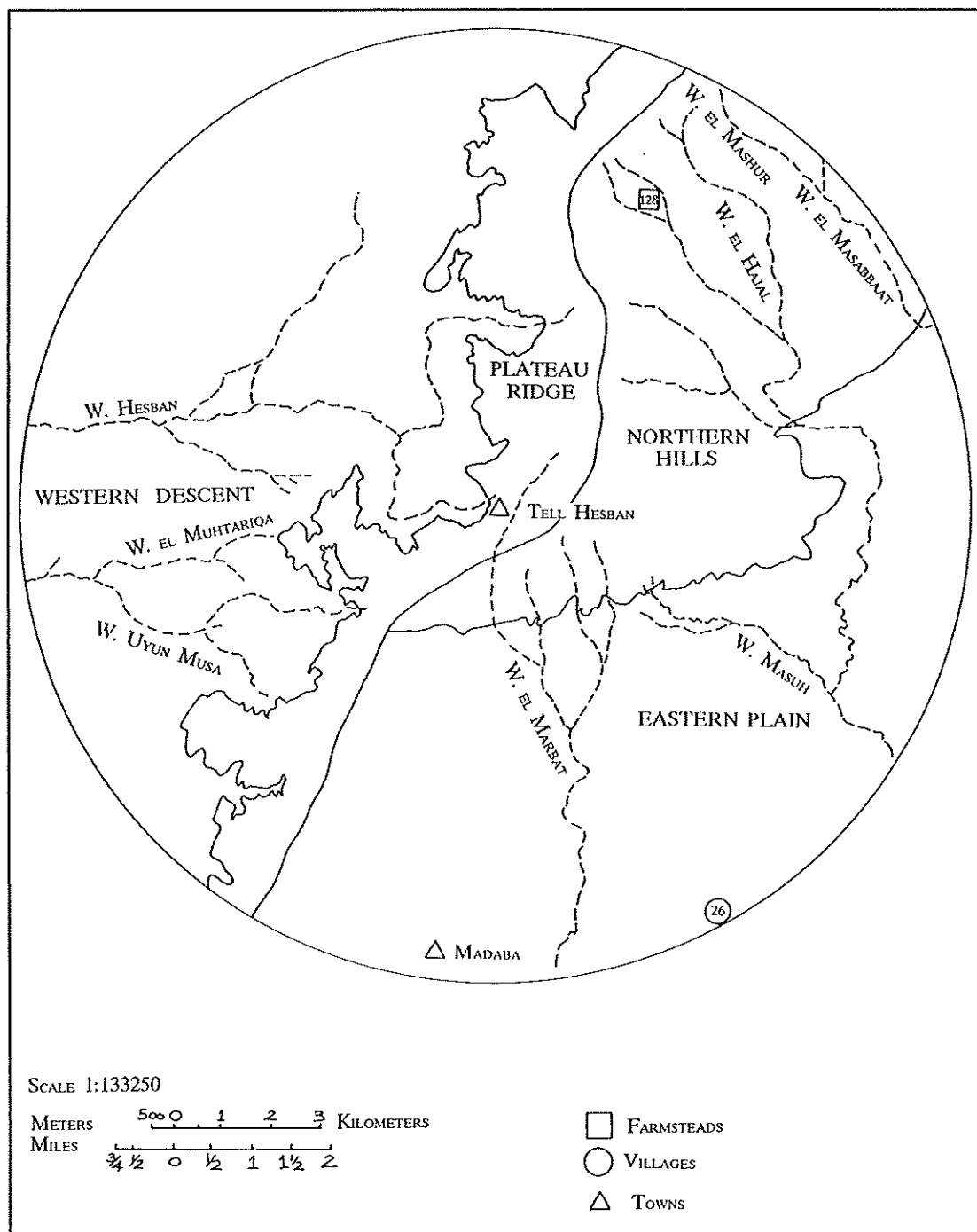


Fig. 5.3 Iron I sites

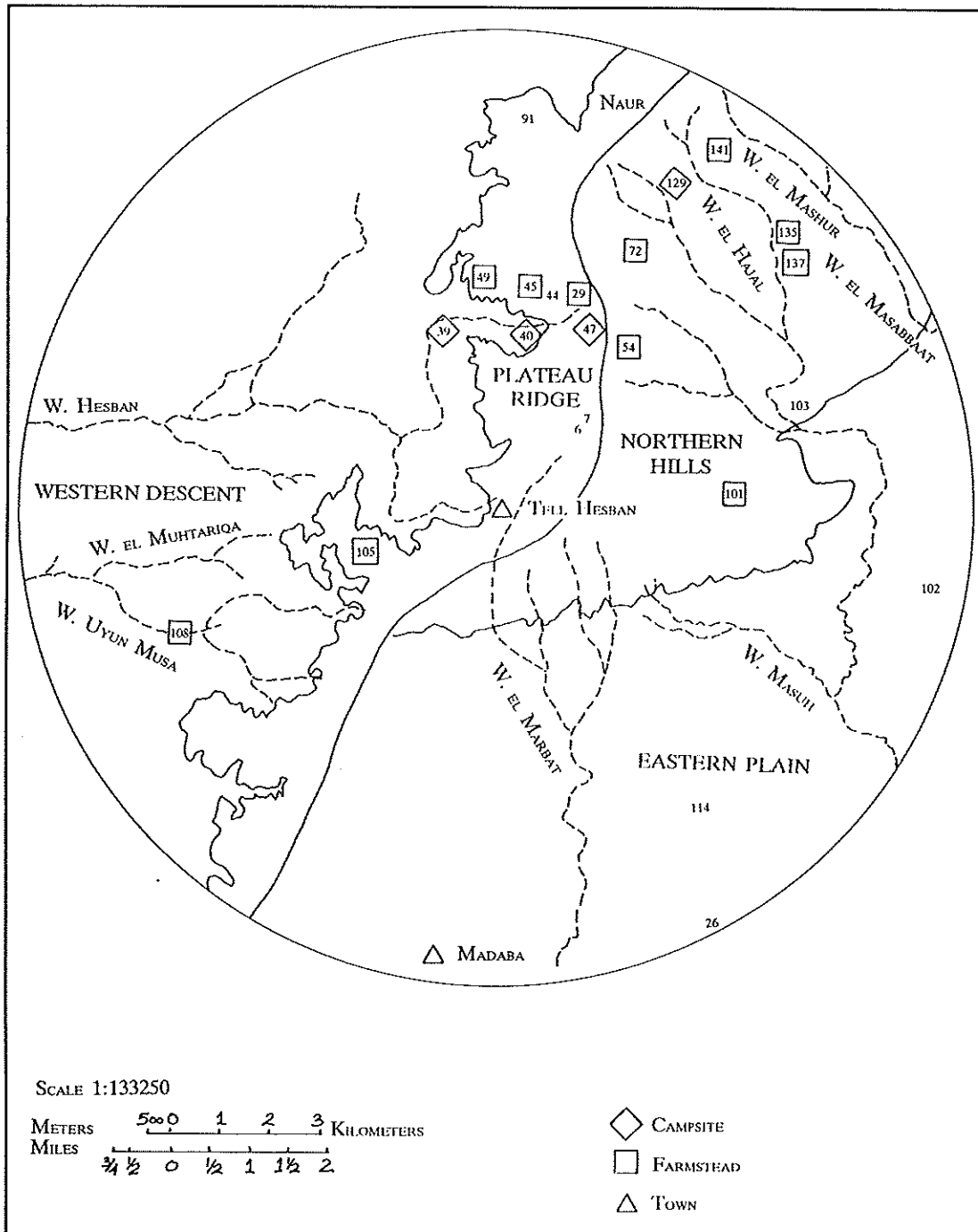


Fig. 5.4 Iron II sites

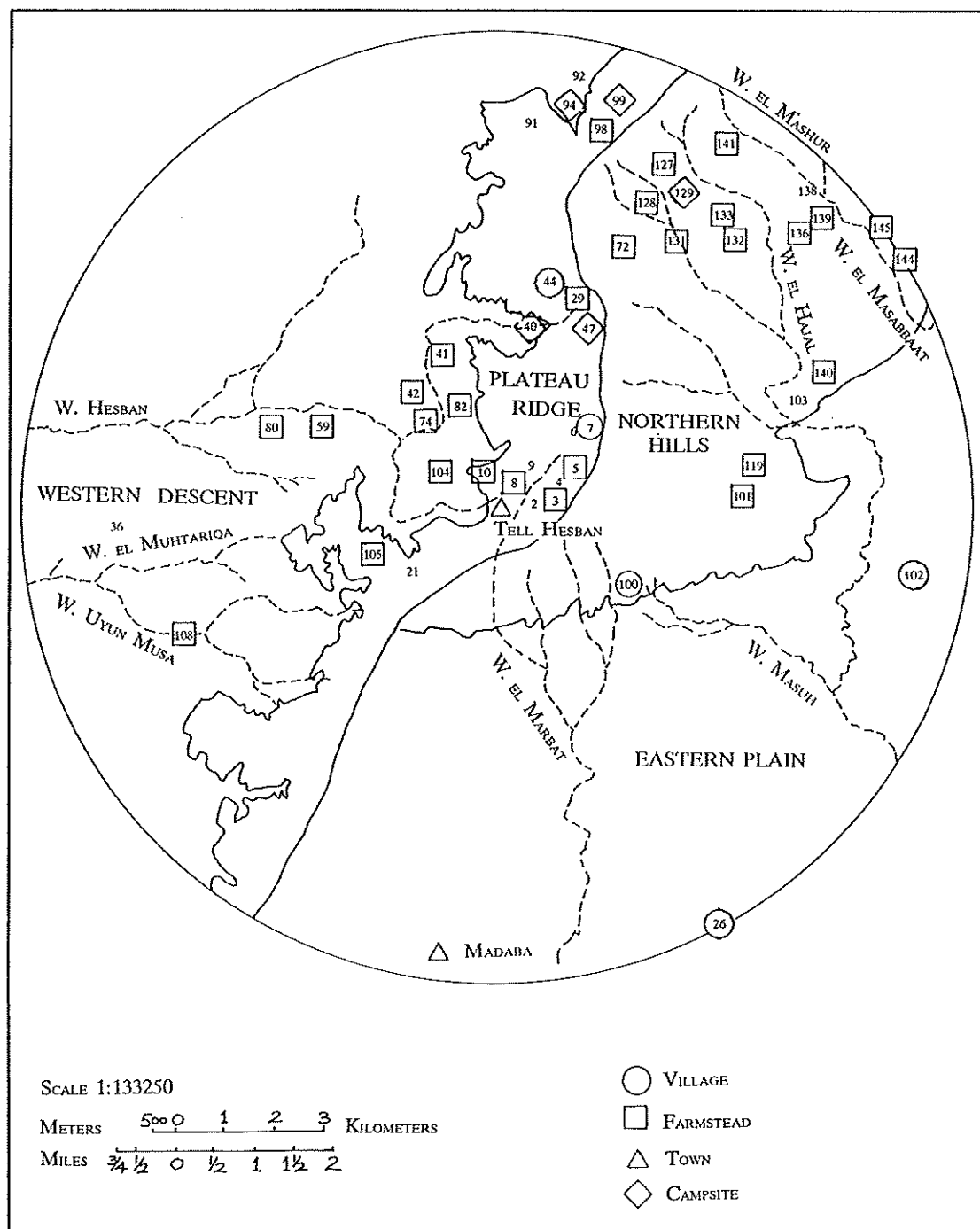


Table 5.1 Number of identified specimens of principal domestic animals from Iron Age strata

Strata	Period	Cattle		Sheep/Goat		Sheep		Goat		Pig		Camel		Equids		Horse		Donkey		Total		Accumulation Rates
		#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	
1	Modern	60	5.7	908	86.0	36	3.4	52	4.9	25	2.4	9	0.9	54	5.1	5	0.5	19	1.8	1,056	5.7	9.96
2-3	Mamluk	1,117	13.3	6,901	81.9	353	4.2	402	4.8	139	1.6	215	2.6	57	0.7	6	0.1	14	0.2	8,429	45.3	43.00
4	Ayyubid	9	10.7	71	84.5	4	4.8	6	7.1	--	--	2	2.4	2	2.4	--	--	--	--	84	0.5	1.40
5	Abbasid	8	3.9	188	91.7	14	6.8	11	5.4	2	1.0	5	2.4	2	1.0	--	--	--	--	205	1.1	0.73
6	Umayyad	68	10.4	494	75.3	47	7.2	33	5.0	80	12.2	8	1.2	6	0.9	--	--	3	0.4	656	6.5	7.80
7-10	Byzantine	162	12.5	932	71.6	58	4.5	48	3.7	130	10.0	14	1.1	63	4.8	5	0.4	10	0.8	1,301	7.0	4.39
11-13	Late Roman	286	11.7	1,892	77.6	140	5.7	115	4.7	183	7.5	17	0.7	58	2.4	2	0.1	6	0.2	2,436	13.1	10.36
14	Early Roman	131	15.0	682	78.1	67	7.7	36	4.1	43	4.9	7	0.8	10	1.1	--	--	3	0.3	873	4.7	4.12
15	Late Hellenistic	136	12.0	977	85.9	135	11.9	75	6.6	6	0.5	15	1.3	4	0.4	--	--	1	0.1	1,138	6.1	2.60
16-18	Iron 2	256	14.3	1,406	78.5	137	7.7	83	4.6	94	5.3	5	0.3	29	1.6	--	--	9	0.5	1,790	9.6	3.58
19	Iron 1	145	22.2	460	70.6	38	5.8	29	4.4	31	4.8	3	0.5	13	2.0	--	--	6	0.9	652	3.5	3.26
Sum	All	2,378	12.8	14,911	80.1	1,029	5.5	890	4.8	733	3.9	300	1.6	298	1.6	18	0.1	71	0.4	18,620	100	5.81

Table 5.2 Number of identified specimens of carbonized seeds from Iron Age strata

Strata	Period	Oats		Barley		Wheat		Lentil		Pea		Bitter Vetch		Broad Bean		Olive		Grape		Garden Heliotrope		Total	
		#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
1-6	Modern-Arabic	--	--	29	15.3	91	48.1	15	7.9	--	--	36	19.0	7	3.7	6	3.2	5	2.6	--	--	189	28.5
7-10	Byzantine	--	--	4	7.5	9	17.0	3	5.7	--	--	8	15.1	--	--	14	26.4	15	28.3	--	--	53	8.0
11-14	Roman	1	0.9	62	58.5	5	4.7	1	0.9	--	--	2	1.9	--	--	--	--	35	33.0	--	--	106	16.0
15	Late Hellenistic	2	1.0	12	5.9	43	21.3	8	4.0	1	0.5	126	62.4	2	1.0	6	3.0	2	1.0	--	--	202	30.4
16-19	Iron	5	4.4	6	5.3	14	12.3	2	1.8	--	--	--	--	--	--	82	72.0	3	2.6	2	1.8	114	17.2
Sum	All	8	1.2	113	17.0	162	24.3	29	4.4	1	0.2	172	25.9	9	1.4	108	16.3	60	9.0	2	0.3	664	100

When the shifts which occurred in the regional distribution of sites between Iron I and Iron II are examined, the same pattern is apparent that was seen during the recent past as discussed in Chapter Three: settlement began along the plateau ridge and in the northern hills and eastern plains, but shifted gradually toward occupation of the western descent region as the food system entered its most intensive phase. Thus, whereas during the Iron I only 8% of the sites from that period are found in the western descent region, during the Iron II settlement in this region had increased to 22% of the sites from that period.

Also reminiscent of the process of settlement accompanying the rise of the modern nation of Jordan is the pattern of reuse of previously settled sites. Thus, the majority of the sites which were settled during the Iron Age had been settled earlier, particularly during the Early Bronze Period. Furthermore, sites were sometimes settled, abandoned, and then resettled again throughout the Iron Age millennium. Thus, the Iron I settlement

at Tell Hesban, which began about 1200 B.C., appears to have been followed by an occupational interruption of ca. 150 years, until the end of the 9th century B.C. when the Iron II settlement appears.

Even within the Iron II Period the site appears to have been totally razed and then rebuilt, as is suggested by the stratigraphic evidence from Stratum 16 (Herr forthcoming). While largely destroying the architectural accomplishments of the previous settlers, this rebuilding activity, which occurred sometime around 700 B.C., was followed by the most intensive build-up of human occupation which took place during the Iron Age.

Changes in Landuse:

From Stock to Crop Production

An important fact to establish at the outset with regard to the bone data from the Iron Age strata (table 5.1) is that, compared to those from the Greco-Roman and Islamic strata, they are the smallest in size, accounting for only approximately

13% of the total assemblage from all periods. This situation is reflected also in the fact that fragment accumulation rates for bones from the Iron Age strata were lower—3.26 for Stratum 19 and 3.58 for Strata 16-18—than the mean accumulation rate for all strata, which was 5.81.

A finding significant to Iron Age bone data is the relative importance of cattle in Iron I (Stratum 19). During this period cattle account for a higher proportion of the finds than at any other time in the tell's history (22.2%), compared with 15%, the highest for the Greco-Roman centuries, and 13.3%, the highest for the Islamic centuries. While it is possible that this finding may be accidental, attributable perhaps to the small size of the bone sample from Iron Age strata, this is unlikely, especially with the fact that this trend was also noted by the author in "bone reading sessions" during earlier seasons at Tell Hesban.

A proposal that might account for this phenomenon is that during the Iron Age centuries, a fundamental shift took place in Transjordan in how cattle were utilized. Thus, whereas in the early Iron Age centuries cattle were raised, along with sheep and goats, as pasture animals, by Iron II times this role was largely superseded by their role as draft animals. This is the principal role which they appear to have played in all subsequent periods. It is significant, in this regard, that as the proportion of cattle in the pasture herds was reduced, the proportion of sheep and goats increased from 70.6% to 78.5% between Iron I and Iron II respectively. The increased role of cattle as draft animals might also account for the slight decline in the proportion of equids between these two periods: from 2.0% in Iron I to 1.6% in Iron II.

Unfortunately very little in the way of ancient plant remains from the Iron Age is available from Tell Hesban. Only six flotation samples were obtained from this period, of which 114 specimens could be identified, as shown in table 5.2. While it is not certain that the garden heliotropes and oats were cultivated locally (Gilliland 1986), the wheat, barley, lentils, and grapes no doubt were grown on the fields of Hesban in the Iron Age as they are today. If the lentils were grown in rotation with wheat or barley, as they are today in Jordan, this would likely have occurred toward the end of Iron I and throughout Iron II as the overall emphasis on crop production intensified at the expense of stock production.

Similarly, grapes and olives were probably produced in much larger quantities during Iron II, as this is the period when settlements increased in number in the western descent region and along the slopes where these crops could be grown on terraces adjacent to nearby villages.

Changes in Operational Conditions

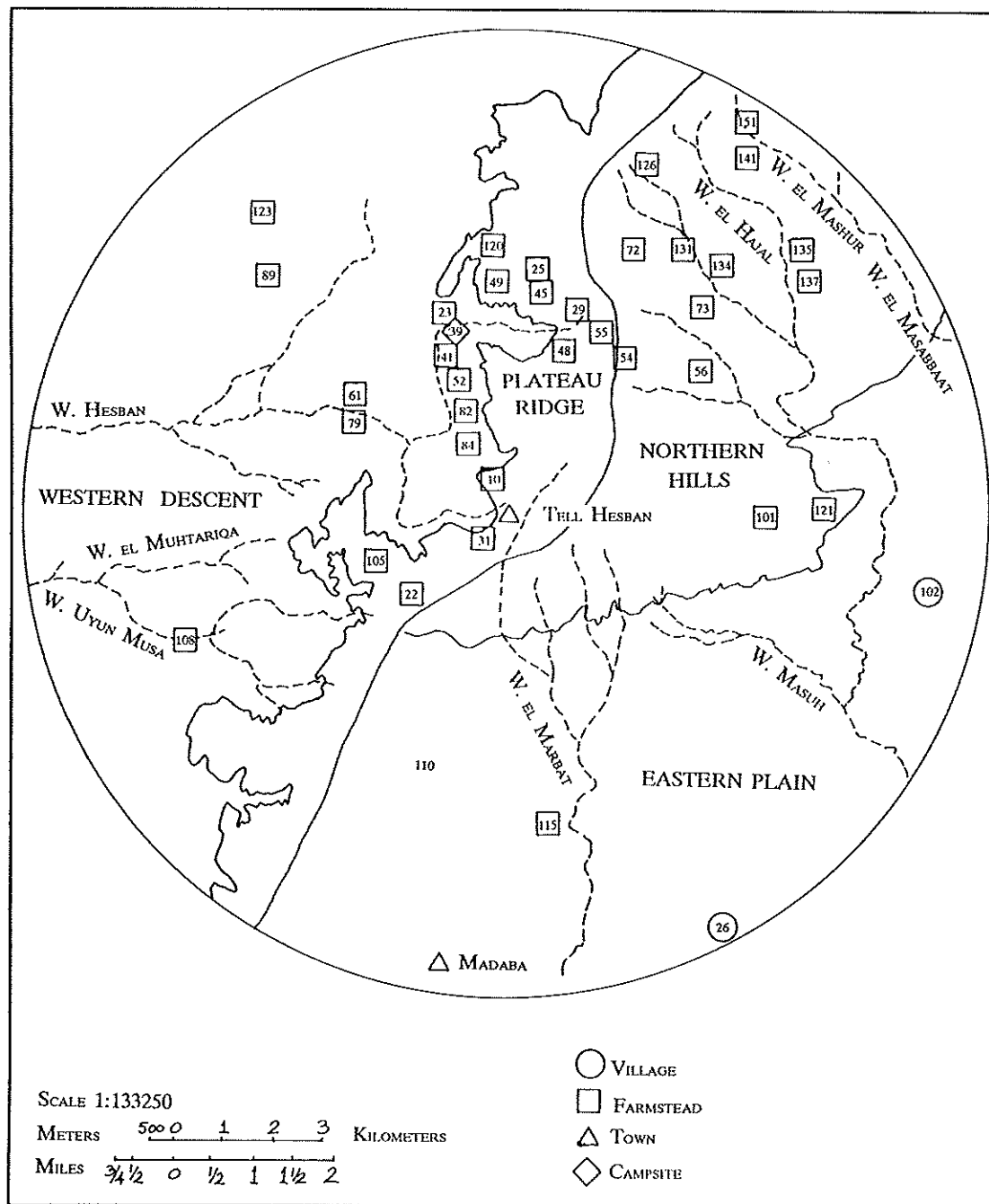
Farmsteads and Farm Towers

At least 10, and possibly as many as 12 of the Hesban Survey sites contain the remains of what appear once to have been isolated farmsteads (see fig. 5.5). All but one of them are located along the plateau ridge and in the northern hills region of the project area. Furthermore, in nearly all instances, they are located either on a natural hill or on a ridge in close proximity to agricultural lands. Judging from the associated pottery, only four of them came from Iron I (49, 105, 108, 137), the remaining ones having come from Iron II (5, 98, 104, 105, 131, 132), except for two which could be dated only to the Iron Age (73, 89).

Associated with many of these isolated Iron Age ruins were other features suggestive of their agricultural function. Site 137 offers a good example. It is located "on a low hill of bedrock surrounded by a cultivated plain." Nearby were "two wine presses cut into bedrock and a small cistern or storage cave" (Ibach 1987: 29). In the case of this site and Sites 98 and 131, the remains of one or more rectangular buildings were also visible. The latter site also included a perimeter wall measuring 192 m along the north and east sides of the site (cf. Johnson 1973; Applebaum, Dar, and Safrai 1977; Edelstein and Gat 1980; Edelstein and Kislev 1981; McGovern 1985).

Sometimes associated with these Iron Age farmstead sites, and other times found in isolation, were the remains of structures which in Ibach's (1987) report were identified as "towers." These towers ranged in size from 8 m to 15 m in diameter (table 5.3), judging from the measurements included in the Hesban Survey account (Ibach 1987). Exactly how these Iron Age towers functioned in the food system of this period is not clear. On the one hand, that they were mere agricultural field towers such as those found in the vicinity of Samaria by Applebaum, Dar, and Safrai (1977) is unlikely, for the sizes of the Samaritan field towers range in

Fig. 5.5 Iron Age farmsteads



diameter only between 3.7 m and 4.6 m. On the other hand, that these structures represent Ammonite defense towers, as has been suggested by several German scholars (Gese 1958; Hentschke 1960; and Fohrer 1961), is an interpretation which does not seem plausible either, especially given their location adjacent to arable valleys. Furthermore, while the tower structures are too small to house many people (*i.e.* a garrison of troops), their foundation stones are too large for normal houses (Yunker personal communication).

Site	Roman Towers	Site	Iron Age Towers
37	7.0 m	5	----
38	6.0 m	49	8.3 m
63	9.8 m	73	12.0 m
64	7.5 m	89	10.9 m
67	7.5 m	98	14.7 m
	9.3 m	104	----
124	5.8 m	105	----
	3.4 m	106	----
125	6.0 m	108	----
	9.0 m	131	----
		132	8.0 m
		137	----
Mean = 7.13 m		Mean = 10.78 m	
Range 3.4-9.8 m		Range 9.3-14.7 m	

Table 5.3 Size of Iron Age and Roman towers

The best explanation for these towers may be that they represent the Iron Age version of the protective dwellings which were in use throughout the Late Ottoman and Early Modern periods in Jordan's history (discussed in Chapter Three). As such they probably served many functions, including service as shelters for cultivators tending nearby orchards and as places for storage of crops and agricultural implements. It is possible, also, that as in the case of the Samaritan field towers, their roofs served as places for ripening and drying fruit and as lookout posts for sighting thieves and destructive animals (*cf.* Applebaum, Dar, and Safrai 1977: 97). As in the case of their counterparts in this century, these Iron Age farm towers also very likely provided places of refuge for farm families and protection for flocks of sheep and goats when under the threat of attack by hostile neighbors.

It is important to be able to distinguish these Iron Age farm towers from the watchtowers built by the Romans a thousand years later. Noteworthy,

therefore, are the following differences: first, whereas the Iron Age farm towers were located adjacent to agricultural lands on hills throughout the project area, the Roman watchtowers found by the Hesban Survey were all found adjacent to the remains of ancient Roman roads. Second, the Iron Age farm towers are generally much larger (see table 5.3), having a mean diameter of about 11 m, compared to the Roman towers which averaged ca. 7 m in diameter. Third, Iron Age sherds are usually present adjacent to the Iron Age farm towers, and, in some instances, they are the most abundant (Hesban Survey Site 135, compare Fohrer 1961: 60). In most instances, Iron Age sherds are absent, or at least not recognized as such, from the sites containing the Roman watchtowers.

In addition to the towers discovered by Ibach's team, mention must also be made of Saller and Bagatti's (1949) survey of the Nebo region which produced over two dozen "stone circles," many of which very likely were agricultural field towers of the sort found around Samaria. The sizes of two of Nebo region stone circles are 1.24 m (F5) and 3.3 m (B6). While some of them may also have served as burial place markers, as Saller has suggested, the fact that he also noted their function as "camping places for the Arabs" argues for their important function in the local food system as well.

Water Management

It has been stated earlier that a crucial condition for the expansion of settled life in Transjordan is the availability of water. As could be expected, therefore, throughout the Iron Age there is a notable expansion of efforts with regard to this resource. Indeed, of the Iron Age remains from Tell Hesban, none are more impressive in terms of effort expended in construction than are the cisterns, channels, and reservoirs from this period. A closer look at the pertinent findings will illustrate this.

According to Herr (forthcoming), the very first evidence of human occupational activity on Tell Hesban is a "long, straight trench crudely carved out of bedrock in B.2, 3, and D.4. Its depth varied around the 4.00 m. mark . . . and its width was 2.00-2.50 m. at the top and around .75 m. at the bottom." To the extent that it was excavated, it measured 16.85 m long. While the function of this trench is enigmatic, the explanation favored in the end by Herr is that it was a channel whereby water from sources to the east of it could flow into a

reservoir believed to have existed to the west of it ("in the general region of B.2").

Given the crucial importance of water for expansion of settled life, this interpretation, insofar as it favors an explanation having to do with water use, is probably as sound as any. It is likely, however, that its function was more than simply that of a channel for transporting water. For this purpose alone it is too big, as it is located near the summit of the tell where its catchment area would have been too small to necessitate the construction of a channel this deep and wide.

More consistent with the concern for water sufficiency would be the suggestion that this trench served both as a channel and as an overflow tank for water overflowing from surrounding cisterns. Cisterns of various sizes and shapes are encountered throughout nearly every stratum at Tell Hesban, beginning with Iron I Stratum 19 (D.1:63). This earliest of the cisterns from Tell Hesban was small, ca. 2.25 m wide and 3.50 m long by 1.75 m high, and shaped roughly like an egg. Also, it was coated completely, top to bottom, by a thick (ca. .08 m) layer of coarse, but very hard, dark tan plaster. If this suggestion is correct, then already in the Iron I village we encounter a significant water management complex consisting of at least one, and probably many (had our excavations been more extensive) cisterns, and an overflow tank, which possibly also served as a channel for leading water to a yet-to-be-discovered reservoir.

More extensive still were investments in water installations during the Iron II Period. The most striking evidence of this is the large plastered reservoir discovered in Iron II Stratum 17 (B.1 and B.2 [pls. 5.1, 5.2]). Cut ca. 7 m deep into bedrock, this roughly square reservoir measured 17 m from its southeastern to its northeastern corner. Also found were various shallow feeder channels carved out of bedrock shelves above it. Herr (forthcoming) estimates that it would have had a capacity of slightly over 2,000,000 liters. Because of the enormity of this reservoir, he has suggested that it might have been built by Mesha, the king of Moab, who claims in the famous Mesha Inscription (Horn 1979) to have built water conservation projects in some of the cities listed in his inscription. The reservoir appears to have been in use throughout most of the Iron II Period.

There can be little doubt that a crucial factor in accounting for the spread of permanent settle-

ments during the Iron Age into regions, such as the eastern plain, where there was no nearby spring or stream to go to for water, was that plastered cisterns came to be relied upon during this period much more than they had been during previous centuries. Thus, cisterns were noted in the Hesban Survey at 7 (or 29%) of the 25 Iron I sites, at 25 (or 49%) of the 51 Iron II sites, and at 8 (or 17%) of the 46 Iron I-II sites. While there is no way of knowing for certain when these cisterns were built and during which periods they were used or not used, short of careful excavation of each, we do know that many of them that are in use today in the villages of Jordan were built in antiquity. We also know that certain of the cisterns excavated at Tell Hesban were in use already in the Iron Age and that they have been used and reused at various points in time since. It may be noted, however, that proportionately more cisterns were found at Iron II than at Iron I sites, a pattern which is consistent with other lines of evidence for the intensification of the food system over these two periods.

Terraces

Nowhere is the blending of the past with the present in Jordan more apparent than when it comes to the maintenance and use of dams and terraces for water and soil erosion control. Indeed, it can safely be said that the majority of terraces currently being utilized by village farmers in Jordan were originally constructed sometime in antiquity. In the case of the majority of these remains, however, it is difficult to be certain about the precise point in time when a given dam or terrace was constructed, used, reused, or neglected.

Examples of terraces can be found in the immediate vicinity of Tell Hesban. In the Wadi el Muhtariqa, a tributary of the Wadi Hesban to the northwest of the tell, a number of retaining walls spaced about 30 m apart can be seen. These form a series of descending platforms, each held in place by these retaining walls. These platforms descend from a large reservoir to the north of the tell which very likely was added sometime during the Roman Period. This whole complex was probably more intact when Musil (1907: 384) visited Hesban, ca. 1902, than it is today. By means of these retaining walls, the flow of water resulting from the winter rains would be slowed and diverted onto the banks

Plate 5.1 Wall B.2:84 as part of the eastern face of the Iron Age reservoir in Area B; view east

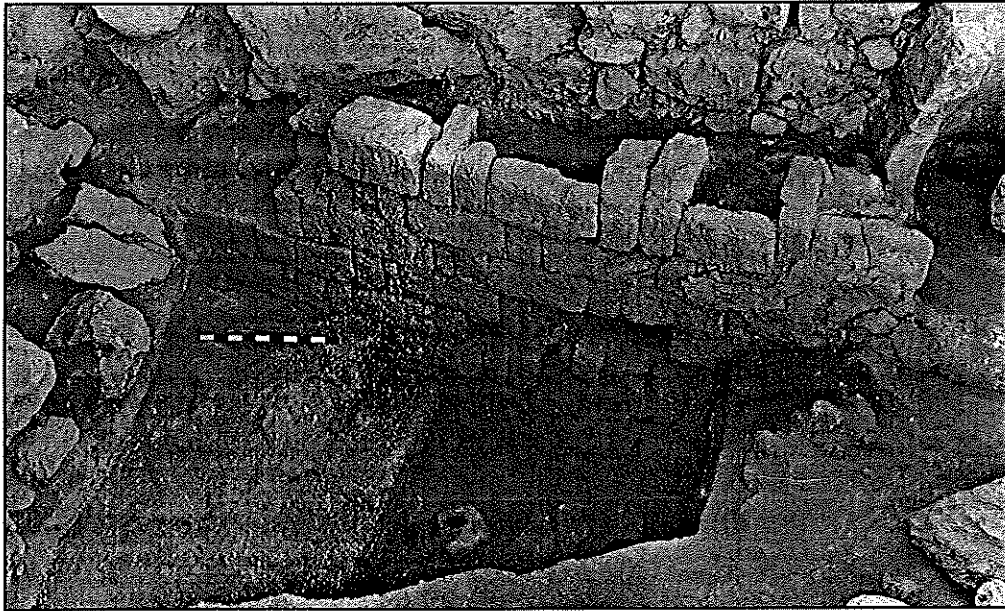
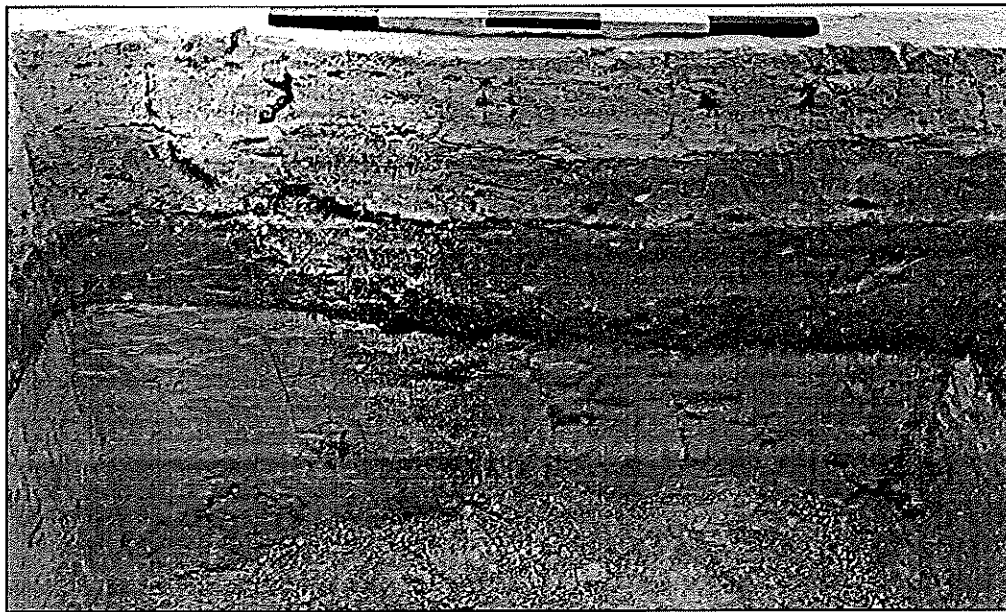


Plate 5.2 Plaster layers (B.1:145ff) visible in the bottom of the Iron Age reservoir; view west



of the wadi, thereby enlarging the lands available for cultivation. Furthermore, the soils washed off from the higher slopes above the wadi would be captured for agricultural use.

Unfortunately none of these wadi terraces have been investigated to determine their date of origin, but that they were in use in the Iron Age is suggested by the intensity of settlement and agricultural activity at Hesban and vicinity, especially during the Iron II Period. Support for this contention is provided by biblical sources. Thus, Stager (1982: 115) has noted that the word *šadmōt* which appears in Isa 16:8 with reference to biblical Heshbon should be translated "terraces." As used in this text, the word *šadmōt* is in "a clear agricultural, or more precisely horticultural, context," writes Stager (1982: 114). His translation of the relevant phrases is as follows: "The terraces of Heshbon languish, and the vine of Sibmah." It should also be noted that agricultural terracing is a well-documented Iron Age phenomenon on the other side of the Jordan River (Stager 1976, 1982; Edelstein and Gat 1980; Edelstein and Kislev 1981).

Just as terrace walls crisscross the slopes of the present-day tell, so did they in the Iron Age. Evidence for this is found in Iron II Stratum 16 where the excavators encountered a terrace wall (Wall C.2:49): "Not founded on bedrock, its crude construction precludes the possibility that it was part of a house or other structure." Its use as a terrace wall can be inferred from the pattern of the water-sorted soil layers below it "which hint at slowly flowing water, possibly draining from the terrace" (Herr forthcoming).

Also associated with several of the farm towers and farmsteads are terraces of various sizes and shapes. Some of these farms were also surrounded by extensive perimeter walls such as found at Sites 131 and 148. These perimeter walls no doubt served to enclose the intensively cultivated lands within the wall from grazing animals and would-be thieves.

Food Processing and Storage

Of the 2,800 objects registered during five seasons of excavations at Tell Hesban, only 120 or 4.3% were found in the Iron Age Strata. Included in this tiny proportion were four artifacts associated with the processing of food, specifically

with the grinding of grains and other food substances: two mortar fragments (#1594, #1708) and a pestle fragment (#1594) found in Iron I Stratum 19 and a muller fragment (#2596) found in Iron I Stratum 18. These were all made of limestone.

Present in very large quantities, especially in the fill from the Iron II reservoir, were pottery fragments (Sauer 1973), most of which can be assumed to have played a role in the preparation, storage, transportation, and consumption of food. Yet to be completed, however, is a study of the pottery from Hesban from the perspective of its role in the food system. Emphasis thus far has been strictly from the perspective of relative chronology.

Except perhaps for the cave or "storage cellar" encountered in Iron I Stratum 18, no other installations were found in the Iron Age strata which can with confidence be related to food processing activity. Conspicuous because of their absence, in fact, are the remains of mill stones and *tabuns*. This situation is probably the result of the complete razing of the older Iron Age occupational remains which is attested to in Iron II Stratum 16.

Frequently encountered throughout the project area, and often adjacent to present-day olive and/or grape orchards, are the remains of wine/olive presses which have been cut into the bedrock in antiquity. Although it is not possible to say with certainty that any of these were constructed during this period, such presses can be found at the following Iron Age sites: 1, 3, 10, 29, 137. The latter of these, as already mentioned, is located near a farmstead of the sort described above.

Textile and Iron Industries

The discovery of a significant number of textile implements from Tell Hesban suggests that a textile industry may have flourished there, particularly during Iron I when pastoral pursuits were still very significant. Thus of the 120 objects found in the Iron Age strata, 60% were textile implements, mostly loom weight fragments, and all but one of these were found in Iron I Stratum and 19. Also found were 2 spindle rests and 1 spindle whorl (#2310, #1299, #1623).

Knowledge of ferrous metallurgy and the carburization process whereby agricultural and other implements of steel could be manufactured ap-

Strata	Period	Cattle		Sheep/Goat		Pig		Camel		Total		Accumulation Rates
		kg	%	kg	%	kg	%	kg	%	kg	%	
1	Modern	1.4	27.45	3.0	58.82	0.2	3.92	0.5	9.80	5.1	4.65	0.05
2-3	Mamluk	14.2	30.67	25.2	54.43	0.8	1.73	6.1	13.17	46.3	42.21	0.24
4	Ayyubid	0.1	33.33	0.2	66.67	--	--	--	--	0.3	0.27	0.01
5	Abbasid	0.2	16.67	0.8	66.67	--	--	0.2	16.67	1.2	1.09	0.01
6	Umayyad	1.6	33.33	2.4	50.00	0.6	12.50	0.2	4.17	4.8	4.38	0.06
7-10	Byzantine	2.3	31.51	3.7	50.68	1.1	15.07	0.2	2.74	7.3	6.65	0.02
11-13	Late Roman	4.4	31.43	7.6	54.28	0.9	6.43	1.1	7.86	14.0	12.76	0.06
14	Early Roman	1.9	33.33	3.3	57.89	0.3	5.26	0.2	3.51	5.7	5.20	0.03
15	Late Hellenistic	3.1	46.27	2.8	41.79	--	--	0.8	11.94	6.7	6.11	0.05
16-18	Iron 2	4.6	40.00	6.3	54.78	0.3	2.61	0.3	2.61	11.5	10.48	0.02
19	Iron 1	3.1	45.59	2.9	42.65	0.3	4.41	0.5	7.35	6.8	6.20	0.03

Table 5.4 Weight of principal meat-yielding species from Iron Age strata (in kg)

pears to have arrived at Tell Hesban "at least by the 7th century" B.C. or sometime before then, possibly as early as in the Iron I Period (London forthcoming; cf. McGovern 1983, 1985: 147). Because only one iron artifact was found among the Iron Age objects, a blade point (#1329) from Iron II Stratum 16, the question of the extent to which iron metallurgy played a role in the intensification of crop production in this region remains an open one.

Changes in Dietary Conditions

Domesticated Mammals

In considering the food consumption patterns of the Iron Age inhabitants of Tell Hesban, changes in the uses of domesticated mammals are examined first. The reason for beginning with this food group is not because it played the most important role in the Iron Age diet, but because it is the food source for which the evidence is most abundant. This is because of all the different kinds of food groups, including meat, poultry and eggs, cereals, legumes, fruits and vegetables, milk and milk products, etc., none are better and more abundantly preserved by the archaeological record than the discarded bones of domesticated mammals. Yet, even these are far from complete in their representation, as was pointed out in Chapter Four.

The enormous drop in the weight accumulation rates of animal remains between Iron I and II (see table 5.4), suggests an overall decline in the consumption of cattle, sheep, and goats. Proportionately the most important of these in the local diet throughout the entire Iron Age was sheep and goat meat. During the Iron II Period, sheep and

goats appear to have been slaughtered and eaten at a younger age.

Beef followed sheep and goats in importance, and may have played a more important role in the Iron I diet than in any subsequent time in this region. Unlike sheep and goats which were sometimes eaten as young animals, cattle were generally not slaughtered until reaching maturity. This conclusion is supported by the absence of remains of young beef in the bone corpus from this era (Boessneck and von den Driesch 1978a; von den Driesch and Boessneck forthcoming).

That horse meat was eaten at various times throughout the history of Tell Hesban is suggested by the fact that butchering marks have been found on many of their bones (Boessneck and von den Driesch 1978a). Whether such marks occur on any of the horse remains from the Iron Age is a question which has yet to be answered. Suffice it to point out here that the remains of horses, along with those of camels and swine, are included in the bone corpus uncovered from this era. That the latter two were eaten, although not in large quantities, is a fact generally not in question (see table 5.1).

Poultry, Fish, and Game

Chickens are the only poultry identified from Iron Age deposits (see table 5.5). These occur in the Iron II strata, as could be expected, but in relatively small quantities when compared to later periods. Of the other forms of poultry encountered in the bone corpus from Tell Hesban, namely the domestic pigeon or house dove and the goose, neither can be said with certainty to come from the Iron Age. Poultry, therefore, apparently really played no significant role in the Iron Age diet.

Strata	Period	# of Bones		Min # of Individuals		% Young
		#	%	#	%	
1	Modern	---	---	---	---	---
2-4	Ayyubid-Mamluk	1566	65.83	128	58.44	22.0
5-6	Umayyad-Abbasid	127	5.34	13	5.94	8.0
7-10	Byzantine	231	9.71	27	12.33	11.5
11-14	Roman	410	17.23	41	18.72	14.2
15	Late Hellenistic	41	1.72	7	3.20	14.6
16-18	Iron 2	3	0.13	2	0.91	---
19	Iron 1	1	0.04	1	0.46	---
Sum	All	2379	100	219	100	---

Table 5.5 Number of identified specimens of chicken from Iron Age strata

Three genera of fish were found in Iron Age strata. In Iron I Stratum 19 sea bream (*Sparidae*) was represented by 5 fragments (out of a total of 11 finds) and in Iron II Stratum 17 parrotfish (*Scaridae*) and sea perch or bass (*Serranidae*) were each represented by one bone fragment (out of a total of 138 and 3 finds respectively, [Lepiksaar forthcoming]). All three of these genera are found in the Red Sea as well as in the Mediterranean Sea. When compared with the total of 872 bones of fish identified from Tell Hesban, the quantity produced by the Iron Age strata is very meager. Again it appears that fish contributed only a small amount to the Iron Age diet.

A wide variety of wildlife is represented in the bone finds from Tell Hesban. While it is not possible at the present time to give the stratum to which every game animal bone belongs, for reasons discussed in the previous chapter, information about the most frequently eaten non-domesticated mammals is presented in table 5.6. Immediately apparent in this table is the paucity of finds from the Iron II strata. While this situation may be simply the result of an overall meagerness of bone finds from Iron II, as was pointed out above, alternatively this fact in itself might reflect an intensifying food system in that formerly unmanaged lands became managed ones with the result that habitats were destroyed for many wild as well as domestic species. The gazelle and the wild sheep could be expected to decline in their numbers just as did domesticated sheep and goats. The same would also hold for wild swine. According to von den Driesch and Boessneck (forthcoming), fallow deer and wild goat were probably not locally hunted animals. They suggest that the presence of these species reflects their importation via the fur trade.

Type	Iron I	Iron II
Fallow Deer	3	1
Gazelle	11	0
Wild Swine	1	0
Wild Goat	2	0
Wild Sheep or Goat	3	1
Wild Sheep	1	0
Total	21	2
Percentage	95%	5%

Table 5.6 Wild animal bones from Iron Age strata

The only wild bird which may have contributed slightly to the Iron Age diet is the partridge (*Alectoris chukar*). This appears to have been the favorite game bird in the Hesban region throughout all periods, judging from the fact that its bones constitute 229 (54%) out of the 420 wild bird bones found on the tell (Boessneck and von den Driesch forthcoming). Other birds which may occasionally have been hunted include the ostrich (*Struthio camelus*), the houbara bustard (*Chlamydotis undulata*), the common quail (*Coturnix coturnix*), and the great bustard (*Otis tarda*). Thirty-seven other species of birds were identified in the Tell Hesban bone corpus (see Boessneck forthcoming), but none of these are likely to have played any significant role in the Iron Age diet.

Cereals, Legumes, Vegetables, and Fruits

Very little can be said with certainty about the relative contribution of various kinds of cereals and produce in the Iron Age diet given the evidence presently on hand. As can be seen in table 5.2, three varieties of grains, namely wheat, barley, and oats were consumed. Of the legumes, only lentils are attested to in the data, while olives and grapes constitute the fruit food group.

In the absence of any other direct lines of evidence regarding the role played by these various food groups, and regarding what other produce might have been consumed, we are left to conjecture on the basis of analogy with the changes in diet which accompanied the intensification of the food system in Jordan over the past 100 years.

Thus it is possible to hypothesize that as the production of pasture animals tapered off, first the field crops, such as wheat, barley, and lentils, and then later the other produce, assumed an increasingly important role in the diet. As the local population became integrated into the wider economy, trade began to account for a relatively greater proportion of the foods consumed as well. Fish, for example, probably was eaten more in Iron II than in Iron I. The Iron II diet generally, in fact, was probably more varied, consisting of a greater variety of locally produced and imported food items. The Iron I diet, on the other hand, was probably less varied, being based primarily on the staple items of wheat, barley, sheep and goat's meat, milk and milk products. Whether eggs were eaten in any appreciable quantity is not known.

Transhumance During the Iron Age

That some type of vertical movement of flocks and households between highland and lowland areas took place during the Iron Age can be inferred from the presence in this region of 17 small sites (numbers 22, 24, 27, 28, 33, 39, 40, 43, 47, 50, 53, 58, 86, 88, 99, 110, 129) which in Ibach's (1987) site list are described as being "very small" or "small" and consist primarily of a concentration of pottery sherds.

As fig. 5.6 shows, these sites are clustered along the edge of the highland plateau north of Tell Hesban and along the upper portions of Wadi Hesban and its tributaries. While all of these sites produced some type of Iron Age sherds, more precise dating was possible in the case of Sites 39, 40, 47, and 129 which were dated to Iron I and Sites 39, 99, 110, and 129 which were dated to Iron II.

Since Ibach's (1987) site list offers no further details about these sites other than their location, relative size, pottery information, and remarks to the effect that no architectural remains were observed, our proposal regarding the users of these sites as having been transhumants must rest on the *a priori principle* (discussed in Chapter Four), on inferences based on historical sources, and on analogy with the situation which existed in this region during the Ottoman Period.

According to the *a priori principle*, the most likely explanation for the presence of these sherd scatters is that they represent activities somehow related to the Iron Age food system. While the

possibility that they represent the remains of some component of the sedentary food system must definitely be reckoned with, the likelihood that many of them were camping sites utilized by the transhumant component of the local food system can be hypothesized on both historical and ethnoarchaeological grounds.

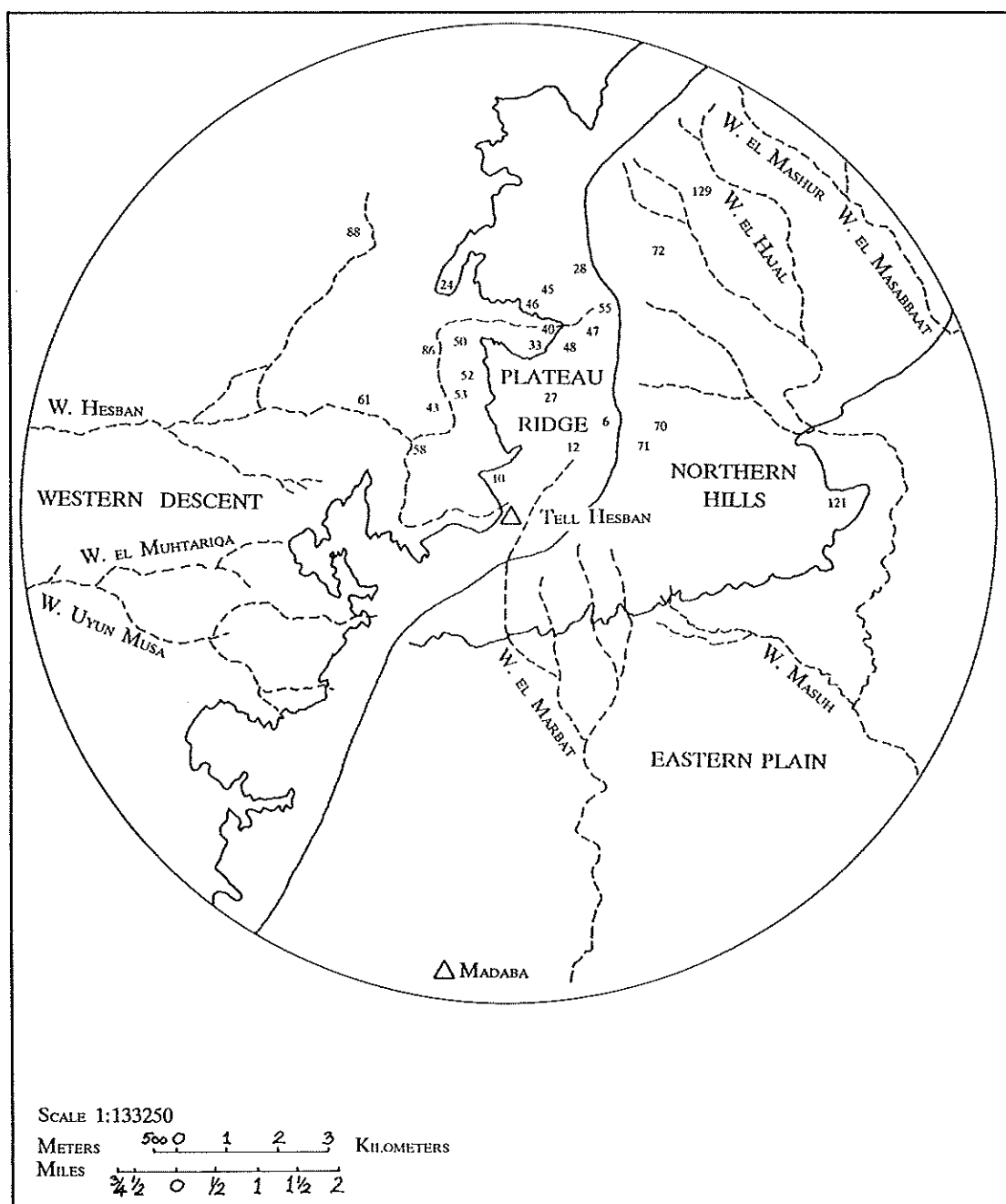
On the one hand, the historical basis for this hypothesis has been provided by Israel Eph'al (1982) in his book *The Ancient Arabs: Nomads on the Borders of the Fertile Crescent 9th-5th Centuries B.C.* In this study of contemporary biblical, Assyro-Babylonian, Greek, and ancient Arabic sources, Eph'al presents convincing literary evidence for the presence of nomadic peoples in Transjordan throughout the entire Iron II Period. On the other hand, the ethnoarchaeological basis for this hypothesis was presented in Chapter Three where it was noted that the western part of the project area was used by the Adwan tribesmen throughout the 19th century as spring and summer pasture. During the fall and winter, they would retreat to their more permanent homes in the foothills and plains to the north of the Dead Sea.

That a similar pattern of transhumant migration occurred throughout the Iron Age is suggested by the concentration of these sherd scatters in the western descent where favorable watering and sheltering conditions for people and animals could be found in the Iron Age as they could be in the recent past. It is also very likely that the Iron Age caves which are located along the plateau ridge, in the northern hills and in the eastern plain also were utilized by transhumants as seasonal shelters and campsites, just as they were in the Ottoman Period. While many of these caves were, no doubt, also utilized by the settled population during medium and high intensity periods, they certainly would have been available for use by transhumant herdsmen during the occupational hiatus between Iron I and Iron II as well as during the Hellenistic Period. Caves were noted at the following Iron I sites: 1, 44, 105, 135; and at the following Iron II sites: 10, 29, 44, 72, 105, 127, 131, 132, 139, 145; Iron I and/or II: 113, 115, 121, 123, 134, 137.

Sedentarization and Nomadization

When the various lines of evidence available pertaining to the Iron Age millennium at Hesban and vicinity are brought together, the picture which

Fig. 5.6 Iron Age sherd scatters



emerges is that of a population responding, by means of movement back and forth along the nomad-sedentary continuum, to shifting political winds. Throughout the entire millennium, transhumant pastoralists were converting to sedentary cultivators and vice versa. Between the 12th and the 6th centuries B.C., the rate at which the population sedentarized exceeded the rate at which it nomadized, resulting in a gradual build-up of sedentary villages and intensification of landuse to where a high-intensity configuration was reached during the 7th and 6th centuries B.C.

Archaeological residues of this high-intensity configuration include widespread occurrences of farmsteads, farm towers, cisterns, and a large reservoir at Tell Hesban. Produced in relatively large amounts during these centuries were fruits

and vegetables in combination with cereals, cattle, sheep, and goats. The fact that several cylinder seals (cf. Herr 1978) and other emblems of delegated authority are included in the finds from these two centuries adds further weight to the conclusion that a form of urban-oriented elite-controlled agriculture prevailed during these two centuries.

The return to transhumance, which followed toward the end of the Iron II Period, is evidenced by the abandonment of most of these facilities which began to occur in the 5th century B.C. This process of nomadization continued to occur until a low-intensity configuration was in place by the 4th century B.C. This configuration appears to have prevailed throughout the 3rd and 2nd centuries B.C., judging from the paucity of sites from these centuries.