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### Balanophagy and the Bedrock Industries of Ancient Jordan

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## Balanophagy and the Bedrock Industries of Ancient Jordan

### Introduction

Anyone who has trod the rocky countryside of Jordan can testify that one of the most prevalent remains of human activity are the cuts, gashes, holes, and channels in the stone outcroppings that reflect the numerous bedrock industries of antiquity. The most ubiquitous of these marks is undoubtedly the simple, but multifunctional, "cup-hole." In his article on cup-marks and the ancient Palestinian wine industry, G. W. Ahlstrom (1978: 44, 45) lists the various proposals scholars have made for the function of bedrock cupholes. These include: 1. ancient fulling works (Hanauer 1900: 361); 2. mortars and querns (Dalman 1908: 23, 34); 3. receptacles for pounding grain (Glueck 1959: 88; 1968: 84); 4. jar holders (Macalister 1912: 49-50; Dalman 1908: 33, 34); 5. receptacles for soap to be used in washing wine presses and vats (Bliss and Macalister 1902: 193; Lutz 1922: 66; Orni and Efrat 1966: 304); 6. receptacles for watering cattle (Macalister 1900: 35); 7. water jug holders for workers (Kenyon 1942: 91); 8. small oil and juice presses (Macalister 1900: 35); 9. juice collectors for catching the runoff from drying grapes (Ahlstrom 1978: 45); 10. post holes for poles that held bag presses (*ibid.*); 11. making homes (*ibid.*); 12. various religious uses such as libation, funerary rites, or some service connected with a water cult (Duncan 1931: 43, 47; Hammond 1973: 48; Ussishkin 1971: 33-34). In this paper I would like to suggest an additional purpose for cupholes: processing sites for acorns.

Although it is little discussed, one of the more common consumption practices of mankind has included that of balanophagy, or acorn eating. Anyone who has ever tried a raw acorn (the nut of an oak tree) may question how this could be, since the tannic acid in most species gives the nuts a very bitter taste. However, if the tannic acid has been leached, the acorn becomes much more palatable and provides an excellent source of carbohydrates (Wolf 1945; Platt 1962 [cited in Flannery 1969: 78]; Baumhoff 1963: 162-163; Brouk 1975: 209; Johnson and King 1977: 487).

Although the better known cases of this practice are those of the California Indians (Gifford 1967) and the west Mediterranean (Lewthwaite 1982), the former abundance of oak forests throughout many of the more temperate zones of the world makes it possible, if not probable, that balanophagy has at one time or another been an important element in the subsistence strategy of many different peoples (Brouk 1975: 209). This would include the ancient Near East — an area which both modern palaeobotanical studies and the ancient historical sources indicate was once covered by extensive oak forests.

### Ethnographic Observations of Balanophagy in the Near East

Actual references to the practice of balanophagy from ancient Near Eastern sources appear, for the present, to be lacking.<sup>1</sup> However, there are several references by

<sup>1</sup> There are a number of ancient sources that describe acorn eating in adjacent regions, particularly from Mediterranean countries. Since the oak belt in the ancient Near East was essentially a continuation of the belt that covered the Mediterranean countries, references from the latter region are worth noting. The earliest references to the use of acorns as a food staple come, as might be expected, from various Greek and Roman writers. For example, Pliny, the Roman naturalist (79-23 BC), wrote that the oak "was the tree which first produced food for mortal man." Many varieties were known to him, some sweeter than others (in Brothwell 1969: 149). Pliny (in Gifford 1968: 93) also described the preparing of acorns for consumption: "In the absence of cereals, a flour is milled from the parched kernels (of acorns) and made into a paste to serve as bread". Pausanias, a Greek geographer of the second century AD, attributed the beginning of balanophagy to Pelasgus (in Gifford 1968: 94): "On the other hand he (Pelasgus) introduced as food the fruit of oak trees, not of all oaks, but only the acorns of the 'phegos' oak. Since his time some people have adhered so closely to this diet that even the Pythian

priestess, in forbidding the Lacedaemonians to touch the land of the Arcadians, spoke the following verses, 'There are many acorn-eating men in Arcadia who will prevent you; though I do not grudge it you'." Herodotus (fifth century BC) also mentioned the Pythian prophetess' reference to the Arcadians. He quoted her as saying, "Many there are in Arcadia land, stout men, eating acorns" (*ibid.*). The Greek didactic poet of the eighth century BC, Hesiod, wrote (in Brothwell 1969: 149): "The earth bears them (mankind) victuals in plenty, and on the mountains the oak has acorns on top and bees in its midst". Finally, Theophrastus (c. 287 BC), the first known botanical writer, describes how acorns were ground and bread made from the flour (in Brouk 1975: 209).

The ancient Greek and Roman writers were not the only ones to document the practice of balanophagy in the Mediterranean region. The eating of acorns apparently continued to be a fairly common practice in this region up until the turn of the present century. Sources attesting to this have been conveniently compiled by Gifford (1968). For example, Hooker and Ball (1878: 268) de-

early explorers of western Palestine and Transjordan who testify that local peoples were utilizing acorns as a food source as recently as the last century. Groser (1888: 68), for example, writes, "Another abundant species (of tree) is the Valonia or prickly-cupped oak (*Quercus aegilops*), well known in the Levant, where its acorns are used in tanning, but the Arabs eat them for food". Tristram (1873: 370), writing about the Oaks of Bashan, makes a similar claim, "It (the Oak of Bashan [also *Quercus aegilops* = *Q. ithaburensis*]) bears very large acorns, and these are used as food by the Arabs, while the acorn cups are employed by dyers".<sup>2</sup>

Moving eastward, Sir Arnold T. Wilson (1932: 54) provides an actual description of processing acorns for food, "The nomads of the Zagros range from Baneh and Saqqiz in Kurdistan to Shiraz, have from the earliest times supplemented their meager stores of cereals with bread made from acorns, which are ground or rather pounded to pulp with the aid of a boulder rolled over a flat rock; the meal thus obtained is soaked in running water for several days, dried, and made into flat cakes. It is not appetizing, but it keeps well, and judging from the physical condition of whole families which have lived with no other cereals and no other food except the produce of their herds, it does not lack vitamins."<sup>3</sup>

scribe the practice in Iberia and North Africa: "The tree was found to be the bellot oak (*Quercus ballota* of Desfontaines), a variety of the evergreen oak, which is widespread through North Africa and Spain, where the sweet acorns are commonly roasted and eaten, as chestnuts elsewhere." A further reference for this area is found in Meakin (1901: 36): "The acorns (Bellot) [of the cork oak], ... are of large size and often eaten." Another reference to balanophagy in Spain is found in Townsend (1792: 90, 91) who traveled in Spain in 1786 and 1787: "For the first two leagues we ascended gradually; then entered a forest of ilex, which, as my guide informed me, stretches east and west near forty leagues. The acorns here are of the kind described by Horace, as the origin of war among the rude inhabitants of an infant world, 'glandem atque cubilia propter.' Not austere, like those of the oak, or the common ilex, but sweet and palatable, like the chestnut, they are food, not merely for swine, but for peasants, and yield considerable profit." Ford (1851: 127) shows that the peasants were not the only Spaniards who ate acorns. Describing Estremadura he stated: "The acorns are still called bellota, the Arabic bollot-belot being the Scriptural term for the tree and the gland — which, with water, formed the original diet of the aboriginal Iberian, as well as of his pig; when dry, the acorns were ground, say the classical authors, into bread, and, when fresh, they were served up as the second course. And in our time ladies of high rank at Madrid constantly ate them at the opera and elsewhere; they were the present sent by Sancho Panza's wife to the Duchess, and formed the text on which Don Quixote preached so eloquently to the goatherds, on the joys and innocence of the golden age and pastoral happiness, in which they constituted the foundation of the kitchen." Brouk (1975: 209) notes that acorns are still used for bread-making in poor areas such as the south of Italy, where the soil will not yield cereals and where poverty prevents the purchase of flour from elsewhere; otherwise acorns are used as fodder. Gifford has also found reference for the use of acorns in Sardinia. The first comes from Altheer (1857: 93) who says that at Ogliastra, Sardinia, fat clay was mixed in a porridge of acorn meal, the compound made into cakes, baked, sprinkled with ashes or smeared with a little grease, and taken as daily food. A full account of the manufacture of acorn bread in Sardinia was given by Antonio de Cortes (1900: 76-83). He says that the acorns were first boiled until soft, pulverized in a mortar, spread on a flat stone, and mixed with ferruginous earth to counteract the tannic acid. They were then baked in an oven.

<sup>2</sup> Fraser also notes how the acorns of the Oaks of Bashan are eaten by native Arabs, but he is clearly basing his observation on Tristram's earlier work (Fraser 1927: 323). Tristram's reference reminds us that acorns were not only used as food but the tannin could be extracted from the acorn and used as a dye. Although this use of acorns is beyond the scope of the present

study, it is important and should be considered ethnoarchaeologically.

One of the most recent documentations of balanophagy in the Near East comes from Frank Hole's study of pastoral nomadism in Western Iran. Specifically, Hole (1978) reports the use of acorns by the Baharvand, a tribe of Luri-speaking people, one-fourth of whom still pursue full-time pastoralism. Although presently the tribe derives much of its subsistence from agriculture this was not the case as recently as a few years ago. According to one of Hole's informants, an older tribesman named Atawak, the tribe had, in earlier days, been capable of subsisting entirely independent of agriculture. Instead, they relied mostly on acorns and wild grains as well as on the products of their herds and trading. Atawak recalled subsisting chiefly on meat and acorn preparations, although occasionally he would have rice (obtained at a market) and chicken (Hole 1978: 147).<sup>4</sup> Although balanophagy (as well as the harvesting of wild grains) was formerly very important to the Luri-speaking nomads, this activity is carried out today only during times of economic stress (Hole 1979: 208).

Hole also describes the processing of the acorns.<sup>5</sup> For the bulk processing of acorns it was necessary to roast them and grind them into flour. The roasters were simply rectangular stone structures about a meter and a half on a side and of similar height. Hole reports that these roof-

<sup>3</sup> This latter example from Persia is of particular interest because, as Gifford explains, it is the only explicit Old World example of removing tannic acid from acorns according to the California practice of pulverizing the acorns in a mortar first, then leaching with water (Gifford 1968: 95; Hole 1979: 209). The similarity of the process between two such geographically separated regions is quite interesting. Gifford suggests that at first glance any connection between the identical pulverizing-leaching practices of California and Iran would seem unlikely. However, he suggests that in view of the widespread nature of balanophagy in antiquity it is not impossible that some of the Asiatic forefathers of the American Indians were acorn eaters and that their descendants, upon reaching the oak regions of the Pacific coasts and elsewhere, revived this food habit of their ancestors. While Gifford acknowledges that this phenomenon could have easily originated independently from different centers, he suggests that one should not be closed minded to the possibility that the knowledge of removing tannin in this particular way could have spread from one center of origin (1968: 95). Throughout most of California the Indians would gather the acorns in the fall when the nuts were mature. In preparing the acorns the women would first dry and then hull the nuts. The hulled nuts were then reduced to flour by pounding them with a stone pestle in one of several types of mortars, either a portable mortar or a bedrock mortar. The acorn meal would then be spread out in a shallow, sandy depression and hot water would be poured into the basin in order to leach the bitter tannin from the flour. The dough was subsequently combined with water and cooked as mush or baked into bread (Newcomb 1974: 195). The description that Wilson provides for the Zagros is not as complete, but it can be seen to be the same basic procedure. The acorns were gathered, then crushed into pulp by a boulder on a flat rock. The meal was then soaked in running water for several days and then dried and made into flat cakes (Wilson 1932: 54). The reference to running water suggests that the nomads must have undertaken this process at or near a natural source of running water since it is unlikely that they would carry sufficient water with them for leaching. Thus, the flat rocks they used for mortars were probably bedrock outcroppings near a spring.

<sup>4</sup> Atawak also claimed that when he was younger the forests were much more extensive; in many places the vegetation was so dense it was difficult to walk through. Although there was less grazing land, there were more acorns and wild game (Hole 1978: 148).

<sup>5</sup> Hole does not mention whether he actually witnessed the procedure or was only told of it by his informants.

less buildings were found in the mountains where there were oaks. Campgrounds were not necessarily found in the vicinity. Nearby was likely to be a large rock on which another rock rested. These were "crushers", very large "manos and matates". One that Hole photographed had a boulder base and an upper stone which was so large that it was simply rocked back and forth over the acorns. The size of the "acorn smashers" that Hole saw greatly exceeded the manos and matates that are found in archaeological village sites, although Hole saw no reason why this should be the case (1978: 154).

In a separate report Hole mentions that in addition to the large boulders, the nomads would use bedrock mortars. These are often distinguished by a line of several depressions in the bedrock (Hole 1979: 209). Similar depressions, often referred to as "cupmarks" or "cupholes" are well known in the Near East. Although many functions have been suggested for these depressions, grinding acorns has not generally been one of them. The ethnographic evidence in the Zagros and California, however, suggests that some of these depressions may have, at times, been used for processing acorns.

It is interesting that, in addition to the bedrock mortars, the mano-matate are also known in both the Near East and California. In the case of California Aikens has suggested that when the mano-matate combinations predominate over mortars and pestles as a food-grinding system, seed gathering is implied. However, when a site reveals an increase in mortars and pestles it is indicative of a shift towards the use of acorns and other large nuts (Aikens 1983: 161).<sup>6</sup>

The mano-matate (or quern) has been found at numerous sites in western Palestine and Transjordan, including Tall al-'Umayri and Jāwa. The mano and matate were probably the most common tools for the grinding of seeds and grains. This is not to say that seeds and grains were not ground in stone or bedrock mortars. Indeed, Glueck provides conclusive evidence that they are (1959: 88, 89). However, when large nuts such as acorns need to be ground, the mortar is more efficient, while the manos and matate are preferred for smaller seeds and grains (Aikens 1983: 161).

### Acorn Processing Sites and the Archaeological Record

These ethnographic or ethnoarchaeological studies of re-

cent and modern Near Eastern acorn-processing sites provide a useful guide for assisting the archaeologists in identifying such sites in the archaeological record. First, the sites could be expected to be found near the ancient location of oak woodlands. The most visible physical features at the site would generally be surface boulders or bedrock outcroppings which provided a surface upon which the acorns were crushed. Depressions or "cupholes" would be expected to appear frequently in the bedrock exposures, serving as bedrock mortars. These boulders and/or bedrock mortars might often be located near sources of water, facilitating the leaching process. "Roasters", such as the type Hole mentions (1978: 154), might be found in the area.

Although no systematic surveys have been conducted to locate acorn processing sites per se, a number of sites have been reported incidentally in the literature, particularly in Palestine, which appear to meet the required parameters. In Jordan, for example, our excavations at Tall al-'Umayri exposed an outcropping of bedrock in field C under levels of an Early Bronze Age occupation that contained numerous "cupholes" or bedrock mortars. The bedrock outcropping, itself, was just a short distance from the only spring in the area. Environmental studies (referred to above) indicated the presence of an oak forest on the surrounding hills during antiquity (Geraty *et al.* 1986: 123, 132). Numerous similar findings have been reported in western Palestine.<sup>7</sup>

It would be nice if acorns were more frequently found at these sites, but being organic, they do not generally survive unless they have been carbonized. Nevertheless they have been reported in Pre-Pottery Neolithic and Chalcolithic deposits at Nahal Oren and Nahal Mishmar in western Palestine (Liphshitz 1986: 2, 3). These sites may represent the camps of either early hunter-gatherers or what Gilbert calls early "herder-gatherers" (Gilbert 1983: 107). Settlements such as Arad and Jarmo have also produced acorns (*ibid.*; Braidwood 1960). These could possibly represent early agricultural settlements whose inhabitants were still including wild plant foods in their subsistence strategies.

Taken all together, the evidence from these sites makes it reasonable to suggest that acorns formed a part of the subsistence system of many Near Eastern peoples in antiquity, including those of Jordan. The only items

<sup>6</sup> For example, at an early Indian site in the southern Sierra foothills, in an early occupation phase known as the Chowchillian (300 BC - AD 300), slab matates and manos were common. However, during the Raymond phase (AD 300 - 1500) bedrock mortars appear alongside the matates and manos, implying a shift to an emphasis on acorn-processing.

<sup>7</sup> The Olami Survey, conducted on the Mount Carmel range in western Palestine, revealed several sites with cupholes near wadis or springs, as well as caves. For example, at Nahal Siah cupholes were found hewn on a rocky surface on the southern bank of the wadi about 200 meters from a cave (Olami 1984: 24). Cupholes were found in the floor of the entrance to the hall of the Ornit Cave which overlooks the wadi bed of Nahal Ornit. There is evidence

that there was running water in the cave in earlier times (Olami 1984: 46, 49). At Ein Qedem 1, 50 cupholes of varying size were found on a rocky surface near the center of a hill which overlooks a spring. To the north are a couple of caves (Olami 1984: 49). At Nahal Dohan four hollows or rock shelters were found on the south bank of the wadi. Cupholes were found in all four shelters (Olami 1984: 101). At H. Shoqef on Mount Carmel about 70 cupholes were scattered about on a large flat rock approximately 100 meters from a spring, although no cave is mentioned in close proximity in this case. All of these sites on Mount Carmel were in an oak forest or maquis in antiquity (Zohary 1982: 29).

missing from this brief survey are the “roasters” which would have the effect of removing the tannic acid. However, their absence may be because water was present for leaching and acorns may, therefore, have not been subjected to roasting.

#### **Acorns: An Alternate Food Source in Times of Stress**

As noted above, ancient references to balanophagy in the Near East are missing, in spite of the more recent ethnographic evidence for the practice in the region. This seems curious, especially in view of the fact that references to oak trees are fairly common. The answer may be, as Hole (1979: 208) points out in the case of the nomads of Luristan, that acorns were not normally the preferred food in the Near East when other foods were available. This is because most species of acorns are bitter due to the tannic acid. Even when it is removed, acorns have a bland flavor at best. Also, since the removal of tannic acid is a somewhat complicated and time consuming process, people would hardly resort to leaching acorns except in time of great need (Gifford 1968: 88).

In connection with this latter point it is interesting to note McHenry's study (1968: 4) which implicitly suggests that in California the motivation for shifting from hunting to acorn gathering was seasonal hunger. Acorns provided a buffer against starvation when other foods were not available. Eventually acorns formed such an integral part of the diet that they came to be a preferred food of many tribes. However, in regions where more intensive subsistence strategies were successfully established acorns would not likely remain an important staple.

A similar situation probably prevailed in the Old World. A reference from Pliny, the Roman naturalist, suggests that when there was an “absence of cereals” acorns were milled for bread (cited in Gifford 1968: 93). Brouk (1975: 209) makes the interesting observation that acorns were still eaten in southern Italy because these were poor areas where the soil will not yield cereals and where poverty prevents the purchase of flour from elsewhere. The only exception to the acorn's low esteem was in Spain where it came to be considered a delicacy. Thus, throughout Europe and the Mediterranean acorns were generally looked upon as poor man's food or a staple to fall back on in time of famine.

This status of acorns may help explain why and when they were used in various places of the ancient Near East. The sites where acorns have been found — such as in the kitchen middens of Jarmo (see below) — were all prehistoric. In other words, they were either pre-agricultural or were used where agriculture was just being established and other food sources were either not yet available or not as plentiful as acorns. It is interesting that most of the bedrock mortars or cupholes found in the

Mount Carmel survey in western Palestine also date to this same period or earlier (also see below). Once domestication and more intensive agricultural practices were established, balanophagy ceased to be as important.

Even after the development of agriculture, however, there were times, such as during famines, warfare, or other natural catastrophes, when the normal food systems that were tied into state or social institutions failed and people were forced to fall back on alternate food sources, such as acorns. Records of the use of these alternate food sources during times of environmental or social stress would not be expected since people were just trying to survive. They were not likely to be writing down their menus!

#### **Historical and Anthropological Implications**

As noted above, most, if not all of the sites where acorns have been found are pre-agricultural or early agricultural camps or settlements. It is possible that some of them could be camp remains of the first pastoral nomads (see Gilbert 1983: 205). The present picture of parallel domestication of plants and animals suggests that early experimentation and husbandry of crops and herds may have proceeded together in some form of “mixed farming” (Braidwood and Howe 1960) that could include, when conditions favored, a variable dependence upon wild foods (Hole 1968; Gilbert 1983). Nevertheless, it is not impossible that a group of “herder-gatherers” emerged at the same time, who may have entered into specialized pastoralism by relying for the bulk of their plant foods on the collection of wild fruits and nuts, especially acorns in the middle elevation oak-pistachio belt (Zohary 1973: 620; Hole 1978: 159, 160; Gilbert 1983: 107).

However, what role did acorns play in subsistence strategies after agriculture became more established? As suggested above, once more desirable food sources could be obtained by pursuing some form of agriculture, acorns were utilized only in times of great need or, as Lewthwaite suggests, periods of “instability” (1982: 226).

In Syro-Palestine one of these periods may be the junction of the Early Bronze/Middle Bronze period (EB/MB) in Palestine when urban life seems to have experienced a decline. For example, Duncan (1931) dated some cupholes at Gezer to c. 2000 BC which, if correct, falls right in the middle of this period of urban decline. The presence of a spring at Gezer as well as some caves (many of which have cup-holes in their entrances) bring together several of the ingredients typical of an acorn processing site.

It is interesting that numerous scholars have suggested that this same period best provides the background to the patriarchal narratives recorded in the early chapters of Genesis. While not wishing to enter into that

debate at the present, it is interesting that one of the common motifs of these narratives is that of famine. Surveys of Palestinian sites dating to this period show that for some reason many of the sites in valleys, such as in the Galilee area, were abandoned, while other sites in the hill country were still being utilized (Gerstenblith 1980: 73).

The common explanations for urban decline during this period include climatic changes that led to a dryer period and over-exploitation of agricultural lands (e.g. Gerstenblith 1980: 73). Whatever the exact cause, the failure of urban sites would also mean the failure of the subsistence system that supported them (whether as a cause or an effect cannot be said presently). Undoubtedly, many people were forced to adopt alternate subsistence strategies, some of which included a return to hunting/gathering or herding/gathering, both of which probably included the use of acorns.<sup>8</sup>

Another period that possibly represents a decline of intensive subsistence systems is between the end of the Middle Bronze II-C (Dever's MB III) and the Late Bronze II periods. Gonen (1984) has shown that there was a drastic reduction of walled urban settlements after the MB IIC followed by a period of gradual reurbanization during the LB I and II. It would seem reasonable to surmise that after such a reduction of large urban centers, for whatever reason, the regional subsistence system was drastically disrupted and people were again forced to revert to simpler systems to survive. In other words, the intensive agricultural systems that supported the MB IIC urban centers would have been replaced with either more extensive agricultural systems or by more nomadic/pastoralist systems by many of the Late Bronze Age peoples. Balanophagy would have undoubtedly been incorporated in many such food systems.

Again, as with the earlier EB/MB junction, Biblical sources may provide some background for this period, particularly the latter part. For example, the period of the Judges appears to reflect harsh conditions in which there was no centralized authority and every man did "what was right in his own eyes". The lack of an integrated food system during this period of political chaos probably forced many rural inhabitants to seek out alternate food sources.<sup>9</sup>

Unfortunately, archaeological excavation in the Near East has focused on urban sites so that most of the material is from urban periods when intensive subsistence strategies were pursued. The archaeological record, as well as the historical sources noted above, do, however,

portray fairly extensive periods when the intensive urban systems were not functioning. Surveys do turn up numerous non-urban camp sites and settlements; closer analysis of some of these sites may turn up evidence that they were occupied during periods when wild plant and animal food-procuring strategies were being incorporated, at least partially. Future work in this area would undoubtedly be "fruitful".

### Conclusion

Taking all the evidence together — the abundance of oak forests; the value of the acorn as a food source; the ancient Greek and Roman references to balanophagy; the remains of acorns at early sites; the ethnographic evidence for balanophagy in western Palestine, Jordan, and the Zagros and the existence of archaeological sites that match the characteristics of the former — the case seems strong for the idea that balanophagy played an important role in the subsistence strategies of both pre- and early agriculturalists as well as later pastoralists and people who were experiencing food shortages. The frequent rise and fall of urban periods in Palestine (and in other places in the Near East) suggests that there were many times when people would be forced to adopt alternate, non-agricultural subsistence strategies, even if only temporarily. Recognition of the practice of balanophagy as an element in such strategies may assist the archaeologist in both locating and identifying enigmatic non-urban sites and fitting them into the historical oscillations of the region.

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<sup>8</sup> For a recent study on alternating periods of sedentarization and nomadization and their associated subsistence strategies see Geraty and LaBianca 1985.

<sup>9</sup> A good description of the times appears in the story of Gideon, which begins by telling how the Israelites were so oppressed by the Midianites that the former were forced to prepare shelters for themselves in mountain clefts, caves and strongholds. Whenever the Israelites did manage to plant crops for themselves the Midianites, and other tribes, would sweep in, stealing or de-

stroying the crops, leaving nothing for the remaining Israelites (Judges 6: 1-6). Being forced to live in caves for security obviously disrupts the subsistence system, but the fact that the record indicates that they were deprived of the crops they had planted would indicate that the people were forced to find whatever they could for food. Situations like this were undoubtedly common in this region throughout antiquity.

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