Ancient threshing floors, threshing tools and plant remains in 'Uvda Valley, southern Negev desert, Israel.
A preliminary report

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Résumé
La vallée d'Uvda, dans le Néguev du Sud, est actuellement une zone désertique extrême. Néanmoins, depuis le VIe millénaire av. J.C., un vaste système agricole s'y est progressivement développé, qui a atteint son apogée au IIIe millénaire av. J.C. Un des phénomènes agricoles remarquables est un groupement de 29 aires de battage anciennes. Une aire de battage que nous avons fouillée a fourni une séquence stratigraphique et chronologique du développement de la technologie du battage (dépiqueage) pendant les IVe et IIIe millénaires av. J.C. Des analyses de laboratoire récentes de micro-traces d'utilisation sur les outils en silex, du pollen et des phytolithes, ont révélé de nouvelles précisions sur cette agriculture du désert, en particulier à propos de l'utilisation du tribulum comme technique de dépiqueage, et sur le paléoenvironnement. Les résultats préliminaires de ces études sont présentés et discutés ici.

Abstract
'Uvda Valley, in the southern Negev, is an extreme desert area today. Nevertheless, since the 6th millennium BC a vast agricultural settlement system gradually developed here, reaching its climax in the 3rd millennium BC. One of the unusual agricultural phenomena is a concentration of 29 ancient threshing floors. An excavated threshing floor yielded a stratigraphic and chronological sequence of development of the threshing technology during the 4th-3rd millennia BC. Recent laboratory analyses, of microwear on flint tools, of pollen and of phytoliths, supplied new evidence for the desert agriculture, for the threshing technology, and for the palaeoenvironment. The preliminary results are presented and discussed below.

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'Uvda Valley is situated in the southern Negev, 40 km north of the Gulf of 'Aqaba. The area is hyper-arid, with mid-day summer temperatures above 40 degrees C., an average annual precipitation of 28 mm, and a potential annual evaporation rate of 4000 mm. This restricts vegetation in the region to the wadi-beds, and therefore, the carrying capacity is very low. Since 1978, one of the writers (Avner, 1979, 1982a, b, 1990, 1998) has conducted an archaeological survey and excavations in the area. The eastern side of the valley was found to be extremely rich in sites, 400 of which were documented, dating from the Early Neolithic to the Early Islamic periods. The majority of the sites were dated to the 6th–3rd millennia BC, including 186 stone-built habitation sites and corrals, 40 tent camps, agricultural installations, and cult and burial sites (fig. 1). Despite the presumed environmental conditions, a vast farming settlement system developed in the valley. The site density in the eastern side of the valley was higher than that found in much more moderate desert areas, such as the Negev Highlands, and reached a population of at least 3000 at its peak, in the 3rd millennium BC (Avner, 1998). Abundant finds pointed to an agricultural economy of the inhabitants, including hundreds of glossed and non-glossed flint blades of various types (see below), hundreds of grinding stones, two stone ard tips, the earliest known to date in the Near East (ca. 3000 BC), botanical remains of domesticated wheat and barley, silos built in the habitation sites and the remains of vast cultivated fields. The inhabitants were able to develop an agricultural system in the valley due to a rare combination of local environmental conditions. One is the unique soil, consisting of lime-sand mixed with silt, which is well ventilated, easily tilled and highly permeable. The other is the hydraulic regime, in which floodwater from a drainage area of 400 sq. km runs slowly over the surface, whose gradient is only 0.3%. As a result, floods are non-destructive, and the water is well absorbed by the soil. The ancients further utilized the natural conditions by building a long series of 'limans' (large level basins, surrounded by earth embankments), which supplied them with 1200 hectares of fertile cultivated field, watered by floods. Today, dense wild cereal stands still grow in the ancient field areas, following the floods (fig. 2).

The threshing floors

During the survey, thirty-two circular structures were found, measuring 8-15 m in diameter. Twenty-nine were built in an area of 0.5 x 2.5 km along the eastern side of the valley (fig. 3). Twenty were cut into the rock surface to a maximum depth of 80 cm, while twelve were circular structures of beaten earth. The interpretation of these installations as threshing floors initially faced objections, due to the absence of known archaeological parallels. Over time, however, conclusive archaeological and ethnographic evidence has been collected to support this interpretation.

All of these structures yielded surface collections of flint and pottery dated to the 5th–3rd millennia BC, as well as from several later periods up to the 20th century.
Fig. 1. Survey map of 'Uvda Valley (due to map scale, not all sites are shown).
Excavations of a threshing floor

An aerial photograph of Site 96, at the mouth of Nahal Yitro (fig. 4, 5), showed intriguing features, particularly a light-colored strip 120 m in length, oriented roughly North-South, which included two circular threshing floors cut into the bedrock. This raised the possibility of an on-site development of the floors, which motivated the excavation of the northernmost one. The first excavation was conducted in 1982, to examine site interpretation and technological development (Avner, 1982, 1990, 1998). An extension of the dig took place in the summer of 2002, in an attempt to verify stratigraphic questions and to select soil samples for micro-botanical analyses. The later excavation yielded a development sequence in the site that was slightly different from the one previously published (Avner, op. cit.). Preliminary results of our recent laboratory analyses of flint micro-wear (by Anderson and Chabot), of pollen (by Bui-thi-Mai and Cummings) and of phytoliths (by Anderson and Cummings), contributed information vital to understanding the site and the ancient agriculture in the region (see below). Following is a brief description of the principal stages identified during the 2002 excavation:

Field observations showed that in the first stage, the upper layer of weathered rock was removed from the surface, and a flat bedrock floor was cleared over an

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1 The first excavation was made on behalf of the Israel Department of Antiquities (now the Israel Antiquities Authority) and the second was supported by the Goodman Foundation in New York. We thank them all for enabling the dig and research.
ANCIENT THRESHING FLOORS, THRESHING TOOLS AND PLANT REMAINS IN 'UVDA VALLEY, ISRAEL.

Fig. 3. Eastern 'Uvda Valley, map of the main concentration of threshing floors.
Fig. 4. Uvda Site 96, An aerial photograph from the North, before excavation: 1, perimeter of first working area; 2, flint workshop; 3, silos; 4, circular rock-cut threshing floors (photo U. Avner).

Fig. 5. Uvda Site 96, a general plan (with numbers of Loci).
ANCIENT THRESHING FLOORS, THRESHING TOOLS AND PLANT REMAINS IN 'UVDA VALLEY, ISRAEL.

Fig. 6. Uvda Site 96, a plan of excavated area of the Northern threshing floor.
area of ca. 18 x 35 m. The rocks removed were used for building a low wall surrounding the cleared area, whose remains were found mainly to the East (W. 7) and West (W. 8, see fig. 6). A vague, curved line connecting the two walls marks its original contour at the Northern end (fig. 5, 7). The cleared area was gradually extended southward until it reached a length of 120 m (figs. 4, 5). Part of the rock floor was later covered by a stone dump (see below), but when re-exposed by excavation (in Locus 7, hereafter, a general term for Loci 7, 14, 15, 16), a dark gray patination was found on its surface, indicating prolonged exposure and use. The circular silo in Locus 10 seems to belong to this stage, and was later cut by Loci 5 and 11 (fig. 6). Ethnographic documents (e.g. Dalman, 1933, p. 188-9; Avitzur, 1966, p. 89) suggest that the silos in the site were used for storage of cleaned grain during the threshing season.

In the second stage a circular structure (Locus 11) was built, partially on top of the cleared rock surface (fig. 6, 8). It contained a stone anvil and a flagstone bench, hundreds of flint debitage pieces and several dozen tools (see below). A large amount of flint was also found around this structure, suggesting that it
ANCIENT THRESHING FLOORS, THRESHING TOOLS AND PLANT REMAINS IN 'UVDA VALLEY, ISRAEL

Fig. 9. The Northern threshing floor, excavation of Locus 7: 1, the earlier cleared rock floor; 2, occupation level; 3, stone dump (photo U. Avner).

Fig. 10. The Northern threshing floor following the second excavation, from the North: 1, the earlier cleared rock floor; 2, flint workshop; 3, silos; 4, rock-cut threshing floor; 5, part of the stone dump left un-excavated (photo U. Avner).

most probably served as a flint workshop. Then, the area of Locus 7 was covered by a thin occupation level 5-7 cm thick, of fine silt and sand, mixed with ash and containing artifacts (fig. 9: 2). \(^{14}C\) dates show that this level dates from ca. 3000 BC (see below). The accumulation of the occupation level indicates that this part of the large cleared rock surface was no longer used for threshing, although threshing at the site did continue. This can be deduced from the construction of Silo 5 at this stage, from the continuous use of the flint workshop, and from the richness of cereal phytoliths and pollen in soil samples from the occupation level (see below).

In the third stage, Silo 6 was built on top of the occupation level and against Wall 7 (fig. 6, W. 7, 10). This indicates, again, continuation of threshing on other parts of the cleared rock surface.

In the fourth stage, the two circular threshing floors were cut into the large cleared rock surface; the northern one (Locus 1) measures 13 x 17 m and is 0.6 m deep. Part of the excavated rocks were used for building the wall surrounding the threshing floor (W. 1, termed «Shall» in the Bible-2 Sam 6 v. 7).
rest of the rock debris was dumped on top of the occupation level to the east (Locus 7, fig. 9:3), also covering the silo in Locus 6. A thin inclined wall (W. 2, fig. 6, 10) was built to support the dumped material and prevent it from spilling onto the threshing floor.

Artifacts from the excavation included large amounts of flint debitage and tools, pottery sherds, two pairs and one trio of grinding stones (saddle querns) made of hard sandstone, a stone ard tip, the end of an elongated wooden implement (95 x 28 x 16 mm), and some sea-shells, fragments of ostrich egg-shell and caprine bone fragments.

Flint implements in the threshing floors and micro-wear analysis

The excavation of the northern threshing floor yielded several thousand flint items, mostly from within the flint workshop and around it. The large majority was debitage, while scraper-like implements were dominant among the tools (39 out of 90, 43 %). An additional pile of 29 «scrapers» was found during the site’s survey, on the surface of Silo 22, slightly covered by wind-blown sand. Similar tools were collected in almost all threshing floors in the valley, in a few habitation sites, and in several threshing floors in the Negev Highlands. These tools present a variety of forms; some are heavy duty while others are elongated and thinner. Some specimens of both are made on transverse flakes, similar to «fan scrapers», and 19 of these 29 tools retain cortex on the dorsal face (fig. 11). All of these heavier tools are made from local, coarse-grained flint.

The occurrence of these tools in the threshing floors posed the question of whether they were used for threshing crops. In fact, flint sledge blades, smaller and thinner than the 'Uvda scraperlike tools, are well known as inserts in ethnographic material, for example from Cyprus, Turkey, Greece, the Balkans and Spain 2. They were also identified in archaeological contexts in 3rd millennium Mesopotamia, Syria and Israel (Adams, 1975; Anderson, 1994, 1998, 1999; Anderson, Inizan, 1994; Anderson, Chabot, 2001; Skakun, 1999; Ataman, 1999; Chabot, 2002) and even in PPNB sites, in Syria and Iraq (Anderson, 1994, 1998, 1999 and this volume) and possibly in Turkey (Ataman, 1999). It is clear, by comparison with microwear traces obtained with experiments and ethnographic threshing sledge inserts, that these tools were inserted in a raft-like structure, known from 3rd millennium texts (Grégoire in Anderson, Inizan, op. cit.). Traces on blades from the PPNB show that the threshing sledge, as the one described in cuneiform texts, was pulled around a threshing floor over harvested plants (Anderson, op. cit.; Ataman, op. cit.) although there is no evidence preserved indicating the appearance of the PPNB instrument.

2. Hornell, 1930; Crawford, 1935; Bordaz, 1969; Whallon, 1978; Cheetham, 1982; Pearlman, 1984, 1987; Fox, Pearlman, 1987; Skakun, 1999; Ataman, 1999. In 1990, Prof. A. Ronen, Haifa University, documented on video a craftsman in Nicosia preparing this type of sledge blade for sale. In 1993, when Avner visited Cyprus, he was told by Pearlman that the craftsman had died. Recently, J. Whittaker interviewed retired flint knappers in Cyprus (Whittaker, 1996, 1999).
Microwear analysis of the 'Uvda material, by Anderson and Chabot, included two principal types of artifacts. One was a group of 20 of the scraper-like tools from the flint workshop and from Silo 22 (fig. 11), and the other was a group of 30 glossed blades from nearby habitation sites (fig. 12), including one large Canaanite blade (fig. 13). The tools were examined under a metallographic microscope, at 100X and 200X magnification, and compared with recent examination of about fifty ethnographic threshing sledge flints from various countries and with flints used in reconstructed threshing sledges from 1995-2002 (Anderson, Chabot, 2001).

An earlier micro-wear analysis of the "scrapers" (Bueller, 1988, p. 20-23, 30), had suggested their use as inserts in a threshing sledge, for non-cereal plants, and following this observation, Avner (1998, p. 167) had suggested that they could have been used for threshing chickpea. In the present analysis, however, the results did not support the earlier hypothesis. Most tools, from both the flint workshop and from Silo 22, did not show any use traces, while some bore only faint use traces of a scraping motion, probably on wood.

Two elongated, tabular scraper-like specimens (fig. 11: second from left, fourth from left) carried diffuse microscopic abrasion traces on the retouched edges, parallel to their long axis, which could have been produced by cutting of plant material in contact with an abrasive such as soil. These traces, however, were too poorly developed and covered too limited an area of the cutting edge to point to any specific agricultural use. Since most tools did not bear any use wear, it is possible that those from the flint workshop never reached the stage of utilisation, while the pile in Silo 22 was possibly made for some symbolic or ritual purpose (cf., the papers of Viklund, Whittaker, Garine et al., this volume, for possible ethnographic parallels).

Thirty backed blades, mostly macrolunates (fig. 12a, d, f, and g), had been previously assumed to be sickle blades due to their gloss (Avner, 1998, p. 160), but had not been analysed for microwear traces. Indeed, the present microwear analysis yielded different results. Some were patinated and therefore had a poorly-visible use-wear pattern which could be identified only as from cutting
cereals in general, without further detail possible, but others bore clear, well-developed wear patterns characteristic of threshing sledge blades (ex. fig. 12b, c, e). These included uni-directional, longitudinal abrasion traces, often in the form of wide, comet-shaped grooves, and large shallow pits, and randomly-oriented scratches (fig. 12 b, c, e, and cf. Anderson, 1994, 1998, 1999; Anderson, Chabot, 2001). Most blades were apparently set parallel to the plank or raft in the underside of the sledge, but a few had traces oriented slightly obliquely to the edge, indicating a canted set in the threshing sledge. Ethnographic threshing sledges often have parallel-set blades nearer their front and middle, and canted-set blades nearer their distal ends (Anderson, Inizan, 1994). No traces of bitumen were found preserved on these blades, unlike many sledge blades from Northern Mesopotamia (see e.g. Anderson, Chabot, 2001, p. 266).

The analyzed Canaanese blade (fig. 13) is one out of only five found to date in 'Uvda. Since this type is rare in the Negev, it was most probably imported from further North. Examination by Jacques Pelegrin (personal communication, 2002) showed that it was removed from a core by a specific pressure technique, using a copper-tipped lever. The technique was first recognized on blades from Northern Mesopotamia and then reconstructed in experiments by Pelegrin (Annex in Chabot, 2002; Chabot, 2002, chap. 3). The blades from this region had been long assumed to be sickle inserts (e.g. Rosen, 1983c, 1997, p. 55-58) and indeed, some possible Canaanese blades were discovered in three wooden sickle remains at Tell Abu Al-Kharaq, Jordan (Fischer, 1994, p. 132; plate 11). However, recent micro-wear analyses on blades from EB sites has revealed a different picture. One hundred and eighty Canaanese blades from Tell 'Atij, NE Syria, all showed use-wear typical for sledge blades and not sickles (Anderson, Chabot, 2001; Chabot, 2002, chap. 5). Out of several hundred blades analyzed from 30 additional sites from northern Syria and Mesopotamia (op. cit., Anderson, Inizan 1994; Anderson, 1999), only one blade, from Tell el-Talatat V shows double use-wear (Nishiaki, Chabot, in preparation), of both harvesting and threshing while all others showed threshing wear only (Eid, personal communication). The present Canaanese blade from 'Uvda, analyzed microscopically by Anderson and Chabot, also showed the typical sledge use-wear (fig. 13b) and would have been easily inserted in a threshing raft such as that cited in cuneiform texts, which we have reconstructed and used in experiments over six seasons (fig. 14).

Fig. 12. Tools with gloss and microwear traces showing use in a threshing sledge: a, d, f, macro-lunates with gloss (small circles) from Uvda Site 166, late 3rd millennium, Early Bronze with traces characteristic of their use as inserts in a threshing sledge or raft (b, traces on tool in a (arrow)); c, traces on tool d (arrow); e, traces on tool f (arrow); g, small backed tool, with traces from use in threshing sledge, from excavated threshing floor, Locus 5 silo, near flint workshop (photos P. C. Anderson, drawings J. Courbot).

3 For the distinction and comparison between sickle and sledge use-wear see Anderson, Chabot, 2001, table 1, p. 264.
**Fig. 13.** a, complete Canaanese blade from Uvda Valley, site 124/IV; b, microwear traces characteristic of its use in a threshing raft or sledge (photos J.-D. Strich, P. C. Anderson).

**Fig. 14.** Reconstruction of a threshing instrument of the time, according to cuneiform texts and archeological data, used in experiments (drawing J. Courbet).
Micro-botanical analysis

Pollen analysis

Pollen analysis was carried out on seven soil samples: one from the excavated threshing floor's occupation level (Locus 7, fig. 9), one from the unexcavated, southern threshing floor at the same site (Locus 20, fig. 5), three samples from occupation levels of 4th-3rd millennium habitation sites, two from underneath the pavements of built silos within habitation sites and one from another unexcavated threshing floor. Although detailed pollen counting is incomplete as yet, the preliminary results greatly contribute to understanding the sites.

The first sample, from the excavated threshing floor, contained many thousands of domesticated cereal pollen, slightly over 50% of the total, while others are from typical agricultural weeds and typical desert vegetation (Chenopodiaceae, Amaranthaceae, Liliaceae, etc.). In one sample, from an occupation level of habitation Site 124/IV, cereal pollen reached 8-10%, while in others it was even lower. The principal result here, therefore, is the outstanding richness of cereal pollen in the threshing floor, in comparison to all the other samples.

Desert vegetation was dominant in all samples excluding the first, however, some pollen indicate a richer vegetation than the present one, including Tamarisk, a tree associated with wet areas which is very rare today in the 'Uvda vicinity, Plantago, Boerhaavia which represent weedy plants, and Myrtaceae, which is a Mediterranean type. Sweet water plants such as sedge (Cyperus and Scirpus spp.) were also identified, which may indicate the presence of a spring or springs in the region that no longer exist today. It seems, therefore, that the 'Uvda environment was somewhat wetter during the 4th-3rd millennia BC than it is today.

Six charcoal samples from the excavated threshing floor were recently identified under a microscope by N. Liphschitz (personal communication, 2003); they represent three species used for combustion, Atlantic pistachio, Tamarisk, and White Broom. The first two were dominant, although they are very rare today in the area, whereas the White Broom, which is common and excellent for combustion, was found in only one sample. Recovery of Tamarisk in both the pollen and charcoal records substantiates the presence of these trees, growing either along wadis or near springs, since they require a great deal of groundwater to survive.

Phytolith analysis

Phytoliths (silica deposited in plant cells which survives decay and shows cell patterns allowing identification of the plant) were analyzed from 17 soil samples from excavated and unexcavated threshing floors, from excavated habitation sites and one control sample of the present desert surface. Five samples from the excavated threshing floor (from Loci 7, 22, and 24) yielded cut cereal stem phytoliths, with smooth, regular profiles, straight and curved, and perpendicular to the stems' (longitudinal) fibers. Based on ethnographic and experimental (fig. 15a)
material, these are clear indications for the use of a threshing sledge equipped with flint blades (Anderson, 1998, 1999, p. 145; Anderson, Chabot, 2001; Anderson, this volume; see also Cummings, this volume; Khedhaier et al.; this volume). Although phytoliths of cultivated cereal are hardly distinguishable from those of grass, the sharp perpendicular cuts do indicate they are from domesticated cereal processed under a sledge. Cereal phytoliths with smooth, curved and straight cuts were also found in a sample taken below the pavement of a built silo in Site 16, and some were burnt (fig. 15b), suggesting intentional or accidental introduction of a winnowing residue with the grain (or possibly midden material). In contrast, the control sample from the desert surface, 1 km south of the threshing floor area, did not contain any cereal phytoliths, indeed almost no phytoliths of any kind.

**14C Dating**

Following the first excavation, one 14C date on charcoal from Silo 3 was early 3rd millennium calibrated BC. Recently two additional results were received. One, from a hearth at the top of the occupation level in Locus 14b (included in the general Locus 7), was around 3000 BC; the other from Locus 15b was 600 years later and most probably represents an intrusion 4. Additional thermoluminescence dates from the base of Wall 11 (the flint workshop) is now under analysis, by N. Porat. The second date mentioned here is presently the most significant. It

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4. The first date was analyzed by I. Carmi in Weizman Institute, Rehovot, Israel, the second by E. Boaretto and G. Mintz in the same laboratory. The third sample was prepared by the latter and dated by AMS in the University of Arizona, Tucson, by T. Jull. Following is the dating information: Samp. No. Locus Material BP cal. BC (1 sigma)

1. RT 648B 3 Charcoal 4250 ±50 2920-2700; 2. RT 4408 14b s 4350 ±40 3020-2900; 3. RT 4407 15b s 3870 ±90 2460-2280.

(Date n° 3 is not yet final). Calibration is based on OxCal 3.4 (Ramsey, 2000).
ANCIENT THRESHING FLOORS, THRESHING TOOLS AND PLANT REMAINS IN 'UVDA VALLEY, ISRAEL

dates the end of the occupation level, and therefore the first large cleared rock surface and the flint workshop are older than 3000 BC.

The evolution of threshing technology in 'Uvda

Although there are still some uncertainties, a general line of development can be hypothesized, based on the identification of the various stages in the site, the finds and the laboratory analyses:

The first stage in the site has a large cleared rock surface (120 m long) which is very different from the circular threshing floors in the 'Uvda Valley and elsewhere, in size and in (irregular) shape.

Theoretically, threshing could have been done there by beating (cf. Judges, 6: 13; Ruth 2: 17; Dalman, 1933, abb. 25) or by animal trampling. The labour investment in removing the top rock layer may indicate that the hard, flat surface was desired for better efficiency of both threshing and collection of the grains. At the present time, this stage is not directly dated, but based on the 14C dates of the following stage, and the prolonged use of the cleared rock surface, as indicated by the patination (see above), it probably dates from the 4th millennium BC.

In the second stage the flint workshop was built, partially on top of the cleared rock floor while cutting into Wall 7 (fig. 10) and it was followed by the accumulation of the occupation level to its north. The necessity of a flint workshop next to the threshing floor, and the reduction of the required threshing area, can be best explained by the introduction of the sledge equipped with flint blades. This is well supported now by the occurrence of abundant cereal pollen in the soil sample, and more so by the cereal phytoliths with sharp, perpendicular cuts. Since the 14C date from the hearth at Locus 7 marks the end of the occupation level's accumulation, the construction time of the flint workshop was probably late 4th millennium BC, i.e. Early Bronze I. To date, the hard evidence for the use of flint blades for equipping a threshing sledge in 'Uvda comes from habitation sites (mainly 124/IV and 166), but the persistent occurrence of the scraper-like tools (fig. 11) in threshing floors speaks for their being associated in some way
with the threshing process, despite the fact that that microwear traces on them do not correspond to use for threshing with the threshing sledge. It should be noted that no wall surrounding a circular space could be identified in the first two stages. It was only in the fourth stage that the circular threshing floor was cut into the older rock surface, and some of the cut-out rocks were used for building the surrounding wall (W. 1). This may mean that the circular, built threshing floor represents consolidation of a development process, following the invention or adoption of the sledge.

It is interesting to find that the desert people at 'Uvda already used the threshing sledge by the late 4th millennium BC, whereas people in Egypt, despite its cultural and technological advancement, did not know of the sledge during the entire Pharaonic period (Murray, 2000, p. 524-5).

An interesting philological point unites 'Uvda Valley with the threshing floors. The Bedouin-'Arabic name for the valley is Wadi 'Uqfi, and 'Uqfi means a wooden pole harnessed to the animals dragging the sledge (Avitsur, 1966, p. 76); the word originated from the Semitic root « walk about ». It is interesting to see threshing in another region carried out today with improvised threshing sledges (fig. 16). The Bedouin of the Negev and Sinai, however, thresh their yields by trampling only (fig. 17), and when questioned, were unfamiliar with the sledge and with the meaning of the valley's name. Since they could not have been the source of the geographical name, a possible alternative origin is from the Nabateans, who also used the same kind of threshing floors in the valley some 2000 years ago. Their language was Aramaic, and the root « walk about » also appears in Aramaic documents (e.g. Jean, Hoftijzer, 1965, p. 220). Therefore, it is possible that the origin of the valley's name is ancient and was passed on to the Bedouin like many other geographical names. In any case, the occurrence of an agricultural geographical name in such a harsh desert environment is unexpected, yet it accords well with the archaeological finds.
Interim conclusions

1. The preliminary results of laboratory analyses, the micro-wear, pollen and phytoliths, contributed new, additional evidence for the interpretation of the circular installations as threshing floors, and to the agricultural nature of the settlement system of the ‘Uvda Valley. This intensive settlement stands out in sharp contrast to the general environmental conditions of the southern Negev, and presents a unique combination of local conditions, with the wisdom of living developed by the desert population.

2. The concentration of threshing floors in the valley is remarkable. According to our present knowledge, this concentration is the largest and earliest identified to date in the Near East.

3. The animal-drawn sledge can be seen as an additional innovation related to the «secondary product revolution», next to the plough (Sherratt, 1981; Chapman, 1983; Davis, 1987, p. 168; Grigson, 2000). We do not suggest that the «patent» on the sledge was first «registered» in the name of the ‘Uvda Valley farmers, but it is still interesting that, in this highly arid area, the sledge was in use already by the 4th millennium BC. It is also of interest that the two earliest ard tips known to date were discovered in ‘Uvda Valley, one of them next to the flint workshop in the excavated threshing floor.

4. In the study of ‘Uvda Valley, many questions remain unanswered, and much work awaits us. Excavations of additional threshing floors and habitation sites are planned, as well as further laboratory analyses. Although the good state of preservation of these desert remains is highly promising for future progress in this research, the valley’s remains are severely threatened by the demands of military training in the area. Although great efforts have already been invested in developing an archaeological park in the valley, it is not yet clear today how many of the sites will survive in the near future, nor how many will remain accessible to visitors and researchers.

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