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TABULAR SCRAPER QUARRY SITES IN THE WĀDĪ AR-RUWAYSHĪD REGION (N/E JORDAN)

Bernd Müller-Neuhof

Introduction

Tabular scrapers (or fan scrapers) belong to the most characteristic lithic tools of the Chalcolithic and Early Bronze Age period, even though they already appear in Late Neolithic lithic assemblages (Rosen 1997: 75). They have a distribution over a broad area, including Egypt (Rizkana and Seeher 1985), North Africa (Roubet 1979), Sinai (Milshtain 1981: 119ff), the Levant (e.g. McConaughy 1980; Khalil *et al.* 2003; Rosen 1997), southeastern Anatolia and northeastern Syria (Algaze 1989: 581; Schmidt 1996: 85ff.) and the Middle Euphrates (Müller-Neuhof n.d.; Schmidt n.d.). There are also some hints on the utilization of these tools in Southern Mesopotamia in the Uruk period, equivalent to the Late Chalcolithic period in the west (Müller-Neuhof 2000: 144, Taf. 110).

Tabular scrapers are characterised by their more or less hand-sized flat appearance and a more or less full cortical cover on the dorsal side. The plans of these tools range from fan-shaped towards more circular to elongated oval or tongue-shaped plans. Retouch caused by knapping or utilization can be observed on all edges.

The function of these tools is seen in the context of caprine pastoralism. It is expected that hide-working and shearing are activities for which these tools were used (Henry 1985: 372), although butchering activities are also proposed (Rosen 1997: 74 quoting McConaughy 1979: 304).

Despite the appearance of tabular scrapers in several Chalcolithic and Early Bronze Age sites in the Near East, the origin of the blanks and the way they were produced remained unclear for a long time. Neither tabular scraper cores nor traces of primary production in order to produce tabular scraper blanks were detected in excavated settlements.

Some small quarry sites with scattered finds of flint nodules with negative scars on their surface, bearing the shape of tabular scrapers, were found in the Negev and Sinai (Rosen pers. comm. June 2005 and Rosen 1997: 75), and these discoveries gave a first impression how these tools were produced. But these few finds of "tabular scraper cores" never explained the large number of tabular scrapers in Chalcolithic and Bronze Age settlements, especially west of the Jordan River.

After Gary Rollefson first noted tabular scraper cores at the Jafr basin in the late 1970s early 1980s (Quintero *et al.* 2002: 18 quoting Rollefson 1980: 14), it was in 1997 and 1999 when Leslie Quintero and Phil Wilke discovered several quarry sites with an enormous number of tabular scraper cores on the northeastern ridge of the al-Jafr Basin in southern Jordan. This was a discovery that resulted in the recognition of the great importance of these artefacts for the Chalcolithic and Early Bronze Age period (Quintero and Wilke 1998; Quintero *et al.* 2002). Parallel to their discoveries, Sumio Fuji discovered two comparable quarry sites in the northern area of the al-Jafr Basin, where he also undertook some excavations (Fuji 1998-2003).

With these discoveries it became clear that the largest part of tabular scraper blank production occurred on large quarry sites in nearly "industrial" dimensions, in view of the number of produced blanks, which were traded over long distances as valuable goods.

Comparable sites were not known in other areas. But it should be mentioned that scattered finds of few tabular scraper cores are known from the Wādī Jilāt area in Northern Jordan, discovered in the 1980s (Baird 2001: 649). This situation changed in 2000.

The ar-Ruwayshid Project

In the framework of a joint cooperation project between the Department of Antiquities (DoA) and its Director-General Fawwaz al-Khraysheh and the Orient Department of the German Archaeological Institute (DAI) in Berlin with its director Ricardo Eichmann, a brief two-day survey in the Basalt Desert (al-Harra) and in the area of the Wādī ar-Ruwayshid (al-Hamād) in northeastern Jordan was carried out in 2000 in order to check the archaeological potential in this area for future projects¹. During this survey a large area covered with large fragments of flint nodules bearing negatives of tabular scraper blanks was discovered on top of an elevation in the Wādī ar-Ruwayshid area. It became clear that this site, named RU 27², is a quarry site for obtaining tabular scraper blanks. This is the first known large quarry site for tabular scrapers in northeastern Jordan. The short stay did not allow a detailed analysis, therefore another visit for an intensive documentation of this site was planned. This was carried out in February 2006 with a small survey within the same co-operational framework³.

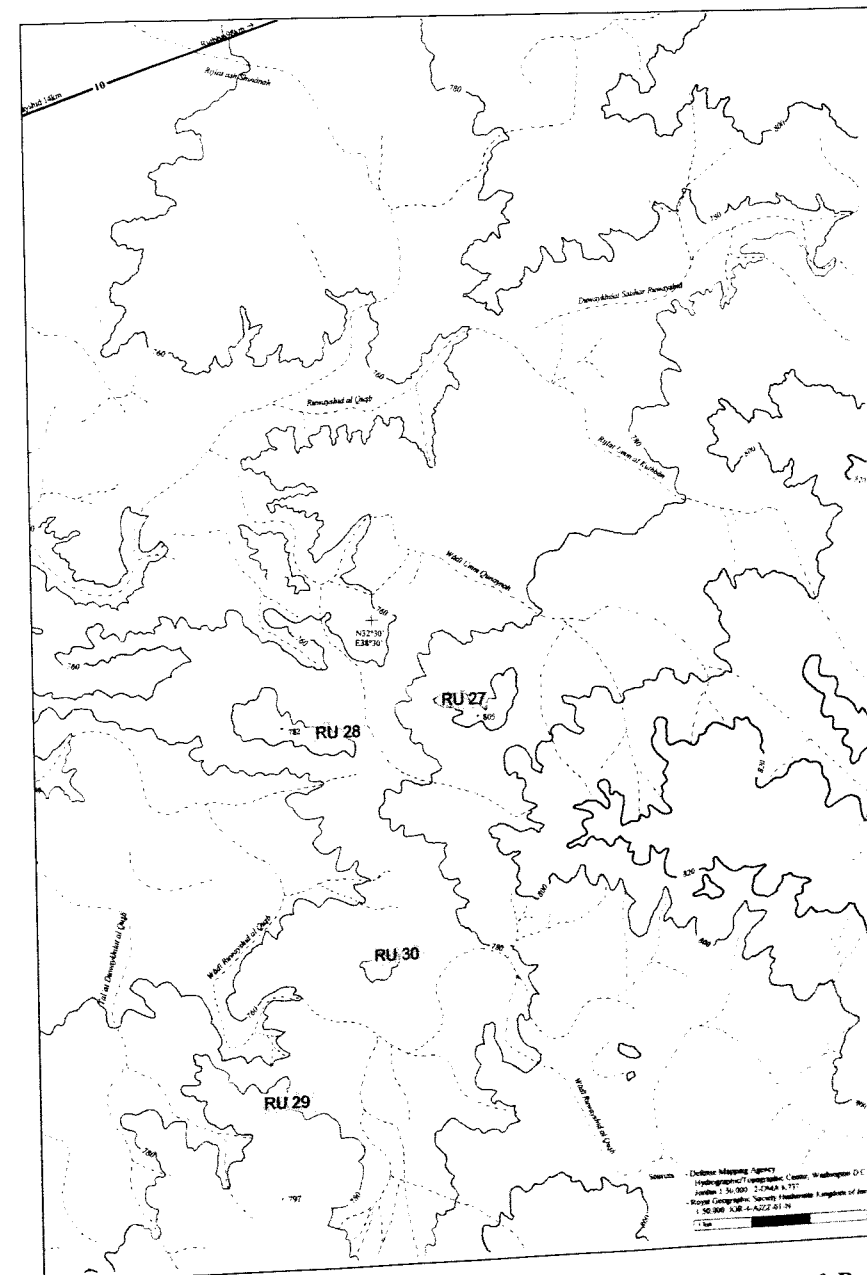
Location and Description of RU 27

The site RU 27 (Fig. 1) is located east of the town ar-Ruwayshid (H4) (Fig. 2) on top of a ca. 1km (aerial distance) long curved ridge or but-

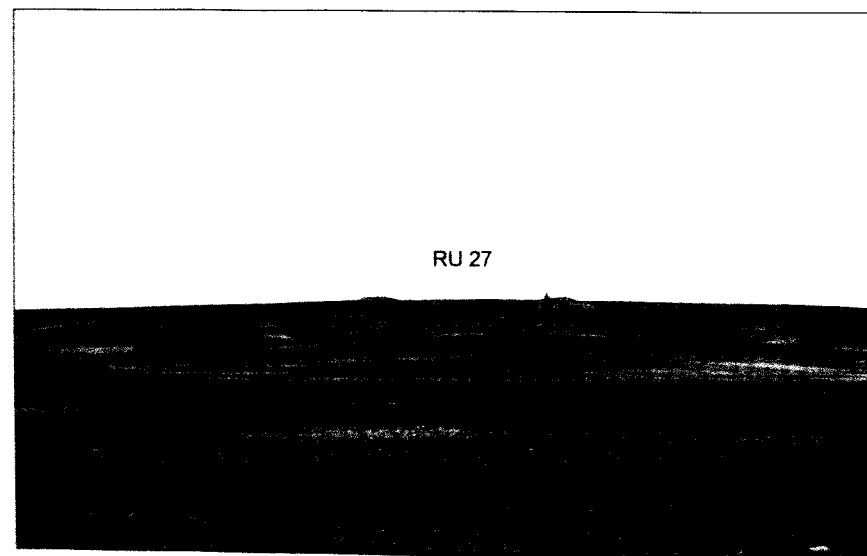
te bordered by wadis, being part of the ar-Ruwayshid wadi system, in the north (Wādī Umm Qunayna) and south. Geologically the buttes are characterised by Eocene / Palaeocene limestone layers with embedded chert layers (Bender 1968: Map). A *rujum*, possibly a grave or landmark cairn, close to the western edge of the elevation was chosen for defining the site coordinates, which are N32°29'16.4 "E038°30'46.4" (WGS 84) (measured by GPS). According to a topographical point in the centre of the butte this point lies 802m asl.

On our first visit in 2000 we stayed just on one of the ends of this prominence where a quarry site is located. On the 2006 survey we could observe that about 10 quarry sites were located on the top of the ridge close to its edges. The borders of these sites are more or less clearly defined. Compared to the surrounding flat "Hamada-surface" these quarrying areas are characterised by a rough surface comprising a concentration of white limestone blocks in the centre (Fig. 3) and large tabular scraper cores represented by pieces of broken flint nodules bearing several negative scars of tabular scraper blanks (Fig. 4).

The extension of the production areas are defined by the absence of, or very little evidence for, tabular scraper blank production between the different production areas, which in some



2. Map of ar-Ruwayshid area with the surveyed quarry sites RU 27 – RU 29 and the Neolithic 'burin' site RU 30.



1. View on RU 27 from north. On top two 'rujums' are visible.

cases complicated a proper identification of the limits of these production sites. Therefore the mentioned number of ca. 10 different production areas is an approximate quantity. The production areas have different expanses, some are more than 100m long⁴, others just ca. 30m. The width is always around 30m, which seems to correlate with the occurrence of usable flint-nodules cropping out at the edges of the elevation below a specific layer of smaller sized limestone blocks (Fig. 5).

Methods of Raw Material Extraction and the Character of Primary Production.

The extraction of raw material occurred on the edges and on top of the butte close to these edges by digging out more or less block-shaped pieces of limestone of the upper matrix covering the lower lying flint-nodule layer. After this was done the flint-nodules were extracted in larger pieces (between ca. 30 and 80cm length) (Fig. 6). It can be assumed that a combination of horizontal quarrying from the escarpment and ad-

4. All measurements were taken with the GPS.

1. Participants were Salem Diyab (DoA), Ricardo Eichmann (DAI) and Bernd Müller-Neuhof (DAI).
2. The numbering of the sites (e.g. RU27) is based on co-ordinates of archaeological sites and specific topo-

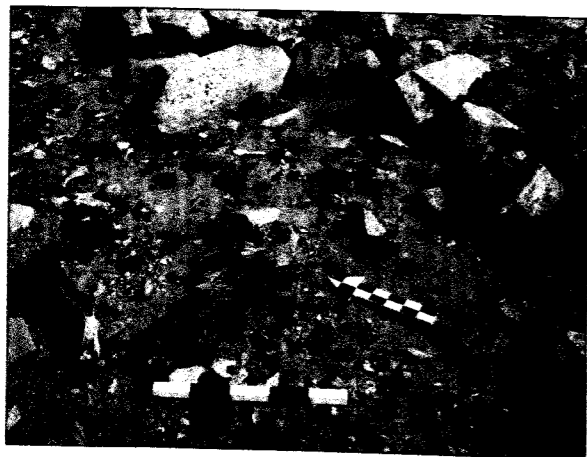
graphical features taken with the GPS in 2000.
3. Participants of the 2006 season were Hussein Askar (DoA) and Bernd Müller-Neuhof (DAI).



3. RU 27: tabular scraper quarry site. The white area in the centre of the area shows the concentration of limestone.



4. RU 27: broken flint-nodules bearing tabular scraper blank negatives.



5. RU 27: outcropping flint-nodules and overlying smaller sized limestone blocks.

ditional "harvesting" was undertaken to obtain the raw material. Interestingly, a lower (older) limestone layer, cropping out on the lower parts of the slopes of the butte, characterised by large



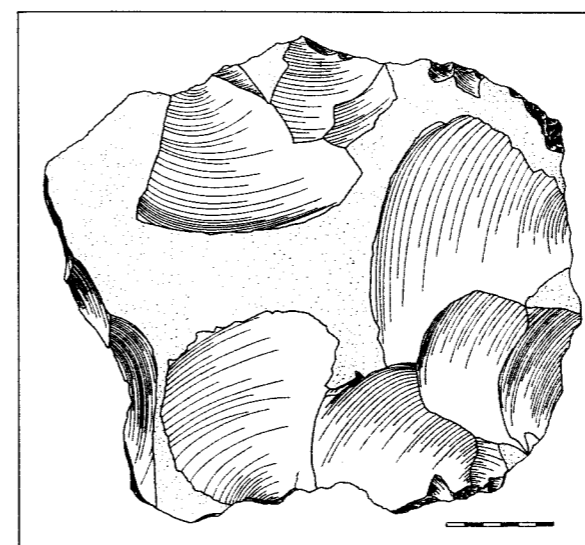
6. RU 27: Flint-nodule bearing tabular scraper negatives.

round limestone nodules (Fig. 7) covering a tabular flint layer does not show any evidence of fan-scraper blank production.

Tabular scraper cores were found abundantly (Fig. 8), and several tabular scraper blanks were found too (Fig. 9a-b). Some of them can be classified as "waste" due to their atypical thickness and irregular shape. Others showed rough traces of (use-) retouch (Fig. 9c-d). In some parts within the production areas the floor was also covered with small flakes stemming from blank production as well as core preparation (Fig. 10). Besides the products of tabular scraper blank production, several large and thick blades were observed that had intentional or use-retouched lateral edges (Fig. 11). It seems, contrary to the tabular scraper blanks, that these blanks were not designated for export. They were used as tools on the site.



7. RU 27: lower limestone layer characterised by large limestone nodules.



8. RU 27: tabular scraper blank core on a flint block (Thickness: 3,5cm).

Economic Output of the Quarry Sites on RU 27

In order to evaluate the economic output of the tabular scraper blank production on RU 27, two tabular scraper blank production areas were chosen for counting the negative flake scars on the cores. All production areas are characterised by a high concentration of tabular scraper cores which suddenly drops at the edges of these areas. The first area (area A) had an area of ca. 4,000m², the second (area B) of ca. 800m².

Within area A altogether 5 squares (2x2 metres) for counting negatives were defined. They were located in the centre, half way between the centre and the edge, and on the edge of the production area. Within these squares all negatives were counted. The number of negatives was between 10 and 40 negatives per square (per 4m², or 2.5 to 10 negatives per m²), which makes an average of 6.25 negatives per square metre. Therefore we can assume that at least 25,000 tabular scraper blanks were produced in area A.

The same sampling procedure was applied for area B, again in four squares (2x2 metres) located in the centre, half way between the centre and the edge, and at the edge of area B. The number of flake scars per square in this area was between 10 and 21 negatives per square (2.5 to 5.25 per m²), which makes an average of 3.8 per m². Therefore we can assume that at least 3,000 tabular scraper blanks were produced in the much smaller area B. These are just two examples of the production areas on RU27, keep-

ing different concentrations of negatives on the other production areas on RU27 and their different sizes in mind (some are smaller but others are even larger), it is possible that at least several 100,000 fan-scraper blanks were produced on RU 27.

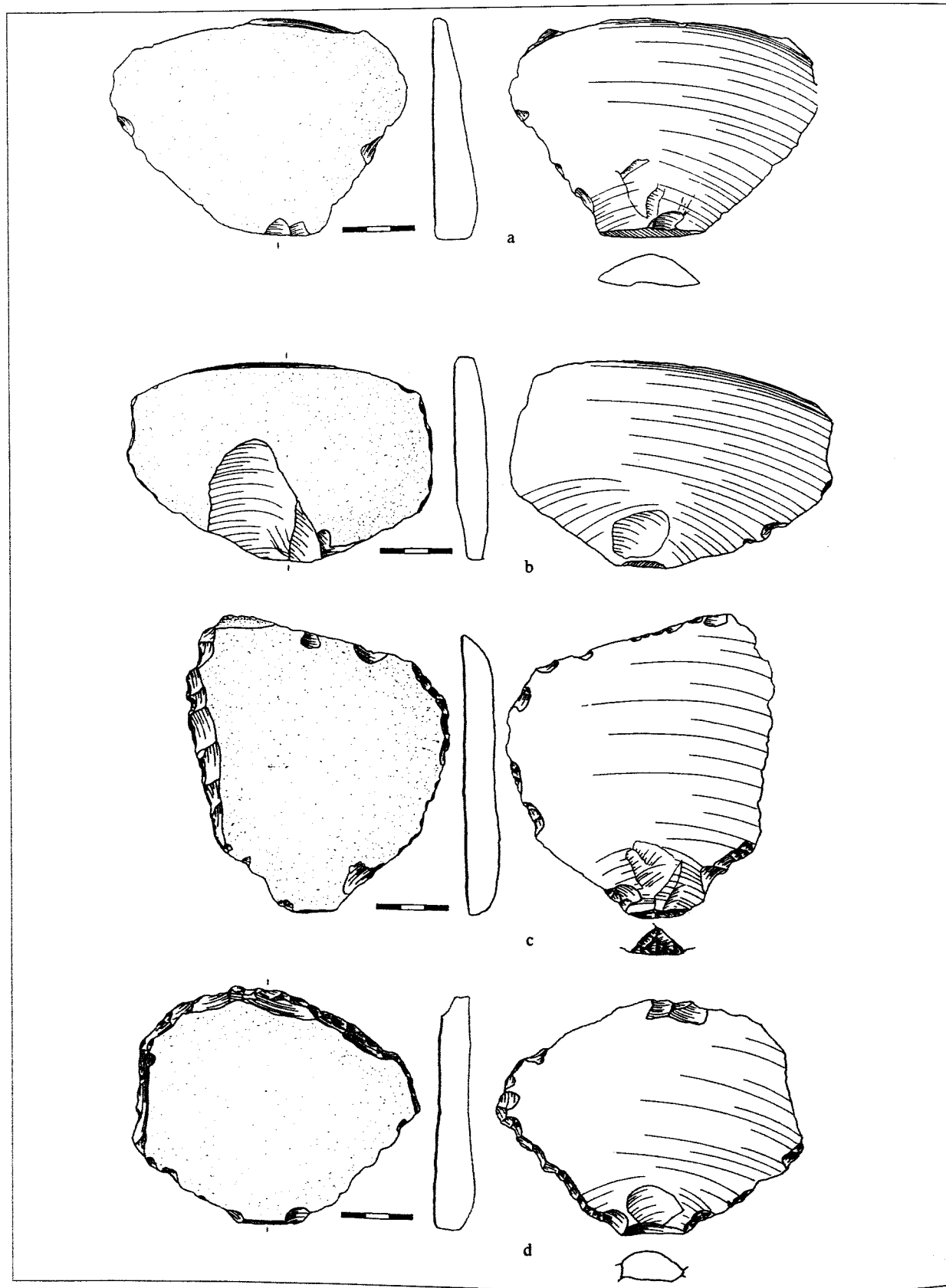
Identification of Other Tabular Scraper Quarry Sites in the Vicinity

During a tour in the vicinity of RU 27, three other archaeological sites on neighbouring buttes were discovered. Two of them (RU 28 and RU 29) are also tabular scraper quarry sites, and the third one (RU 30) is a small Neolithic burin site.

The site RU 28 (N32°28'55.5" E038°29'43.9": ca. 782m asl.) is located on the opposite site of the wadi, west of RU 27 (Fig. 12). This butte has also a *rujum* close to its southern end. The same situation concerning the evidence for tabular scraper blank production as at RU 27 could be observed here. Here also production areas are located on top of the butte close to the edges and in contact with outcropping flint-nodules (Fig. 13) partly covered by a layer of block-shaped limestone. Due to the short time a detailed documentation of this and the following sites was not possible. Our impression is that tabular scraper blank production on RU 28 resembles the production on RU 27, although it appears that the concentration of tabular scraper cores on RU 28 is somewhat lower. Besides the evidence for tabular scraper blank production, some burins were also found on RU28, giving a hint to the utilization of this site in the Neolithic (PPNB-PN).

South of RU 27 and RU 28 on the other edge of Wādī Ruwayshid al-Qūsh, another butte was located and named RU 29 (N 32°27'48.9" E 038°31'41.5"; ca. 780m asl.) (Fig. 14). Three *rujums* occur on this elevation close to its northern edge. In the area around these *rujums*, close to the edge of the butte, traces of tabular scraper production (Fig. 15) and the same geological situation as at RU 27 and RU 28 was noted (Fig. 16). Here the concentration of fan-scraper cores also seems to be lower compared to RU 27.

The impression gained on RU 27 that the production of tabular scraper blanks was linked to a specific layer of flint-nodules covered by a layer of block-shaped limestone was confirmed



9. RU 27: not used tabular scraper blanks (a-b) and retouched tabular scraper blanks (c-d).



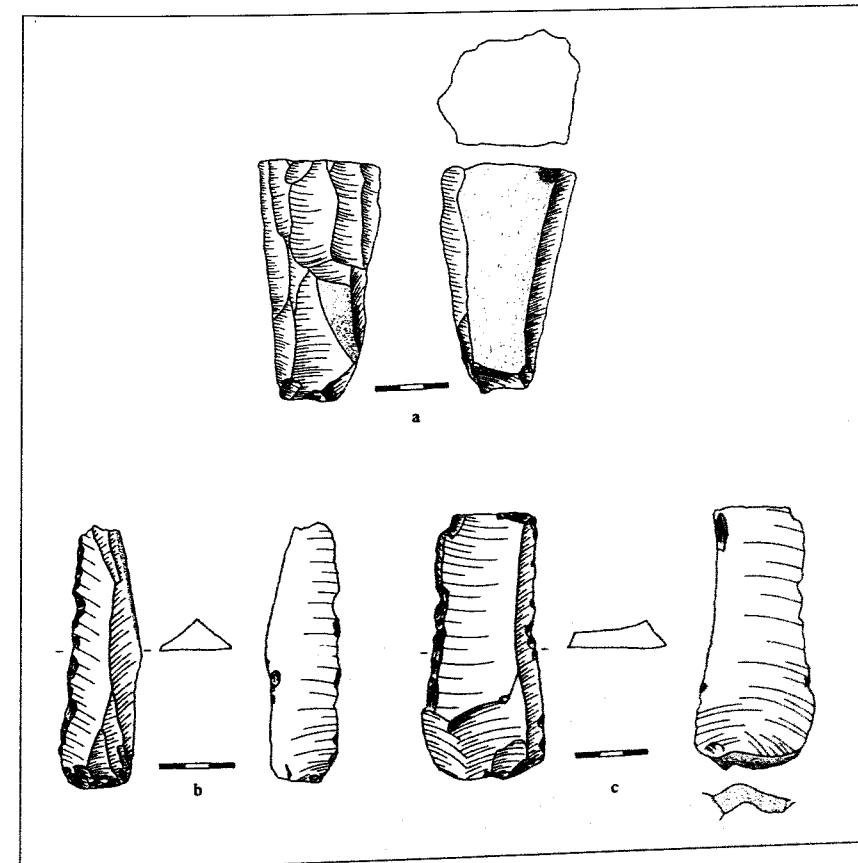
10. RU 27: flaking area on tabular scraper blank production site.

on the sites RU 28 and RU 29. All the quarrying and production activities were carried out on top of the buttes close to the edges and a few metres downhill in the area of the outcropping layers of block-shaped limestone, overlying a layer of flint nodules. In the vicinity of nodule shaped limestone, cropping out on the lower parts of the slopes, no trace of tabular scraper blank production was observed.

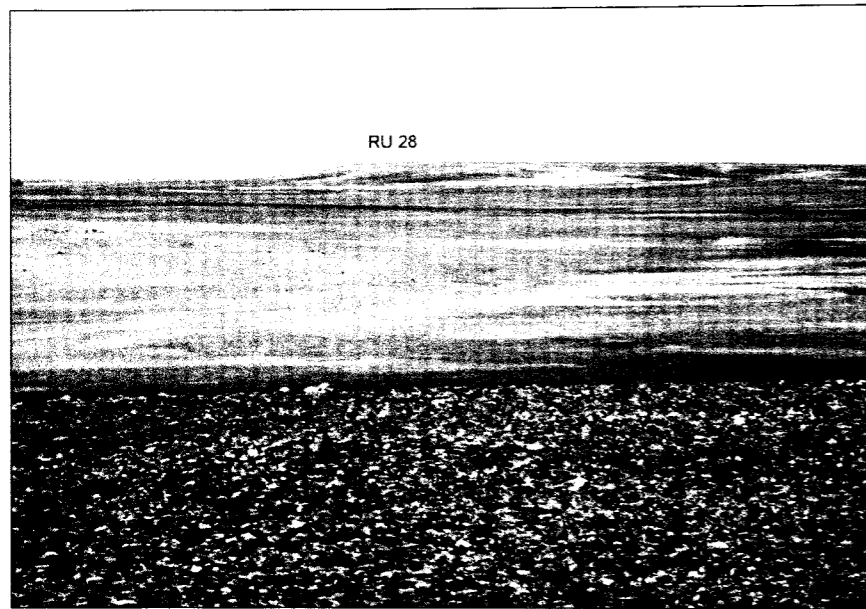
To confirm this observation another butte, labelled RU 30 (N 32°27'58.3" E 038°31'24.7"; ca. 765m asl.) was visited, which is located in the Wādī Ruwayshid al-Quṣb between RU 27 and RU 29 (Fig. 17). This butte is much lower than the others, and it is characterised by a more or less round shape, bordered by a band of large limestone nodules. No hints on fan-scraper blank production were found here, instead some blades with burin-facets were found, comparable to similar material from other so called 'burin-sites' in the eastern desert (e.g. Betts 1987), which gives a clue to date the utilization of this site in the Neolithic period (PPNB – PN).

Dating and Conclusion

These sites are difficult to date due to the fact that the utilization of tabular scrapers reaches chronologically from the Late Neolithic to the Early Bronze Age (see Rosen 1997: 75), but it is possible that the exploitation of the flint layers on these sites, which shows a sort of industrial standard, occurred in the Chalcolithic to EB III period (ca. 5000-2700BC). During this period tabular scrapers, especially fan-shaped tabular



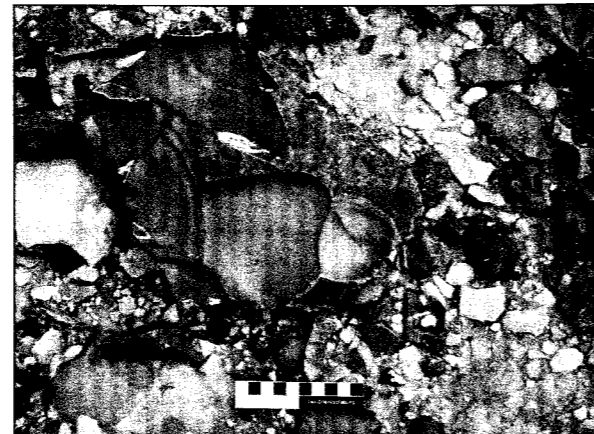
11. RU 27: blade core (a) and large irregular retouched blades (b-c).



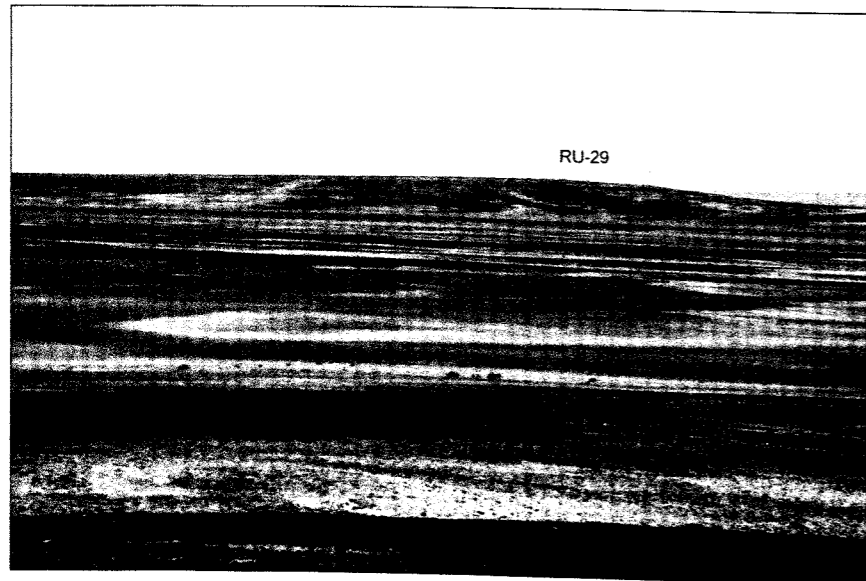
12. View on RU 28 from east.



13. RU 28: outcropping flint nodules and traces of tabular scraper blank production.



15. RU 29: tabular scraper blank core and flakes.



14. View on RU 29 from north.



16. RU 29: outcropping flint-nodules below a layer of small limestone blocks.

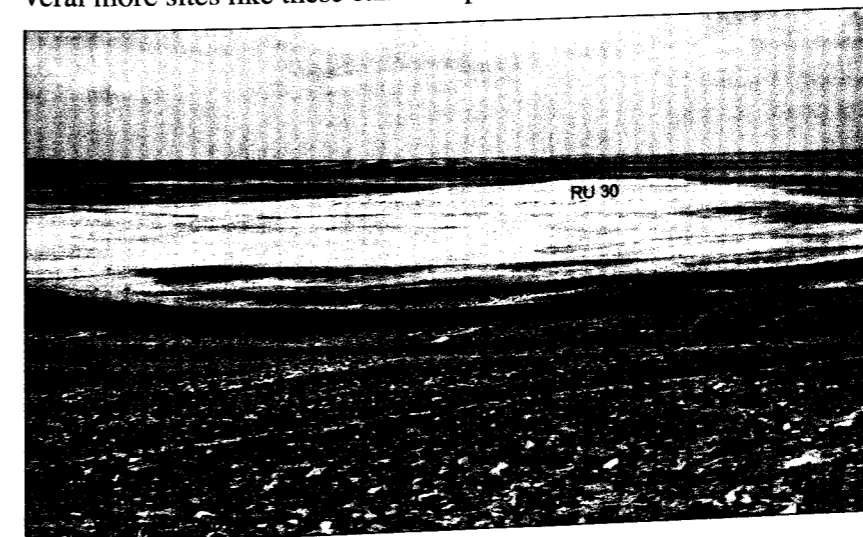
scrapers, are common in excavated settlements of this period in the west, illustrating their high economic value, which is also characterised by the utilization of specific sorts of high quality flint for the production of these tools.

It is most probable that the production and trade of these items occurred within a pastoral economy that also used the steppe and desert regions in the east during their annual shifts of pastures. The wadis around the quarry sites offer very good pastures in springtime, even at present. During visits to these pastures, tabular scraper blanks were produced and afterwards, while moving with the herds, they were transported over long distances towards settled areas, for example towards the west.

The al-Jafr and the ar-Ruwayshid sites probably represent only a small part of all quarry sites for tabular scraper blank production. Several more sites like these can be expected to be

located in the deserts of Jordan and neighbouring regions, where hundreds of thousands of tabular scraper blanks were produced. This raises the question: where did all these tabular scrapers go? The number of tabular scrapers found in towns and rural settlements is surprisingly low, forming just a tiny fraction of all tabular scrapers that presumably were produced on quarry site like these.

The assumed close relationship of these tools with animal husbandry, especially wool shearing, butchering and hide working, gives us a possible indication of the whereabouts of most of these items. It might be that tabular scrapers, especially worn and broken examples, could be found in great numbers in campsites of Chalcolithic and Early Bronze age pastoral nomads, where butchering, shearing and hide working activities occurred. Sites like these existed in the arid regions, but they are difficult to date. Additionally, camp sites of pastoral nomads also existed close to rural settlements and towns especially in the west, where these groups remained with their herds for a specific time in the year during the annual movements among pastures; not least because pastoral nomads also relied on goods from sedentary societies, especially agricultural products, which they received in exchange for such animal products as wool, skin and meat. For logistical reasons, because it would have been beneficial to maintain close proximity to potential customers of the animal products in the towns, it is expectable that activities producing these animal products for exchange mostly occurred close to these settlements, which means that ta-



17. View on the 'burin' site RU 30 from south (from RU 29).

bular scrapers and their remains should appear there in greater numbers.

It becomes clear that the research on tabular scraper quarry sites is just at its beginning. More quarry sites must be discovered, including in other regions, and the relationship of the cores to specific flint layers should be determined geologically and geographically, whilst palaeontological (e.g. microfossil analysis) methods have to be developed in order to identify the geological deposits of tabular scrapers found in settlements. All of this would lead to new possibilities for examining prehistoric trade networks.

Additionally, archaeological work in Chalcolithic and EB rural settlements and towns should focus on their surrounding areas, in the close vicinity, in order to locate the existence of possible camp sites and tabular scraper remains.

Acknowledgements

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B. Müller-Neuhof
c/o Deutsches Archäologisches Institut
Orientabteilung
Podbielskiallee 69-71
14195 Berlin-Germany

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